

# APPENDIX A

BEFORE THE MISSISSIPPI COMMISSION  
ON ENVIRONMENTAL QUALITY

MISSISSIPPI COMMISSION ON  
ENVIRONMENTAL QUALITY

COMPLAINANT

VS.

ORDER NO. **5823 10 1**

CITY OF JACKSON  
PO BOX 17  
JACKSON, MISSISSIPPI 39205-0017

RESPONDENT

AGREED ORDER

COME NOW the Mississippi Commission on Environmental Quality ("Commission"), acting through the staff and Executive Director of the Mississippi Department of Environmental Quality ("MDEQ"), Complainant, and the City of Jackson, Respondent, in the above captioned cause and agree as follows:

1.

This Agreed Order addresses the following violations relating to Respondent's Savannah Street Waste Water Treatment Facility (the "SSWWTF") and its associated collection system:

- A. On March 21, 2009, a 100 million gallon per day ("MGD") influent pump failed at the SSWWTF. On March 27, 2009, discharges of untreated wastewater were observed from manholes located near the State Fairgrounds, the east end of High Street, and at Eubanks Creek near I-55 as a result of such wastewater backing up into the collection system due to the pump failure. On March 30, 2009, Respondent notified Complainant of these discharges that occurred as a result of a 100 MGD pump failure. Water samples taken on April 2, 2009 from the Pearl River indicated that impacts, as a result of the discharges, violated water quality

standards. Respondent was contacted by Complainant on April 20, 2009, and notified that these discharges constituted violations of NPDES Permit No. MS0024295 (the "Permit") (see Conditions T-24: Proper Operation, Maintenance, and Replacement, T-25: Duty to Mitigate, and T-30: Bypassing- Prohibition of Bypass.)

- B. On July 22, 2009, MDEQ staff observed Respondent diverting a portion of the SSWWTF's influent wastewater into the storm diversion cells located at the SSWWTF. On July 22, 2009, Respondent also released wastewater from the storm diversion cells and blended this flow into the main effluent from the SSWWTF. This blended flow was then discharged from the SSWWTF's Outfall 001. Respondent's actions were the result of the SSWWTF not having sufficient storage and/or treatment capacity to handle the volume of influent wastewater. The SSWWTF's storage and/or treatment capacity has been limited by the accumulation of excess sludge and solids in the storm diversion cells and in the aeration basins and secondary clarifiers within the SSWWTF as a result of, at least in part, Respondent's sludge handling facilities being unavailable to properly process the sludge and solids for disposal. This accumulation of sludge and thus this diversion of wastewater on July 22, 2009 constitutes a violation of the Permit (see Conditions T-24: Proper Operation, Maintenance, and Replacement and T-25: Duty to Mitigate).
- C. Mississippi Code 49-17-29 prohibits the discharge of any wastes into any waters of the State which reduce the quality of those waters. Complainant notified Respondent of the following discharges within the collection system:
- i. On August 11, 2009, MDEQ confirmed a discharge of untreated wastewater from a manhole located off Browning Street near Clinton. The discharge continued several days following MDEQ notifying Respondent of the discharge. Water samples taken on August 20, 2009 from Bakers Creek indicated that impacts, as a result of the discharge, violated water quality standards.
  - ii. On August 24, 2009, MDEQ confirmed a discharge of untreated wastewater from a lift station near the Brookwood Subdivision in south Hinds

County. The discharge continued several days following MDEQ notifying Respondent of the discharge. Water samples taken on August 27, 2009 from an unnamed tributary entering Trahon Creek indicated that impacts, as a result of the discharge, violated water quality standards.

- D. On June 24, 2009, Complainant notified Respondent that land application activities of wastewater treatment sludges had been conducted on properties without a current, valid permit in violation of Section II of the Mississippi Nonhazardous Waste Management Regulations. Further, Respondent failed to timely submit applications for permit reissuance for the Jackson Landfill, Parcel 2 and Parcel 3 Landfarm, Jackson Biosolids Beneficial Agricultural Application Sites, and the Berry Land Application Site in violation of Solid Waste Management Permit No. SW02501A0005, No. SW02501C0420, No. SW0250030464, and No. SW0250030468, respectively.

2.

In lieu of a formal enforcement hearing concerning the specific violation(s) listed above, Complainant and Respondent agree to settle this matter as follows:

- A. Respondent agrees to pay and Complainant agrees to accept a civil penalty in the amount of \$240,000.00. Respondent shall pay this penalty to MDEQ within thirty (30) days after this Agreed Order has been executed by the MDEQ Executive Director, or her designee (the "Effective Date").
- B. On or before August 31, 2010, Respondent shall submit to MDEQ for approval a Sewer Overflow Response Plan ("SORP") that will establish timely and effective methods and means of: (a) responding to, cleaning up, and/or minimizing the impact of all sanitary sewer overflows ("SSOs"); (b) timely reporting the location, volume, cause, impact, and other pertinent information of all SSOs to the appropriate regulatory agencies; and (c) notifying the potentially impacted public.
- i. For purposes of the SORP and this Agreed Order, the following definitions

shall apply:

- (a) "SSO" shall mean an overflow, spill, or release of wastewater from Respondent's Sewer System including: (i) Unpermitted Discharges; (ii) any overflows, spills, or releases of wastewater, including those that may not have reached waters of the State or waters of the United States; and (iii) all Building Backups.
- (b) "Unpermitted Discharge" shall mean a discharge of pollutants which reaches waters of the United States or the State from (i) the Sewer System, (ii) a Wastewater Treatment Plant ("WWTP") through a point source not specified in an NPDES Permit, or (iii) a WWTP which constitutes a prohibited Bypass.
- (c) "Building Backup" shall mean a wastewater backup into a building that is caused by blockages, malfunctions, or flow conditions in the Sewer System. A wastewater backup into a building that is caused by a blockage or other malfunction of a Private Lateral is not a Building Backup.
- (d) "Sewer System" shall mean the Wastewater Collection Transmission Systems ("WCTS") and the WWTPs.
- (e) "Wastewater Collection and Transmission Systems" or "WCTS" shall mean the municipal wastewater collection and transmission systems, including all pipes, force mains, gravity sewer lines, lift stations, pump stations, manholes and appurtenances thereto, which are owned or operated by Respondent.
- (f) "Wastewater Treatment Plant" or "WWTP" shall mean devices or systems used in the storage, treatment, recycling, and reclamation of municipal wastewater. For purposes of this Agreed Order, this definition shall include all facilities owned, managed, operated, and maintained by Respondent, including but not limited to the following facilities: Savanna Street WWTP, Trahon/Big Creek WWTP and Presidential Hills WWTP.

- (g) "Bypass" shall have the meaning set forth at 40 C.F.R. § 122.41(m).
  - (h) "Private Lateral" shall mean that portion of a sanitary sewer conveyance pipe, including that portion in the public right of way, that extends from the wastewater main to the single-family, multi-family, apartment or other dwelling unit or commercial or industrial structure to which wastewater service is or has been provided.
- ii. Within twenty-four (24) hours of the time Respondent first becomes aware of an SSO, Respondent shall provide in an oral report to MDEQ the location of the SSO by street address or any other appropriate method (i.e., latitude-longitude). The oral report shall be given to MDEQ's Environmental Compliance and Enforcement Division's Municipal and Private Facilities Branch at (601) 961- 5171.
- iii. Respondent shall also provide a written report to MDEQ for all SSOs within 5 days of the time Respondent becomes aware of the SSO. Respondent shall maintain a copy of any written reports prepared pursuant to this subparagraph for a period of not less than five (5) years from the date of the SSO. The written report shall contain the following:
- (a) Location of the SSO by street address, or any other appropriate method (i.e., latitude-longitude);
  - (b) Estimated date and time when the SSO began and stopped, or if it is still an active SSO, the anticipated time to stop the SSO;
  - (c) Steps taken to respond to the SSO;
  - (d) Name of the receiving water, if applicable;
  - (e) An estimate of the volume (in gallons) of sewage discharged;

- (f) Description of the Sewer System component from which the SSO was released (such as manhole, crack in pipe, pump station wet well or constructed overflow pipe);
- (g) Estimate of the SSO's impact on public health and to water quality in the receiving water body;
- (h) Cause or suspected cause of the SSO;
- (i) The date of the last SSO at the same location;
- (j) Steps taken or to be taken to reduce, eliminate, and prevent reoccurrence of the SSO and a schedule of major milestones for those steps; and
- (k) Report of all notifications to the public and other agencies or departments.

If submitted within 24 hours of the SSO, this written report may be submitted in lieu of providing oral notification as stated in 2.B.ii. above.

- iv. Respondent shall maintain for all SSOs, for a period of not less than five (5) years from the date of the SSO, all records documenting the steps that have been and will be taken to prevent the SSO from recurring, including work order records associated with investigation and repair activities related to the SSO. Respondent shall also maintain for a period of not less than five (5) years from the date of the SSO a list and description of complaints from customers or others regarding an SSO.
- v. The SORP shall provide procedures for responding to SSOs to minimize the environmental impact and potential human health risk of SSOs. The SORP shall include, but not be limited to, the following:
  - (a) A detailed description of the actions Respondent will undertake to immediately provide notice to the public (through the local news media or other means including signs or barricades to restrict access) of the SSO;

- (b) A detailed description of the actions Respondent will undertake to provide notice to appropriate federal, state or local agencies/authorities;
- (c) A detailed plan (including the development of response standard operating procedures) to minimize the volume of untreated wastewater transmitted to the portion of the Sewer System impacted by the events precipitating the SSO to minimize overflow volumes;
- (d) For Building Backups, the SORP shall include a detailed plan describing the standard operating procedures to be followed by Respondent personnel in responding, including:
  - (1) A description of methods for communicating with customers about how to report Building Backups and how to obtain clean-up;
  - (2) A description of Respondent's response to Building Backups, including:
    - (A) The timeframe for responses;
    - (B) The measures taken to cleanup Building Backups caused by conditions in Respondent's Sewer System. Such measures shall include procedures necessary to disinfect and/or remove items potentially contaminated by Building Backups, and shall include wet vacuuming or other removal of spillage, wiping floors and walls with cleaning solution and disinfectant, flushing out and disinfecting plumbing fixtures, carpet cleaning and/or replacement and other appropriate measures to disinfect and/or remove items potentially contaminated by Building Backups; and
    - (C) The measures taken to correct or repair conditions in the Sewer System causing or contributing to Building Backups; and

- (3) A description of Respondent's follow-up process to insure adequacy of cleanup.
  - (e) A detailed plan of the resources to be used to correct or repair the condition causing or contributing to the SSO;
  - (f) A plan to ensure the preparedness, including response training of Respondent's employees, contractors, and personnel of other affected agencies necessary for the effective implementation of the SORP in the event of a SSO;
  - (g) Identification of SSO locations within the sewershed served by each pump station and those locations at which a SSO is likely to occur first in the event of pump station failure for each pump station; and
  - (h) Pump station-specific emergency procedures, bypass/pump-around strategies, and estimated storage capacity (i.e., maximum volume of sewage that can be stored in the event of a pump station failure or repair without causing a SSO and estimated time during which sewage can be stored before a SSO will occur). In the event that a repair may cause or lengthen the time of a SSO, the SORP shall provide a procedure for determining when additional storage or pump around will be needed.
  
- vi. Respondent shall provide adequate training necessary for its employees, contractors, and personnel of other affected agencies to effectively implement the SORP. The SORP shall provide training guidelines to ensure adequate response training is provided to management and field personnel responsible for responding to SSOs. Respondent shall establish procedures, and provide adequate training to response personnel for estimating volumes of wastewater released during SSOs.
  
- vii. Respondent shall identify and include in the SORP a list of those SSO locations within the sewershed that has been recorded as overflowing more

than once in the past two (2) years and those locations at which a SSO is likely to occur first in the event of pump station failure for each pump station. Respondent shall establish routine inspection routes to be performed after each rain event. The inspection routes shall include all SSOs identified as occurring more than once in the past two (2) years and those pump stations that are not monitored at a central location via telemetry, SCADA, or other remote monitoring device.

- viii. Respondent acknowledges that the SORP to be implemented as a part of this Agreed Order may be deemed interim in nature despite being approved by MDEQ and, as a result, MDEQ and/or the United States Environmental Protection Agency may require additional measures to be included in the SORP.
- C. On or before August 31, 2010, Respondent shall submit to MDEQ for approval a written plan to address the proper maintenance of all pumps in the influent pump station at the SSWWTF. This plan should also include a contingency plan to be implemented in the event of pumps in the pump station failing or otherwise being taken off line to ensure adequate influent flow into the SSWWTF.
- D. On or before November 30, 2010, Respondent shall submit to MDEQ for approval a Sludge and Solids Removal Plan that shall provide for the removal and proper disposal of excess, accumulated sludge/solids from the SSWWTF's storm diversion cells. The Sludge and Solids Removal Plan shall identify the minimum amount of sludge/solids that are to remain in the storm diversion cells, so as to achieve the maximum design capacity of the storm diversion cells as certified by a Professional Engineer licensed in the State of Mississippi. The Sludge and Solids Removal Plan shall also include, at a minimum, a schedule for completion of removal and disposal activities not to exceed September 1, 2011. The plan shall take into account the flow during the sludge/solids removal so as to minimize the environmental impact of the removal process. The Plan shall provide for Respondent to demonstrate that the minimum amount of sludge to remain in the

storm diversion cells has been achieved using acceptable measuring techniques. The plan shall also address sludge management to include proper storage and proper disposal. After Respondent has commenced sludge/solids removal, the Plan shall also provide for Respondent to submit weekly Status Reports to MDEQ that shall include, at a minimum, the hours of sludge removal operations performed, the quantity of sludge/solids removed, any operational setbacks experienced (weather, equipment failure, etc.), and an analysis of Respondent's progress to complete work under the Plan on or before the September 1, 2011 deadline.

- E. On or before November 30, 2010, Respondent shall submit to MDEQ for approval a Sludge and Solids Removal Plan that shall provide for the removal and proper disposal of excess, accumulated sludge/solids from the SSWWTF's aeration basins and secondary clarifiers within the SSWWTF. The Sludge and Solids Removal Plan shall identify the minimum amount of sludge/solids that are to remain in the aeration basins and the secondary clarifiers so as to achieve the maximum secondary treatment of all flow discharged from the SSWWTF as certified by a Professional Engineer licensed in the State of Mississippi. The Sludge and Solids Removal Plan shall also include, at a minimum, a schedule for completion of removal and disposal activities not to exceed March 31, 2011. The plan shall take into account the flow during the sludge/solids removal so as to minimize the environmental impact of the removal process. The Plan shall provide for Respondent to demonstrate that the minimum amount of sludge to remain in the aeration basins and the secondary clarifiers has been achieved using acceptable measuring techniques. The plan shall also address sludge management to include proper storage and proper disposal. After Respondent has commenced sludge/solids removal, the Plan shall also provide for Respondent to submit weekly Status Reports to MDEQ that shall include the hours of sludge removal operations performed, the quantity of sludge/solids removed, any operational setbacks experienced (weather, equipment failure, etc.), and an analysis of Respondent's progress to complete work under the Plan on or before the March

31, 2011 deadline.

- F. On or before August 31, 2010, Respondent shall submit to MDEQ for approval an engineering study on its sludge handling and disposal practices associated with the SSWWTF. To eliminate the current and any future accumulation of excess sludge at the SSWWTF, this study, at a minimum, shall determine the need for additional sludge dewatering facilities, additional land application sites, and alternative means of final disposal. The study shall include a schedule, not to exceed June 30, 2011, for actions to be taken by Respondent to address and provide for these additional needs to be met for its sludge handling and disposal practices.
- G. Respondent shall immediately cease the land application of waste on properties that do not have a current, valid permit under Section II of the Mississippi Nonhazardous Waste Management Regulations and on properties that Respondent once held a solid waste management permit for such activities but did not submit a reissuance application 180 days prior to expiration.

3.

In addition to the penalty set forth in Paragraph 2.A. of this Agreed Order, Respondent agrees to pay a stipulated penalty of \$100 per day each day after the expiration of any deadline set forth in Paragraphs 2.B. – 2.G. until each item has been completed. MDEQ shall have the discretion to calculate and notify Respondent of the amount of accrued stipulated penalties on a periodic basis, which shall be no more frequently than monthly. Respondent agrees to pay the entire amount of the accrued stipulated penalties within 30 days of receipt of such notification from MDEQ.

4.

Notwithstanding the provision by this Agreed Order for stipulated penalties to accrue in certain circumstances, the Commission reserves the right to conduct a separate enforcement action concerning any violation by Respondent of this Agreed Order or of the laws or regulations within the jurisdiction of the Commission. If the Commission conducts a separate enforcement action concerning a violation for which stipulated penalties are provided in this Agreed Order, the Commission will be deemed to have waived the right to collect stipulated penalties in lieu of

the right to conduct the separate enforcement action. In that separate enforcement action, the Commission may seek penalties, injunctive relief, or other appropriate relief different from or in the excess of the amount of stipulated penalties included in this Agreed Order, up to and including the statutory maximum penalty.

5.

Nothing in this Agreed Order shall limit the rights of MDEQ or the Commission in the event Respondent fails to comply with this Agreed Order. The Agreed Order shall be strictly construed to apply to those matters expressly resolved herein.

6.

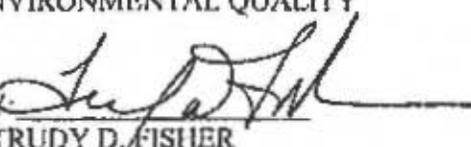
The civil penalty imposed in Paragraph 2.A of this Agreed Order addresses only those specific violations asserted in Paragraph 1. Nothing contained in this Agreed Order shall limit the rights of MDEQ, the Commission, or the United States Environmental Protection Agency to take enforcement or other actions, including the imposition of injunctive relief and/or penalties, against Respondent for past violations not specifically addressed herein and for future violations of any law, rule, regulation and/or permit.

7.

Respondent understands and acknowledges that it is entitled to an evidentiary hearing before the Commission pursuant to Miss. Code Ann. Section 49-17-31 (Rev. 2003), and that it has made an informed waiver of that right.

ORDERED, this the 10 day of September, 2010.

MISSISSIPPI COMMISSION ON  
ENVIRONMENTAL QUALITY

BY: 

TRUDY D. FISHER  
EXECUTIVE DIRECTOR  
MISSISSIPPI DEPARTMENT  
OF ENVIRONMENTAL QUALITY

AGREED, this the \_\_\_\_\_ day of \_\_\_\_\_, 2010.

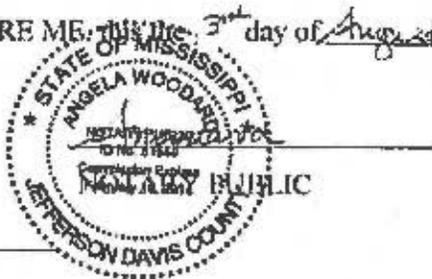
CITY OF JACKSON

BY: [Signature]  
TITLE: Mayer

STATE OF Mississippi  
COUNTY OF Hinds

PERSONALLY appeared before me, the undersigned authority in and for the jurisdiction aforesaid, the within named Henry Johnson, Jr. who first being duly sworn, did state upon his/her oath and acknowledge to me that he/she is the Mayer of the City of Jackson and is authorized to sign and enter this Agreement on behalf of the City of Jackson.

SWORN AND SUBSCRIBED BEFORE ME, this the 3<sup>rd</sup> day of August, 2010.



My Commission expires: Feb 17, 2014

BEFORE THE MISSISSIPPI COMMISSION  
ON ENVIRONMENTAL QUALITY

MISSISSIPPI COMMISSION ON  
ENVIRONMENTAL QUALITY

COMPLAINANT

VS.

AMENDMENT TO  
AGREED ORDER NO.5823 10

JACKSON POTW, SAVANNA STREET  
PO BOX 17 DEPARTMENT OF PUBLIC WORKS  
JACKSON, MISSISSIPPI 39205-0017

RESPONDENT

ORDER AMENDMENT

Mississippi Commission on Environmental Quality Order No. 5823 10, previously issued on September 10, 2010, in the above captioned matter, came before the Executive Director of the Mississippi Department of Environmental Quality (MDEQ) on Respondent's request for amendment. Having considered Respondent's request, the Executive Director finds that the requirements outlined in the above-referenced Order should be amended as follows:

1.

Paragraph 2.A. of Agreed Order No. 5823 10 is amended to read as follows:

Respondent agrees to pay, and Complainant agrees to accept, a civil penalty in the amount of \$240,000.00. Respondent shall pay this penalty to MDEQ in four equal installments in accordance with the following schedule:

<u>Installment Due Date</u>	<u>Installment Amount</u>
October 15, 2010	\$60,000.00
February 15, 2011	\$60,000.00
May 15, 2011	\$60,000.00
August 15, 2011	\$60,000.00

2.

This Order Amendment shall not, and is not intended to, supersede Order No. 5823 10, except to the limited extent described in Paragraph 1 above. Except as amended by Paragraph 1 above, all terms and conditions of Order No. 5823 10 shall remain in full force and effect.

ORDERED, this the 11 day of October, 2010.

MISSISSIPPI COMMISSION ON  
ENVIRONMENTAL QUALITY

BY:   
TRUDY D. FISHER  
EXECUTIVE DIRECTOR  
MISSISSIPPI DEPARTMENT  
OF ENVIRONMENTAL QUALITY

BEFORE THE MISSISSIPPI COMMISSION  
ON ENVIRONMENTAL QUALITY

MISSISSIPPI COMMISSION ON  
ENVIRONMENTAL QUALITY

COMPLAINANT

VS.

AMENDMENT TO  
AGREED ORDER NO.5823 10

JACKSON POTW, SAVANNA STREET  
PO BOX 17 DEPARTMENT OF PUBLIC WORKS  
JACKSON, MISSISSIPPI 39205-0017

RESPONDENT

AGREED ORDER AMENDMENT

Mississippi Commission on Environmental Quality Agreed Order No. 5823 10, previously issued on September 10, 2010, and amended on October 11, 2010, in the above captioned matter, came on this day for reconsideration upon the joint request of the Mississippi Commission on Environmental Quality, Complainant, and Jackson POTW, Savanna Street, Respondent, and the Executive Director of the Mississippi Department of Environmental Quality having received additional information in this cause, finds that the requirements outlined in the above-referenced Order should be amended as follows:

1.

Paragraph 2.D. of Agreed Order No. 5823 10 is amended to read as follows:

On or about December 3, 2010, Respondent submitted to MDEQ for approval its "Savanna Street Wastewater Treatment Plant Sludge Removal Plan." That plan contained four alternative proposals for the removal and proper disposal of excess, accumulated sludge/solids from the SSWWTF's storm diversion cells. The plan included, for each such

alternative, a schedule for completion of removal and disposal activities. After considering the alternative proposals, MDEQ tentatively approved implementation of "Option 2A" contained in the plan, but requested additional, clarifying information regarding implementation of that option. On June 3, 2011, Respondent submitted to MDEQ its "Savanna Street Wastewater Treatment Plant Sludge Removal Plan Addendum," and on July 19, 2011, Respondent submitted its "Sludge Removal Plan Addendum II." Those documents provided additional details regarding certain aspects of the sludge removal plan, including sludge excavation and dewatering and odor control. However, in the addendum, Respondent reserved the right to choose at a later date, depending upon contractor capabilities and resource availability, among various alternatives for sludge excavation, dewatering, and ultimate disposal. MDEQ has now approved the implementation of Option 2A of the sludge removal plan, as supplemented by the Savanna Street Wastewater Treatment Plant Sludge Removal Plan Addendum and Sludge Removal Plan Addendum II. Respondent shall immediately begin implementation of the plan. In accordance with the schedule of implementation provided for in the plan, Respondent shall notify MDEQ, in writing, on or before May 1, 2012, which alternatives for sludge excavation and dewatering Respondent will implement. After Respondent has commenced sludge/solids removal, the Respondent shall submit quarterly Status Reports to MDEQ that shall include, at a minimum, the hours of sludge removal operations performed, including the hours of dredging operations and ultimate disposal operations, the quantity of sludge/solids removed, the method(s) of disposal used, any operational setbacks experienced (weather, equipment failure, etc.), and an analysis of Respondent's progress to complete work under Option 2A on or before the December 31, 2017, deadline. In any event, Respondent, in accordance with the implementation schedule, shall remove all sludge not later than April 30, 2014 and shall dispose of all removed sludge no later than December 31, 2017.

2.

This Order Amendment shall not, and is not intended to, supersede Order No. 5823 10, or any previous amendment thereof, except to the limited extent described in Paragraph 1 above.

Except as amended by Paragraph 1 above, all terms and conditions of Order No. 5823 10, as previously amended on October 11, 2010, shall remain in full force and effect.

ORDERED, this the 29 day of September, 2011.

MISSISSIPPI COMMISSION ON  
ENVIRONMENTAL QUALITY

BY:   
TRUDY D. FISHER  
EXECUTIVE DIRECTOR  
MISSISSIPPI DEPARTMENT  
OF ENVIRONMENTAL QUALITY

# APPENDIX B

BEFORE THE MISSISSIPPI COMMISSION  
ON ENVIRONMENTAL QUALITY

MISSISSIPPI COMMISSION ON  
ENVIRONMENTAL QUALITY

COMPLAINANT

VS.

ORDER NO. 6005 11

JACKSON POTW, PRESIDENTIAL HILLS  
PO BOX 17  
JACKSON, MISSISSIPPI 39205

RESPONDENT

AGREED ORDER

COME NOW the Mississippi Commission on Environmental Quality (Commission), acting through the staff and Executive Director of the Mississippi Department of Environmental Quality (MDEQ), Complainant, and the City of Jackson, Respondent, in the above captioned cause and agree as follows:

I.

Respondent owns and operates the Jackson POTW, Presidential Hills facility, located in Hinds County. Complainant reviewed Discharge Monitoring Reports for NPDES Permit No. MS0030295 from December 2009 through September 2010. By letters dated August 4, 2010, November 30, 2010, January 12, 2011, March 8, 2011, and March 24, 2011, Respondent was contacted by Complainant and notified of the following violations:

- A. The effluent BOD, 5-day limitation was exceeded during December 2009, January, August, and November 2010, and January – February 2011.
- B. The effluent ammonia limitation was exceeded during January, February, April, June, August, and December 2010 and January – February 2011.
- C. The effluent BOD percent removal limitation was not met during December 2009.

- D. The effluent suspended solids percent removal was not met during December 2009 and September 2010.

Subsequent to Complainant's last correspondence regarding effluent violations, Respondent reviewed discharge monitoring reports for March 2011 and advised Complainant the facility exceeded the effluent BOD, 5-day and ammonia nitrogen effluent limitations.

2.

In lieu of a formal enforcement hearing concerning the violation(s) listed above, Complainant and Respondent agree to settle this matter as follows:

- A. Respondent agrees to pay and Complainant agrees to accept a civil penalty in the amount of \$22,500.00. Respondent shall pay this penalty to MDEQ within forty-five (45) days after this Agreed Order has been executed by the MDEQ Executive Director, or her designee. The settlement payment above shall be submitted to the following address:

Mississippi Department of Environmental Quality  
Attn: Mona Varner  
P.O. Box 2339  
Jackson, MS 39225

- B. On or before July 31, 2011, Respondent shall submit a report detailing the steps it intends to take to bring the wastewater treatment facility into compliance with its NPDES permit. The draft report shall be provided for review and comment by MDEQ prior to implementation. At a minimum, this report shall include the following:
1. A description of all viable options, including operational changes, equipment replacements or upgrades, and infrastructural changes or improvements, available to return the facility to compliance with its NPDES permit requirements.
  2. A cost analysis (including capital improvement and operational and maintenance costs) and time lines for each of the viable options evaluated to bring the wastewater treatment facility into compliance.

3. The option(s) selected by Respondent to be implemented and a description of the basis for that selection.

- C. Respondent shall implement its selected option as detailed in the report required by 2.B., or as otherwise modified and agreed upon by Complainant and Respondent. Within 10 days of completion of implementation, Respondent shall submit written documentation to MDEQ of completion.
- D. On or before May 31, 2014, Respondent shall have either: (i) complied with the effluent limitations found in its NPDES permit for three consecutive months or (ii) ceased discharging from the Presidential Hills facility. Respondent shall demonstrate compliance through the submission of the required Discharge Monitoring Reports.

3.

Until such time that Respondent demonstrates compliance with its BOD, 5-day, ammonia nitrogen, BOD % removal, and total suspended solids % removal, but no later than May 31, 2014, Respondent shall comply with the following interim effluent limitations:

Parameter	Quantity/ Loading	Quantity/ Loading	Conc./ Quality	Conc./Quality	Frequency	Months
BOD, 5-day	94 lbs/day, Monthly Avg	141 lbs/day, Max Wkly Avg	15 mg/l, Monthly Avg	22.5 mg/l, Max Wkly Avg	Monthly	May - Oct
Ammonia Nitrogen	31 lbs/day Monthly Avg	47 lbs/day Max Wkly Avg	5 mg/l, Monthly Avg	8 mg/l, Max Wkly Avg	Monthly	May - Oct
BOD, 5-day	125 lbs/day, Monthly Avg	188 lbs/day, Max Wkly Avg	20 mg/l, Monthly Avg	30 mg/l, Max Wkly Avg	Monthly	Nov - Apr
Ammonia Nitrogen	125 lbs/day Monthly Avg	188 lbs/day Max Wkly Avg	20 mg/l, Monthly Avg	30 mg/l, Max Wkly Avg	Monthly	Nov - Apr
BOD, % Removal	*****	*****	65%, Minimum	*****	Monthly	Jan - Dec
TSS, % Removal	*****	*****	65%, Minimum	*****	Monthly	Jan - Dec

During the period that the interim limitations are applicable, Respondent agrees to pay to Complainant a stipulated penalty of \$100 for each violation of an interim limitation.

4.

If the Respondent fails to comply with any of the requirements established in Paragraphs 2.B.-C. of this Agreed Order, the Respondent shall pay a stipulated penalty of \$5,000 per day of violation of the relevant deadline. If the Respondent fails to achieve compliance as specified in Paragraph 2.D. of this Agreed Order, the Respondent shall pay a stipulated penalty of \$20,000.

5.

The per-day stipulated penalties referenced in Paragraph 4 above shall apply and accrue for a period of 60 days from the relevant deadline, after which time the Commission reserves the right to conduct a separate enforcement action concerning any violation by Respondent of the requirements established in Paragraphs 2.B.-C. of this Agreed Order. If the Commission conducts a separate enforcement action concerning a violation of any of the requirements established in Paragraphs 2.B.-C., the penalties sought and recovered in such separate enforcement action shall be in addition to any stipulated penalties which accrue during the 60-day period following the relevant deadline. In such separate enforcement action, the Commission may seek penalties, injunctive relief, or other appropriate relief different from or in the excess of the amount of stipulated penalties included in this Agreed Order, up to and including the statutory maximum penalty.

6.

Nothing in this Agreed Order shall limit the rights of MDEQ or the Commission in the event Respondent fails to comply with this Agreed Order. The Agreed Order shall be strictly construed to apply to those matters expressly resolved herein.

7.

Nothing contained in this Agreed Order shall limit the rights of MDEQ or the Commission to take enforcement or other actions against Respondent for violations not addressed herein and for future violations of environmental laws, rules, and regulations.

8.

Respondent understands and acknowledges that it is entitled to an evidentiary hearing before the Commission pursuant to Miss. Code Ann. Section 49-17-31 (Rev. 2003), and that it has made an informed waiver of that right.

ORDERED, this the 23 day of August, 2011.

MISSISSIPPI COMMISSION ON  
ENVIRONMENTAL QUALITY

BY   
TRUDY D. FISHER  
EXECUTIVE DIRECTOR  
MISSISSIPPI DEPARTMENT  
OF ENVIRONMENTAL QUALITY

AGREED, this the \_\_\_\_\_ day of \_\_\_\_\_, 2011.

JACKSON POTW, PRESIDENTIAL HILLS

BY: [Signature]  
TITLE: Mayor

STATE OF Mississippi  
COUNTY OF Hinds

PERSONALLY appeared before me, the undersigned authority in and for the jurisdiction aforesaid, the within named Harvey Johnson Jr who first being duly sworn, did state upon his/her oath and acknowledge to me that he/she is the \_\_\_\_\_ of Jackson POTW, Presidential Hills and is authorized to sign and enter this Agreement.

SWORN AND SUBSCRIBED BEFORE ME, this the 12 day of August, 2011.

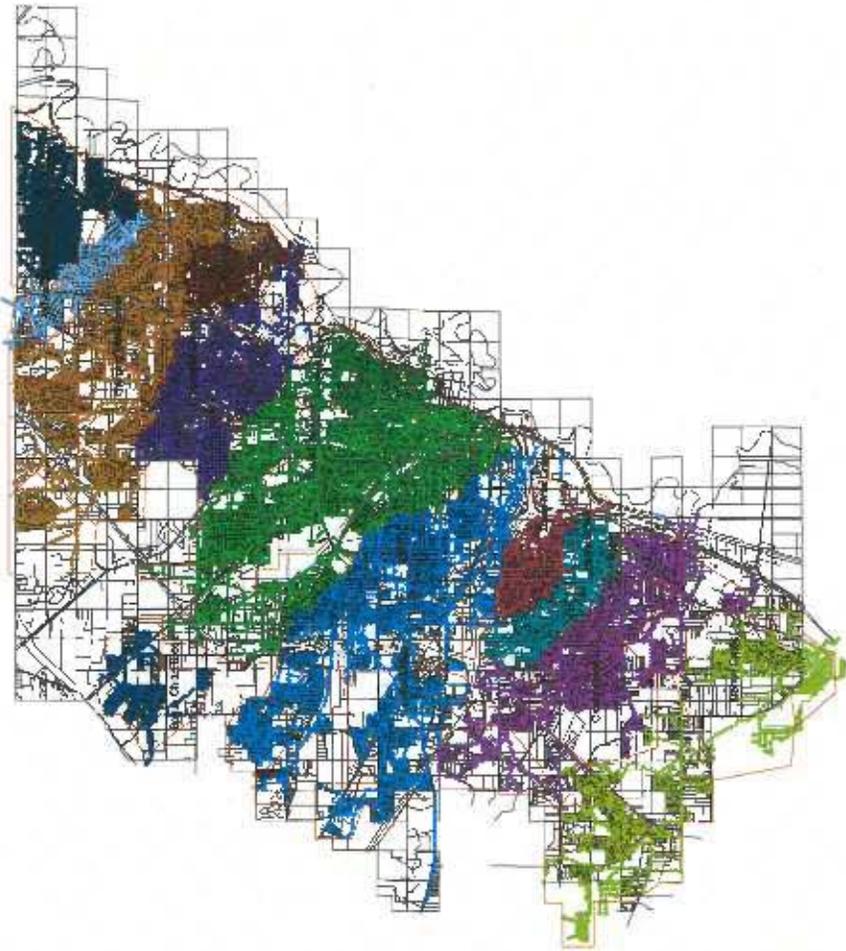
[Signature]  
NOTARY PUBLIC



My Commission expires:

# APPENDIX C

# APPENDIX C



# APPENDIX D



# **GUIDE FOR EVALUATING CAPACITY, MANAGEMENT, OPERATION, AND MAINTENANCE (CMOM) PROGRAMS AT SANITARY SEWER COLLECTION SYSTEMS**

GUIDE FOR EVALUATING CAPACITY,  
MANAGEMENT, OPERATION, AND  
MAINTENANCE PROGRAMS  
AT AIR AND WATER TREATMENT

United States  
Environmental Protection  
Agency



Office of Enforcement and  
Compliance Assurance (2224A)

EPA 305-B-05-002

[www.epa.gov](http://www.epa.gov)

January 2005

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## CHAPTER 1. INTRODUCTION

### 1.1 Purpose of this Guide

This guide identifies some of the criteria used by EPA to evaluate a collection system's management, operation, and maintenance (CMOM) program activities. The guide is intended for use by EPA and state inspectors as well as the regulated community – owners or operators of sewer systems collecting domestic sewage as well as consultants or other third-party evaluators or compliance assistance providers. Collection system owners or operators can review their own systems by following the checklist in Chapter 3 to reduce the occurrence of sewer overflows and improve or maintain compliance. The guidance herein may also be taken a step further. If a federal or state reviewer observes a practice that does not effectively meet the elements of a CMOM program, he or she may make recommendations to educate the operator, inspector, case developer, or those involved in a settlement agreement. Additionally, having key board members (policy makers) read this guide will also allow them to better understand the benefits of investing in good CMOM programs.

The guide is applicable to small, medium, and large systems; both publicly and privately owned systems; and both regional and satellite collection systems. Regardless of size, each owner or operator will have an organization and practices unique to its collection system. While these specific characteristics will vary among systems, the CMOM concepts and best management practices are likely to apply to all types of systems. Where appropriate, this document provides guidance on the differences.

This document does not, however, substitute for the CWA or EPA's regulations, nor is it a regulation itself. Thus, the document does not and cannot impose legally binding requirements upon these circumstances. EPA and state decision-makers retain the discretion to adopt approaches on a case-by-case basis that differ from this guidance where appropriate. EPA may change this guidance in the future.

Individuals reviewing a collection system are strongly encouraged to read the guidance portion of this document prior to conducting a review. Reviewers should use the checklist in Chapter 3 as the primary tool for questions during the paperwork and/or onsite review of the collection system.

While some sections or topics may not appear to relate directly to environmental performance, taken as a whole, they provide an indication of how well the utility is run.

### 1.2 Terminology

To provide a more user-friendly guidance and for clarification, the terminology for several terms has been modified. The following paragraphs list these terms and reasoning for the modifications.

Frequently, the term "COLLECTION SYSTEM OWNER OR OPERATOR", abbreviated as "OWNER OR OPERATOR," is used in this guide and refers to the entities responsible for the administration and oversight of the sewer system and its associated staff (in either a municipal or industrial context); capacity evaluation, management, operation, and maintenance programs; equipment; and facilities. The owner and operator may be two different entities. For example, the owner may own the infrastructure and be responsible for its maintenance while it designates responsibility for the day to day operation of

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the system to the operator. It should be noted that the term used in EPA's CMOM Program Self Assessment Checklist is "MUNICIPAL WASTEWATER UTILITY OPERATORS" or "UTILITY" rather than "collection system owner or operator." Both refer to the same individual(s).

The term "REVIEW" is used in this document in place of "INSPECTION" or "AUDIT." Because "inspection" often refers to an evaluation conducted by the regulatory authority and "audit" has been used to refer to an evaluation with very specific requirements, "review" is more appropriately used to capture the wider universe of evaluations (e.g., those conducted by a regulatory authority, the system itself, and/or by a third-party).

Similarly, the term used to describe the person conducting the CMOM review is the "REVIEWER" – this could be either an inspector, a third party reviewer hired by the owner or operator, or personnel of the owner or operator performing a self-evaluation of the collection system.

The term "FACILITY" is used in this document to refer to the components of the collection system (e.g., pump stations, sewer lines).

### **1.3 How to Use the Guide**

The guide and checklist provide a three-tiered approach to the CMOM review:

- Evaluation of the CMOM program, based on interviews with management and field personnel, as well as observation of routine activities and functions
- Review of pertinent records and information management systems
- Evaluation based on field/site review

Chapter 2 provides a breakdown and overview of each CMOM concept and what to look for when reviewing the system, defines the CMOM elements for the reviewer, and follows through with a discussion of the indicators or other clues about which the reviewer should be aware. Chapters 2 and 3 present detailed information on conducting reviews of collection systems. Chapter 3 contains the comprehensive reviewer checklist, supported by the information in Chapter 2. Appendix A presents a Collection System Performance Indicator Data Collection Form which provides examples of the types of information a reviewer should attempt to obtain while on-site.

The "one size does not fit all" approach to reviewing CMOM programs cannot be overstated. The principles covered in this guide are applicable to all wastewater collection systems, however, these principles may be implemented through different means depending on the system. Larger systems may have the resources and the need to implement more costly and complex means of meeting the CMOM program elements. In occasional cases a CMOM feature may not be implemented at all, due to characteristics of the system. A reviewer should be able to look at the system as a whole and determine whether certain key elements are present or should be present and to what extent the system incorporates the CMOM principles.

Reviewers will also find that the location or names of some documents, logs, or reports may vary from system to system. This guide tries to provide a general description of the materials the reviewer should request.

*Guide for Evaluating CMOM Programs at Sanitary Sewer Collection Systems*

**Although use of this guide cannot guarantee a collection system will avoid permit violations or discharge violations, generally, when owners or operators adequately practice the principles laid out in the guide, they should experience fewer problems and, therefore, fewer instances of noncompliance.**

#### 1.4 Overview of the Underlying Issues

Sanitary sewer collection systems are designed to remove wastewater from homes and other buildings and convey it to a wastewater treatment plant. The collection system is a critical element in the successful performance of the wastewater treatment process. EPA estimates that collection systems in the U.S. have a total replacement value between \$1 to \$2 trillion. Under certain conditions, poorly designed, built, managed, operated, and/or maintained systems can pose risks to public health, the environment, or both. These risks arise from sanitary sewer overflows (SSOs) from the collection system or by compromised performance of the wastewater treatment plant. Effective and continuous management, operation, and maintenance, as well as ensuring adequate capacity and rehabilitation when necessary, are critical to maintaining collection system capacity and performance while extending the life of the system.

EPA believes that every sanitary sewer system has the capacity to have an SSO. This may be due to a number of factors including, but not limited to:

- Blockages
- Structural, mechanical, or electrical failures
- Collapsed or broken sewer pipes
- Insufficient conveyance capacity
- Vandalism



SSOs include untreated discharges from sanitary sewer systems that reach waters of the United States (photo: US EPA).

Additionally, high levels of inflow and infiltration (I/I) during wet weather can cause SSOs. Many collection systems that were designed according to industry standards experience wet weather SSOs because levels of I/I may exceed levels originally expected; prevention of I/I has proven more difficult and costly than anticipated; or the capacity of the system has become inadequate due to an increase in service population without corresponding system upgrades (EPA 2004).

SSOs can cause or contribute to environmental and human health impacts (e.g., water quality standards violations, contamination of drinking water supplies, beach closures, etc.) which, in addition to flooded basements and overloaded wastewater treatment plants, are some symptoms of collection systems with inadequate capacity and improper management, operation, and maintenance. These problems create the need for both the owner or operator and the regulatory authority to conduct more thorough evaluations of sanitary sewer collection systems.

## 1.5 Purpose of CMOM Programs

CMOM programs incorporate many of the standard operation and maintenance activities that are routinely implemented by the owner or operator with a new set of information management requirements in order to:

- Better manage, operate, and maintain collection systems
- Investigate capacity constrained areas of the collection system
- Proactively prevent SSOs
- Respond to SSO events

The CMOM approach helps the owner or operator provide a high level of service to customers and reduce regulatory noncompliance. CMOM can help utilities optimize use of human and material resources by shifting maintenance activities from “reactive” to “proactive” – often leading to savings through avoided costs due to overtime, reduced emergency construction costs, lower insurance premiums, changes in financial performance goals, and fewer lawsuits. CMOM programs can also help improve communication relations with the public, other municipal works and regional planning organizations, and regulators.

It is important to note that the collection system board members or equivalent entity should ensure that the CMOM program is established as a matter of policy. The program should not be micro-managed, but an understanding of the resources required of the operating staff to implement and maintain the program is necessary.

In CMOM planning, the owner or operator selects performance goal targets, and designs CMOM activities to meet the goals. The CMOM planning framework covers operation and maintenance (O&M) planning, capacity assessment and assurance, capital improvement planning, and financial management planning. Information collection and management practices are used to track how the elements of the CMOM program are meeting performance goals, and whether overall system efficiency is improving.

On an periodic basis, utility activities should be reviewed and adjusted to better meet the performance goals. Once the long-term goal of the CMOM program is established, interim goals may be set. For instance, an initial goal may be to develop a geographic information system (GIS) of the system. Once the GIS is complete, a new goal might be to use the GIS to track emergency calls and use the information to improve maintenance planning.

An important component of a successful CMOM program is periodically collecting information on current systems and activities to develop a “snapshot-in-time” analysis. From this analysis, the owner or operator evaluates its performance and plans its CMOM program activities.

Maintaining the value of the investment is also important. Collection systems represent major capital investments for communities and are one of the communities’ major capital assets. Equipment and facilities will deteriorate through normal use and age. Maintaining value of the capital asset is a major goal of the CMOM program. The infrastructure is what produces sales and service. Proper reinvestment in capital facilities maintains the ability to provide service and generate sales at the least cost possible and helps ensure compliance with environmental requirements. As a capital asset, this will result in the

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need for ongoing investment in the collection system and treatment plant to ensure design capacity while maintaining existing facilities and equipment as well as extending the life of the system.

The performance of wastewater collection systems is directly linked to the effectiveness of its CMOM program. Performance characteristics of a system with an inadequate CMOM program include frequent blockages resulting in overflows and backups. Other major performance indicators include pump station reliability, equipment availability, and avoidance of catastrophic system failures such as a collapsed pipe.

A CMOM program is what an owner or operator should use to manage its assets; in this case, the collection system itself. The CMOM program consists of a set of best management practices that have been developed by the industry and are applied over the entire life cycle of the collection system and treatment plant. These practices include:

- Designing and constructing for O&M
- Knowing what comprises the system (inventory and physical attributes)
- Knowing where the system is (maps and location)
- Knowing the condition of the system (assessment)
- Planning and scheduling work based on condition and performance
- Repairing, replacing, and rehabilitating system components based on condition and performance
- Managing timely, relevant information to establish and prioritize appropriate CMOM activities
- Training of personnel

#### 1.6 National Pollutant Discharge Elimination System Regulatory Requirement

The National Pollutant Discharge Elimination System (NPDES) program prohibits discharges of pollutants from any point source into the nation's waters except as authorized under an NPDES permit.

EPA and state NPDES inspectors evaluate collection systems and treatment plants to determine compliance with permit conditions including proper O&M. Among others, these permit conditions are based on regulation in 40 CFR 122.41(c): "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."

When violations occur, the collection system or wastewater treatment plant owner or operator can face fines and requirements to implement programs to compensate residents and restore the environment. For example, in June 2004, the U.S. District Court for the Southern District of Ohio entered a consent decree resolving CSO, SSO, and wastewater treatment plant violations at the Hamilton County sewer system in Cincinnati, Ohio. In addition to a \$1.2 million civil penalty, the settlement included programs to clean up residents' basements, compensate residents, and implement measures to prevent further basement backups. The settlement also includes over \$5.3 million in supplemental environmental projects.



Sewer rehabilitation can include lining aging sewers (photo: NJ Department of Environmental Protection).

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### 1.7 EPA Region 4 MOM Programs Project

EPA Region 4 created the “Publicly Owned Treatment Works MOM Programs Project” under which the Region invites permitted owners or operators, and contributing satellite systems, in watersheds it selects to perform a detailed self-assessment of the management, operation, and maintenance (MOM) programs associated with their collection system. Participants provide a report which includes the results of the review, any improvements that should be made, and schedules to make those improvements. Participants that identify and report a history of unpermitted discharges from their collection system, and a schedule for the necessary improvements, can be eligible for smaller civil penalties while under a remediation schedule.

EPA’s Office of Compliance coordinated with EPA Region 4 on the development of this CMOM Guide. This guide is based in part on material obtained from the Region 4 MOM Programs Project. Some of the more specific items of the Region 4 program have been omitted in order to provide a more streamlined review framework. The fundamental concepts behind CMOM have been maintained in this guide. By combining elements of the Region’s program with existing NPDES inspection guidance, this CMOM Guide provides a comprehensive framework for reviewers and regulated communities to evaluate the effectiveness of O&M throughout the collection system.



## **CHAPTER 2. COLLECTION SYSTEM CAPACITY, MANAGEMENT, OPERATION, AND MAINTENANCE PROGRAMS**

This chapter provides an overview of the CMOM program elements. The information will help evaluate wastewater collection system operation and maintenance (O&M) practices. The key elements of the CMOM program, which are presented in detail in the following sections, include:

- Collection System Management
- Collection System Operation
- Collection System Maintenance
- Collection System Capacity Evaluation

In addition to this overview, there are several areas (e.g., 2.1.3 Internal Communications, 2.1.4 Customer Service, etc.) in this guide that go into greater depth regarding the operation and maintenance of a collection system. The intent of this detail is not only to provide the owner or operator with suggestions as to what to look for in their own program, but to provide the reviewer a complete overview of good operations, in general, regardless of a particular item resulting in poor performance or a violation.

For EPA and state inspectors or other reviewers, conducting an evaluation of collection system CMOM programs shares many similarities with other types of compliance reviews. Overall, the reviewer would examine records, interview staff and conduct field investigations, generally in that order although tailored, if necessary, to meet site-specific needs. Prior to performing the on-site interviews and evaluations, preliminary information may be requested that will provide an overall understanding of the organization to allow for a more focused approach for the review. This information also provides a basis for more detailed data gathering during on site activities. The information typically requested prior to the review should include a schematic map of the collection system (could be as-built drawings) and any written operations or maintenance procedures. Depending on the volume of information, the collection system owner or operator may need ample lead time to gather and copy these documents. Alternatively, the reviewer may offer to examine the documents and bring them back when doing the on-site review so that extra copies are not necessary. No matter which method is used, the importance of up-front preparation cannot be overemphasized. With the exception of pump stations and manholes, much of the collection system is not visible. Therefore, the more complete the reviewer's understanding of the system is prior to the review, the more successful the assessment will be.

The reviewer would then proceed with the on-site activities. Guidance for conducting compliance reviews is provided in the *NPDES Compliance Inspection Manual* (EPA 2004). The manual provides the general procedures for performing compliance reviews and is a valuable source of information on such topics as entry, legal authority, and responsibilities of the reviewer. Although CMOM evaluations are not specifically addressed in the manual, the general

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review procedures can be applied to CMOM reviews. Another good reference for general review information is the *Multi-Media Investigations Manual, NEIC* (EPA 1992). Some issues with entry are specific to CMOM reviews. Some facilities may be on private property and the reviewer may need property owner consent for entry.

***Documents to Review On-site Include:***

- Organization chart(s)
- Staffing plans
- Job descriptions
- Sewer use ordinance
- Overall map of system showing facilities such as pump stations, treatment plants, major gravity sewers, and force mains
- O&M budget with cost centers<sup>1</sup> for wastewater collection
- Performance measures for inspections, cleaning, repair, and rehabilitation
- Recent annual report, if available
- Routine reports regarding system O&M activities
- Collection system master plan
- Capital improvement projects (CIP) plan
- Flow records or monitoring
- Safety manual
- Emergency response plan
- Management policies and procedures
- Detailed maps/schematics of the collection system and pump stations
- Work order management system
- O&M manuals
- Materials management program
- Vehicle management and maintenance records
- Procurement process
- Training plan for employees
- Employee work schedules
- Public complaint log
- Rate ordinance or resolution
- Financial report ("notes" section)
- As built plans
- Discharge monitoring reports (DMRs)

The above list is not all inclusive nor will all utilities necessarily have formal, written documentation for each of the items listed. The *Collection System Performance Indicator Data Collection Form*, included as Appendix A, provides examples of the types of information a reviewer should attempt to obtain while on-site.

Interviews are generally conducted with line managers and supervisors who are responsible for the various O&M activities

**Reviewer - Point to Note**

A schedule should be established by the reviewer for the staff interviews and field assessments.

<sup>1</sup> A cost center is any unit of activity, group of employees, line of products, etc., isolated or arranged in order to allocate and assign costs more easily

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and support services staff from engineering, construction, human resources, and purchasing, where appropriate. Appendix B presents an example agenda and schedule that would be used for a large collection system owner or operator. The collection system's size and physical characteristics will determine the length of time needed for the review. A guideline for the time required, given a two person review team, would be two days for a small system, and a week or more for large systems.

Field reviews are typically conducted after interviews. The following is a list of typical field sites the team should visit:

- Mechanical and electrical maintenance shop(s)
- Fleet maintenance facilities (vehicles and other rolling stock)
- Materials management facilities (warehouse, outside storage yards)
- Field maintenance equipment storage locations (i.e., crew trucks, mechanical and hydraulic cleaning equipment, construction and repair equipment, and television inspection equipment)
- Safety equipment storage locations
- Pump stations
- Dispatch and supervisory control and data acquisition (SCADA) systems
- Crew and training facilities
- Chemical application equipment and chemical storage areas (use of chemicals for root and grease control, hydrogen sulfide control [odors, corrosion])
- Site of SSOs, if applicable
- A small, but representative, selection of manholes

Collection system operators typically assist with manhole cover removal and other physical activities. The inspector should refrain from entering confined spaces. A confined space is defined by the Occupational Safety and Health Administration (OSHA) as a space that: (1) is large enough and so configured that an employee can bodily enter and perform assigned work; and (2) has limited or restricted means for entry or exit; and (3) is not designed for continuous employee occupancy [29 CFR 1910.146(b)]. A "permit-required confined space (permit space)" is a confined space that has one or more of the following characteristics: (1) contains or has a potential to contain a hazardous atmosphere; (2) contains a material that has the potential for engulfing an entrant; (3) has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section; or (4) contains any other recognized serious safety or health hazard [29 CFR 1910.146(b)].

Though OSHA has promulgated standards for confined spaces, those standards do not apply directly to municipalities, except in those states that have approved plans and have asserted jurisdiction under Section 18 of the OSHA Act. Contract operators and private facilities do have to comply with the OSHA requirements and the inspector may find that some municipalities elect to do so voluntarily. In sewer collection systems, the two most common confined spaces are the underground pumping station and manholes. The underground pumping station is typically entered through a relatively narrow metal or concrete shaft via a fixed ladder. Inspectors conducting the field evaluation component of the CMOM audit should be able to identify and

avoid permit-required confined spaces. Although most confined spaces are unmarked, confined spaces that may have signage posted near their entry containing the following language:

**DANGER—PERMIT REQUIRED—CONFINED SPACE  
AUTHORIZED PERSONNEL ONLY**

If confined space entry is absolutely necessary, inspectors should consult with the collection system owner or operator first, have appropriate training on confined space entry, and use the proper hazard detection and personal safety equipment. More information on confined space entry can be found in *Operation and Maintenance of Wastewater Collection Systems Volumes I and II* (California State University (CSU) Sacramento 1996; CSU Sacramento 1998).

## 2.1 Collection System Management

Collection system management activities form the backbone for operation and effective maintenance activities. The goals of a management program should include:

- Protection of public health and prevention of unnecessary property damage
- Minimization of infiltration, inflow and exfiltration, and maximum conveyance of wastewater to the wastewater treatment plant
- Provision of prompt response to service interruptions
- Efficient use of allocated funds
- Identification of and remedy solutions to design, construction, and operational deficiencies
- Performance of all activities in a safe manner to avoid injuries

**Management Documents to Review**

- Organization chart(s)
- Staffing plans—Number of people and classifications
- Job descriptions for each classification
- Sewer use ordinance
- Safety manual
- Training program documentation
- Notes to financial reports

Without the proper procedures, management and training systems, O&M activities may lack organization and precision, resulting in a potential risk to human health and environmental contamination of surrounding water bodies, lands, dwellings, or groundwater. The following sections discuss the common elements of a robust collection system management program.

### 2.1.1 Organizational Structure

Well-established organizational structure, which delineates responsibilities and authority for each position, is an important component of a CMOM program for a collection system. This information may take the form of an organizational chart or narrative description of roles and

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responsibilities, or both. The organizational chart should show the overall personnel structure, including operation and maintenance staff.

Additionally, up-to-date job descriptions should be available. Job descriptions should include the nature of the work performed, the minimum requirements for the position, the necessary special qualifications or certifications, examples of the types work, lists of licences required for the position, performance measures or promotion potential. Other items to note in regard to the organizational structure are the percent of staff positions currently vacant, on average, the length of time positions remain vacant, and the percent of collection system work that is contracted out.

**Reviewer - Point to Note**

The reviewer may want to note the turnover rate and current levels of staffing (i.e., how many vacant positions exist and for how long they have been vacant). This may provide some indication of potential understaffing, which can create response problems.

Reviewers should evaluate specific qualifications of personnel and determine if the tasks designated to individuals, crews, or teams match the job descriptions and training requirements spelled out in the organizational structure. From an evaluation standpoint, the reviewer might try to determine what type of work is performed by outside contractors and what specific work is reserved for collection system personnel. If much of the work is contracted, it is appropriate to review the contract and to look at the contractor's capabilities. If the contractor handles emergency response, the reviewer should examine the contract with the owner or operator to determine if the emergency response procedures and requirements are outlined.

The inclusion of job descriptions in the organizational structure ensures that all employees know

their specific job responsibilities and have the proper credentials. Additionally, it is useful in the course of interviews to discuss staff management. The reviewer should note whether staff receive a satisfactory explanation of their job descriptions and responsibilities. In addition, when evaluating the CMOM program, job descriptions will help a reviewer determine who should be interviewed.

**Reviewer - Point to Note**

A reviewer should look for indications that responsibilities are understood by employees. Such indications may include training programs, meetings between management and staff, or policies and procedures.

When evaluating the organizational structure, the reviewer should look for the following:

- Except in very small systems, operation and maintenance personnel ideally should report to the same supervisor or director. The supervisor or director should have overall responsibility for the collection system.
- In some systems, maintenance may be carried out by a city-wide maintenance

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organization, which may also be responsible for such diverse activities as road repair and maintenance of the water distribution system. This can be an effective approach, but only if adequate lines of responsibility and communication are established.

- In general, one supervisor should manage a team of individuals small enough that is safe and effective. However, the individuals on the team may have additional employees reporting to them. This prevents the top supervisors from having to track too many individuals. The employee-supervisor ratio at individual collection systems will vary depending on their need for supervisors.

In a utility with well-established organizational structure, staff and management should be able to articulate their job and position responsibilities. Personnel should be trained to deal with constantly changing situations and requirements, both regulatory and operational.

The system's personnel requirements vary in relation to the overall size and complexity of the collection system. In very small systems, these responsibilities may include operation of the treatment plant as well as the collection system. In many systems, collection system personnel are responsible for the stormwater as well as wastewater collection system. References providing staff guidelines or recommendations are available to help the reviewer determine if staffing is adequate for the collection system being reviewed. Following is a list of available references:

- *Manpower Requirements for Wastewater Collection Systems in Cities of 150,000 to 500,000 Population* (EPA 1974)
- *Manpower Requirements for Wastewater Collection Systems in Cities and Towns of up to 150,000 Population* (EPA 1973)
- *Operation and Maintenance of Wastewater Collection Systems, Volume II* (California State University (CSU) Sacramento 1998)

Volumes I and II of *Operations and Maintenance of Wastewater Collection Systems* can be obtained through:

Office of Water Programs  
California State University Sacramento  
6000 J Street  
Sacramento, CA 95819-6025  
phone: 916/278-6142  
[www.owp.csus.edu](http://www.owp.csus.edu)

The following tables have been taken from the two EPA documents listed above to provide the reviewer with guidance. However, these documents may not take into account technological advances that have occurred since their publication date that might reduce staffing requirements. For instance, advances in remote data acquisition and telemetry have likely reduced the number

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of field inspection staff needed for systems with several pump stations. Other system-specific characteristics should also be accounted for when using these tables. An example of this might be collection systems that are not primarily constructed of brick will not require the masons the tables specify.

System Size	200,000		500,000		1,000,000		2,000,000		Notes
	Min	Max	Min	Max	Min	Max	Min	Max	
1	1	1	1	1	1	1	1	1	
2	1	1	1	1	1	1	1	1	
3	1	1	1	1	1	1	1	1	
4	1	1	1	1	1	1	1	1	
5	1	1	1	1	1	1	1	1	
6	1	1	1	1	1	1	1	1	
7	1	1	1	1	1	1	1	1	
8	1	1	1	1	1	1	1	1	
9	1	1	1	1	1	1	1	1	
10	1	1	1	1	1	1	1	1	
11	1	1	1	1	1	1	1	1	
12	1	1	1	1	1	1	1	1	
13	1	1	1	1	1	1	1	1	
14	1	1	1	1	1	1	1	1	
15	1	1	1	1	1	1	1	1	
16	1	1	1	1	1	1	1	1	
17	1	1	1	1	1	1	1	1	
18	1	1	1	1	1	1	1	1	
19	1	1	1	1	1	1	1	1	
20	1	1	1	1	1	1	1	1	
21	1	1	1	1	1	1	1	1	
22	1	1	1	1	1	1	1	1	
23	1	1	1	1	1	1	1	1	
24	1	1	1	1	1	1	1	1	
25	1	1	1	1	1	1	1	1	
26	1	1	1	1	1	1	1	1	
27	1	1	1	1	1	1	1	1	
28	1	1	1	1	1	1	1	1	
29	1	1	1	1	1	1	1	1	
30	1	1	1	1	1	1	1	1	
31	1	1	1	1	1	1	1	1	
32	1	1	1	1	1	1	1	1	
33	1	1	1	1	1	1	1	1	
34	1	1	1	1	1	1	1	1	
35	1	1	1	1	1	1	1	1	
36	1	1	1	1	1	1	1	1	
37	1	1	1	1	1	1	1	1	
38	1	1	1	1	1	1	1	1	
39	1	1	1	1	1	1	1	1	
40	1	1	1	1	1	1	1	1	
41	1	1	1	1	1	1	1	1	
42	1	1	1	1	1	1	1	1	
43	1	1	1	1	1	1	1	1	
44	1	1	1	1	1	1	1	1	
45	1	1	1	1	1	1	1	1	
46	1	1	1	1	1	1	1	1	
47	1	1	1	1	1	1	1	1	
48	1	1	1	1	1	1	1	1	
49	1	1	1	1	1	1	1	1	
50	1	1	1	1	1	1	1	1	

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**STAFF COMPLEMENTS FOR WASTEWATER COLLECTION SYSTEM MAINTENANCE  
POPULATION SIZE  
(Estimated Number of Personnel)**

Occupational Title	5,000		10,000		25,000		50,000		100,000	
	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)
Superintendent	1	5	1	10	1	20	1	40	1	40
Assistant Superintendent										
Maintenance Supervisor							1	40	2	80
Foreman	1	15	1	20	1	20	1	40	1	40
Maintenance Man II	1	15	1	20	1	20	1	40	1	40
Maintenance Man I	1	15	1	20	2	60	3	120	5	200
Mason II							1	40	1	40
Mason I									1	40
Maint. Equipment Personnel					1	40	2	80	3	120
Construction Equipment Personnel	1	15	1	20	1	20	1	40	1	40
Auto. Equipment Personnel									1	40
Photo. Inspection Technician									1	40
Laborer	1	15	1	20	2	40	2	80	5	200
Dispatcher							1	40	2	80
Clerk Typist							1	20	1	20
Stock Clerk							1	40	1	40
Sewer Maint. Staff	6	80	6	110	9	220	16	620	27	1,060
Maintenance Mechanic II	see comment (c) below									
Maintenance Mechanic I	see comment (d) below									
Maintenance Mechanic Helper	see comment (d) below									
Construction Inspection Supervisor	see comments (c) and (f) below									
<b>Total Staff</b>										

(a) Estimated number of personnel.

(b) Estimated total man-hours per week.

(c) Multiply number of lift stations maintained by 8/3.

(d) Multiply number of lift station visits per week by 1.

(e) Multiply estimated construction site visits per week by 8/3.

(f) Determined by the number of Construction Inspectors employed and developed on a judgmental basis.

Unit processes included in this staffing table are:

1. Maintenance of sanitary sewer main lines & appurtenances (laterals not included).
2. Maintenance of storm sewer main lines.
3. Maintenance of lift stations.
4. Inspection of newly constructed sewer main lines and appurtenances.

(U.S. EPA 1973)

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**STAFF COMPLEMENTS FOR WASTEWATER COLLECTION SYSTEM MAINTENANCE  
POPULATION SIZE  
(Estimated Number of Personnel)**

Occupational Title	150,000	200,000	300,000	400,000	500,000
Suprintendent	1	1	1	1	1
Assistant Suprintendent	1	1	1	1	1
Maintenance Supervisor II	1	1	1	1	1
Maintenance Supervisor I	1	2	2	3	3
Equipment Supervisor	1	1	1	1	1
TV Technician II	1	2	2	3	3
TV Technician I	1	2	2	3	3
Foreman	2	3	4	5	6
Maintenance Man II	3	5	6	8	9
Maintenance Man I	11	17	22	29	33
Mason II	1	2	2	3	3
Mason I	1	2	2	3	3
Maintenance Equipment Personnel	6	8	12	15	18
Construction Equipment Personnel	3	4	6	8	9
Auto. Equipment Personnel	2	3	4	5	6
Laborer	7	10	14	18	22
Dispatcher	2	2	2	3	3
Stock Clerk	1	2	2	3	3
Clerk Typist	2	2	2	3	3
Sewer Maintenance Staff	48	70	88	116	131
Maintenance Mechanic II					see comment (a) below
Maintenance Mechanic I					see comment (b) below
Maintenance Mechanic Helper					see comment (b) below
Electrician					see comment (c) below
Construction Inspector Supervisor					see comment (d) below
Construction Inspector					see comment (e) below
<b>Total Staff</b>					

(a) Divide number of lift stations maintained by 15.

(b) Divide number of lift station visits per week by 40

(c) Divide number of lift stations maintained by 15.

(d) Determined by the number of Construction Inspectors employed and developed on a judgmental basis.

(e) Divide estimated daily construction site visits by 2.

Unit processes included in this staffing table are:

1. Maintenance of sanitary sewer main lines & appurtenances (laterals not included).
2. Maintenance of storm sewer main lines.
3. Maintenance of lift stations.
4. Inspection of newly constructed main lines and appurtenances.

(U.S. EPA 1974)

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### 2.1.2 Training

The commitment of management to training is key to a successful program. It is important to recognize training as a budget expense item. A guideline for the typical amount of funding for training is three to five percent of the gross budget for the collection system. However, in large collection systems or those undergoing extensive construction this percentage may be considerably lower, and, in systems with a high turnover, training costs may be higher due to orienting new employees. Other changes, such as incorporation of new technology, will have a short-term impact on training costs. Although training is not explicitly required under current regulations, a collection system with untrained or poorly trained collection system personnel runs a greater risk of experiencing noncompliance.

The following elements are essential for an effective training program:

- Fundamental mission, goals, and policies of the collection system are addressed
- Mandatory training requirements are identified for key employees
- On-the-job training progress and performance are measured
- Effectiveness of the training is assessed including periodic testing, drills, or demonstrations
- New employees receive training

The owner or operator should generally provide training in the following areas:

- Routine line maintenance (may be on-the-job training only)
- Safety during confined space entry (every system should also have a strict policy and permit program)
- Traffic control (where applicable)
- Record keeping
- Pump station O&M
- Electrical and instrumentation (may be a combination of formal and on-the-job training)
- Public relations and customer service
- SSO/Emergency response
- Pump station operations and maintenance
- Pipe repair; bursting or cured in place pipe (CIPP); or closed circuit TV and trench/shoring (where these activities are not outsourced)

#### Sources of Training

Training is required to safely perform inspections, follow replacement procedures, and lubricate and clean parts and equipment. Following are the many sources of maintenance training:

- Manufacturer
- In-house
- On-the-job (OJT)
- Industry-wide (e.g., consultants, regulatory authorities, professional associations, or educational institutions)

The training program should identify the types of training required and offered. Types of training vary, but may include general environmental awareness, specific equipment, policies and

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procedures, and conducting maintenance activities. If the owner or operator is carrying out its own training, the reviewer should evaluate one or more examples of training materials to answer the following questions: are the materials appropriate to the training topic and the level of those being trained; and are they likely to accomplish the intended goal?

**Owner or Operator - Point to Note**

The owner or operator should routinely assess the effectiveness of training through periodic testing, drills, demonstrations, or informal reviews, and improve training based on this assessment.

**2.1.3 Internal Communication**

Communication is essential to ensuring that collection systems run efficiently and effectively. It is especially important that an effective communication link exists between wastewater treatment plant operators and collection system crews as well as with other municipal departments.

Effective communication requires the top-down, bottom-up, and lateral exchange of information amongst staff. Examples of top-down communication are bulletin board posters, paycheck inserts, regular staff meetings, e-mail or informal brown-bag lunch discussions. Examples of bottom-up communication may include the establishing environmental committees, confidential hotlines, e-mail, or direct open discussions. Collection system owners or operators may also offer incentives to employees for performance, and encourage them to submit suggestions for ways to improve the performance of the collection system. "Front line" employees are often an excellent source of ideas, issues, and information about how to improve performance at the work site. In this context, the reviewer can check for morale-boosting activities or reward programs, such as "Employee of the Month" and "Employee of the Year."

The reviewer should attempt to determine lines of internal communication to ensure all employees receive information and have an appropriate forum to provide feedback. The reviewer should assess the level of communication by interviewing several levels of staff or by simply observing collection system teams on work assignments. The owner or operator should have procedures and be able to demonstrate internal communication between the various levels and functions of the collection system regarding its management, operation, and maintenance programs.

**2.1.4 Customer Service**

The community often knows very little about the wastewater treatment and collection services performed for them. The community may only be aware of the collection system and its owner or operator through articles in local newspapers, public radio and television announcements, or only when there is an SSO. Collection system representatives should talk to schools and universities, make presentations to local officials and businesses about the wastewater field. Formal presentations can also be given to citizens, building inspectors, public utility officials,

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and members of the media.

An effective customer service and public relations program ensures that the owner or operator addresses all incoming inquiries, requests, and complaints in a timely fashion. From this information, owners or operators may further develop or revise programs to better address areas of concern. The reviewer should examine customer service records for the following:

- Personnel who received the complaint or request
- Date and nature of the complaint or request
- Location of the problem
- Name, address, and telephone number of the customer
- Cause of the problem
- To whom the follow-up action was assigned
- The initial date of the follow-up action
- Date the complaint or request was resolved
- Total days to end the problem
- Feedback to the customer

Awareness of past issues, population served, compliance history, and other elements help a reviewer determine whether the amount and types of inquiries, requests, or complaints are increasing or decreasing. For example, there may have been many complaints during only a certain week. The reviewer can examine those records to determine if there were specific circumstances (e.g., a large precipitation event) that caused the increase in inquiries or complaints.

**Reviewer - Point to Note**

To fully understand the context of customer inquiries, requests, or complaints, a reviewer should understand the history, topography, boundaries, and demographics of the collection system's jurisdiction before site evaluations are conducted.

Employees who handle customer service should be specifically trained to handle complaints, requests, or inquiries. These employees should be provided with sample correspondence, Q/A's, or "scripts" to help guide them through written or oral responses to customers. The reviewer should look for procedures on how to answer the telephone, e-mail, and other communication used by personnel. A reviewer may evaluate staff telephone responses by evaluating:

- The number of persons available to answer calls
- The number of repeat callers
- The average length of calls
- The volume of calls per day

Collection system field crews and their activities are the most visible segment of any wastewater treatment organization. Workers project a public image for their system on city and town streets. For this reason, personnel need to be trained in what to expect in public situations. For example,

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collection system supervisory staff should be familiar with the areas around public rights-of-way and easements to which their field crews must gain access to service facilities. Additionally, crew leaders should know how to deal with the public when approached.

Collection systems field crews influence the public's confidence in the collection system owner or operator. Reviewers should observe whether personnel wear uniforms or not, and if vehicles and equipment are identifiable as utility property and kept in good working order. Vehicles should be equipped with adequate emergency lighting and flashers, traffic control signs and barriers, etc. Before major construction or maintenance work begins, owners or operators should notify homeowners where properties may be affected. Methods of notification may include door hangers, newspaper notices, fliers, signs, or public radio or television announcements. Information should also be provided to residents on cleanup and safety procedures following basement backups and other overflows.

### **2.1.5 Management Information Systems**

The ability of the owner or operator to effectively manage its collection system is directly related to its ability to maintain access to the most current information concerning the facilities. Maintenance of this current information is an effort involving all members of the collection system from the staff answering the telephone to the worker in the street. Operational information informs and clarifies financial information. This will make the financial information more useful for the policy makers, leading to better decisions. A satisfactory management information system should provide the owner or operator with the following advantages:



A growing number of sewer systems have shifted to computer-based collection system management [photo: Milwaukee Metropolitan Sewerage District (MMSD)].

- Maintain preventive maintenance and inspection schedules
- Offer budgetary justification
- Track repairs and work orders
- Organize capital replacement plans
- Manage tools and equipment inventories
- Create purchase orders
- Record customer service inquiries, complaints, or requests
- Provide measurement of effectiveness of program and O&M activities

Owners and operators have been shifting to computer-based systems to manage data. Only the smaller collection system owners or operators may still rely on paper management systems.

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Computer-based Maintenance Management Systems (CMMSs) are designed to manage the data needed to track the collection system's O&M performance. Geographic Information Systems (GIS) are used to map and locate facilities and because of computer-based compatibility, can often easily be integrated with a CMMS. The computer-based system however, can only be as accurate as the data used to develop it, which was most likely paper files.

**Types of Management Information Tracking**

- Customer service
- Safety incident
- Emergency response
- Process change
- Inspection scheduling and tracking
- Monitoring and/or sampling schedules
- Compliance
- Planned maintenance (schedules and work orders)
- Parts inventory

Regardless of the information management style chosen, the collection system should have written instructions regarding the use of the management information systems. These procedures may include operating the system, upgrading the system, accessing data and information, and generating and printing reports. The system should be kept current with accurate information. Work reports from the field crews should be complete, accurate, and legible.

The reviewer may select some number of complaints and see how well they can be tracked through the system to an ultimate conclusion. Work reports generated by the field crew should be randomly chosen and scanned for legibility and completeness. The reviewer should do a random check of the timeliness and accuracy of data entry. Additionally, the reviewer should obtain selected original data sources (such as field reports) and compare them to the appropriate database output to determine how long entry takes. This will provide a check on how current the database is and what data entry backlog exists.

### **2.1.6 SSO Notification Program**

The owner or operator should maintain a written procedure indicating the entities, (e.g., drinking water purveyors, the public, public health officials, and the regulatory authority) that should be notified in the event of an SSO. The procedure should clearly indicate the chain of communication used to notify the proper personnel of an SSO event for reporting and remediation. The procedure should include the names, titles, phone numbers, and responsibility of all personnel involved. The reviewer should verify that the personnel listed in the procedure are still in the position listed and are aware of their responsibilities.

**Reviewer - Point to Note**

To verify the effectiveness of the notification program, the reviewer should walk an overflow occurrence report through the chain of events that would occur from the time of initial notification.

The procedure may allow for different levels of response for different types of SSOs. For example, the regulatory authority may request that SSOs due to sewer line obstructions be

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reported on a monthly basis. Therefore, the procedure may simply be to gather this information from the maintenance information system and have the appropriate personnel put together a reporting form. A chronic SSO at a pump station that discharges when overloaded during wet weather may require a more complex notification procedure, including immediate telephone notification to specified authorities.

To verify the effectiveness of the notification program, the reviewer should walk an overflow occurrence report through the chain of events that would occur from the time of initial notification. This can be done by choosing several random overflow events from the complaint records and observing whether they are handled as procedures dictate. The minimum information that should be reported for an SSO includes the date, time, location, cause, volume of the overflow (which may be estimated), how it was stopped, and any remediation methods taken. The reviewer should not only verify that the SSO notification procedures are appropriate, but also verify that the owner or operator has reliable methods for the detection of overflows and a phone number or hotline for the public to report observed overflow events.

### **2.1.7 Legal Authority**

The collection system owner or operator should select and enforce the legal authority necessary to regulate the volume of flow entering the collection system, including residential and commercial customers, satellite communities and industrial users. The legal authority may take the form of sewer use ordinances, contracts, service agreements, and other legally binding documents.

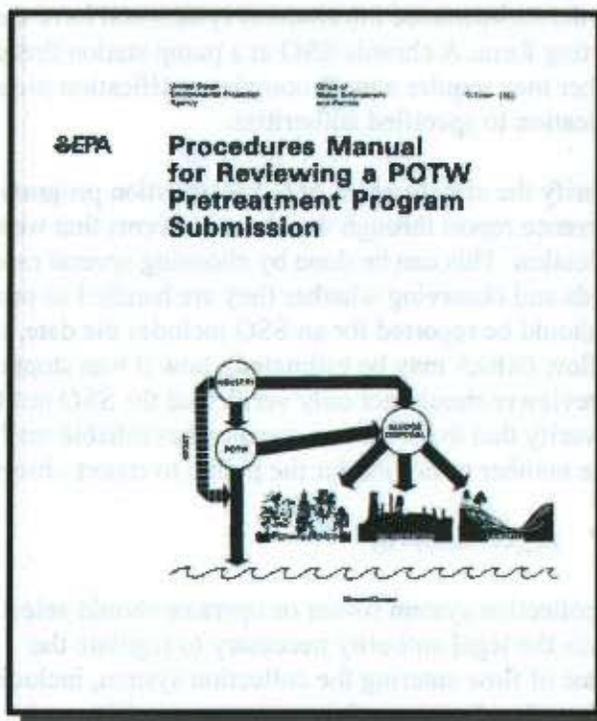
A satellite community is a collection systems which does not own the treatment facility to which it discharges.

The pretreatment program seeks to prevent the discharge of materials into the sewer system (by non-domestic users) that interfere with proper operation of the wastewater treatment plant or may pass through the plant untreated. At the time the operator of a wastewater treatment plant submits its pretreatment program to the regulatory authority for approval, the plant operator must include a statement from the city solicitor or other legal authority that the plant has the authority to carry out the program [40 CFR 403.9(a)(1)]. The reviewer should verify the existence of this statement and inquire as to whether any significant changes have occurred in the program such that the legal authority may need further review. Additionally, some owners or operators may have a pretreatment program approved by the state, through which discharge permits are issued to industrial users and enforcement is conducted. Further information on legal authority under the pretreatment program may be found in *Procedures Manual for Reviewing a POTW Pretreatment Program Submission* (EPA 1983).

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The owner or operator should have the authority to ensure that new and rehabilitated sewers and connections have been properly designed, constructed, and tested before being put into service. This authority could take the form of design and performance specifications in a sewer use ordinance or other legal document such as a statute or series of contracts or joint powers agreements. The ordinance or legal document should contain, at a minimum, general prohibitions, adequate grease control requirements and measures, prohibitions on stormwater inflow, infiltration from laterals, and new construction standards.

The grease control section of the document should contain the requirement to install grease traps at appropriate facilities (e.g., restaurants). Additionally, these facilities should be required to properly maintain the grease traps and pump them out on a regular basis. The document should also address periodic inspections of grease traps by collection system personnel and the ability to enforce (i.e., levy fines on persistent offenders).

**General Prohibitions**

- Fire and explosion hazards
- Corrosive and obstructive materials
- Material which may cause interference at the wastewater treatment plant
- Heat which may inhibit biological activity at the wastewater treatment plant
- Oils or petroleum products which may cause interference or pass through the wastewater treatment plant

The owner or operator should maintain strict control over the connection of private sewer laterals to sewer mains. These connections have significant potential as sources of infiltration. Standards for new connections should be clearly specified. The sewer use ordinance should contain provisions for inspection, approval of new connections, and a program to implement the requirements. A method to maintain control over existing connections is to

require an inspection of the lateral prior to sale of a property. It is important to note that implementing this type of program may require a change to the local ordinance or code.

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The owner or operator should also have the legal authority to prohibit stormwater connections to the sanitary sewer. Stormwater connections may include catch basins; roof, cellar and yard drains; sump pumps; direct connections between the storm and sanitary sewers; leaking manhole covers; uncapped cleanouts; and the direct entrance of streams into the collection system. This practice is now discouraged. Direct stormwater connections to a separate sanitary sewer system are known as inflow. Inflow can severely impact the ability of the collection system to transport flows to the treatment plant during wet weather, leading to overflows and noncompliance with the wastewater treatment plant's NPDES permit.



Sources of stormwater in the collection system may include building downspouts connected directly to the system (photo: MMSD).

Satellite communities should not be allowed to contribute excessive flows that cause or contribute to overflows, flooding, or noncompliance at the wastewater treatment plant. Should

**Owner or Operator - Point to Note**

The owner or operator should have a comprehensive program which addresses flows from satellite communities.

any of these situations exist, it is not sufficient for the owner or operator to charge the satellite community for the excess flow. The owner or operator must be able to prohibit the contribution of the excess flow. This may be done through a legal inter-jurisdictional agreement between the wastewater treatment plant owner or operator and the satellite community that addresses allowable flows and sets requirements. The reviewer should examine all contracts between systems and their

satellites (unless too numerous, then select representative contracts). Contracts should have a date of termination and allow for renewal under renegotiated terms. Contracts should limit flow from satellite communities and limit peak wet weather flow rates.

## 2.2 Collection System Operation

Collection systems have little of what is traditionally referred to as "operability" as compared to a wastewater treatment plant (i.e., the number of ways to route the wastewater is typically limited). However, the design of some collection systems does allow flow to be diverted or routed from one pipe to another or even to different treatment plants. This can be accomplished by redirecting flow at a pump station from one discharge point to another or opening and closing valves on gravity sewers and force mains.

**Owner or Operator - Point to Note**

There should be detailed, written procedures available to guide owners or operators through flow routing activities. Also, there should be operating procedures for mechanical equipment such as pump station pump on/off and service rotation settings or in-line grit removal (grit trap) operations.

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There are many reasons why the owner or operator may want to divert flows; among them, to relieve overloading on a system of piping or the wastewater treatment plant or to add more flow to piping serving an area not yet fully developed to maintain a cleansing velocity.

### 2.2.1 Budgeting

The budget is one of the most important variables in the CMOM program. Although an adequate budget is not a guarantee of a well operated collection system, an inadequate budget will make attaining this goal difficult. Funding can come from a variety of sources, including user fees or appropriations from the state or local government.

**Reviewer - Point to Note**

Reviewers need to determine the source of the funding for the collection system and who controls it. Reviewers should also request budget documents, summaries, or pie charts to learn more about the systems' budget.

A key element of the operation budget program is the tracking of costs in order to have accurate records each time the annual operating budget is developed. Having an annual baseline provides documentation for future budget considerations and provides justification for future rate increases. Collection system management

should be aware of the procedures for calculating user rates and for recommending and making user rate changes.

Collection system and wastewater treatment plant costs may be combined into one budget, or budget line items may be divided into each of two individual budgets. For example, electrical and mechanical maintenance work performed by plant staff on a pump station may be carried as an O&M cost in the treatment plant budget, although pumping stations are generally considered to be a collection system component.

The cost of preventive and corrective maintenance and major collection system repairs and alterations are key items in the annual operating budget. The collection system owner or operator should keep adequate records of all maintenance costs, both in-house and contracted, plus the costs for spare parts. This will assist in the preparation of the following year's budget. In general, there should be an annual (12-month cycle) budget of discretionary and non-discretionary items. There may also be a Capital Improvement Plan (CIP) which may encompass small projects (one to two year cycles) or larger projects (three to five year cycles). Larger projects may include items such as equipment, labor, training, or root cause failure analysis.

**Examples of O&M Budget Items**

- Labor (usually at least 50% of total budget)
- Utilities
- Capital
- Maintenance materials and supplies
- Chemicals
- Motor vehicles
- Contracted services

The major categories of operating costs are labor, utilities, and supplies. Cost accounting for

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these categories should include information on unit costs, total costs, and the amount and/or quantities used. The reviewer should evaluate the current and proposed budget, and current year balance sheets. In examining current and proposed expenditure levels, the reviewer should consider:

- Whether the budgets include contributions to capital reserve (sinking) funds. These funds are savings for replacement of system components once they reach their service life.
- Whether all income from water and sewer billings supports those functions, or if it goes into the general fund.
- Whether raising user fees is a feasible option to meet budget needs based on recent expenditure history.

### **2.2.2 Monitoring**

The collection system owner or operator may be responsible for fulfilling some water quality or other monitoring requirements. Responsibilities may include:

- Monitoring discharges into the collection system from industrial users
- Monitoring to determine the effects of SSOs on receiving waters
- Monitoring required as part of an NPDES permit, a 308 letter, administrative order, or consent decree

The owner or operator should maintain written procedures to ensure that sampling is carried out in a safe, effective, and consistent manner. The procedures should specify, at a minimum the following:

- Sampling location(s)
- Sample volumes, preservatives, and holding times
- Instructions for the operation of any automatic sampling and/or field monitoring (e.g., pH or dissolved oxygen) equipment
- Sampling frequency
- Sampling and analytical methodologies
- Laboratory QA/QC

Records should be maintained of sampling events. These records should at a minimum include the following:

- Date, time, and location of sampling
- Sample parameters
- Date shipped or delivered to the laboratory

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The collection system owner or operator should have a program under which they monitor areas of the collection system which may be vulnerable to the adverse effects of hydrogen sulfide. It may be possible to perform visual inspections of these areas. The records should note such items as the condition of metal components, the presence of exposed rebar (metal reinforcement in concrete), copper sulfate coating on copper pipes and electrical components, and loss of concrete from the pipe crown or walls.

**Areas Subject to Generation of Hydrogen Sulfide:**

- Sewers with low velocity conditions and/or long detention times
- Sewers subject to solids deposition
- Pump stations
- Turbulent areas, such as drop manholes or force main discharge points
- Inverted siphon discharges

As mentioned in Section 2.4.2, the collection system owner or operator should be carrying out routine manhole inspections. The hydrogen sulfide readings generated as a result of these inspections should be added to the records of potential areas of corrosion. A quick check of the pH of the pipe crown or structure enables early indication of potential hydrogen sulfide corrosion. A pH of less than four indicates further investigation is warranted. "Coupons" may be installed in structures or pipelines believed to be potentially subject to corrosion. Coupons are small pieces of steel inserted into the area and measured periodically to determine whether corrosion is occurring.

**Reviewer - Point to Note**

The reviewer should be aware that a system in which infiltration and inflow (I/I) has successfully been reduced may actually face an increased risk of corrosion. The reviewer should pay particular attention to the hydrogen sulfide monitoring program in these systems.

The reduction of flow through the pipes allows room for hydrogen sulfide gases to rise into the airway portion of the sewer pipe and react with the bacteria and moisture on the pipe walls to form sulfuric acid. Sulfuric acid corrodes ferrous metals and concrete.

There are several methods to prevent or control hydrogen sulfide corrosion. The first is proper design. Design considerations are beyond the scope of this manual but may be found in the *Design Manual: Odor and Corrosion Control in Sanitary Sewerage Systems and Treatment Plants* (EPA 1985). The level of dissolved sulfide in the wastewater may also be reduced by chemical or physical means such as aeration, or the addition of chlorine, hydrogen peroxide, potassium permanganate, iron salts, or sodium hydroxide. Whenever chemical control agents are used, the owner or operator should have procedures for their application and maintain records of the dosages of the various chemicals. Alternatively, sewer cleaning to remove deposited solids reduces hydrogen sulfide generation. Also, air relief valves may be installed at the high points of the force main system. The valve allows air to exit thus avoiding air space at the crown of the pipe where acid can form. The reviewer should examine the records to see that these valves are

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receiving periodic maintenance.

Collection systems vary widely in their vulnerability to hydrogen sulfide corrosion. Vitrified clay and plastic pipes are very resistant to hydrogen sulfide corrosion while concrete, steel, and iron pipes are more susceptible. The physical aspects of the collection system are also important. Sewage in pipes on a decline that moves the wastewater at a higher velocity will have less hydrogen sulfide than sewage in pipes where the wastewater may experience longer detention times. Therefore, some systems may need a more comprehensive corrosion control program while some might limit observations to vulnerable points.

#### **2.2.4 Safety**

The reasons for development of a safety program should be obvious for any collection system owner or operator. The purpose of the program is to define the principles under which the work is to be accomplished, to make the employees aware of safe working procedures, and to establish and enforce specific regulations and procedures. The program should be in writing (e.g., procedures, policies, and training courses) and training should be well documented.

The purpose of safety training is to stress the importance of safety to employees. Safety training can be accomplished through the use of manuals, meetings, posters, and a safety suggestion program. One of the most common reasons for injury and fatalities in wastewater collection systems is the failure of victims to recognize hazards. Safety training cuts across all job descriptions and should emphasize the need to recognize and address hazardous situations. Safety programs should be in place for the following areas:

- Confined spaces
- Chemical handling
- Trenching and excavations
- Material Safety Data Sheets (MSDS)
- Biological hazards in wastewater
- Traffic control and work site safety
- Lockout/Tagout
- Electrical and mechanical safety
- Pneumatic or hydraulic systems safety

**Point to Note**

Although a safety program may not be explicitly required under current NPDES regulations, an excessive injury rate among personnel increases the likelihood of collection system noncompliance with other requirements. Furthermore, when good safety practices are not followed, there may be a risk to the public or to collection system workers.

The collection system owner or operator should have written procedures which address all of the

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above issues and are made available to employees. In addition to training, safety programs should incorporate procedures to enforce the program. For example, this could include periodic tests or “pop” quizzes to monitor performance and/or compliance and follow-up on safety related incidents.

The owner or operator should maintain all of the safety equipment necessary for system staff to perform their daily activities and also undertake any emergency repairs. This equipment should include, at minimum:

- Atmospheric gas testing equipment
- Respirators and/or self-contained breathing apparatus
- Full body harness
- Tripods or non-entry rescue equipment
- Hard hats
- Safety glasses
- Rubber boots
- Rubber and/or disposable gloves
- Antibacterial soap
- First aid kit
- Protective clothing
- Confined space ventilation equipment
- Traffic and/or public access control equipment
- Hazardous gas meter

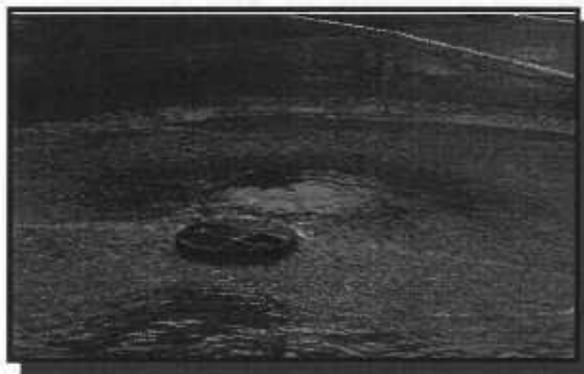
**Reviewer - Point to Note**

The reviewer should, in the course of interviewing personnel, determine their familiarity with health and safety procedures according to their job description.

Each field crew vehicle should have adequate health and safety supplies. If the reviewer has access to the municipal vehicle storage area, he or she might choose to check actual vehicle stocks, not just supplies in storage.

### **2.2.5 Emergency Preparedness and Response**

The collection system owner or operator should have a comprehensive plan in place for dealing with both routine and catastrophic emergencies. Routine emergencies include situations such as overflowing manholes, line breaks, localized electrical failure, and power outages at pump stations. Catastrophic emergencies include floods, tornados, earthquakes, other natural events, serious chemical spills, or widespread electrical



SSOs can include overflows out of manholes onto city streets, sidewalks, and surrounding areas (photo: U.S. EPA).

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failure. Ideally, this plan is written, reviewed, and adjusted as needed at periodic intervals.

The reviewer should determine if the emergency response plan generally follows the guidelines described below. The location where the plan is housed may vary but, in general, such a document should be available in the yard office or other building commonly accessible to and frequented by collection system personnel. The emergency preparedness and response procedures may be contained in the collection system's O&M manual, or may be reflected in the descriptions of equipment and unit operations. Putting emergency procedures in a stand-alone document, rather than combining it with other information in the O&M manual, makes it easier for collection system personnel to find information.

The plan should utilize the most current information on the collection system. For larger systems, a structured analysis, or *risk assessment*, should be made of the collection system, treatment plant, and the community. The risk assessment should identify areas where the collection system is vulnerable to failure and determine the effect and relative severity to collection systems operations, equipment and public safety, and health of such a failure. The risk assessment should concentrate on such factors as topography, weather, sewer system size, and other site-specific factors which reflect the unique characteristics of the system. Once the areas of vulnerability are known, the collection system owner or operator should have appropriate plans in place to ensure collection system operations continue for the duration of the emergency.

The plans must clearly identify the steps staff should take in the event of emergency situations. Plans should include information on when it is appropriate to initiate and cease emergency operations. The plans should be very specific as to the collection system or repair equipment involved. Instructions should be available which explain how to operate equipment or systems during an emergency event when they are not functioning as intended but are not fully inoperable. The plan should also include specific procedures for reporting events that result in an overflow or other noncompliance event to the appropriate authorities.

The owner or operator should track emergency situations to become better prepared for future emergencies and to assist with reporting and maintaining compliance with emergency-related requirements. Typical components of an emergency program may include:

- General information regarding emergencies, such as telephone numbers of collection system personnel, fire department, and ambulance.
- Identification of hazards (e.g., chlorine storage areas) and use of universal classification system for hazards: combustible material, flammable liquids, energized electrical circuits, and hazardous materials.
- Vulnerability analysis that identifies the various types of emergencies that could occur, such as natural disasters, power outages, or equipment failures.
- Emergency response procedures.
- Methods to reduce risk of emergencies.
- Responsibilities of staff and management.

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- Continuous training.

Procedures for emergency response plans should be understood and practiced by all personnel in order to ensure safety of the public and the collection system personnel responding. Procedures should be specific to the type of emergency that could occur. It is important to keep detailed records of all past emergencies in order to constantly improve response training, as well as the method and timing of future responses. The ability to deal with emergencies depends on the knowledge and skill of the responding crews, in addition to availability of equipment. The crew should be able to rapidly diagnose problems in the field under stress and select the right equipment needed to correct the problem. If resources are limited, consideration should be given to contracting other departments or private industries to respond to some emergency situations, for example, those rare emergencies that would exceed the capacity of staff.

**2.2.6 Modeling**

Computer programs (modeling programs) are available that are capable of simulating the different flows within the collection system. The purpose of modeling is to determine system capacity requirements with respect to sewer design and structural conditions. Therefore the input of accurate data on sizes, location, elevation, and condition of sewer system components such as pipes, manholes, and pump stations is necessary. When possible, flow monitoring data should be used to calibrate the model.

Modeling is also useful in examining effects before and after rehabilitation. For example, models can be applied to “before” and “after” scenarios to estimate the effects of repairs. If a collection system is not experiencing any capacity related issues (i.e., overflows, bypasses, basement backups, street flooding, hydraulic overload at the treatment plant, etc.) then maintenance of a model may be optional for that system, although most medium and large systems should maintain a model of the larger diameter portion of their system. If any of the mentioned conditions are occurring then development and maintenance of a model is essential to performing a capacity assessment in the problem areas.

Computer modeling is a specialized and complex subject. The reviewer may not have a comprehensive knowledge of modeling. If this is the case the he or she should obtain the following basic information:

- Is the owner or operator using a model?
- What areas of the collection system are being modeled and why?
- What model (including the version) is being used? Who developed the model and when?

**Reviewer - Point to Note**

The reviewer should determine whether a model used by the owner or operator:

- Has user support
- Has adequate documentation such as a user's manual that describes data input requirements, output to be expected, model capabilities and limitations, and hardware

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- How are the modeling results being used?

**2.2.7 Mapping**

The importance of maintaining accurate, current maps of the collection system cannot be overstated. Efficient collection system maintenance and repairs are unlikely if mapping is not adequate. Collection system maps should clearly indicate the information that personnel need to carry out their assignments. The collection system maps should contain information on the following:

- Main, trunk and interceptor sewers
- Building/house laterals
- Manholes
- Cleanouts
- Force mains
- Pump stations
- Service area boundaries
- Other landmarks (roads, water bodies, etc.)

Collection system maps should have a numbering system which uniquely identifies all manholes and sewer cleanouts. The system should be simple and easy to understand. Manholes and sewer cleanouts should have permanently assigned numbers and never be renumbered. Maps should also indicate the property served and reference its cleanout.

Sewer line maps should indicate the diameter, the length between the centers of manholes, and the slope or direction of flow. The dimensions of easements and property lines should be included on the maps. Other information that should be included on maps are access and overflow points, a scale, and a north arrow. All maps should have the date the map was drafted and the date of the last revision. Although optional, maps often include materials of pipe construction. Maps may come in different sizes and scales to be used for different purposes. Detailed local maps may be used by maintenance or repair crews to perform the duties. However, these detailed local maps should be keyed to one overall map that shows the entire system.

Geographic Information System (GIS) technology have made the mapping and map updating process considerably more efficient. GIS is a computerized mapping program capable of combining mapping with detailed information about the physical

**Key Design Characteristics**

- Line locations, grades, depths, and capacities
- Maximum manhole spacing and size
- Minimum pipe size
- Pumping Station dimensions and capacities
- Drop manholes
- Flow velocities and calculations (peak flow and low-flow)
- Accessibility features
- Other technical specifications (e.g., materials, equipment)

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structures within the collection system. If a GIS program is being used by the owner or operator, the reviewer should ask if the program is capable of accepting information from the owner or operator's management program.

Specific procedures should be established for correction of errors and updating maps and drawings. Field personnel should be properly trained to recognize discrepancies between field conditions and map data and record changes necessary to correct the existing mapping system. Reviewers should check to see that maps and plans are available to the personnel in the office and to field personnel or contractors involved in all engineering endeavors.

### **2.2.8 New Construction**

The owner or operator should maintain strict control over the introduction of flows into the system from new construction. New construction may be public (i.e., an expansion of the collection system) or private (i.e., a developer constructing sewers for a new development). Quality sanitary sewer designs keep costs and problems associated with operations, maintenance, and construction to a minimum. Design flaws are difficult to correct once construction is complete. The reviewer should be aware that this has historically not been adequately addressed in some collection systems. The owner or operator should have standards for new construction, procedures for reviewing designs and protocols for inspection, start-up, testing, and approval of new construction. The procedures should provide documentation of all activities, especially inspection. Reviewers should examine construction inspection records and be able to answer the following:

- Does the volume of records seem reasonable given system size?
- Do records reflect that the public works inspectors are complying with procedures?

The state or other regulatory authority may also maintain standards for new construction. The standards held by the owner or operator should be at least as stringent. Start-up and testing should be in accordance with the manufacturers' recommendation where applicable and with recognized industry practices. Each step of the review, start-up, testing, and approval procedures should be documented.

The owner or operator approval procedure should reflect future ease of maintenance concerns. After construction is complete, a procedure for construction testing and inspection should be used. Construction supervision should be provided by qualified personnel such as a registered professional engineer.

### **2.2.9 Pump Stations**

Proper operation, maintenance, and repair of pump stations typically requires special electrical, hydraulic, and mechanical knowledge. Pump station failure may damage equipment, the environment, or endanger public health. Variation in equipment types, pump station

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configuration, and geographical factors determine pump station design and O&M requirements.

The reviewer should verify that the O&M manual contains procedures in writing for the following:

- Are pumps rotated manually or automatically? If manually, how frequently?
- Are wet well operating levels set to limit pump starts and stops?
- Is there a procedure for manipulating pump operations (manually or automatically) during wet weather to increase in-line storage of wet weather flows?
- Is flow monitoring provided? How is the data collected used?
- Does the pump station have capacity-related overflows? Maintenance related overflows? Is overflow monitoring provided?
- Is there a history of power outages? Is there a source of emergency power? If the emergency power source is a generator, is it regularly exercised under load?

### **2.3 Equipment and Collection System Maintenance**

Every collection system owner or operator should have a well-planned, systematic, and comprehensive maintenance program. The goals of a maintenance program should include:

- Prevention of overflows
- Maximization of service and system reliability at minimum cost
- Assurance of infrastructure sustainability (i.e., ensure all components reach their service life)

There should then be procedures which describe the maintenance approach for various systems. In addition, there should be detailed instructions for the maintenance and repair of individual facilities. These instructions should provide a level of detail such that any qualified collection system personnel or repair technician could perform the repair or maintenance activity.

Maintenance may be planned or unplanned. There are essentially two types of planned maintenance; predictive and preventive. Predictive maintenance is a method that tries to look for early warning signs of equipment failure such that emergency maintenance is avoided. Preventive maintenance consists of scheduled maintenance activities performed on a regular basis. There are two types of unplanned maintenance, corrective and emergency. Corrective maintenance consists of scheduled repairs to problems identified under planned or predictive maintenance. Emergency maintenance are activities (typically repairs) performed in response to a serious equipment or line failure where action must be taken immediately. The goal of every owner or operator should be to reduce corrective and emergency maintenance through the use of planned and predictive maintenance. The reviewer should evaluate the progress of the owner or operator in achieving that goal. The goals of the reviewer in assessment of the maintenance program are:

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- Identify SSOs caused by inadequate maintenance
- Determine maintenance trends (i.e., frequent emergency maintenance performed as opposed to predictive maintenance)
- Identify sustainability issues (i.e., inadequate maintenance to allow system components to reach service life and/or many components nearing or at service life)

### **2.3.1 Maintenance Budgeting**

The cost of a maintenance program is a significant part of the annual operating budget. The collection system owner or operator should track all maintenance costs incurred throughout the year, both by internal staff and contractors, to ensure that the budget is based on representative costs from past years. Budgets should be developed from past cost records which usually are categorized according to preventive maintenance, corrective maintenance, and projected and actual major repair requirements. Annual costs should be compared to the budget periodically to control maintenance expenditures.

The reviewer should evaluate the maintenance budget keeping in mind the system's characteristics, such as age. Costs for emergency repairs should be a relatively small percentage of the budget; five to ten percent would not be considered excessive. The establishment of an "emergency reserve" may also be included as part of the maintenance budget. This is especially useful where full replacement is not funded. The budget should also be considered in light of maintenance work order backlog. The labor budget should be evaluated for consistency with local pay rates and staffing needs and the reviewer should compare local pay rates and staffing needs according to the tables in Section 2.1.1.

### **2.3.2 Planned and Unplanned Maintenance**

A planned maintenance program is a systematic approach to performing maintenance activities so that equipment failure is avoided. Planned maintenance is composed of predictive and preventive maintenance. In the end, a good planned maintenance program should reduce material and capital repair and replacement costs, improve personnel utilization and morale, reduce SSOs, and sustain public confidence.

Examples of predictive maintenance includes monitoring equipment for early warning signs of impending failure, such as excess vibration, heat, dirty oil, and leakage. Assessment and inspection activities can be classified as predictive maintenance. Vibration and lubrication analyses, thermography, and ultrasonics are among the more common predictive maintenance tools. Predictive maintenance also takes into account historical information about the system as all systems will deteriorate over time. A predictive maintenance program strives to identify potential problem areas and

**Reviewer - Point to Note**

The reviewer should inquire as to whether tools such as vibration and lubrication analysis, thermography, or ultrasonics are used, and obtain information on the extent of the programs.

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uncover trends that could affect equipment performance. Predictive maintenance offers an early warning. It allows collection system personnel to detect early signs of increasing rates of wear and therefore failure, and thus shift a "corrective" task into a "planned" task. To be truly effective predictive, however, maintenance should not spur personnel into doing the work too soon and wasting useful life and value of the equipment in question.

The basis of a good predictive maintenance program is recordkeeping. Only with accurate recordkeeping can baseline conditions be established, problem areas identified, and a proactive approach taken to repairs and replacement.

Effective preventive maintenance minimizes system costs and environmental impacts by reducing breakdowns and thus the need for corrective or emergency maintenance, improves reliability by minimizing the time equipment is out of service, increases the useful life of equipment thus avoiding costly premature replacement, and avoids potential noncompliance situations. An effective preventive maintenance program includes:

- Trained personnel
- Scheduling based on system specific knowledge
- Detailed instructions related to the maintenance of various pieces of equipment
- A system for recordkeeping
- System knowledge in the form of maps, historical knowledge and records

An effective preventive maintenance program builds on the inspection activities and predictive maintenance described in Sections 2.4.1 to 2.4.4, and includes a well thought-out schedule for these activities.

The basis of the schedule for mechanical equipment maintenance (i.e., pump station components) should be the manufacturers' recommended activities and frequencies. This schedule may then be augmented by the knowledge and experience of collection system personnel to reflect the site-specific requirements. The schedule for sewer line cleaning, inspection, root removal, and repair activities should be based on periodic inspection data. In most systems, uniform frequencies for sewer line cleaning, inspection, and root removal are not necessary and inefficient. In many systems, a relatively small percentage of the pipe generates most of the problems. Efficient use of inspection data allows the owner or operator to implement a schedule in the most constructive manner. In rare cases it may be appropriate to reduce maintenance frequency for a particular piece of equipment. An example of a scheduling code and maintenance schedule for a pump is shown below:

**Lubrication**

Lubrication is probably one of the most important maintenance activities for mechanical systems, such as pumps and motors. Frequency of lubrication, choice of lubricant and lubrication procedure are all important factors in this activity. These items should closely follow manufacturer instructions, but may be modified to fit site-specific conditions and particular equipment applications.

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Rotary Pump Maintenance Schedule	
Frequency	Maintenance Required
D	Check packing gland assembly
D	Check discharge pressure
S	Inspect and lubricate bearings
A	Flush bearings and replace lubricant

D = Daily

A = Annually

S = Semiannually

Typically, there is a maintenance card or record for each piece of equipment within the collection system. These records should contain maintenance recommendations, schedule, and instructions on conducting the specific maintenance activity. The records should include documentation regarding any maintenance activities conducted to date and other observations related to that piece of equipment or system. Maintenance records are generally kept where maintenance personnel have easy access to them. The reviewer should examine the full series of periodic work orders (i.e. weekly, monthly, semiannually, and annually) for a selection of system components (e.g., a few pump stations, several line segments). The reviewer should then compare the recommended maintenance frequency to that which is actually performed. He or she should also look at the backlog of work; not focusing solely on the number of backlogged work orders, but on what that number represents in time. A very large system can have a hundred orders backlogged and only be one week behind. In a computerized system, a listing of all open work orders is usually very simple for collection system personnel to generate. The owner or operator should be able to explain their system for prioritizing work orders.

The reviewer needs to clearly understand the following:

- How the maintenance data management system works
- How work orders are generated and distributed
- How field crews use the work orders
- How data from the field is collected and returned
- How and on whose authority work orders are closed out

The reviewer should check to see if data entry is timely and up to date.

Unplanned maintenance is that which takes place in response to equipment breakdowns or emergencies. Unplanned maintenance may be corrective or emergency maintenance. Corrective maintenance could occur as a result of preventive or predictive maintenance activities which identified a problem situation. A work order should be issued so that the request for corrective maintenance is directed to the proper personnel. An example of non-emergency corrective maintenance could be a broken belt on a belt driven pump. The worn belt was not detected and

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replaced through preventive maintenance and therefore the pump is out of service until corrective maintenance can be performed. Although the pump station may function with one pump out of service, should another pump fail, the situation may become critical during peak flow periods.

If the information can be easily generated the reviewer should select a sampling of work orders and compare them to the corrective maintenance database to determine if repairs are being made in a timely manner. Reviewers should note the current backlog of corrective maintenance work orders. A corrective maintenance backlog of two weeks or less would indicate an owner or operator in control of corrective maintenance. The owner or operator should be able to explain corrective maintenance work orders that have not been completed within six months.

Corrective maintenance takes resources away from predictive and preventive maintenance. When corrective maintenance becomes a predominant activity, personnel may not be able to perform planned maintenance, thus leading to more corrective maintenance and emergency situations. Emergency maintenance occurs when a piece of equipment or system fails, creating a threat to public health, the environment, or associated equipment. This type of maintenance involves repairs, on short notice, of malfunctioning equipment or sewers. A broken force main, totally non-functional pump station, and street cave-ins are all examples of emergency situations.

**Types of Portable Emergency Equipment**

- Bypass pumps
- Portable generator
- Air compressor, trailer-mounted
- Manhole lifters and gas testing equipment
- Sewer rodder and/or flushing machine
- Portable lights and hand tools
- Chemical spray units (for insects and rodent control)
- Truck (1-ton) and trailers
- Vacuum truck
- Repair equipment for excavation (backhoe, shoring equipment, concrete mixers, gasoline operated saws, traffic control equipment, etc.)
- Confined space entry gear

Emergency crews should be geared to a 24-hour-a-day, year-round operation. Most large systems have staffed 24-hour crews; many small systems have an "on-call" system. The owner or operator should be able to produce written procedures which spell out the type of action to take in a particular type of emergency and the equipment and personnel requirements necessary to carry out the action. The crews should have copies of these procedures and be familiar with them. Equipment must be located in an easily accessible area and be ready to move in a short period of time. Vehicles and equipment must be ready to perform, under extreme climatic conditions if necessary. The emergency crew

**Reviewer - Point to Note**

The reviewer should note the presence of supplies during the review of the yard where equipment and spare parts are maintained and personnel are dispatched.

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may need materials such as piping, pipe fittings, bedding materials and concrete. The owner or operator should have supplies on hand to allow for two point (i.e. segment, fitting, or appurtenance) repairs of any part of its system.

Pump stations should be subject to inspection and preventive maintenance on a regular schedule. The frequency of inspection may vary from once a week, for a reliable pump station equipped with a telemetry system, to continuous staffing at a large pump station. The basic inspection should include verification that alarm systems are operating properly, wet well levels are properly set, all indicator lights and voltage readings are within acceptable limits, suction and discharge pressures are within normal limits, that the pumps are running without excessive heat or vibration and have the required amount of lubrication, and that the emergency generator is ready if needed. Less frequent inspections may include such items as vibration analysis and internal inspection of pump components.

**Owner or Operator - Point to Note**

Occasionally a supervisor should perform an unscheduled inspection to confirm that tasks have been performed as expected.

Observations and tasks performed should be recorded in a log book or on a checklist at the pump station. It is important to note how this data returns to the central maintenance data management system. At the time of the inspection, collection system personnel may perform minor repairs if necessary. If non-emergency repairs are required that are beyond the staff's training, it will probably be necessary to prepare a work order which routes a request through the proper channels to initiate the repair action. During the review the reviewer should check a random number of work orders to see how they move through the system. The reviewer should note whether repairs are being carried out promptly. In pump stations, for critical equipment (pumps, drives, power equipment, and control equipment), there should not be much backlog, unless the staff is waiting for parts.

During the review, the reviewer should also make on-site observations of a representative pump stations. The reviewer should plan at least half an hour to look at the simplest two-pump prefabricated station, and one to two hours to look at a larger station. In large systems, drive time between stations may be significant. The reviewer should strive to see a range of pump station sizes and types (i.e., the largest, smallest, most remote and any that review of work orders has indicated might be problematic).

Overall, the pump station should be clean, in good structural condition and exhibit minimal odor. The reviewer should note the settings of the pumps (i.e., which are operating, which are on stand-by, and which are not operating and why). The operating pumps should be observed for noise, heat, and excessive vibration. The settings in the wet well should be noted (as indicated on the controls, as direct observation of the reviewer in the wet well is not recommended) and the presence of any flashing alarm lights. The reviewer is reminded of the atmospheric hazards in a pump station (make sure ventilation has been running prior to arrival) and to avoid confined

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space entry. If the pump station has an overflow its outlet should be observed, if possible, for signs of any recent overflows such as floatable materials or toilet paper. The reviewer should check the log book and/or checklist kept at the pump station to ensure that records are current and all maintenance activities have been performed. Below is a listing of items that indicate inadequate maintenance:

- Overall poor housekeeping and cleanliness
- Excessive grease accumulation in wet well
- Excessive corrosion on railings, ladders, and other metal components
- Sagging, worn, improperly sized, or inadequate belts
- Excessive equipment out of service for repair or any equipment for which repair has not been ordered (i.e., a work order issued)
- Pumps running with excessive heat, vibration, or noise
- Peeling paint and/or dirty equipment (the care given to equipment's outer surfaces often, but not always, mirrors internal condition)
- Check valves not closing when pumps shut off
- Inoperative instrumentation, alarms, and recording equipment
- "Jury-rigged" repairs (i.e., "temporary" repairs using inappropriate materials)
- Leakage from pumps, piping, or valves (some types of pump seals are designed to "leak" seal water)
- Inadequate lighting or ineffective/inoperative ventilation equipment

### 2.3.3 Sewer Cleaning

The purpose of sewer cleaning is to remove accumulated material from the sewer. Cleaning helps to prevent blockages and is also used to prepare the sewer for inspections. Stoppages in gravity sewers are usually caused by a structural defect, poor design, poor construction, an accumulation of material in the pipe (especially grease), or root intrusion. Protruding traps (lateral sewer connections incorrectly installed so that they protrude into the main sewer) may catch debris which then causes a further buildup of solids that eventually block the sewer. If the flow is less than approximately 1.0 to 1.4 feet per second, grit and solids can accumulate leading to a potential blockage.

#### Results of Various Flow Velocities

<u>Velocity</u>	<u>Result</u>
2.0 ft/sec.....	Very little material buildup in pipe
1.4-2.0 ft/sec.....	Heavier grit (sand and gravel) begin to accumulate
1.0-1.4 ft/sec.....	Inorganic grit and solids accumulate
Below 1.0 ft/sec.....	Significant amounts of organic and inorganic solids accumulate

(EPA 1974)

There are three major methods of sewer cleaning: hydraulic, mechanical, and chemical.

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Hydraulic cleaning (also referred to as flushing) refers to any application of water to clean the pipe. Mechanical cleaning uses physical devices to scrape, cut, or pull material from the sewer. Chemical cleaning can facilitate the control of odors, grease buildup, root growth, corrosion, and insect and rodent infestation. For additional information on sewer cleaning methods refer to Volumes I and II of *Operation and Maintenance of Wastewater Collection Systems* (CSU Sacramento 1996 and 1998).

The backbone of an effective sewer cleaning program is accurate recordkeeping. Accurate recordkeeping provides the collection system owner or operator with information on the areas



Root and grease buildup can cause blockages in a sewer system [photo: North Carolina Department of Natural Research (NCDNR)].

bottlenecks in the collection system, areas of poor design (e.g., insufficiently sloped sewers), areas prone to root intrusion, sags, and displacements. The connection between problem areas in the collection system and the preventive maintenance cleaning schedule should be clear. The owner or operator should also be able to identify the number of stoppages experienced per mile of sewer pipe. If the system is experiencing a steady increase in stoppages, the reviewer should try to determine the cause (i.e., lack of preventive maintenance funding, deterioration of the sewers due to age, an increase in grease producing activities, etc).

**Sewer Cleaning Records**

- Date, time, and location of stoppage or routine cleaning activity
- Method of cleaning used
- Cause of stoppage
- Identity of cleaning crew
- Further actions necessary and/or initiated
- Weather conditions

of the collection system susceptible to stoppages such that all portions of the system can be on an appropriate schedule. The reviewer should examine the records for legibility and completeness. He or she should then review the database to determine if entry of the field notes is current and accurate.

Sewers vary widely in their need for preventive cleaning. The collection system in a restaurant district may require cleaning every six months in order to prevent grease blockages. An area of the sewer system with new PVC piping and no significant grease contribution with reasonable and consistent slopes (i.e., no sags) may be able to go five years with no problems.

The owner or operator should be able to identify problem collection system areas, preferably on a map. Potential problem areas identified should include those due to grease or industrial discharges, hydraulic

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An inventory of spare parts, equipment, and supplies should be maintained by the collection system owner or operator. The inventory should be based on equipment manufacturer's recommendations, supplemented by historical experience with maintenance and equipment problems. Without such an inventory, the collection system may experience long down times or periods of inefficient operation in the event of a breakdown or malfunction.

Files should be maintained on all pieces of equipment and major tools. The owner or operator should have a system to assure that each crew always has adequate tools. Tools should be subject to sign out procedures to provide accountability. Tools and equipment should be replaced at the end of their useful life. The reviewer should inquire as to how

this is determined and how funds are made available to ensure this is the case. In addition, the reviewer should look at the tools and note their condition.

**Basic Equipment Inventory**

- Type, age, and description of the equipment
- Manufacturer
- Fuel type and other special requirements
- Operating costs and repair history

The owner or operator should maintain a yard where equipment, supplies, and spare parts are maintained and personnel are dispatched. Very large systems may maintain more than one yard. In this case, the reviewer should perform a visual survey at the main yard. In small to medium size systems, collection system operations may share the yard with the department of public works, water department, or other municipal agencies. In this case the reviewer should determine what percentage is being allotted for collection system items. The most important features of the yard are convenience and accessibility.

The reviewer should observe a random sampling of inspection and maintenance crew vehicles for equipment as described above. A review of the equipment and manufacturer's manuals aids in determining what spare parts should be maintained. The owner or operator should then consider the frequency of usage of the part, how critical the part is, and finally how difficult the part is to obtain when determining how many of the part to keep in stock. Spare parts should be kept in a clean, well-protected stock room. Critical parts are those which are essential to the operation of the collection system. Similar to equipment and tools management, a tracking system should be in place, including procedures on logging out materials, when maintenance personnel must use them. The owner or operator should be able to produce the spare parts inventory and clearly identify those parts deemed critical. The reviewer should evaluate the inventory and selected items in the stockroom to determine whether the specified number of these parts are being maintained.

**Owner or Operator - Point to Note**

The owner or operator should have a procedure for determining which spare parts are critical.

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## 2.4 Sewer System Capacity Evaluation - Testing and Inspection

The collection system owner or operator should have a program in place to periodically evaluate the capacity of the sewer system in both wet and dry weather flows and ensure the capacity is maintained as it was designed. The capacity evaluation program builds upon ongoing activities and the everyday preventive maintenance that takes place in a system. The capacity evaluation begins with an inventory and characterization of the system components. The inventory should include the following basic information about the system:

- Population served
- Total system size (feet or miles)
- Inventory of pipe length, size, material and age, and interior and exterior condition as available
- Inventory of appurtenances such as bypasses, siphons, diversions, pump stations, tide or flood gates and manholes, etc., including size or capacity, material and age, and condition as available
- Force main locations, length, size and materials, and condition as available
- Pipe slopes and inverts
- Location of house laterals - both upper and lower

The system then undergoes general inspection (described below in Sections 2.4.1 to 2.4.4) which serves to continuously update and add to the inventory information.

The next step in the capacity evaluation is to identify the location of wet weather related SSOs, surcharged lines, basement backups, and any other areas of known capacity limitations. These areas warrant further investigation in the form of flow and rainfall monitoring and inspection procedures to identify and quantify the problem. The reviewer should determine that the capacity evaluation includes an estimate peak flows experienced in the system, an estimate of the capacity of key system components, and identifies the major sources of I/I that contribute to hydraulic overloading events. The capacity evaluation should also make use of a hydraulic model, if any, to identify areas with hydraulic limitations and evaluate alternatives to alleviate capacity limitations. Short and long term alternatives to address hydraulic deficiencies should be identified, prioritized, and scheduled for implementation.



A sewer inspection is an important part of a sewer system capacity evaluation (photo: N.J. Department of Environmental Protection).

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### 2.4.1 Flow Monitoring

Fundamental information about the collection system is obtained by flow monitoring. Flow monitoring provides information on dry weather flows as well as areas of the collection system potentially affected by I/I. Flow measurement may also be performed for billing purposes, to assess the need for new sewers in a certain area, or to calibrate a model. There are three techniques commonly used for monitoring flow rates: (1) permanent and long-term, (2) temporary, and (3) instantaneous. Permanent installations are done at key points in the collection system such as the discharge point of a satellite collection system, pump stations, and key junctions. Temporary monitoring consists of flow meters typically installed for 30-90 days. Instantaneous flow metering is performed by collection system personnel, one reading is taken and then the measuring device is removed. The collection system owner or operator should have a flow monitoring plan that describes their flow monitoring strategy or should at least be able to provide the following information:

- Purpose of the flow monitoring
- Location of all flow meters
- Type of flow meters
- Flow meter inspection and calibration frequency

A flow monitoring plan should provide for routine inspection, service, and calibration checks (as opposed to actual calibration). In some cases, the data is calibrated rather than the flow meter. Checks should include taking independent water level (and ideally velocity readings), cleaning accumulated debris and silt from the flow meter area, downloading data (sometimes only once per month), and checking the desiccant and battery state. Records of each inspection should be maintained.

Flow measurements performed for the purpose of quantifying I/I are typically separated into three components: base flow, infiltration, and inflow. Base flow is generally taken to mean the wastewater generated without any I/I component. Infiltration is the seepage of groundwater into pipes or manholes through defects such as cracks, broken joints, etc. Inflow is the water which enters the sewer through direct connections such as roof leaders, direct connections from storm drains or yard, area, and foundation drains, the holes in and around the rim of manhole covers, etc. Many collection system owners or operators add a third classification: rainfall induced infiltration (RII). RII is stormwater that enters the collection system through defects that lie so close to the ground surface that they are easily reached. Although not from piped sources, RII tends to act more like inflow than infiltration.

In addition to the use of flow meters, which may be expensive for a small owner or operator, other methods of inspecting flows may be employed such as visually monitoring manholes during low-flow periods to determine areas with excessive I/I. For a very small system, this technique may be an effective and low-cost means of identifying problem areas in the system which require further investigation.

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The owner or operator should have in place a program for the efficient identification of excessive I/I. The program should look at the wastewater treatment plant, pump stations, permanent meter flows, and rainfall data to characterize peaking factors for the whole system and major drainage basins. The reviewer should evaluate the program including procedures and records associated with the flow monitoring plan. Temporary meters should be used on a "roving" basis to identify areas with high wet weather flows. Areas with high wet weather flows should then be subject to inspection and rehabilitation activities.

#### **2.4.2 Sewer System Testing**

Sewer system testing techniques are often used to identify leaks which allow unwanted infiltration into the sewer system and determine the location of illicit connections and other sources of stormwater inflow. Two commonly implemented techniques include smoke testing and dyed water testing. Regardless of the program(s) implemented by the owner or operator, the reviewer should evaluate any procedures and records that have been established for these programs. The reviewer should also evaluate any public relations program and assess how the owner or operator communicates with the public during these tests (i.e., when there is a possibility of smoke entering a home or building).

**Smoke testing** is a relatively inexpensive and quick method of detecting sources of inflow in sewer systems, such as down spouts, or driveway and yard drains and works best suited for detecting cross connections and point source inflow leaks. Smoke testing is not typically used on a routine basis, but rather when evidence of excessive I/I already exists. With each end of the sewer of interest plugged, smoke is introduced into the test section, usually via a manhole. Sources of inflow can then be identified when smoke escapes through them.

#### **Areas Usually Smoke Tested**

- Drainage paths
- Ponding areas
- Roof leaders
- Cellars
- Yard and area drains
- Fountain drains
- Abandoned building sewers
- Faulty service connections

If the collection system owner or operator implements a regular program of smoke testing, the program should include a public notification procedure. The owner or operator should also have procedures to define:

- How line segments are isolated
- The maximum amount of line to be smoked at one time
- The weather conditions in which smoke testing is conducted (i.e., no rain or snow, little wind and daylight only)

The results of positive smoke tests should be documented with carefully labeled photographs. Building inspections are sometimes conducted as part of a smoke testing program and, in some cases, may be the only way to find illegal connections. If properly connected to the sanitary sewer system, smoke should exit the vent stacks of the surrounding properties. If traces of the

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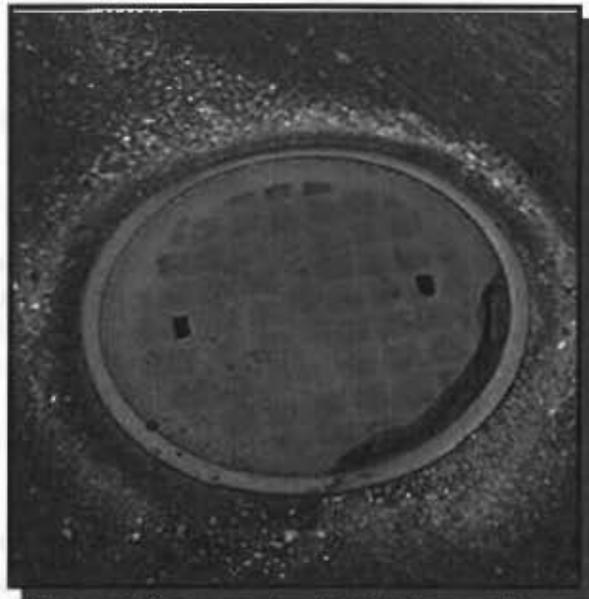
smoke or its odor enter the building, it is an indication that gases from the sewer system may also be entering. Building inspections can be labor intensive and require advanced preparation and communication with the public.

**Dyed water testing** may be used to establish the connection of a fixture or appurtenance to the sewer. It is often used to confirm smoke testing or to test fixtures that did not smoke. As is the case with smoke testing, it is not used on a routine basis but rather in areas that have displayed high wet weather flows. Dyed water testing can be used to identify structurally damaged manholes that might create potential I/I problems. This is accomplished by flooding the area close to the suspected manholes with dyed water and checking for entry of dyed water at the frame-chimney area, cone/corbel, and walls of the manhole.

### 2.4.3 Sewer System Inspection

Visual inspection of manholes and pipelines are the first line of defense in the identification of existing or potential problem areas. Visual inspections should take place on both a scheduled basis and as part of any preventive or corrective maintenance activity. Visual inspections provide additional information concerning the accuracy of system mapping, the presence and degree of I/I problems, and the physical state-of-repair of the system. By observing the manhole directly and the incoming and outgoing lines with a mirror, it is possible to determine structural condition, the presence of roots, condition of joints, depth of debris in the line, and depth of flow. The reviewer should examine the records of visual inspections to ensure that the following information is recorded:

- Manhole identification number and location
- Cracks or breaks in the manhole or pipe (inspection sheets and/or logs should record details on defects)
- Accumulations of grease, debris, or grit
- Wastewater flow characteristics (e.g., flowing freely or backed up)
- Inflow
- Infiltration (presence of clear water in or flowing through the manhole)
- Presence of corrosion
- Offsets or misalignments
- Condition of the frame
- Evidence of surcharge
- Atmospheric hazard measurements (especially hydrogen sulfide)
- If repair is necessary, a notation as to whether a work order has been issued



Damage to the sewer system infrastructure, such as this broken manhole cover allows stormwater into the sewer system (photo: Limno-Tech, Inc.)

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Manholes should undergo routine inspection typically every one to five years. There should be a baseline for manhole inspections (e.g., once every two years) with problematic manholes being inspected more frequently. The reviewer should conduct visual observation at a small but representative number of manholes for the items listed above.

There are various pipeline inspection techniques, the most common include: lamping, camera inspection, sonar, and CCTV. These will be explained further in the following sections.

#### **2.4.3.1 Sewer System Inspection Techniques**

Sewer inspection is an important component of any maintenance program. There are a number of inspection techniques that may be employed to inspect a sewer system. The reviewer should determine if a inspection program includes frequency and schedule of inspections and procedures to record the results. Sewer system cleaning should always be considered before inspection is performed in order to provide adequate clearance and inspection results. Additionally, a reviewer should evaluate records maintained for inspection activities including if information is maintained on standardized logs and should include:

- Location and identification of line being inspected
- Pipe size and type
- Name of personnel performing inspection
- Distance inspected
- Cleanliness of the line
- Condition of the manhole with pipe defects identified by footage from the starting manhole
- Results of inspection, including estimates of I/I

**Lamping** involves lowering a still camera into a manhole. The camera is lined up with the centerline of the junction of the manhole frame and sewer. A picture is taken down the pipe with a strobe-like flash. A disadvantage of this technique is that only the first 10-12 feet of the pipe can be inspected upstream and downstream of the access point. Additionally, it has limited use in small diameter sewers. The benefits of this technique include not requiring confined space entry and little equipment and set-up time is required.

**Camera inspection** is more comprehensive than lamping in that more of the sewer can be viewed. A still camera is mounted on a floatable raft and released into a pipe. The camera takes pictures with a strobe-like flash as it floats through the sewer pipe. This technique is often employed in larger lines where access points are far apart. Similarly to lamping, portions of the pipe may still be missed using this technique. Obviously, there also must be flow in the pipe for the raft to float. This technique also does not fully capture the invert of the pipe and its condition.

**Sonar** is a newer technology deployed similarly to CCTV cameras, described in more detail below. The sonar emits a pulse which bounces off the walls of the sewer. The time it takes for

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this pulse to bounce back provides data providing an image of the interior of the pipe including its structural condition. A benefit of this technique is that it can be used in flooded or inaccessible sections of the sewer. The drawback is that the technique requires heavy and expensive equipment.

**Sewer scanner** and evaluation is an experimental technology where a 360 degree scanner produces a full digital picture of the interior of the pipe. This technique is similar to sonar in that a more complete image of a pipe can be made than with CCTV, but not all types of sewer defects may be identified as readily (i.e., infiltration, corrosion).

**Closed Circuit Television (CCTV)** inspections are a helpful tool for early detection of potential problems. This technique involves a closed-circuit camera with a light which is self-propelled or pulled down the pipe. As it moves it records the interior of the pipe. CCTV inspections may be done on a routine basis as part of the preventive maintenance program as well as part of an investigation into the cause of I/I. CCTV, however, eliminates the hazards associated with confined space entry. The output is displayed on a monitor and videotaped. A benefit of CCTV inspection is that a permanent visual record is captured for subsequent reviews.

## **2.5 Sewer System Rehabilitation**

The collection system owner or operator should have a sewer rehabilitation program. The objective of sewer rehabilitation is to maintain the overall viability of a collection system. This is done in three ways: (1) ensuring its structural integrity; (2) limiting the loss of conveyance and wastewater treatment capacity due to excessive I/I; and (3) limiting the potential for groundwater contamination by controlling exfiltration from the pipe network. The rehabilitation program should build on information obtained as a result of all forms of maintenance and observations made as part of the capacity evaluation and asset inventory to assure the continued ability of the system to provide sales and service at the least cost. The reviewer should try to gain a sense of how rehabilitation is prioritized. Priorities may be stated in the written program or may be determined through interviews with system personnel.

There are many rehabilitation methods. The choice of methods depends on pipe size, type, location, dimensional changes, sewer flow, material deposition, surface conditions, severity of I/I, and other physical factors. Non-structural repairs typically involve the sealing of leaking joints in otherwise sound pipe.

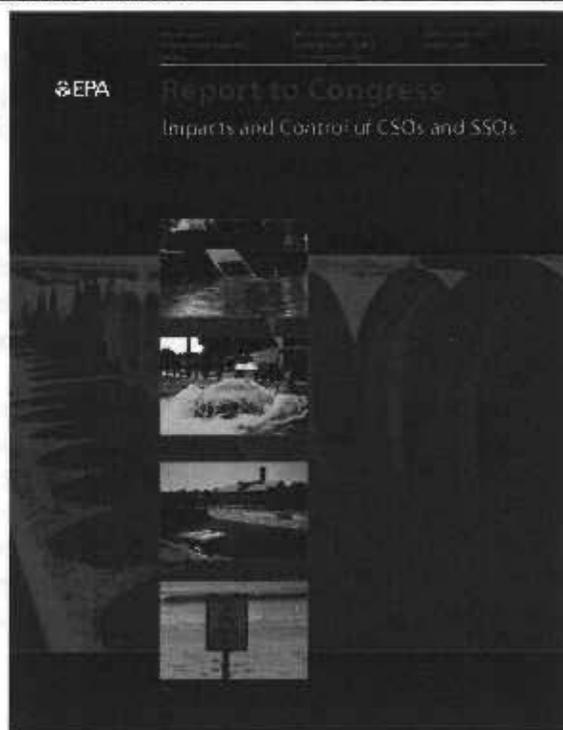
Structural repairs involve either the replacement of all or a portion of a sewer line, or the lining of the sewer. These repairs can be carried out by excavating usually for repairs limited to one or two pipe segments (these are known as point repairs) or by trenchless technologies (in which repair is carried out via existing manholes or a limited number of access excavations).

The rehabilitation program should identify the methods that have been used in the past, their success rating and methods to be used in the future. An reviewer who wants further guidance on methods of rehabilitation may consult:

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- Technology Description from 2004 Report to Congress (EPA 2004)
- *Operation and Maintenance of Wastewater Collection Systems*, Volumes I and II (CSU Sacramento 1996 and 1998)
- *Existing Sewer Evaluation and Rehabilitation* (WEF 1994)

The reviewer should determine the owner's or operator's policies regarding service lateral rehabilitation since service laterals can constitute a serious source of I/I. Manholes should not be neglected in the rehabilitation program. Manhole covers can allow significant inflow to enter the system because they are often located in the path of surface runoff. Manholes themselves can also be a significant source of infiltration from cracks in the barrel of the manhole.



The owner or operator should be able to produce documentation on the location and methods used for sewer rehabilitation. The reviewer should compare the rehabilitation accomplished with that recommended by the capacity evaluation program. When examining the collection system rehabilitation program, the reviewer should be able to answer the following questions:

- Is rehabilitation taking place before it becomes emergency maintenance?
- Are recommendations made as a result of the previously described inspections?
- Does the rehabilitation program take into account the age and condition of the sewers?

## **CHAPTER 3. CHECKLIST FOR CONDUCTING EVALUATIONS OF WASTEWATER COLLECTION SYSTEM CAPACITY, MANAGEMENT, OPERATION, AND MAINTENANCE (CMOM) PROGRAMS**

The following is a comprehensive checklist available for use in the review process. The checklist consists of a series of questions organized by major categories and sub-categories. The major category is followed by a brief statement describing the category. Following the sub-category is a brief clarifying statement. References are then given.

Questions are provided in a table format that includes the question, response, and documentation available.

Response is completed by using information and data acquired from the data and information request, onsite interviews, and site reviews. An alternative to this process is to transmit the entire checklist to the collection system owner or operator to complete and return electronically.

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**I. General Information - Collection System Description**

Question	Response	Documentation Available	
		Yes	No
Size of service area (acres).			
Population of service area.			
Number of pump stations.			
Feet (or miles) of sewer.			
Age of system (e.g., 30% over 30 years, 20% over 50 years, etc.).			

Comments:

## II. Continuing Sewer Assessment Plan

Question	Response	Documentation Available	
		Yes	No
Does the collection system experience problems related to I/I? How do these problems manifest themselves? (Manhole overflows, basement flooding, structure, SSOs)			
How does the owner or operator prioritize investigation, repairs and rehabilitation related to I/I?			
What methods are considered to remedy hydraulic deficiencies?			
Does the plan include a schedule for investigative activities?			
Is the plan regularly updated?			

Comments:

*[Faint, illegible handwritten text in the comments section]*

### III. A. Collection System Management: Organizational Structure

Question	Response	Documentation Available	
		Yes	No
Is an organizational chart available that shows the overall personnel structure for the collection system, including operation and maintenance staff?			
Are there organizational charts that show functional groups and classifications?			
Are up to date job descriptions available that delineate responsibilities and authority for each position?			
Are the following items discussed in the job descriptions: <input type="checkbox"/> nature of work to be performed, <input type="checkbox"/> minimum requirements for the position, <input type="checkbox"/> necessary special qualifications or certifications, <input type="checkbox"/> examples of the types of work, <input type="checkbox"/> list of licences required for the position, <input type="checkbox"/> performance measures or promotional potential?			
Does the organizational chart indicate how many positions are budgeted as opposed to actually filled?			
On average, how long do positions remain vacant?			
Are collection system staff responsible for any other duties, (e.g., road repair or maintenance, O&M of the storm water collection system)?			

Comments:

### III. B. Collection System Management: Training

Question	Response	Documentation Available	
		Yes	No
Is there a documented formal training program?			
Does the training program address the fundamental mission, goals, and policies of the collection system owner or operator?			
Does the owner or operator provide training in the following areas: <input type="checkbox"/> safety, <input type="checkbox"/> routine line maintenance, <input type="checkbox"/> confined space entry, <input type="checkbox"/> traffic control, <input type="checkbox"/> record keeping, <input type="checkbox"/> electrical and instrumentation, <input type="checkbox"/> pipe repair, <input type="checkbox"/> bursting CIPP, <input type="checkbox"/> public relations, <input type="checkbox"/> SSO/emergency response, <input type="checkbox"/> pump station operations and maintenance, <input type="checkbox"/> CCTV and trench/shoring, <input type="checkbox"/> other?			
Which of these programs have formal curriculums?			
Does On-the-Job (OJT) training use Standard Operating and Standard Maintenance Procedures (SOPs & SMPs)?			
Is OJT progress and performance measured?			
Does the owner or operator have mandatory training requirements identified for key employees?			
What percentage of employees met or exceeded their annual training goals during the past year?			
Which of the following methods are used to assess the effectiveness of the training: <input type="checkbox"/> periodic testing, <input type="checkbox"/> drills, <input type="checkbox"/> demonstration, <input type="checkbox"/> none?			
What percentage of the training offered by the owner or operator is in the form of the following: manufacturer training, on-the-job training, in-house classroom training, industry-wide training?			

Comments:

### III. C. Collection System Management: Communication and Customer Service

Question	Response	Documentation Available	
		Yes	No
What type of public education/outreach programs does the owner or operator have about user rates?			
Do these programs include communication with groups such as local governments, community groups, the media, schools, youth organizations, senior citizens? List applicable groups.			
Is there a public relations program in place?			
Are the employees of the collection system trained in public relations?			
Are there sample correspondence or "scripts" to help guide staff through written or oral responses to customers?			
What methods are used to notify the public of major construction or maintenance work: <input type="checkbox"/> door hangers, <input type="checkbox"/> newspaper, <input type="checkbox"/> fliers, <input type="checkbox"/> signs, <input type="checkbox"/> other, <input type="checkbox"/> none?			
Is the homeowner notified prior to construction that his/her property may be affected?			
Is information provided to residents on cleanup procedures following basement backups and overflows from manholes when they occur?			
Which of the following methods are used to communicate with system staff: <input type="checkbox"/> regular meetings, <input type="checkbox"/> bulletin boards, <input type="checkbox"/> e-mail, <input type="checkbox"/> other?			
How often are staff meetings held (e.g., daily, weekly, monthly)?			
Are incentives offered to employees for performance improvements?			
Does the owner or operator have an "Employee of the Month/Quarter/Year" program?			

Question	Response	Documentation Available	
		Yes	No
How often are performance reviews conducted (e.g., semi-annually, annually, etc.)?			
Does the owner or operator regularly communicate with other municipal departments?			
Does the owner or operator have a formal procedure in place to evaluate and respond to complaints?			
What are the common complaints received?			
Does the owner or operator have a process for customer evaluation of the services provided?			
Do customer service records include the following information: <input type="checkbox"/> personnel who received the complaint or request, <input type="checkbox"/> nature of complaint or request, <input type="checkbox"/> to whom the follow-up action was assigned, <input type="checkbox"/> date of the complaint or request, <input type="checkbox"/> date the complaint or request was resolved, <input type="checkbox"/> customer contact information, <input type="checkbox"/> location of the problem, <input type="checkbox"/> date the follow-up action was assigned, <input type="checkbox"/> cause of the problem, <input type="checkbox"/> feedback to customer?			
Does the owner or operator have a goal for how quickly customer complaints (or emergency calls) are resolved?			
What percentage of customer complaints (or emergency calls) are resolved within the timeline goals?			
How are complaint records maintained? (i.e., computerized) Is this information used as the basis for other activities such as routine preventative maintenance?			

Comments:

### III. D. Collection System Management: Management Information Systems

Question	Response	Documentation Available	
		Yes	No
What types of work reports are prepared by the O&M Staff?			
Do the work reports include enough information? (See example report forms)			
How are records kept?			
Are records maintained for a period of at least three years?			
Are the records able to distinguish activities taken in response to an overflow event?			
Does the owner or operator use computer technology for its management information system? (Computer Based Maintenance Management Systems, spreadsheets, data bases, SCADA, etc). If so, what type of system(s) is used?			
Are there written instructions for managing and tracking the following information: <input type="checkbox"/> complaint work orders, <input type="checkbox"/> scheduled work orders, <input type="checkbox"/> customer service, <input type="checkbox"/> scheduled preventative maintenance, <input type="checkbox"/> scheduled inspections, <input type="checkbox"/> sewer system inventory, <input type="checkbox"/> safety incidents, <input type="checkbox"/> scheduled monitoring/sampling, <input type="checkbox"/> compliance/overflow tracking, <input type="checkbox"/> equipment/tools tracking, <input type="checkbox"/> parts inventory?			
Do the written instructions for tracking procedures include the following information: <input type="checkbox"/> accessing data and information, <input type="checkbox"/> instructions for using the tracking system, <input type="checkbox"/> updating the MIS, <input type="checkbox"/> developing and printing reports?			
How often is the management information system updated (immediately, within one week of the incident, monthly as time permits)?			

Comments:

**III. E. Collection System Management: SSO Notification Program**

Question	Response	Documentation Available	
		Yes	No
Does the owner or operator have standard procedures for notifying state agencies, health agencies, the regulatory authority, and the drinking water purveyor of overflow events?			
Are above notification procedures dependent on the size or location of the overflow? If so, describe this procedure.			
Is there a Standard form for recording overflow events? Does it include location, type, receiving water, estimated volume, cause?			
Are chronic SSO locations posted?			

Comments:

### III. F. Collection System Management: Legal Authority

Question	Response	Documentation Available	
		Yes	No
Does the collection system receive flow from satellite communities?			
What is the total area from satellite communities that contribute flow to the collection system (acres or square miles)?			
Does the owner or operator require satellite communities to enter into an agreement?			
Does the agreement include the requirements listed in the sewer use ordinance (SUO)?			
Do the agreements have a date of termination and allow for renewal under different terms?			
Does the owner or operator maintain the legal authority to control the maximum flow introduced into the collection system from satellite communities?			
Are standards, inspections, and approval for new connections clearly documented in a SUO?			
Does the SUO require satellite communities to adopt the same industrial and commercial regulator discharge limits as the owner or operator?			
Does the SUO require satellite communities to adopt the same inspection and sampling schedules as required by the pretreatment ordinance?			
Does the SUO require the satellite communities or the owner or operator to issue control permits for significant industrial users?			
Does the SUO contain provisions for addressing overstrength wastewater from satellite communities?			
Does the SUO contain procedures for the following: inspection standards, pretreatment requirements, building/sewer permit issues?			

		<p>Does the SUC contain general prohibitions of the following materials: <input type="checkbox"/> fire and explosion hazards, <input type="checkbox"/> oils or petroleum, <input type="checkbox"/> corrosive materials, <input type="checkbox"/> materials which may cause interference at the wastewater treatment plant, <input type="checkbox"/> obstructive materials?</p>	<p>Does the SUC contain procedures and enforcement actions for the following: <input type="checkbox"/> fats, oils, and grease (FOG); <input type="checkbox"/> I/I; building structures over the sewer lines; <input type="checkbox"/> storm water connections to sanitary lines; <input type="checkbox"/> defects in service laterals located on private property; <input type="checkbox"/> sump pumps, air conditioner?</p>
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Comments:

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### IV. A. Collection System Operation: Budgeting

Question	Response	Documentation Available	
		Yes	No
What are the owner or operator's current rates?			
What is the average annual fee for residential users?			
How are user rates calculated?			
How often are user charges evaluated and adjusted based on that evaluation?			
How many rate changes have there been in the last 10 years and what were they?			
Does the owner or operator receive sufficient funding from its revenues?			
Are collection system enterprise funds used for non-enterprise fund activities?			
Is there a budget for annual operating costs?			
Does the budget provide sufficient line item detail for labor, materials and equipment?			
Are costs for collection system O&M separated from other utility services, i.e., water, storm water and treatment plants?			
Do O&M managers have current O&M budget data?			
What is the collection system's average annual O&M budget?			
What percentage of the collection system's overall budget is allocated to maintenance of the collection system?			
Does the owner or operator have a Capital Improvement Plan (CIP) that provides for system repair/replacement on a prioritized basis?			
What is the collection system's average annual CIP budget?			

Question	Response	Documentation Available	
		Yes	No
<p>What percentage of the maintenance budget is allotted to the following maintenance: Predictive maintenance (tracking design, life span, and scheduled parts replacement), preventative maintenance (identifying and fixing system weakness which, if left unaddressed, could lead to overflows), corrective maintenance (fixing system components that are functioning but not at 100% capacity/efficiency), emergency maintenance (reactive maintenance, overflows, equipment breakdowns).</p>			
<p>Does the owner or operator have a budgeted program for the replacement of under-capacity pipes?</p>			
<p>Does the owner or operator have a budgeted program for the replacement of over-capacity pipes?</p>			
<p>Are O&amp;M staff involved in O&amp;M budget preparation?</p>			
<p>How are priorities determined for budgeting for O&amp;M during the budget process?</p>			
<p>Does the owner or operator maintain a fund for future equipment and infrastructure replacement?</p>			
<p>How is new work typically financed?</p>			

Comments:

### IV. B. Collection System Operation: Compliance

Question	Response	Documentation Available	
		Yes	No
Does the owner or operator have inter-jurisdictional or inter-municipal agreements?	Already asked		
Is there a sewer-use and a grease ordinance?			
Is there a process in place for enforcing sewer and grease ordinances?			
Are all grease traps inspected regularly?			
How does the owner or operator learn of new or existing unknown grease traps?			
Who is responsible for enforcing the sewer ordinance and grease ordinance? Does this party communicate with the utility department on a regular basis?			
Are there any significant industrial dischargers to the system?			
Is there a pretreatment program in place? If so, please describe.			
Is there an ordinance dealing with private service laterals?			
Is there an ordinance dealing with storm water connections or requirements to remove storm water connections?			

Comments:

### IV. C. Collection System Operation: Water Quality Monitoring

Question	Response	Documentation Available	
		Yes	No
Is there a water quality monitoring program in the service areas?			
If so, who performs the monitoring?			
How many locations are monitored?			
What parameters are monitored and how often?			
Is water quality monitored after an SSO event?			
Are there written standard sampling procedures available?			
Is analysis performed in-house or by a contract laboratory?			
Are chain-of-custody forms used?			

Comments:

**IV. D. Collection System Operation: Hydrogen Sulfide Monitoring and Control**

Question	Response	Documentation Available	
		Yes	No
Are odors a frequent source of complaints? How many?			
Are the locations of the frequent odor complaints documented?			
What is the typical sewer slope? Does the owner or operator take hydrogen sulfide corrosion into consideration when designing sewers?			
Does the collection system owner or operator have a hydrogen sulfide problem, and if so, does it have in place corrosion control programs? What are the major elements of the program?			
Does the owner or operator have written procedures for the application of chemical dosages?			
Are chemical dosages, dates, and locations documented?			
Does the owner or operator have a program in place for renewing or replacing severely corroded sewer lines to prevent collapse?			
Are the following methods used for hydrogen sulfide control: <input type="checkbox"/> aeration, <input type="checkbox"/> iron salts, <input type="checkbox"/> enzymes, <input type="checkbox"/> activated charcoal canisters, <input type="checkbox"/> chlorine, <input type="checkbox"/> sodium hydroxide, <input type="checkbox"/> hydrogen peroxide, <input type="checkbox"/> potassium permanganate, <input type="checkbox"/> biofiltration, <input type="checkbox"/> others?			
Does the system contain air relief valves at the high points of the force main system?			
How often are lb valves maintained and inspected (weekly, monthly, etc.)?			
Does the owner or operator enforce pretreatment requirements?			

Comments:

3-18

**IV. E. Collection System Operation: Safety**

Question	Response	Documentation Available	
		Yes	No
Is there a documented safety program supported by the top administration official?			
Is there a Safety Department that provides training, equipment, and an evaluation of procedures?			
If not, who provides safety training?			
Does the owner or operator have written procedures for the following: <input type="checkbox"/> lockout/tagout, <input type="checkbox"/> MSDS, <input type="checkbox"/> chemical handling, <input type="checkbox"/> confined spaces permit program, <input type="checkbox"/> trenching and excavations, <input type="checkbox"/> biological hazards in wastewater, <input type="checkbox"/> traffic control and work site safety, <input type="checkbox"/> electrical and mechanical systems, <input type="checkbox"/> pneumatic and hydraulic systems safety?			
What is the agency's lost-time injury rate(percentage or in hours)?			
Is there a permit required confined space entry procedure for manholes, wetwells, etc.? Are confined spaces clearly marked?			
Are the following equipment items available and in adequate supply: <input type="checkbox"/> rubber/disposable gloves; <input type="checkbox"/> confined space ventilation equipment; <input type="checkbox"/> hard hats, <input type="checkbox"/> safety glasses, <input type="checkbox"/> rubber boots; <input type="checkbox"/> antibacterial soap and first aid kit; <input type="checkbox"/> tripods or non-entry rescue equipment; <input type="checkbox"/> fire extinguishers; <input type="checkbox"/> equipment to enter manholes; <input type="checkbox"/> portable crane/hoist; <input type="checkbox"/> atmospheric testing equipment and gas detectors; <input type="checkbox"/> oxygen sensors; <input type="checkbox"/> H <sub>2</sub> S monitors; <input type="checkbox"/> full body harness; <input type="checkbox"/> protective clothing; <input type="checkbox"/> traffic/public access control equipment; <input type="checkbox"/> 5-minute escape breathing devices; <input type="checkbox"/> life preservers for lagoons; <input type="checkbox"/> safety buoy at activated sludge plants; <input type="checkbox"/> fiberglass or wooden ladders for electrical work; <input type="checkbox"/> respirators and/or self-contained breathing apparatus; <input type="checkbox"/> methane gas or OVA analyzer; <input type="checkbox"/> J.F.L. metering?			
Are safety monitors clearly identified?			
How often are safety procedures reviewed and revised?			

Question	Response	Documentation Available	
		Yes	No
Are workplace accidents investigated?			
How does the Administration communicate with field personnel on safety procedures; memo, direct communication, video, etc.?			
Is there a Safety Committee with participation by O&M staff? How often does it meet?			
Is there a formal Safety Training Program? Are records of training maintained?			

Comments:

**IV. F. Collection System Operation: Emergency Preparedness and Response**

Question	Response	Documentation Available	
		Yes	No
Does the owner or operator have an emergency response plan? A contingency plan?			
How often is the plan reviewed and updated? What was the date it was last updated?			
Does the plan take into consideration vulnerable points in the system, severe natural events, failure of critical system components, vandalism or other third party events, and a root cause analysis protocol?			
Are staff trained and drilled to respond to emergency situations? Are responsibilities detailed for all personnel who respond to emergencies?			
Are there emergency operation procedures for equipment and processes?			
Does the owner or operator have standard procedures for notifying state agencies, local health departments, the regulatory authority, and drinking water authorities of significant overflow events?			
Does the procedure include an up-to-date list of the names, titles, phone numbers, and responsibilities of all personnel involved?			
Do work crews have immediate access to tools and equipment during emergencies?			
Is there a public notification plan? If so, does it cover both regular business hours and off-hours?			
Does the owner or operator have procedures to limit public access to and contact with areas affected with SSOs?			
Does the owner or operator use containment techniques to protect the storm drainage systems?			

<p>Do the overflow records include the following information: <input type="checkbox"/> date and time, <input type="checkbox"/> cause(s), <input type="checkbox"/> names of affected receiving water(s), <input type="checkbox"/> location, <input type="checkbox"/> how it was stopped, <input type="checkbox"/> any remediation efforts, <input type="checkbox"/> estimated flow/volume discharged, <input type="checkbox"/> duration of overflow?</p>	
<p>Does the owner or operator have signage to keep public from affected area?</p>	
<p>Is there a hazard classification system? Where is it located?</p>	
<p>Does the owner or operator conduct vulnerability analyses?</p>	
<p>Are risk assessments performed? How often?</p>	

Comments:

<p><i>[Faint, illegible handwritten text in the comments section]</i></p>	<p><i>[Faint, illegible handwritten text in the comments section]</i></p>
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### IV. H. Collection System Operation: Engineering - System Mapping and As-built Plans (Record Drawings)

Question	Response	Documentation Available	
		Yes	No
What type of mapping/inventory system is used?			
Is the mapping tied to a GPS system?			
Are "as-built" plans (record drawings) or maps available for use by field crews in the office and in the field?			
Do field crews record changes or inaccuracies and is there a process in place to update "as built" plans (record drawings)?			
Do the maps show the date the map was drafted and the date of the last revision?			
Do the sewer line maps include the following: <input type="checkbox"/> scale; <input type="checkbox"/> north arrow; <input type="checkbox"/> date the map was drafted; <input type="checkbox"/> date of the last revision; <input type="checkbox"/> service area boundaries; <input type="checkbox"/> property lines; <input type="checkbox"/> other landmarks; <input type="checkbox"/> manhole and other access points; <input type="checkbox"/> location of building laterals; <input type="checkbox"/> street names; <input type="checkbox"/> SSOs/CSOs; <input type="checkbox"/> flow monitors; <input type="checkbox"/> force mains; <input type="checkbox"/> pump stations; <input type="checkbox"/> lined sewers; <input type="checkbox"/> main, trunk, and interceptor sewers; <input type="checkbox"/> easement lines and dimensions; <input type="checkbox"/> pipe material; <input type="checkbox"/> pipe diameter; <input type="checkbox"/> pipe diameter; <input type="checkbox"/> installation date; <input type="checkbox"/> slope; <input type="checkbox"/> manhole rim elevation; <input type="checkbox"/> manhole coordinates; <input type="checkbox"/> manhole invert elevation; <input type="checkbox"/> distance between manholes?			
Are the following sewer attributes recorded: <input type="checkbox"/> size, <input type="checkbox"/> shape, <input type="checkbox"/> invert elevation, <input type="checkbox"/> material, <input type="checkbox"/> separate/combined sewer, <input type="checkbox"/> installation date?			
Are the following manhole attributes recorded: <input type="checkbox"/> shape, <input type="checkbox"/> type, <input type="checkbox"/> depth, <input type="checkbox"/> age, <input type="checkbox"/> material?			
Is there a systematic numbering and identification method/system established to identify sewer system manhole, sewer lines, and other items (pump stations, etc.)?			

Comments:

### IV. I. Collection System Operation: Engineering - Design

Question	Response	Documentation Available	
		Yes	No
Is there a document which details design criteria and standard construction details?			
Is life cycle cost analysis performed as part of the design process?			
Is there a document that describes the procedures that the owner or operator follows in conducting design review? Are there any standard forms that are used as a guide?			
Are O&M staff involved in the design review process?			
Does the owner or operator have documentation on private service lateral design and inspection standards?			
Does the owner or operator attempt to standardize equipment and sewer system components?			

Comments:

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### IV. J. Collection System Operation: Engineering - Capacity

Question	Response	Documentation Available	
		Yes	No
What procedures are used in determining whether the capacity of existing gravity sewer system, pump stations and force mains are adequate for new connections?			
Is any metering of flow performed prior to allowing new connections?			
Is there a hydraulic model of the system used to predict the effects of new connections?			
Is there any certification as to the adequacy of the sewer system to carry additional flow from new connections required?			

Comments:

*[Faint, illegible handwritten notes and a grid pattern are visible in this section, likely representing a table or form used for data entry or calculations.]*

**IV. K. Collection System Operation: Engineering - Construction**

Question	Response	Documentation Available	
		Yes	No
Who constructs new sewers? If other than the owner or operator, does the owner or operator review and approve the design?			
Is there a document that describes the procedures that the owner or operator follows in conducting their construction inspection and testing program?			
Are there any standard forms that guide the owner or operator in conducting their construction inspection and testing program?			
Is new construction inspected by the owner or operator or others?			
What are the qualifications of the inspector(s)?			
What percentage of time is a construction inspector on site?			
Is inspection supervision provided by a registered professional engineer?			
How is the new gravity sewer construction tested? (Air, water, weirs, etc.)			
Are new manholes tested for inflow and infiltration?			
Are new gravity sewers televised?			
What tests are performed on pump stations?			
What tests are performed on force mains?			
Is new construction built to standard specifications established by the owner or operator and/or the State?			
Is there a warranty for new construction? If so, is there a warranty inspection done at the end of this period?			

Comments:

### IV. L. Collection System Operation: Pump Station Operation

Question	Response	Documentation Available	
		Yes	No
How many pump stations are in the system? How many have backup power sources?			
Are enough trained personnel assigned to properly maintain pump stations?			
Are these personnel assigned full-time or part-time to pump station duties?			
Are there manned and un-manned pump stations in the system? How many of each?			
Is there a procedure for manipulating pump operations (manually or automatically during wet weather to increase in-line storage of wet weather flows)?			
Are well-operating levels set to limit pump start/stops?			
Are the lead, lag, and backup pumps rotated regularly?			

Comments:

**IV. L. 1. Collection System Operation: Pump Stations - Inspection**

Question	Response	Documentation Available	
		Yes	No
How often are pump stations inspected?			
What work is accomplished during inspections?			
Is there a checklist?			
Are records maintained for each inspection?			
What are the average annual labor hours spent on pump station inspections?			
Are there Standard Operating Procedures (SOPs) and Standard Maintenance Procedures (SMPs) for each station?			
What are the critical operating characteristics maintained for each station? Are the stations maintained within these criteria?			

Comments:

<p><i>[Faint, illegible handwritten text in the comments section]</i></p>
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**IV. L. 2. Collection System Operation: Pump Stations - Emergencies**

Question	Response	Documentation Available	
		Yes	No
Is there an Emergency Operating Procedure for each pump station?			
Is there sufficient redundancy of equipment in all pump stations?			
Who responds to lift station failures and overflows? How are they notified?			
How is loss of power at a station dealt with? (i.e. on-site electrical generators, alternate power source, portable electric generator(s))			
What equipment is available for pump station bypass?			
What process is used to investigate the cause of pump station failure and take necessary action to prevent future failures?			

Comments:

*[Faint, illegible handwritten text in a grid format, likely representing a response or notes.]*

**IV. L. 3. Collection System Operation: Pump Stations - Emergency Response and Monitoring**

Question	Response	Documentation Available	
		Yes	No
How are lift stations monitored?			
If a SCADA system is used, what parameters are monitored?			

Comments:







**IV. K. Collection System Operation: Engineering - Construction**

Question	Response	Documentation Available	
		Yes	No
Who constructs new sewers? If other than the owner or operator, does the owner or operator review and approve the design?			
Is there a document that describes the procedures that the owner or operator follows in conducting their construction inspection and testing program?			
Are there any standard forms that guide the owner or operator in conducting their construction inspection and testing program?			
Is new construction inspected by the owner or operator or others?			
What are the qualifications of the inspector(s)?			
What percentage of time is a construction inspector on site?			
Is inspection supervision provided by a registered professional engineer?			
How is the new gravity sewer construction tested? (Air, water, weirs, etc.)			
Are new manholes tested for inflow and infiltration?			
Are new gravity sewers televised?			
What tests are performed on pump stations?			
What tests are performed on force mains?			
Is new construction built to standard specifications established by the owner or operator and/or the State?			
Is there a warranty for new construction? If so, is there a warranty inspection done at the end of this period?			

Comments:

### IV. L. Collection System Operation: Pump Station Operation

Question	Response	Documentation Available	
		Yes	No
How many pump stations are in the system? How many have backup power sources?			
Are enough trained personnel assigned to properly maintain pump stations?			
Are these personnel assigned full-time or part-time to pump station duties?			
Are there manned and un-manned pump stations in the system? How many of each?			
Is there a procedure for manipulating pump operations (manually or automatically during wet weather to increase in-line storage of wet weather flows)?			
Are well-operating levels set to limit pump start/stops?			
Are the lead, lag, and backup pumps rotated regularly?			

Comments:

**IV. L. 1. Collection System Operation: Pump Stations - Inspection**

Question	Response	Documentation Available	
		Yes	No
How often are pump stations inspected?			
What work is accomplished during inspections?			
Is there a checklist?			
Are records maintained for each inspection?			
What are the average annual labor hours spent on pump station inspections?			
Are there Standard Operating Procedures (SOPs) and Standard Maintenance Procedures (SMPs) for each station?			
What are the critical operating characteristics maintained for each station? Are the stations maintained within these criteria?			

Comments:

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**IV. L. 2. Collection System Operation: Pump Stations - Emergencies**

Question	Response	Documentation Available	
		Yes	No
Is there an Emergency Operating Procedure for each pump station?			
Is there sufficient redundancy of equipment in all pump stations?			
Who responds to lift station failures and overflows? How are they notified?			
How is loss of power at a station dealt with? (i.e. on-site electrical generators, alternate power source, portable electric generator(s))			
What equipment is available for pump station bypass?			
What process is used to investigate the cause of pump station failure and take necessary action to prevent future failures?			

Comments:

*[Faint, illegible handwritten text in a grid format, likely a table for recording responses or comments.]*

**IV. L. 3. Collection System Operation: Pump Stations - Emergency Response and Monitoring**

Question	Response	Documentation Available	
		Yes	No
How are lift stations monitored?			
If a SCADA system is used, what parameters are monitored?			

Comments:



**IV. L. 4. Collection System Operation: Pump Stations - Recordkeeping**

Question	Response	Documentation Available	
		Yes	No
Are operations logs maintained for all pump stations?			
Are manufacturer's specifications and equipment manuals available for all equipment?			
Are pump run times maintained for all pumps?			
Are elapsed time meters used to assess performance?			

Comments:




**V. A. Equipment and Collection System Maintenance: Maintenance Budgeting**

Question	Response	Documentation Available	
		Yes	No
How does the collection system owner or operator track yearly maintenance costs?			
Is there a maintenance cost control system?			
Are maintenance costs developed from past cost records?			
How does the owner or operator categorize costs? Preventive? Corrective? Projected Costs? Projected Repair?			
How does the owner or operator control expenditures?			

Comments:

*[Faint grid area for handwritten notes or comments]*

**V. B. Equipment and Collection System Maintenance: Planned Maintenance**

Question	Response	Documentation Available	
		Yes	No
Are preventive maintenance tasks and frequencies established for all pump stations and equipment?			
How were preventive maintenance frequencies established?			
What percentage of the operator's time is devoted to planned as opposed to unplanned maintenance?			
What predictive maintenance techniques are used as part of PM program?			
Is there a formal procedure to repair or replace pump stations and equipment when useful life is reached?			
Has an energy audit been performed on pump station electrical usage?			
Is an adequate parts inventory maintained for all equipment?			
Is there a sufficient number of trained personnel to properly maintain all stations?			
Who performs mechanical and electrical maintenance?			
Are there Standard Maintenance Procedures (SMP's) for each station?			

Comments:

### V. C. Equipment and Collection System Maintenance: Maintenance Scheduling

Question	Response	Documentation Available	
		Yes	No
Does the owner or operator plan and schedule preventive and corrective maintenance activities?			
Is there an established priority system? Who sets priorities for maintenance?			
Is a maintenance card or record kept for each piece of mechanical equipment within the collection system?			
Do equipment maintenance records include the following information: <input type="checkbox"/> maintenance recommendations, <input type="checkbox"/> instructions on conducting the specific maintenance activity, <input type="checkbox"/> other observations on the equipment, <input type="checkbox"/> maintenance schedule, <input type="checkbox"/> a record of maintenance on the equipment to date.			
Are dated tags used to show out-of-service equipment?			
Is maintenance backlog tracked?			
How is O&M performance tracked and measured?			
What percent of repair finds are spent on emergency repairs?			
Are corrective repair work orders backlogged more than six months?			
Is maintenance performed for other public works divisions?			
How are priorities determined for this work?			
How is this work funded?			
Are maintenance logs maintained for all pump stations?			

Comments:

**V. D. Equipment and Collection System Maintenance: Maintenance Right-of-Way**

Question	Response	Documentation Available	
		Yes	No
Does the owner or operator perform scheduled maintenance on Rights-of-Way and Easements?			
Does the owner or operator monitor street paving projects?			
Does the owner or operator have a program to locate and raise manholes (air valves, etc) as needed?			
How are priorities determined?			
How is the effectiveness of the maintenance schedule measured?			

Comments:

*[This area contains faint, illegible handwritten notes and a grid pattern.]*

### V. E. Equipment and Collection System Maintenance: Sewer Cleaning

Question	Response	Documentation Available	
		Yes	No
Is there a routine schedule for cleaning sewer lines on a system wide basis, e.g., at the rate of once every seven to twelve years or a rate of between 8% and 14% per year?			
What is the owner or operator's goals for annual system cleaning?			
What percent of the sewer lines are cleaned, even high/repeat cleaning trouble spots, during the past year?			
Is there a program to identify sewer line segments that have chronic problems and should be cleaned on a more frequent schedule?			
What is the average number of stoppages experienced per mile of sewer pipe per year?			
Has the number of stoppages increased, decreased, or stayed the same over the past five years?			
Are stoppages diagnosed to determine the cause?			
Are stoppages plotted on maps and correlated with other data such as pipe size and material, or location?			
Do the sewer cleaning records include the following information: <input type="checkbox"/> date and time, <input type="checkbox"/> cause of stoppage, <input type="checkbox"/> method of cleaning, location of stoppage or routine cleaning activity, <input type="checkbox"/> identity of cleaning crew, <input type="checkbox"/> further actions necessary/initiated?			
If sewer cleaning is done by a contractor are videos taken of before and after cleaning?			

Comments:

### V. E. 1. Equipment and Collection System Maintenance: Sewer Cleaning - Cleaning Equipment

Question	Response	Documentation Available	
		Yes	No
What type of cleaning equipment does the owner or operator use?			
How many cleaning units of each type does the owner or operator have? What is the age of each?			
How many cleaning crews and shifts does the owner or operator employ?			
How many cleaning crews are dedicated to preventive maintenance cleaning?			
How many cleaning crews are dedicated to corrective maintenance cleaning?			
What has the owner or operator's experience been regarding pipe damage caused by mechanical equipment?			
Where is the equipment stationed?			

Comments:

**V. E. 2. Equipment and Collection System Maintenance: Sewer Cleaning - Chemical Cleaning and Root Removal**

Question	Response	Documentation Available	
		Yes	No
Does the owner or operator have a root control program?			
Does the owner or operator have a FOG program?			
Are chemical cleaners used?			
What types of chemical cleaners are used?			
How often are they applied?			
How are the chemical cleaners applied?			
What results are achieved through the use of chemical cleaners?			

Comments:

*(This area contains a large grid for handwritten notes and comments, which is mostly blank in the provided image.)*

**V. F. Equipment and Collection System Maintenance: Parts Inventory**

Question	Response	Documentation Available	
		Yes	No
Does the owner or operator have a central location for the storage of spare parts?			
Have critical spare parts been identified?			
Are adequate supplies on hand to allow for two point repairs in any part of the system?			
Is there a parts standardization policy in place?			
Does the owner or operator maintain a stock of spare parts on its maintenance vehicles?			
What method(s) does the owner or operator employ to keep track of the location, usage, and ordering of spare parts? Are parts logged out when taken by maintenance personnel for use?			
Does the owner or operator salvage specific equipment parts when equipment is placed out-of-service and not replaced?			
How often does the owner or operator conduct a check of the inventory of parts to ensure that their tracking system is working?			
Who has the responsibility of tracking the inventory?			
For those parts which are not kept in inventory, does the owner or operator have a readily available source or supplier?			

Comments:

**V. G. Equipment and Collection System Maintenance: Equipment and Tools Management**

Question	Response	Documentation Available	
		Yes	No
Is there a list of equipment and tools used for operation and maintenance?			
Do personnel feel they have access to the necessary equipment and tools to do all aspects of operation and maintenance of the collection system?			
Is there access to suitable equipment if the owner or operator's equipment is down for repair?			
Does the owner or operator own or have access to portable generators?			
Where does the owner or operator store its equipment?			
Is a detailed equipment maintenance log kept?			
Are written equipment maintenance procedures available?			
What is the procedure for equipment replacement?			
Are the services of an in-house vehicle and equipment maintenance services used?			
What is the typical turnaround time for equipment and vehicle maintenance?			

Comments:

**VI. Management Information Systems: Performance Indicators**

Question	Response	Documentation Available	
		Yes	No
How many sanitary sewer overflows (SSOs) have occurred in the last 5 years? How many less than 1,000 gallons?			
Does the owner or operator document and report all SSOs regardless of size?			
Does the owner or operator document basement backups?			
Are there areas that experience basement or street flooding?			
How many SSOs have reached "Waters of the US"? Is there a record?			
Approximately, what percent of SSOs discharge were from each of the following in the last 5 years: manholes, pump stations, main and trunk sewers, lateral and branch sewers, structural bypasses?			
What is the per capita wastewater flow for the maximum month and maximum week or day?			
What is average annual influent (BOD)?			
What is the ratio of maximum wet weather flow to average dry weather flow?			
Approximately, what percent of SSO discharge were caused by the following in the last 5 years: debris buildup, collapsed pipe, root intrusion, capacity limitations, excessive infiltration and inflow, FOG, vandalism?			
What percent of SSOs were released to: soil; surface water; basements; paved areas; coastal, ocean, or beach areas; rivers, lakes or streams?			
For surface water releases, what percent are to surface waters that could affect: contact recreation, shellfish growing areas, drinking water sources?			
How many chronic SSO locations are in the collection system?			

<p>Are pipes with chronic SSOs being monitored for sufficient capacity and/or structural condition?</p>	
<p>Prior to collapse, are structurally deteriorating pipelines being monitored for renewal or replacement?</p>	
<p>What is the annual number of mainline sewer cave-ins? What was the cause (i.e. pipe corrosion, leaks, etc.)</p>	
<p>What other types of performance indicators does the owner or operator use?</p>	

Comments:

**VII. A. Sewer System Capacity Evaluation (SSES): Internal TV Inspection**

Question	Response	Documentation Available	
		Yes	No
Does the owner or operator use internal T.V. inspection? If so please describe the program.			
Do the internal TV record logs include the following: <input type="checkbox"/> pipe size, type, length, and joint spacing; <input type="checkbox"/> distance recorded by internal TV; <input type="checkbox"/> results of the internal TV inspection; <input type="checkbox"/> internal TV operator name; <input type="checkbox"/> cleanliness of the line; <input type="checkbox"/> location and identification of line being televised by manholes?			
Is a rating system used to determine the severity of the defects found during the inspection process?			
Is there documentation explaining the codes used for internal TV results reporting?			
Approximately what percent of the total defects determined by TV inspection during the past 5 years were the following:			
Are main line and lateral repairs checked by internal TV inspection after the repair(s) have been made?			

Comments:

**VII. B. SSES: Survey and Rehabilitation (general)**

Question	Response	Documentation Available	
		Yes	No
Have SSES's been performed in the past? If so, is documentation available?			
Has any sewer rehabilitation work been done in the past 15 years? If so, please describe?			
Does the owner or operator have standard procedures for performing SSES work?			
Do the SSES reports include recommendations for rehabilitation, replacement, and repair?			
Were defects identified in the SSES repaired?			
Does the owner or operator have a multi-year Capital Improvements Program that includes rehabilitation, replacement, and repair?			
How are priorities established for rehabilitation, replacement, and repair?			
Has the owner or operator established schedules for performing recommended rehabilitation, both short term and long term?			
Has funding been approved for the recommended rehabilitation?			
Is post rehabilitation flow monitoring used to assess the success of the rehabilitation?			

Comments:

**VII. C. SSES: Sewer Cleaning Related to I/I Reduction**

Question	Response	Documentation Available	
		Yes	No
Are sewers cleaned prior to flow monitoring?			
Are sewers cleaned prior to internal T.V. inspection?			
When cleaning, is debris removed from the system?			

Comments:

*[The following area contains a large grid of empty lines for handwritten notes and comments.]*

**VII. D. SSES: Flow Monitoring**

Question	Response	Documentation Available	
		Yes	No
Does the owner or operator have a flow monitoring program? If so, please describe.			
Does the owner or operator have a comprehensive capacity assessment and planning program?			
Are flows measured prior to allowing new connections?			
Number of permanent meters? Number of temporary meters?			
What type(s) of meters are used?			
Number of rain gauges?			
How frequently are flow meters checked?			
Do the flow meter checks include: <input type="checkbox"/> independent water level, <input type="checkbox"/> checking the desiccant, <input type="checkbox"/> velocity reading, <input type="checkbox"/> cleaning away debris, <input type="checkbox"/> downloading data, <input type="checkbox"/> battery condition?			
Are records maintained for each inspection?			
Do the flow monitoring records include: <input type="checkbox"/> descriptive location of flow meter, <input type="checkbox"/> type of flow meter, <input type="checkbox"/> frequency of flow meter inspection, <input type="checkbox"/> frequency of flow meter calibration?			
Are flow data used for billing, capacity analysis, and/or I/I investigations?			
What is the ratio of peak wet weather flow to average dry weather flow at the wastewater treatment plant?			
Does the owner or operator have any wet weather capacity problems?			
Are low points or flood-plain areas monitored during rain events?			
Does the owner or operator have any dry weather capacity problems?			

**VII. E. SSES: Smoke Testing and Dyed Water Flooding**

Question	Response	Documentation Available	
		Yes	No
Does the owner or operator have a smoke testing program to identify sources of inflow and infiltration into the system including private service laterals and illegal connections? If so please describe.			
Are there written procedures for the frequency and schedule of smoke testing?			
Is there a documented procedure for isolating line segments?			
Is there a documented procedure for notifying local residents that smoke testing will be conducted in the area?			
What is the guideline for the maximum amount of line to be tested at one time?			
Are there guidelines for the weather conditions under which smoke testing should be conducted?			
Do the written records contain location, address, and description of the smoking element that produced a positive result?			
What follow-up occurs as a result of positive results for smoke or dye testing?			
Is there a goal for the percent of the system smoke tested each year?			
What percent of the system has been smoke tested over the past year?			
Does the owner or operator have a dyed water flooding program If so please describe.			
Is there a goal for the percent of the system dye tested each year?			
What percent of the system has been dye tested over the past year?			
Does the owner or operator share smoke and dye testing equipment with another owner or operator?			
Comments:			

### VII. F. SSES: Manhole Inspection

Question	Response	Documentation Available	
		Yes	No
Does the owner or operator have a routine manhole inspection and assessment program?			
What is the purpose of the inspection program?			
Does the owner or operator have a goal for the number of manholes inspected annually?			
How many manholes were inspected during the past year?			
Do the records for manhole/pipe inspection include the following: <input type="checkbox"/> conditions of the frame and cover; <input type="checkbox"/> evidence of surcharge; offsets or misalignments; <input type="checkbox"/> atmospheric hazards measurements; <input type="checkbox"/> details on the root cause of cracks or breaks in the manhole or pipe including blockages; <input type="checkbox"/> recording conditions of corbel, walls, bench, trough, and pipe seals; <input type="checkbox"/> presence of corrosion, if repair is necessary; <input type="checkbox"/> manhole identifying number/location; wastewater flow characteristics; <input type="checkbox"/> accumulations of grease, debris, or grit; <input type="checkbox"/> presence of infiltration, location, and estimated quantity; <input type="checkbox"/> inflow from manhole covers?			
Are manholes susceptible to inflow identified and inspected on a regular frequency?			
Is there a data management system for tracking manhole inspection activities?			
What triggers whether a manhole needs rehabilitation?			
Does the owner or operator have a multi-year Capital Improvements Program that includes rehabilitation, replacement, and repair of manholes?			
How are priorities established for rehabilitation, replacement, and repair of manholes?			
Has the owner or operator established schedules for performing rehabilitation, both short term and long term of manholes?			



**VIII. A. Rehabilitation: Manhole Repairs**

Question	Response	Documentation Available	
		Yes	No
What rehabilitation techniques are used for manhole repairs?			
How are priorities determined for manhole repairs?			
What type of documentation is kept?			
Does the owner or operator use manhole inserts?			
Are they used system wide or only on low lying manholes?			

Comments:

**VIII. B. Rehabilitation: Mainline Sewers**

Question	Response	Documentation Available	
		Yes	No
What type of main line repairs has the owner or operator used in the past?			
Does the owner or operator currently use any of above techniques for main line repairs? What other techniques is the owner or operator presently using?			
How are priorities established for main line repairs?			
What type of follow-up is performed after the repair (e.g., CCTV)?			

Comments:

**Appendix A**

**EXAMPLE  
COLLECTION SYSTEM PERFORMANCE  
INDICATOR DATA  
COLLECTION FORM**

Indicator	Target	Actual	Notes
1. The number of cases filed in the court within the prescribed time frame.	100%	95%	5 cases were filed late due to clerical error.
2. The number of cases resolved within the prescribed time frame.	100%	100%	All cases were resolved on time.
3. The number of cases with no pending matters.	100%	100%	All cases were closed.
4. The number of cases with no pending matters.	100%	100%	All cases were closed.

APPENDIX A - COLLECTION SYSTEM PERFORMANCE INDICATOR DATA COLLECTION FORM

## EXAMPLE COLLECTION SYSTEM PERFORMANCE INDICATOR DATA COLLECTION FORM

**I. General Information**

- A. Agency Name \_\_\_\_\_
- B. Agency Address  
Street \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_
- C. Contact Person \_\_\_\_\_
- D. Telephone: Voice \_\_\_\_\_ Fax \_\_\_\_\_ Email \_\_\_\_\_
- E. Data provided for latest fiscal/calendar year, 20\_\_

**II. Collection System Description**

- A. Service Area \_\_\_\_\_ Square miles
- B. Population Served \_\_\_\_\_
- C. System Inventory

Miles of gravity sewer	Miles of force main	Number of maintenance access structures	Number of pump stations	Number of siphons	Number of air, vacuum, or air/vacuum relief valves

- D. Number of Service Connections:  
Residential \_\_\_\_\_ Commercial \_\_\_\_\_ Industrial \_\_\_\_\_ Total \_\_\_\_\_
- E. Lateral Responsibility (check one)
  - 1. At main line connection only \_\_\_\_\_
  - 2. From main line to property line or easement/cleanout \_\_\_\_\_
  - 3. Beyond property line/cleanout \_\_\_\_\_
  - 4. Other \_\_\_\_\_
- F. System combined (storm and sanitary)? Yes \_\_\_ No \_\_\_ If yes, % combined \_\_\_
- G. Average Annual Precipitation \_\_\_\_\_ inches
- H. System Flow Characteristics (total for service area)

Peak Dry Weather Flow (MGD)	Peak Wet Weather Flow (MGD)	Average Daily Flow (MGD)

**III. Special Conditions**

- A. Indicate local conditions that are accounted for during design, construction, operation, and maintenance of the collection system.
1. Precipitation: Yes \_\_\_ No \_\_\_ If yes, provide brief explanation \_\_\_\_\_
  2. Terrain: Yes \_\_\_ No \_\_\_ If yes, provide brief explanation \_\_\_\_\_
  3. Soils: Yes \_\_\_ No \_\_\_ If yes, provide brief explanation \_\_\_\_\_
  4. Temperature: Yes \_\_\_ No \_\_\_ If yes, provide brief explanation \_\_\_\_\_
  5. Groundwater: Yes \_\_\_ No \_\_\_ If yes, provide brief explanation \_\_\_\_\_
  6. Geology: Yes \_\_\_ No \_\_\_ If yes, provide brief explanation \_\_\_\_\_
  7. Other: \_\_\_\_\_

- B. Is corrosion a significant problem? Yes \_\_\_ No \_\_\_  
 • Is there a corrosion control program in place? Yes \_\_\_ No \_\_\_
- C. Is odor a significant problem? Yes \_\_\_ No \_\_\_  
 • Is there an odor control program in place? Yes \_\_\_ No \_\_\_
- D. Is grease a significant problem? Yes \_\_\_ No \_\_\_  
 • Is there a grease control program in place? Yes \_\_\_ No \_\_\_
- E. Are roots a significant problem? Yes \_\_\_ No \_\_\_  
 • Is there a root control program in place? Yes \_\_\_ No \_\_\_

**IV. Age Distribution of Collection System**

Age	Gravity Sewer, miles	Force Mains, miles or feet	Number of Pump Stations
0 - 25 years			
26 - 50 years			
51 - 75 years			
> 76 years			

**V. Size Distribution of Collection System**

Diameter in inches	Gravity Sewer, miles	Force Mains, miles or feet
8 inches or less		
9 - 18 inches		
19 - 36 inches		
> 36 inches		

**VI. Distribution of Gravity Sewer By Material**

- A. Vitrified Clay Pipe (VCP) \_\_\_\_\_ Miles
- B. Reinforced Concrete Pipe (RCP) \_\_\_\_\_ Miles
- C. Unreinforced Concrete Pipe (CP) \_\_\_\_\_ Miles
- D. Plastic (all types) \_\_\_\_\_ Miles
- E. Brick \_\_\_\_\_ Miles
- F. Other \_\_\_\_\_ Miles
- G. Other \_\_\_\_\_ Miles
- H. Other \_\_\_\_\_ Miles

**VII. Distribution of Force Mains By Material**

- A. Reinforced Concrete Pipe (RCP) \_\_\_\_\_ (circle one) miles or feet
- B. Prestressed Concrete Cylinder Pipe (PCCP) \_\_\_\_\_ miles or feet
- C. Asbestos Cement Pipe (ACP) \_\_\_\_\_ miles or feet
- D. Polyvinyl Chloride (PVC) \_\_\_\_\_ miles or feet
- E. Steel \_\_\_\_\_ miles or feet
- F. Ductile Iron \_\_\_\_\_ miles or feet
- G. Cast Iron \_\_\_\_\_ miles or feet
- H. Techite (RPMP) \_\_\_\_\_ miles or feet
- I. High Density Polyethylene (HDPE) \_\_\_\_\_ miles or feet
- J. Fiberglass Reinforced Plastic (FRP) \_\_\_\_\_ miles or feet
- K. Other \_\_\_\_\_ miles or feet

**VIII. Preventive Maintenance of System**

**A. Physical Inspection of Collection System, Preventive Maintenance**

Inspection Activity	Total Annual Labor Hours Expended for This Activity	Total Completed (Miles of Pipe or Manholes Inspected Annually)	Crew Size (s)
CCTV			
Visual Manhole Inspection, Surface Only			
Visual Manhole Inspection, Remove Cover			
Visual Gravity Line Inspection, Surface Only			
Visual Force Main Inspection, Surface Only			
Other (Sonar, etc.)			

**B. Mechanical and Hydraulic Cleaning, Preventive Maintenance**

Cleaning Activity	Total Annual Labor Hours Expended for This Activity	Total Annual Labor Hours Expended for Scheduled PM	Total Miles Cleaned Annually	Crew Size (s)	Range of Pipe Diameters Cleaned
Hydraulic Jet					
Balls, Kites, Scooters					
Combination Machines					
Rod Machines					
Hand Rodding					
Bucket Machines					
Chemical Root Control					
Chemical or Biological Grease Control					

**IX. Dry Weather Stoppages**

- A. Number of stoppages, annually \_\_\_\_\_
- B. Average time to clear stoppage \_\_\_\_\_
- C. Number of stoppages resulting in overflows and/or backups annually \_\_\_\_\_
- D. Total quantity of overflow(s) \_\_\_\_\_
- E. Is there an established procedure for problem diagnosis? Yes \_\_\_ No \_\_\_
- F. Are future preventive measures initiated based on diagnosis? Yes \_\_\_ No \_\_\_
- G. What equipment is available for emergency response? \_\_\_\_\_

**X. Repairs and Rehabilitation, Proactive**

- A. Number of annual spot repairs identified \_\_\_\_\_
- B. Number of annual spot repairs completed \_\_\_\_\_
- C. Percent of spot repairs contracted \_\_\_\_\_
- D. Number of manholes identified for rehabilitation \_\_\_\_\_
- E. Number of manholes rehabilitated annually \_\_\_\_\_
- F. Percent of manhole repairs contracted \_\_\_\_\_
- G. Feet of main line needing rehabilitation \_\_\_\_\_
- H. Feet of main line rehabilitated \_\_\_\_\_
- I. Percent of main line rehabilitation contracted \_\_\_\_\_
- J. Number of manholes scheduled for rehabilitation under Capital Improvement Program (s) \_\_\_\_\_
- K. Feet of main line scheduled for rehabilitation under Capital Improvement Program (s) \_\_\_\_\_

**XI. Repairs and Rehabilitation, Reactive**

- A. Number of annual line features \_\_\_\_\_
- B. Number of line repairs \_\_\_\_\_

**XII. Pump Stations**

- A. Number of pump stations inspected \_\_\_\_\_
  - Frequency of inspections \_\_\_\_\_ (daily, every other day, weekly)
- B. Number of inspection crews \_\_\_\_\_
- C. Crew size \_\_\_\_\_
- D. Number of pump stations with pump capacity redundancy \_\_\_\_\_
- E. Number of pump stations with backup power sources \_\_\_\_\_
- F. Number of pump stations with dry weather capacity limitations \_\_\_\_\_
- G. Number of pump stations with wet weather capacity limitations \_\_\_\_\_
- H. Number of pump stations calibrated annually \_\_\_\_\_
- I. Number of pump stations with permanent flowmeters \_\_\_\_\_
- J. Number of pump stations with remote status monitoring \_\_\_\_\_
- K. Number of pump stations with running time meters \_\_\_\_\_
- L. Number of mechanical maintenance staff assigned to mechanical maintenance \_\_\_\_\_
- M. Number of electrical maintenance staff assigned to electrical maintenance \_\_\_\_\_
- N. Total labor hours scheduled annually for electrical and mechanical PM tasks \_\_\_\_\_
- O. Total labor hours expended annually for electrical and mechanical PM tasks \_\_\_\_\_

**XIII. Pump Station Failures, Dry Weather**

- A. Number of failures resulting in overflows/bypass or backup, annually \_\_\_\_\_
- B. Total quantity of overflow/bypass \_\_\_\_\_ Gallons or MG
- C. Average time to restore operational capability \_\_\_\_\_ hours
- D. Total labor hours expended for electrical and mechanical corrective maintenance tasks \_\_\_\_\_
- E. Is failure mode and effect diagnosed? Yes \_\_\_ No \_\_\_
- F. Are future preventive measures initiated based on diagnosis? Yes \_\_\_ No \_\_\_
- G. What equipment is available for emergency response? \_\_\_\_\_

**XIV. Force Mains**

- A. Force mains inspected annually \_\_\_\_\_ miles or feet (visual surface inspection of alignment)
- B. Force mains monitored annually \_\_\_\_\_ miles or feet (pressure profile, capacity)
- C. Number of force main failures annually \_\_\_\_\_
- D. Cause(s) of force main failures \_\_\_\_\_  
\_\_\_\_\_

**XV. Air Relief/Vacuum Valves**

- A. What is frequency of valve inspections? \_\_\_\_\_
- B. What is frequency of PM (backflushing, etc)? \_\_\_\_\_
- C. Number of annual valve failures \_\_\_\_\_
- D. Cause(s) of valve failures \_\_\_\_\_  
\_\_\_\_\_

**XVI. System Operation and Maintenance Efficiency**

- A. Total full time or full time equivalent staff assigned to O & M (excluding administration staff but including line managers, supervisors) \_\_\_\_\_
- B. Total estimated labor hours actually expended for active O & M tasks (this is the total above less hours for sick, vacation, holidays, training, breaks, etc., not directly related to performing O & M tasks) \_\_\_\_\_

**XVII. Level of Service**

- A. Average annual rate for residential users \_\_\_\_\_
- B. Rate based on: water consumption \_\_\_\_\_ Flat rate \_\_\_\_\_ Other \_\_\_\_\_
- C. Number of complaints annually \_\_\_\_\_
- D. Number of complaints that are agency responsibility \_\_\_\_\_
- E. Number of public health or other warnings issued annually \_\_\_\_\_
- F. Number of claims for damages due to backups annually \_\_\_\_\_
- G. Total cost of claims settled annually \_\_\_\_\_

**XVIII. Financial**

- A. Total annual revenue received from wastewater \_\_\_\_\_
  - 1. % of revenue for long-term debt \_\_\_\_\_
  - 2. % of revenue for treatment and disposal \_\_\_\_\_
  - 3. % of revenue for collection and conveyance \_\_\_\_\_
- B. Current value of collection system assets \_\_\_\_\_
- C. Annual O & M expenditure \_\_\_\_\_
- D. Annual CIP expenditure for repair, replacement, or rehabilitation \_\_\_\_\_
- E. Annual O & M training budget \_\_\_\_\_
- F. Total number of O & M personnel (including administrative in O & M department) \_\_\_\_\_
- G. Number of personnel with collection system certification \_\_\_\_\_
- H. Number of personnel qualified for collection system certification \_\_\_\_\_
- I. Amount of O & M budget allocated for contracted services \_\_\_\_\_
- J. Hydroflush cost per foot \_\_\_\_\_
- K. Rodding cost per foot \_\_\_\_\_
- L. Bucketing cost per foot \_\_\_\_\_
- M. CCTV cost per foot \_\_\_\_\_
- N. Spot repairs, cost each \_\_\_\_\_

**XIX. Safety**

- A. Total labor hours assigned to O & M \_\_\_\_\_
- B. Number of lost time injuries \_\_\_\_\_
- C. Total lost time days \_\_\_\_\_
- D. Total cost of lost time injuries \_\_\_\_\_

**XX. Regulatory**

- A. Total number of violations issued annually \_\_\_\_\_
- B. Total cost of fines paid annually \_\_\_\_\_
- C. What is minimum reportable quantity in gallons? \_\_\_\_\_
- D. What is time reporting requirement? \_\_\_\_\_
- E. Number of annual WWTP upsets due to wet weather flow \_\_\_\_\_

**XXI. General**

- A. Has SSES been performed on system? Yes \_\_\_\_\_ No \_\_\_\_\_
- B. Total O & M positions currently budgeted \_\_\_\_\_
- C. Total O & M positions currently filled \_\_\_\_\_
- D. Is computerized maintenance management system (s) used for O & M managing? Yes \_\_\_\_\_ No \_\_\_\_\_
- E. Is GIS system used for O & M managing? Yes \_\_\_\_\_ No \_\_\_\_\_

**XXII. Procedures or Other Documentation Available**

- A. Overflow, bypass and containment Yes \_\_\_\_\_ No \_\_\_\_\_
- B. Problem evaluation and solution Yes \_\_\_\_\_ No \_\_\_\_\_
- C. Cleanup procedure Yes \_\_\_\_\_ No \_\_\_\_\_
- D. Failure mode and effect procedure Yes \_\_\_\_\_ No \_\_\_\_\_
- E. O & M budget process Yes \_\_\_\_\_ No \_\_\_\_\_
- F. O & M budget with line item detail Yes \_\_\_\_\_ No \_\_\_\_\_
- G. Long-range CIP planning for system expansion, rehabilitation, and replacement Yes \_\_\_\_\_ No \_\_\_\_\_
- H. Is there a written procedure for cleanup to mitigate effect of overflow? Yes \_\_\_\_\_ No \_\_\_\_\_
- I. Is there a written procedure for containing overflows and bypasses? Yes \_\_\_\_\_ No \_\_\_\_\_
- J. Is there an established procedure for containing overflows and bypasses? Yes \_\_\_\_\_ No \_\_\_\_\_
- K. Is there an established procedure for problem evaluation and solution? Yes \_\_\_\_\_ No \_\_\_\_\_
- L. Is there an established procedure for cleanup to mitigate effect of overflow? Yes \_\_\_\_\_ No \_\_\_\_\_
- M. Is there a grease control program? Yes \_\_\_\_\_ No \_\_\_\_\_
- N. Is there a pretreatment program? Yes \_\_\_\_\_ No \_\_\_\_\_
- O. Is there a private source I/I reduction program? Yes \_\_\_\_\_ No \_\_\_\_\_
- P. Do you have chronic O & M problems that are designed into your system? Yes \_\_\_\_\_ No \_\_\_\_\_  
If yes, provide brief description \_\_\_\_\_
- Q. Do you have chronic O & M problems that are constructed into your system? Yes \_\_\_\_\_ No \_\_\_\_\_  
If yes, provide brief description \_\_\_\_\_
- R. How would you rate your construction inspection program?  
Very effective \_\_\_\_\_ Needs improvement \_\_\_\_\_ Poor \_\_\_\_\_

**XXIII. Definitions/Clarifications**

- A. Maintenance access structures, most commonly manholes, in your system that are incorporated into your O & M program.
- B. Pump capacity redundancy is the ability to maintain pumping at design capacity with the largest pump out of service.
- C. Remote status monitoring is any remote monitoring system such as alarm telemetry or SCADA that provides remote pump station status information.
- D. You will notice that in the section on stoppages and pump station failures, we are asking for dry weather incidents only. Dry weather system performance is a good indicator of effectiveness of O & M program. If you have wet weather information that you wish to provide also, please do.
- E. Under the Special Conditions sections we are identifying conditions that are present in your system that require consideration during design, construction, and O & M of your system.

- F. Any of the questions dealing with labor hours are designed to determine total labor hours irrespective of crew size or crews that are only assigned to cleaning, for example, less than full time.
- G. Our goal is to obtain data that can be or are standardized and that are accurate. We also realize that some data may not be available; however, data can be accurately estimated. If you estimate data please follow with an (E).
- H. If data is not available please indicate "NA." If data does not apply to your system, please indicate by "DNA."
- I. Failure mode and effect refers to any established procedure you have to diagnose system failures to determine the cause and effect of the failure. This can apply to crews clearing stoppages or to pump station failures.
- J. Pump station inspection (XII) means scheduled inspection by operators to verify station operation and perform PM. It excludes electrical or mechanical craft maintenance.
- K. Stoppage in section IX refers only to stoppages other than pump stations. Pump stations are covered in Section XIII. Backup in this case refers to a basement or other structure backup as opposed to main line sewer backup.

**XXIV. Additional Comments**

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## EXAMPLE INTERVIEW SCHEDULE AND TOPICS

### Days 1 and 2 Interviews

Work Practice or Maintenance Function	Description	Examples of Discussion Topics and Supporting Documents	Name	Interview Date, Time, and Location
Senior Management	Discuss project expectations, report review and comment process.  Overview of organizational structure and "culture".  Identify sensitive issues and how to approach.  Schedule			
Project Kick off Meeting	Overview and purpose of project.  Interview and field assessment process.  Report content and review process.  Questions and answers	None		
Physical Inspection and Testing – Gravity sewer system	Visual Inspection, pipe alignment.  CCTV  Smoke and Dye Testing  Other	Reports, inspection forms, performance data, inspection strategy, crew assignments and schedules, equipment available, current expenditures and budgeted amounts, area maps, Standard Operating Procedures, field maps.		

Work Practice or Maintenance Function	Description	Examples of Discussion Topics and Supporting Documents	Name	Interview Date, Time, and Location
Preventive Maintenance - Mechanical and hydraulic cleaning	High velocity jets and combination machines. Other hydraulic methods Rodding Machines Bucket Machines	Reports, performance data, preventive maintenance cleaning strategy, crew assignments and schedules, equipment available, current and budgeted, problem areas, Standard Operating Procedures, Standard Maintenance Procedures, problem diagnosis		
Chemical and biological cleaning	Root control Grease control Odor control Corrosion control	Grease control ordinance, enforcement, odor and corrosion control strategy, root control program, design for O&M considerations, materials used (MSDS), reports, performance data, preventive maintenance cleaning strategy, crew assignments and schedules, equipment available, current and budgeted, problem areas, Standard Operating Procedures, Standard Maintenance Procedures, problem diagnosis, public education, enforcement		
Pump Stations	Routine inspection Electrical and mechanical maintenance SCADA Standby/emergency systems Valves Forecains	Logs, inspection sheets, Standard Maintenance Procedures, Standard Operating procedures, pump station inventory and attribute data base, spares inventory, Reports, performance data, preventive maintenance strategy, crew assignments and schedules, equipment available, current and budgeted, critical pump stations, Standard Operating Procedures, Standard Maintenance Procedures, problem diagnosis, preventive and predictive maintenance methods, maintenance tasks and frequencies, O&M manuals, capacity issues		

Work Practice or Maintenance Function	Description	Examples of Discussion Topics and Supporting Documents	Name	Interview Date, Time, and Location
Training and Certification	Training program, technical, supervisory and management. Certification program	Knowledge, skills and abilities, basic skills, career paths, minimum qualifications, certification, educational assistance program, internal and external training, OJT, training budget		
Work Management	Planning and scheduling work Materials management Priority Backlog management Procurement Manual or Computer Maintenance Management System (CMMS)	Complaints and emergencies normal hours and after hours. Corrective, preventive and predictive maintenance work orders, work backlog, labor utilization, reports.		

Work Practice or Maintenance Function	Description	Examples of Discussion Topics and Supporting Documents	Name	Interview Date, Time, and Location
Safety	<p>Safety committee</p> <p>Safety meetings</p> <p>Safety enforcement</p> <p>Documentation of comprehensive safety training</p> <p>Compliance with safety regulations</p> <p>Documentation of effectiveness of safety program (e.g., reduction of accidents)</p> <p>Documentation of attendance and learning at safety training sessions</p>	<p>Policy and procedures for trenching, confined space, lockout tagout, PPE. Safety manual, formal training, tracking, accident investigation</p>		
Financial	<p>Annual O&amp;M Budget</p> <p>Rates</p> <p>CIP for rehabilitation/rehab</p> <p>Non-enterprise fund allocations</p>	<p>O&amp;M budget process, line item accounts, five year CIP plan, repair, rehabilitation, replacement strategy for pipes and pump stations</p>		

Work Practice or Maintenance Function	Description	Examples of Discussion Topics and Supporting Documents	Name	Interview Date, Time, and Location
Construction and Repair	Emergency repair Spot repairs, gravity system Rehabilitation Lateral installation Inspection New Construction Testing	Reports, inspection forms, performance data, inspection strategy, crew assignments and schedules, equipment available, current and budgeted, area maps, Standard Operating Procedures, field maps,		
Fleet Management	Maintenance Replacement Availability Budgeting	Inventory, repair and replacement process, maintenance turn around time, preventive maintenance, Standard Operating Procedures, Standard Maintenance Procedures, CMMS,		

**Day 3 - Field**

**Pump Stations**

Work Practice or Maintenance Function	Description	Examples of Discussion Topics and Supporting Documents	Name	Interview Date, Time and Location
Pump Station Maintenance	Submersible Cast in place wet well dry well Prefabricated Grinder/low Pressure System	Logs, O&M manuals, on-site procedures, vehicles and equipment, SCADA, Supervisory controls, electrical systems, flow meters, IIVAC, variable speed systems, chronic problems, pumps and hydraulic systems.		

**Day 4 – Field**

**Facilities and Crews**

Work Practice or Maintenance Function	Description	Examples of Discussion Topics and Supporting Documents	Name	Interview Date, Time and Location
Facilities	Electrical and mechanical repair shops and equipment Warehouse and equipment storage areas Vehicle maintenance shops Crew areas; locker rooms, training areas, dispatch areas	Logs, O&M manuals, on-site procedures, vehicles and equipment, SCADA, Supervisory controls, electrical systems, flow meters, HVAC, variable speed systems, chronic problems, pumps and hydraulic systems.		
Crews	CCTV Cleaning Construction Repair Overview of findings for week	N/A None		

## Appendix C

### INFORMATION SOURCES

**Information Sources**  
(Updated November 2004)

**WEBSITES** (water and/or wastewater-oriented; financial related)

EPA National Compliance Assistance Clearinghouse	<a href="http://www.epa.gov/clearinghouse">www.epa.gov/clearinghouse</a>
Compliance Assistance Centers	<a href="http://www.assistancecenters.net">http://www.assistancecenters.net</a>
Construction Industry Compliance Assistance Center	<a href="http://www.cicacenter.org">www.cicacenter.org</a>
EPA NPDES website	<a href="http://www.epa.gov/npdes">http://www.epa.gov/npdes</a>
EPA Operator On-Site Technical Assistance Program -104(g) (hands-on assistance to small municipal WWTP operators at no cost to community)	<a href="http://www.epa.gov/owm/mab/smcomm/104g/sstc.htm">www.epa.gov/owm/mab/smcomm/104g/sstc.htm</a>
EPA Office of Wastewater Management	<a href="http://www.epa.gov/owm">www.epa.gov/owm</a>
EPA Clean Water Tribal Grant Program	<a href="http://www.epa.gov/owm/mab/indian/cwisa.htm">www.epa.gov/owm/mab/indian/cwisa.htm</a>
EPA Colonias Program	<a href="http://www.epa.gov/owm/mab/mexican">www.epa.gov/owm/mab/mexican</a>
EPA Clean Water State Revolving Loan Fund Program	<a href="http://www.epa.gov/owm/cwfinance/cwsrf">www.epa.gov/owm/cwfinance/cwsrf</a>
EPA Website (Headquarters & Regions)	<a href="http://www.epa.gov/">www.epa.gov/</a>
EPA Small Business Gateway	<a href="http://www.epa.gov/smallbusiness">http://www.epa.gov/smallbusiness</a>
Environmental Finance Center	<a href="http://sspa.boisestate.edu/efc">http://sspa.boisestate.edu/efc</a>
National Environmental Services Center/WV University	<a href="http://www.ncsc.wvu.edu">www.ncsc.wvu.edu</a>
Local Govt. Environmental Assistance Network	<a href="http://www.lean.org">www.lean.org</a>
Rural Community Assistance Program (RCAP)	<a href="http://www.rcap.org">www.rcap.org</a>
Water Environment Federation (WEF)	<a href="http://www.wef.org">www.wef.org</a>
AMSA	<a href="http://www.amsa-cleanwater.org/pubs/">www.amsa-cleanwater.org/pubs/</a>
American Water Works Assoc. (AWWA)	<a href="http://www.awwa.org/">http://www.awwa.org/</a>
National Association of Towns & Townships (NATAT)	<a href="http://www.natat.org/">http://www.natat.org/</a>

**PUBLICATIONS /TRAINING VIDEOS /NEWSLETTERS, etc.**

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**EPA Office of Water Resource Center**

Tele: 202-566-1729 (24 hours)  
[center.water-resources@epa.gov](mailto:center.water-resources@epa.gov)

National Environmental Services Center (formerly the National Small Flows Clearinghouse)

West Virginia University Small Business Gateway

P.O. Box 6064

Morgantown, WV 26506

Tele: 1-800-624-8301

California State University - Sacramento

Tele: 916-278-6142

(training videos, etc.)

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**EPA Region 4  
Guide to  
Collection and Transmission System  
Management, Operation, and Maintenance Programs**

**Version 1.1**



**PURPOSE & DISCLAIMER**

This document is the work product of the EPA Region 4, Water Protection Division, Clean Water Enforcement Branch (CWEB) and supercedes a previous draft dated September 2003 (Version 1.0). This document serves as an introduction for new Region 4 inspectors in the CWEB Municipal Infrastructure Enforcement Program and contains descriptive information for utilities conducting self-assessments in the Region 4 Management, Operation, and Maintenance (MOM) Programs Project.

The MOM Programs Project is conducted in compliance with EPA Policy, EPA Guidance, and Rules and Regulations promulgated under the Clean Water Act. If some statement or part of the document is not in compliance with the Act, EPA Policy, EPA Guidance or the Rules and Regulations, then it should not be construed as conveying rights not conveyed by the Clean Water Act, EPA Policy, or the Rules and Regulations.

October 2011

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## INTRODUCTION

A utility should develop an appropriate, comprehensive Management, Operation and Maintenance (MOM) Program for the sewerage infrastructure (sewer system and wastewater treatment plant) which it owns and operates. A comprehensive MOM Program is comprised of individual management, operation, and maintenance programs, each of which:

- is specific to, and tailored for, the utility's infrastructure;
- has a written purpose explaining why the program is needed; has specific written goal(s) establishing the accomplishment(s) desired for the current fiscal year;
- has the details of the activities and procedures that are followed to implement the program written down in the form of Standard Management Procedures (SP), Standard Operating Procedures (SOP), and/or Standard Maintenance Procedures (SMP) that are used by the utility's personnel;
- is implemented by well-trained personnel; has established appropriate performance measures which are tracked by management; and,
- has a written procedure requiring periodic review, evaluation, and any necessary revision.

An important concept is that MOM programs are utility-specific. Most, if not all, of the programs described in this guide are based on actual programs observed at proactive utilities. However, utilities may have different titles for the various MOM programs described in this guide and may have them organized very differently. Some utilities may be organized in a way that they consolidate some of the MOM programs described in this guide, or they may exclude part of a program described in this guide because of justifiable circumstances. Utilities may also have additional MOM programs that are not contained in this guide.

### Tailored to the Utility

The utility should have programs tailored to match its geographic, physical, and climatic conditions; level of complexity; infrastructure configuration; and level of sophistication. Utilities may also have a number of their MOM programs implemented through a managed contract rather than by their own trained personnel.

### Program Purpose

The purpose of a given MOM program is the reason why the program is needed and why it exists.

*Example:* The purpose our utility's smoke testing program is to identify sources of inflow our sewer system that need to be eliminated so that we can regain some of our peak flow capacity.

### Program Goal

The individual program goal(s) establishes the accomplishments desired for the given MOM program during the upcoming fiscal year.

*Example:* The goal our smoke testing program for this fiscal year is to reclaim system peak

capacity, and to reduce treatment plant hydraulic loading by identifying sources of inflow to the system by conducting investigations in the ABC and DEF sewersheds. This goal will be accomplished in a cost-effective manner using our personnel and by using a contractor.

#### Program Documentation

The program documentation specifies, in writing, the specific details of the activities and procedures that personnel follow to implement the program. Program documentation should be maintained in a central location and made available to all personnel.

*Example:* Our utility has a long-term, ongoing, smoke testing program. The program priorities and standard operating procedures are contained in a manual entitled "Smoke Testing Program for Utility X."

#### Implemented by Trained Personnel

Training programs are established and followed to ensure that utility personnel are well-trained to implement each program and successfully achieve each program's goals.

*Example:* All personnel assigned to our smoke testing activity receive three hours of basic training followed by eighty (80) hours of on-the-job training to assure competency. Our contract with outside sources to conduct smoke testing requires the contractor to follow our standard operating procedures.

#### Performance Measures

Appropriate performance measures should be established for each program and reviewed at minimum on an annual basis.

*Example:* During this fiscal year, the performance goal is to smoke test 200,000 lineal feet of gravity sewer in two sewersheds selected according to our priority procedures. Last year, we exceeded our performance goal of 178,000 lineal feet of gravity sewer by smoke testing 193,000 lineal feet. As a result, 623 defects were identified and passed on to our rehabilitation and private service lateral programs for correction.

#### Periodic Evaluation

An evaluation by utility management should occur for each program, annually at minimum, to evaluate how well a program accomplished the program goals established at the beginning of the period and to determine whether the program, as presently implemented, is using the most efficient approach. Remedies should be identified and scheduled to correct any deficiencies. Questions the evaluation should answer are:

- Are there program design, resource or implementation deficiencies that keep the program from achieving its performance measures?
- Are these program deficiencies leading to sanitary sewer overflows, permit violations or other

Clean Water Act violations?

- Are there program deficiencies leading to decreased customer service and/or unwarranted deterioration of utility assets?
- Are there changes that should be made to the program that will make its implementation more efficient, thereby conserving resources for better implementation of other programs?

*Example:* The smoke testing program has yielded good results during the past four years. Following our priority criteria, most of the significant inflow problems have been eliminated. Next year the program will be reduced by 25% and the resources applied to our maintenance of way program. Peak flows will be monitored at key locations to determine if this reduction in the smoke testing program will need to be reversed in the future. Additionally, we are conducting a cost analysis to determine whether we should contract out for all smoke testing work in the future.

## **SYSTEM PROFILE AND PERFORMANCE SUMMARY**

A proactive utility will maintain a profile of its system as a basis for explaining its situation to regulatory agencies, the public, and when networking with other utilities. A profile typically contains basic population and inventory information as well as a recent system performance summary. An example of a system performance summary is provided on the following page.

**Population Served:** .....

**Number of Customers:** .....

**Number of Treatment Plants:** .....

**Total Wastewater Design Treatment Capacity:**

**Total Volume of Wastewater Treated:** .....

**Miles of Gravity Sewers:** .....

**Number of Manholes:** .....

**Number of Inverted Siphons:** .....

**Number of Pump Stations:** .....

**Miles of Force Main:** .....

**Number of Employees:** .....

**Annual Capital Improvement Budget:** .....

**Annual Operation and Maintenance Budget: ...**

**Total Annual Operating Budget:** .....

System-Wide MOM Programs Recent Performance Summary											
Performance Measures for Previous 12 Months	Year	Month									
A. Number of Customer Complaints											
B. Number of NPDES Permit Violations											
C. Number of Capacity-Related Overflows											
D. Number of Maintenance-Related Overflows											
E. Number of Operations-Related Overflows											
F. Number of Blockages											
G. Number of Cave-Ins											
H. Number of Pump Station Failures											
I. Peak Flow Factor at Treatment Plant (1 hour high/dry month avg.)											
J. Monthly Average Treatment Plant Flow Rate (gal/capita/day)											
K. Monthly High One Day Treatment Flow Rate (gal/capita/day)											
L. Number of By-Passes at Treatment Plant											
M. Volume of Treatment Plant By-Passes (gal)											
N. WWTP Weekly Average Influent BOD (mg/L)											

## **MANAGEMENT PROGRAMS**

### **1. Organization**

#### **a. Organizational Chart**

An organizational chart clearly depicts all units in the organization, the lines of authority between the various organization units, a description of the functions of each of the organization units, the title and duties of each position in the organization units and an indication of whether or not each position is currently budgeted and filled.

#### **b. Relation to Other Municipal Functions**

An organizational chart clearly depicts the relationship of the sewerage utility to other municipal functions such as public works, streets and drainage, building inspection, building permits, and public health. There is a mechanism for updating the chart in manner timely to changes which may occur in the organization.

### **2. Training**

#### **a. Technical Training Program**

This program specifies requirements (curriculum) for initial and refresher training to ensure each employee has a level of knowledge, commensurate with duties, of the overall functions of the utility's infrastructure. This program also includes outside technical training and networking opportunities, such as conferences and seminars, that are made available to employees.

The program includes the extent to which employee certification, at either the State or the utility's organization level, is required as a basis for obtaining or maintaining a position. Records of technical training are maintained and the degree to which completed technical training is tied to promotion and pay is specified. Finally, the program specifies the technical training required before an employee is permitted to undertake specific work assignments or tasks.

#### **b. Skills Training Program**

This program specifies requirements (curriculum) for initial and refresher training to ensure each employee has a level of knowledge, commensurate with duties, of the specific equipment to be used and the procedures to be followed in carrying out duties. This program should include outside skills training opportunities, such as manufacturers' or vendors' training workshops, that are made available to employees.

The program includes the extent to which employee certification, at either the State or the utility's organization level, is required as a basis for obtaining or maintaining a position. Records of skills training, whether formal or on-the-job apprenticeship, are maintained and the degree to which completed training is tied to promotion and pay is specified. Finally, the program specifies the skills and on-the-job training required before an employee is permitted to undertake specific work assignments or tasks.

**c. Safety Training Program**

This program specifies requirements (curriculum) for initial and refresher training to ensure each employee has an adequate level of knowledge regarding on-the-job safety. The program includes the extent to which employee safety certification at the State or at the utility's organization level is required as a basis for obtaining or maintaining a position. Records of safety training, including on-the-job safety meetings, are maintained. Finally, the program specifies the safety training required before an employee is permitted to undertake specific work assignments or tasks.

**3. Safety**

**a. Safety Authority**

A Safety Authority (whether a safety department, safety committee, safety officer, or similar mechanism) is present to establish utility safety policy, oversee compliance, and maintain the overall Safety Program. Program maintenance includes specifying safety resources needed for utility activities, assuring record of appropriate standard reporting forms, and establishing a Safety Review Board if appropriate.

**b. Confined Space Program**

This program provides marking for confined spaces, and uses a permitting system and written standard procedures for confined space entry.

**c. General Safety Procedures Program**

This program provides instruction in defensive driving, first aid, CPR, personal sanitation, personal protection clothing, and similar general work-related safety issues.

**d. Traffic Management Procedures Program**

This program provides for standard traffic management techniques, off-hour scheduling of line work, and coordination with law enforcement.

**e. Lock-Out/Tag-Out Program**

This program provides signs on equipment involved in the program, limitation to authorized personnel, required tag information, and permit requirements.

**f. Safety Equipment Program**

This program assures the availability of appropriate safety equipment such as tripods and hoists, well-calibrated atmospheric testing equipment, self-contained breathing apparatuses, lights and barricades, exhaust fans, and personal protective clothing.

**g. Safety Performance Program**

This program tracks parameters such as number of injuries, lost days, and workman's compensation claims to be used by management to assess Safety Program effectiveness.

**4. Information Management Systems (IMS)**

**a. Management Programs IMS**

This information management system enables utility management to adequately evaluate operation, maintenance, customer service (complaint response), and system rehabilitation activities so that overall system performance can be determined and utility planning can be conducted.

**b. Operation Programs IMS**

This information management system is used to track scheduled operational activities and to enhance operational performance. The system ensures timely production of operating reports and standardized data collection methods are used by field personnel (e.g., forms or PDA files). The system requires data review by the field supervisor and securely preserves operating records. While the system need not be computer-based, it should be capable of feeding information to the Management Programs IMS.

**c. Maintenance Programs IMS**

This information management system is used to track scheduled maintenance activities and to enhance maintenance performance. The system ensures timely production of maintenance reports and standardized data collection methods are used by field personnel (e.g., forms or PDA files). The system requires data review by the field supervisor and securely preserves maintenance records. While the system need not be computer-based, it should be capable of feeding information to the Management Programs IMS.

**d. Customer Service IMS**

This information management system is used to track reactive activities (i.e., emergencies or customer complaints) and to enhance customer service. The system ensures timely production of complaint reports and standardized data collection methods are used by field personnel (e.g., work order forms or PDA files). The system requires data review by the field supervisor and securely preserves service records. While the system need not be computer-based, it should be capable of feeding information into the Management Programs IMS.

**5. Engineering**

**a. Collection and Transmission System Plans Program**

This program ensures a full set of as-built plans for the collection and transmission system are available, field crews have ready access to the plans, and a written standard procedure is present to account changes, update the plans, and supply revised versions to field crews in a timely manner.

**b. System Inventory Program**

This program ensures an inventory of the utility's collection and transmission system is present, updated, and cataloged by service area or sewershed. The inventory lists the system components with their attributes and characteristics (c.g., pipe age, pipe size, pipe material, invert elevation, pump sizes, location of inverted siphons, pump stations, manholes, etc.).

**c. Mapping Program**

This program ensures adequately detailed maps are available to be used in conjunction with the utility's MOM programs. At minimum, the maps depict the location of gravity sewer lines, force mains, air valves, manholes (by identifying numbers), pump stations, major appurtenances, and the size of pipes.

**d. Sewer System Design Program**

This program ensures all new sewer system construction will be adequately designed and constructed using specifications that assure the integrity of the infrastructure. The program includes documented design criteria (e.g., slope and bedding materials), use of standardized construction details, use of standardized materials and construction practices, a standard design review process which includes review by utility personnel for possible maintenance concerns, standardized review forms, and record keeping procedures.

**e. New Construction and Rehabilitation Inspection Program**

This program ensures new construction or rehabilitative work is properly inspected, and built using the utility's standard construction specifications (including use of best management practices to prevent stream pollution). The program includes use of standardized construction procedures, standardized construction testing procedures, standardized inspection and testing forms/reports, and assurance that the inspection is conducted under the authority and supervision of a registered Professional Engineer. The program also provides subsequent closed circuit television (CCTV) inspection of line construction prior to expiration of the warranty, and retention of the tapes for reference.

**f. Acquisition Considerations Program**

This program ensures prospective infrastructure is inspected and evaluated for compliance with the utility's standard design and construction criteria before it is acquired by the utility from another entity. The program includes written standard procedures to conduct the evaluation and estimate the time/cost requirements to bring the infrastructure into compliance with utility standards.

**g. Continuous Sewer System Assessment Program**

*i.) Prioritization*

This program prioritizes sewer service areas (i.e., sewersheds) for sewer system assessment activities. Prioritization is based upon information such as complaints, flow monitoring (including flow isolation studies), historical location of sewer overflows, pump station run times, field crew work orders, and other relevant information available to the utility.

*ii.) Dyed Water Flooding*

This program conducts dyed water testing, when appropriate, to locate sources of inflow and other illicit connections to the sewer system. The program includes written standard procedures, standard forms, performance measures, and a mechanism for including dyed water testing information in the IMS.

*iii.) Corrosion Defect Identification*

This program identifies locations within the sewer infrastructure subject to corrosion and provides for inspection of those locations for corrosion on a routine basis. The program includes written procedures for corrosion identification, corrosion identification forms, performance goals, corrosion defect analysis, and a mechanism for including corrosion defect information in the IMS.

*iv.) Manhole Inspection*

This program ensures routine inspection of manholes within the sewer system. The program includes standard manhole inspection procedures, manhole inspection forms, performance goals, manhole defect analysis, and a mechanism for including manhole inspection information in the IMS.

*v.) Flow Monitoring*

This program supplies flow monitoring data to support engineering analyses related to sewer system capacity and peak flow evaluations, and to assist scheduling of sewer line maintenance. The program may include installation of an appropriate number of calibrated permanent and/or temporary flow meters, or rudimentary use of visual flow observations taken during base flow periods in wet and dry seasons. The latter option is more cost-effective for some very small utilities. Either program should include a procedure for adequate rainfall measurement, servicing meters, and a mechanism for including flow monitoring information in the IMS.

*vi.) Closed Circuit Television (CCTV)*

This program provides internal inspection of the integrity of gravity sewer lines. The appropriate number of qualified CCTV personnel and dedicated equipment, or the scope of a CCTV contract, is determined to ensure sewer inspection work is completed properly. The program includes standard operating procedures (including pre-inspection cleaning), performance measures, and mechanisms for including CCTV information in the IMS and retaining CCTV tapes.

*vii.) Gravity System Defect Analysis*

This program analyzes gravity sewer system defects. The program includes standard defect codes, written defect identification procedures and guidelines, a standardized process for cataloging gravity system defects, a mechanism for including gravity system defect information in the IMS, and training specified for personnel.

*viii.) Smoke Testing*

This program identifies sources of inflow into the gravity sewer system by use of smoke

testing equipment. The program includes written standard smoke testing procedures, smoke testing forms, performance goals, smoke testing defect analysis, and a mechanism for including smoke testing information in the IMS.

*ix.) Service Lateral Investigations*

This program investigates infiltration and inflow contributions and other problems originating in service laterals. The program includes written standard investigation techniques, standard investigation forms, performance goals, standard analysis procedures, and a mechanism for including service lateral investigation information in the IMS.

*x.) Pump Station Performance and Adequacy*

This program permits evaluation of pump station performance and pump station adequacy. The program includes trend analysis of pump run-time meter, pump start-counter, or amperage data; historical review of the fundamental causes of pump failures; use of appropriate remote monitoring and alarm notification equipment; and a mechanism for including pump station performance information in the IMS.

**h. Infrastructure Rehabilitation Program**

This program rehabilitates gravity sewer lines, force mains, manholes, pump stations, and related appurtenances. The program includes a process for prioritizing rehabilitation, inventory of all completed rehabilitation (including a breakdown of the rehabilitation techniques used), inspection and performance measurement for all completed rehabilitation, written schedules for rehabilitation work, and a mechanism for including rehabilitation information in the IMS.

**i. System Capacity Assurance Program**

*i.) Capacity Assurance for New Connections*

This program ensures there is adequate capacity to collect, transmit, and treat additional sewage expected as a result of prospective new sewer connections. The program is integrated into, or thoroughly coordinated with, the building permit process. It is also integrated into the Acquisition Considerations Program described above in 5(f). The program has a mechanism for including capacity assurance information in the IMS.

*ii.) Protocols for Capacity Assurance*

The program includes, but is not limited to: use of standardized design flow rate rules of thumb (i.e., regarding pipe roughness, manhole head losses, accuracy of distance and slope on as-built drawings, and water use); use of techniques to predict the impacts of additional flow (i.e., use of a hydraulic model of gravity system, pressure system, and other appropriate techniques); and use of flow metering to confirm mathematical estimations of existing peak flow. The program requires certification of adequate capacity by a registered Professional Engineer, and includes an IMS mechanism for integrating analysis from this program with information on infiltration/inflow reduction activities.

## **6. Overflow Tracking**

### **a. State Agency Reporting Program**

This program includes written standard operating procedures which clearly define the minimum State Agency reporting requirements for events where sewage leaves the infrastructure before treatment, and the steps utility personnel must follow to meet or exceed those reporting requirements.

### **b. Local Agency Reporting Program**

This program provides secondary notice to the public and to other appropriate organizations (e.g., downstream utilities with water intakes and local public health authorities) when an overflow presents an imminent and substantial threat to public health or the environment. The program includes written criteria for making this notice, procedures for notifying news media and posting notices at stream locations, and may also prepare an annual summary report available to the public.

### **c. Records Management Program**

This program tracks all events where sewage leaves the utility's collection or transmission system before treatment (i.e., overflows to land, directly to waters, or indirectly to waters by storm drains or other paths). The program uses standardized forms which record, at minimum, the following information for response and inclusion in the IMS:

- ❖ Location of the discharge
- ❖ Name of the receiving water and description of the pathway (e.g., storm drain)
- ❖ Estimation of the discharge volume and the method of estimation
- ❖ Description of the system component that is source of the discharge
- ❖ Date and time the discharge started and stopped
- ❖ Root cause, or suspected root cause, of the discharge
- ❖ Steps taken to eliminate the discharge and steps taken to prevent reoccurrence.

## **7. Financial Analyses**

### **a. Cost Analysis Program**

This program regularly analyzes and projects future utility management, operations, and maintenance costs needed to properly implement these utility programs. The cost analyses include, at a minimum: overhead, labor and equipment, financial impacts of outsourcing certain activities, overtime, and the financial impacts imposed by organizational departments or agencies outside the utility. Cost analyses are performed for all management, operations, and maintenance equipment and the capital infrastructure investment. Cost analyses incorporate life cycle depreciation and establish cost-effective points for replacement. The program has a mechanism for including such replacement points in the IMS.

### **b. Capital Improvement Financing Program**

This program analyzes, projects, plans and finances capital improvement needs established through proper engineering study. Capital improvement financing is planned using a five (5) year planning horizon with annual updates.

**c. Budget and Customer Rate Program**

This program establishes the annual utility budget and recommends customer rates. The program assures that the budget and funding provided by customer rates will meet the cost and capital financing needs set by programs 7(a) and 7(b) above.

**8. Equipment and Supplies**

**a. Spare Parts Inventory Program**

This program ensures proper management of the utility spare parts inventory including spare pipe. The program includes adequate parts storage facilities, identification and retention of an adequate number of critical spare parts (i.e., those which are difficult to obtain quickly but critical to proper operations), control of access to spare parts, an organized system for inventory management (either manual or computerized), arrangement with local vendors for common parts, and specification of spare parts to be carried on vehicles.

**b. Equipment and Tools Inventory Program**

This program ensures proper management of the utility equipment and tools inventory. The program includes adequate equipment and tools storage facilities, control of access to equipment and tools, an organized system for inventory management (either manual or computerized), and specification of equipment and tools to be carried on vehicles.

**c. Vehicle Repair Program**

This program ensures proper management of utility vehicles. The program includes provisions for vehicle maintenance and vehicle repair. Performance measures for the program will consider turn-around time, cost factors, contract maintenance, and the life cycle cost analysis performed for vehicles.

**9. Customer Service**

**a. Complaint Management Program**

This program ensures proper complaint management. The program includes written standard management procedures for dispatchers (i.e., dispatch priorities, work order generation, and standardized complaint and problem codes). The program uses an organized record keeping procedure (including the use of standardized forms) which facilitates tracking work orders and follow-up with customers, and uses a mechanism to evaluate response performance and supply this information to the IMS.

**b. Public Information Program**

This program communicates utility activities which may closely impact the public (e.g., smoke testing, major construction or maintenance, or emergency maintenance), and ensures communication of activities which may coincide with those of other departments and agencies (e.g., street paving).

**c. Public Education Program**

This program educates the public and solicits support regarding issues such as service lateral maintenance, grease management, food disposals, inflow sources,

maintenance/rehabilitation needs requiring increased rates, and problems caused by basement sump pumps.

## **10. Legal Support**

### **a. Inter-Jurisdictional Agreement Program**

This program develops, negotiates, and enforces agreements with neighboring utilities which send the utility flow or with major volume sewer customers. The program ensures that the agreements require the second party to have proper management, operation, and maintenance programs so the utility's infrastructure is not stressed by problems originating across jurisdictional boundaries. The program also ensures the agreements address flow-based capacity issues, specify the life of the agreement, have credible provisions for enforcement, and have provisions for modification.

### **b. Sewer Ordinance Program**

This program develops, revises, and amends sewer ordinances as needed to support the proper management, operation, and maintenance of the utility. The program provides adequate legal authority for the utility regarding sewer use, grease management, pretreatment, private service laterals, sump pumps and roof drains, private haulers, recovering costs of damage to utility infrastructure, and other legal authorities as required. Legal support is provided for case work and guidance for utility staff.

## **11. Water Quality Monitoring**

### **a. Routine Monitoring Program**

This program determines the existence of unpermitted discharges originating at locations where sewers cross waterways or at other isolated or remote sewer locations. The program includes scheduled sampling during dry weather periods from a network of monitoring stations. The program also includes a map of the sampling network, and formally establishes sampling frequency, sampling parameters (i.e., fecal coliform and others), standard sampling procedures, quality assurance/quality control procedures, and a mechanism for including program information in the IMS.

### **b. Investigative Monitoring Program**

This program determines the source of industrial, commercial, or sanitary wastewater resulting from cross connections with the stormwater drainage system, and typically activates through complaints or discovery by operations personnel. The program has formally established sampling parameters (i.e., fecal coliform and others), standard sampling procedures, quality assurance/quality control procedures, and a mechanism for including program information in the IMS.

### **c. Impact Monitoring Program**

This program determines the impact of pollution resulting from discharges occurring within the utility infrastructure before treatment. Combined with the reporting programs described in Overflow Tracking (6) above, this program assists the utility, regulatory authorities, and public health authorities determine the appropriate response to protect health and/or the environment. The program has formally established sampling parameters (i.e., fecal coliform

and others), standard sampling procedures, quality assurance/quality control procedures, and a mechanism for including program information in the IMS.

## 12. Contingency Plan for Utility Infrastructure

### a. Contingency Planning Program

This program develops and modifies contingency plans for the sewer system and the treatment facilities that will be implemented during emergency situations. The planning process includes a preparedness committee of senior and experienced management and field personnel. A system overview is conducted to determine vulnerability to a variety of events which may be due to utility failures, natural causes, or failures caused by another party. Based upon these hypothetical events and past experience taken from root cause failure information in the IMS, prediction system component failure is made. Strategies to timely repair or overcome such component failures are developed, and the six (6) major contingency plan components are available in writing: public notification, agency notification, emergency flow control, emergency operation and maintenance, preparedness training, and water quality monitoring (described in 11(c) above).

#### i.) Public Notification

The public notification component includes a set of criteria, developed with input from local public health authorities, which are used as a basis for initiating public notification; a step-by-step procedural flow diagram; a list of manager names and phone numbers; a plan for regular business hours, off-hours, weekends, and holidays; a list of *Public Contacts* with phone numbers; identification of managers authorized to give statements; and pre-scripted news releases.

#### ii.) Agency Notification

The agency notification component includes a set of criteria, developed with input from appropriate local, State, and Federal authorities, which are used as a basis for initiating agency notification; a step-by-step procedural flow diagram; a list of manager names and phone numbers; a plan for regular business hours, off hours, weekends, and holidays; a list of *Agency Contacts* with phone numbers; identification of personnel authorized to contact agencies; and copies of standard reporting forms used by the agencies.

#### iii.) Emergency Flow Control

The emergency flow control component is used to reduce overflow volumes and pollution where possible. The component includes a set of criteria which are used as a basis for initiating emergency flow control procedures; a step-by-step procedural flow diagram; a list of manager names and phone numbers; a plan for regular business hours, off-hours, weekends, and holidays; a list of *Emergency Flow Control Contacts* with phone numbers; identification of personnel authorized to initiate the emergency flow control program; and standard emergency flow control reporting forms.

Flow control activities may include flow re-routing, flow diversion, household flow reduction and advisories, commercial flow reduction and advisories, water pressure reduction and advisories, or use of pretreatment program protocols set forth in permits for

significant industrial users. The initiating criteria, reporting forms and report formats should be developed in cooperation with significant industrial users and appropriate local, State, and Federal authorities.

*iv.) Emergency Operation and Maintenance*

The emergency operation and maintenance component includes a set of criteria which are used as a basis for initiating emergency operation and maintenance procedures; a step-by-step procedural flow diagram; a list of manager names and phone numbers; a plan for regular business hours, off-hours, weekends, and holidays; a list of *Emergency Operation and Maintenance Contacts* with phone numbers; identification of personnel authorized to initiate emergency operation and maintenance procedures; and standard reporting forms.

The initiating criteria, reporting forms, and report formats should be developed in cooperation with utility's insurance representatives, State and Federal emergency management agencies, and the State regulatory authority. Further, development of the emergency operations and maintenance component should include analyses of the need and use of stand-by equipment (prearranged rentals), stand-by contractors, and access to critical spare parts.

*v.) Preparedness Training*

The preparedness training component ensures that all personnel are fully aware of procedures and able to efficiently implement the Contingency Plan. The preparedness training component includes specialized training courses, field trials, and special emergency situation safety training.

**b. Response Flow Diagram**

This diagram includes the roles of senior management and field personnel and shows the relationship of the six (6) major contingency plan components: public notification, agency notification, emergency flow control, emergency operation and maintenance, preparedness training, and water quality monitoring.

## **OPERATION PROGRAMS**

### **1. Pump Station Operation**

#### **a. Preventive Operation Program**

This program ensures reliable operation of the transmission system through use written standard operating procedures available for both manned and unmanned stations. Procedures may include reading and recording information from pump run-time meters, or start counters, or taking amperage readings; recording wet well conditions and grease accumulation; checking and resetting (as necessary) wet-well set points; checking and recording system pressure; checking remote monitoring and alarm equipment components; checking operation of alarms and stand-by power; and reporting maintenance needs. The program has established schedules, routes, priorities, standard forms, performance measures, and a mechanism for including program information in the IMS.

#### **b. Reactive Operation Program**

This program ensures timely response to atypical situations in the transmission system through use of written standard operating procedures available for both manned and unmanned stations. Procedures may include initiating auxiliary power with portable generators, installing portable pumps during high flow, or initiating the Contingency Plan. The program has established standard forms and reporting procedures, performance measures, and a mechanism for including program information in the IMS.

### **2. Pretreatment Program**

This program ensures that operation of the utility's treatment facility is protected from pollutant pass-through or interference. If a utility has industrial or commercial users it may have this program which includes industrial user identification, permitting, monitoring and inspections, enforcement, and other components. Personnel involved with the utility pretreatment program will have frequent communication with operation and maintenance personnel to detect possible pretreatment permit violations. The program has standard operating procedures, performance measures, inspection schedules, and a mechanism for including program information in the IMS.

### **3. Corrosion Control Program**

This program provides for inspection of the utility infrastructure for corrosion caused by hydrogen sulfide or other corrosives, the development and implementation of site-specific corrosion control measures, a monitoring program to evaluate corrosion control measures, program performance measures, and a mechanism for including program information in the IMS.

### **4. Fats, Oils, and Grease Control Program**

This program prevents fats, oils, and grease from entering the utility infrastructure, therefore preserving sewer capacity, prolonging the infrastructure life, reducing overflow events, and saving the utility maintenance costs. The program includes a grease control ordinance, grease trap and interceptor design standards, permitting and inspecting commercial grease traps and interceptors, a credible enforcement component, a public education component for residential sources, performance measures, and a mechanism for including program information in the IMS.

### **5. Service Connection/Disconnection Program**

This program includes written standard procedures for new sewer tap installation or for sewer disconnection; inspection of all new service connections to, or disconnections from, the utility sewer; a credible enforcement program; performance measures; and a mechanism for notifying personnel in the Mapping Program or including program information in the IMS.

### **6. Private Haulers Program**

This program issues permits to private commercial or septic tank waste haulers discharging to the utility, and includes written standard operating procedures for inspection/sampling of the haulers, a credible enforcement program, program performance measures, and a mechanism for including program information in the IMS.

### **7. Line Location Program**

This program responds to requests for utility sewer line locates, and includes written standard line location procedures, defined prioritization to assist scheduling, appropriate staffing and equipment for the average number of requests, standard line location procedures, standard forms, performance measures, and a mechanism for including program information in the IMS.

## **MAINTENANCE PROGRAMS**

### **1. Pump Station Preventive Maintenance**

#### **a. Pump Station Repair Program**

This program is a reactive maintenance component intended to repair pump stations that are currently in a state of disrepair but still cost-effective to service. The program includes established priorities for pump station repairs, maintaining an ongoing inventory of completed repairs, a work schedule for pump station repairs, and a mechanism for including pump station repair information in the IMS. Upon completion of pump station repairs, service activities are transferred to the pump station Preventive maintenance program.

#### **b. Electrical Maintenance Program**

This program is a component of the pump station Preventive maintenance program. The program includes an established number of crews and personnel required to perform effective electrical maintenance, written standard electrical maintenance procedures, scheduling Preventive maintenance, standard forms, performance measures, and a mechanism for including electrical maintenance information in the IMS.

#### **c. Mechanical Maintenance Program**

This program is a component of the pump station Preventive maintenance program. The program includes an established number of crews and personnel required to perform effective mechanical maintenance, written standard mechanical maintenance procedures, scheduling Preventive maintenance, standard forms, performance measures, and a mechanism for including mechanical maintenance information in the IMS.

#### **d. Physical Maintenance Program**

This program is a component of the pump station Preventive maintenance program. The program includes an established number of crews and personnel required to perform effective physical maintenance, written standard physical maintenance procedures, scheduling, standard forms, performance measures, and a mechanism for including physical maintenance information in the IMS.

### **2. Gravity Line Preventive Maintenance**

#### **a. Routine Hydraulic Cleaning Program**

This program includes accurately determined cleaning needs, established priorities and scheduled cleaning activities, support of an appropriate number of crews and personnel, acquired necessary equipment (e.g., Jet Unit, Combination Unit, etc.), written standard hydraulic cleaning procedures, standard forms, performance measures, and a mechanism for including hydraulic cleaning information in the IMS.

#### **b. Routine Mechanical Cleaning Program**

This program includes accurately determined cleaning needs, established priorities and scheduled cleaning activities, support of an appropriate number of crews and personnel, acquired necessary equipment (e.g., Rodders, Bucket Machine, etc.), written standard mechanical cleaning procedures, standard forms, performance measures, and a mechanism

for including mechanical cleaning information in the IMS.

**c. Root Control Program**

This program includes accurately determined root control needs, established priorities and scheduled activities, support of an appropriate number of crews and personnel, acquired necessary equipment (e.g., mechanical, chemical, etc.), written standard root control procedures, standard forms, performance measures, and a mechanism for including root control information in the IMS.

**d. Manhole Preventive Maintenance Program**

This program includes accurately determined manhole maintenance needs, established priorities and scheduled activities, support of an appropriate number of crews and personnel, acquired necessary equipment (rings and lids, structural repair, etc.), written standard manhole maintenance procedures, standard forms, performance measures, and a mechanism for including manhole maintenance information in the IMS.

**3. Air Valve Preventive Maintenance Program**

This program provides for inspection and maintenance of air valves located on force mains (including regular valve exercise). The program includes an established number of crews and personnel required to perform effective Preventive maintenance, written standard air valve maintenance procedures, scheduling, standard forms, performance measures, and a mechanism for including air release valve maintenance information in the IMS.

**4. Maintenance of Way**

**a. Maintenance of Rights-of-Way and Easements Program**

This program includes accurately determined maintenance needs, established priorities and scheduled activities, support of an appropriate number of crews and personnel (based on the number of waterway crossings and/or miles of sewer off-street), written standard maintenance procedures, standard forms, performance measures, and a mechanism for including maintenance information in the IMS.

**b. Street Paving Monitoring Program**

This program includes accurately determined monitoring needs, established priorities and scheduled activities, coordination with storm drain projects and street and highway officials, support of an appropriate number of crews and personnel, acquired necessary equipment (e.g., manhole and valve raising, etc.), written standard monitoring procedures, standard forms, performance measures, and a mechanism for including monitoring information in the IMS.

**5. Reactive Maintenance Program**

This program provides response to customer complaints or other unscheduled system problems forwarded by dispatchers. The program includes support of an appropriate number of crews and personnel, written standard response procedures including a protocol for initiating the Contingency Plan, standard forms, collection of information in support of failure analysis, sewer map availability, performance measures, and a mechanism for including reactive maintenance information in the IMS.

**SYSTEM PROFILE AND PERFORMANCE SUMMARY**

A proactive utility will maintain a profile of its system as a basis for explaining its situation to regulatory agencies, the public, and when networking with other utilities. A profile typically contains basic population and inventory information as well as a recent system performance summary. An example of a system performance summary is provided on the following page.

- Population Served: ..... \_\_\_\_\_
- Number of Customers: ..... \_\_\_\_\_
- Number of Treatment Plants: ..... \_\_\_\_\_
- Total Wastewater Design Treatment Capacity: \_\_\_\_\_
- Total Volume of Wastewater Treated: ..... \_\_\_\_\_
- Miles of Gravity Sewers: ..... \_\_\_\_\_
- Number of Manholes: ..... \_\_\_\_\_
- Number of Inverted Siphons: ..... \_\_\_\_\_
- Number of Pump Stations: ..... \_\_\_\_\_
- Miles of Force Main: ..... \_\_\_\_\_
- Number of Employees: ..... \_\_\_\_\_
- Annual Capital Improvement Budget: ..... \_\_\_\_\_
- Annual Operation and Maintenance Budget: ... \_\_\_\_\_
- Total Annual Operating Budget: ..... \_\_\_\_\_

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Promotes water efficient products and practices, saving H2O and electricity. Partners receive recognition and use of EPA logo.

~ Success story: Georgia's Cobb County replaced 1682 toilets with low flow saving 9.5 million gal./yr.

[www.epa.gov/watersense](http://www.epa.gov/watersense)

Artie Buff, 404-562-9336



Water conservation in action.

### NATIONAL PARTNERSHIP FOR ENVIRONMENTAL PRIORITIES (NPEP)

Partnership with EPA that reduces the use of any of the 31 Priority Chemicals (e.g. Lead, Polycyclic Aromatic Hydrocarbons (PAHs).

~ Success stories: Wirerobe Works eliminated 27,000 lbs. Lead, Saving \$50,000/yr.

[www.epa.gov/epaoswer/hazwaste/minimize/partnership.htm](http://www.epa.gov/epaoswer/hazwaste/minimize/partnership.htm)

Dave Langston, 404-562-8478



### PERFORMANCE TRACK

Go above and beyond legal requirements. Benefits: Reduced Reporting under Maximum Achievable Control Technology (MACT), Extended Accumulation for RCRA Waste, and more.

~ Success story: Rohm and Haas Electronic Materials replaced burner control sections with high-efficiency motor controllers. Saving \$49,000/yr. and reducing energy use by 3.7 billion BTU/yr.

[www.epa.gov/performance-track](http://www.epa.gov/performance-track)

Reggie Barrino, 404-562-9635

### ENERGY STAR

Save money through energy efficient products and practices. Covers 50 product categories. In 2007, program saved consumers \$16 billion in energy costs.

~ Success story: Marriott instituted various energy saving techniques saving \$6 million; 3M increases energy efficiency 9%, saves \$10 million.

[www.energystar.gov](http://www.energystar.gov)

Danny Orlando, 404-562-9087

### WASTE REDUCTION RESOURCE CENTER (WRRC)

Pollution Prevention (P2) Info clearinghouse—Online technical P2 library/case studies, training courses, Topic Hubs, P2 News, State P2 Contact Information.

<http://wrrc.p2pays.org>

1-800-476-8686

### WASTE WISE

Information geared towards municipal solid waste and select industrial wastes (e.g. packaging, paper, wood pallets, batteries) Free technical assistance, case studies, and public recognition/awards.

~ Success story: Pepsi switched from corrugated to reusable shipping, saving \$44 million.

[www.epa.gov/wastewise](http://www.epa.gov/wastewise)

Rhonda Rollins, 404-562-8664



Wooden pallets being prepared for reuse.

### RESOURCE CONSERVATION CHALLENGE (RCC)

Save money and energy - Manage materials more efficiently through recycling and reuse.

[www.epa.gov/rcc](http://www.epa.gov/rcc)

[www.epa.gov/region4/recycle](http://www.epa.gov/region4/recycle)

~ Success story: Rooms To Go's comprehensive recycling program grossed over \$1 million in 2007.

Dee Rodgers-Smith (Solid Waste), 404-562-8688

Mary Beth Van Pelt (Organics), 404-562-8615

Kim Clifton (E-Waste), 404-562-8477

Steve Smith (C&D), 404-562-8501

## SECTOR-SPECIFIC REGULATORY COMPLIANCE ASSISTANCE

### COMPLIANCE ASSISTANCE CENTERS

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[www.epa.gov/compliance/assistance](http://www.epa.gov/compliance/assistance)

Wesley Hardegree, 404-562-9629



*Mills like the one above can get help with environmental regulations.*

### INDUSTRY SECTOR NOTEBOOKS

- Profiles environmental challenges for more than 35 manufacturing, transportation and agricultural sectors. Covers typical operations, pollutants, regulations, P2 opportunities, common environmental violations, and voluntary initiatives.

[www.epa.gov/compliance/sectornotebooks.html](http://www.epa.gov/compliance/sectornotebooks.html)



# EPA

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## STATE POLLUTION PREVENTION (P2) RESOURCES

Find all the P2 State contacts at:

~ <http://wrrc.p2pays.org>

EPA partnership programs and general P2  
~ [www.epa.gov/partners](http://www.epa.gov/partners) and [www.epa.gov/p2](http://www.epa.gov/p2)

Buy environmentally responsible computers  
~ [www.epeat.net](http://www.epeat.net)

Recycling opportunities for practically everything.  
~ [www.earth911.org](http://www.earth911.org)

Best management practices/Lower plant energy bills  
~ [www1.eere.energy.gov/industry](http://www1.eere.energy.gov/industry)

## ADDITIONAL SUCCESS STORIES

- ~ EPA's Colorado Lab—Reduces water usage 50%, saving 650,000 gallons, and \$1,900/yr.
- ~ Retail complex in Oregon uses native landscaping—maintenance costs reduced 80%, and water bill \$2,400.
- ~ Fiberglass Mfr. reduces waste acetone by 80%, goes from Small Quantity Generator (SQG) to Conditionally Exempt Small Quantity Generator (CESQG).
- ~ Dow reconcitions steel drums, Saves \$2.3 million, conserves 7.8 million lbs of steel.
- ~ Seydel's (textiles) reduction & re-manufacturing efforts generates \$518,000 in revenue.
- ~ Institute for Local Self-reliance (ISLR) deconstructs/recycles home, nets \$7,400 in materials.

## Make your pockets GREENER with Voluntary Programs



EPA has over 60 voluntary programs to help you reduce waste, understand legal requirements, and save millions; with flexible, market-driven solutions. Other companies have saved millions of dollars...and so can you!



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#### REGION 4

61 Forsyth St.  
Atlanta, GA 30303  
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For More Information Contact  
Waste Reduction Resource Center  
1-800-476-8686

**EPA Region 4  
Introduction to Conducting Evaluations  
of  
Municipal Wastewater Collection System  
Management, Operation, and Maintenance Programs  
Version 1.0**



**PURPOSE & DISCLAIMER**

This document is the work product of the EPA Region 4, Water Management Division, Water Programs Enforcement Branch (WPEB) and supercedes a 10-30-1996 draft previously released. This document serves as an introduction for new Region 4 inspectors in the WPEB Municipal Infrastructure Enforcement Program and as introductory information for utilities invited to participate in the Region 4 Management, Operation, and Maintenance (MOM) Programs Project. Questions in this document are provided to initiate the thought process necessary for conducting an evaluation of a collection system. Formal instruction for conducting an evaluation under the MOM Programs Project is provided in separate literature.

The MOM Programs Project is conducted in compliance with EPA Policy, EPA Guidance, and Rules and Regulations promulgated under the Clean Water Act. If some statement or part of the document is not in compliance with the Act, EPA Policy, EPA Guidance or the Rules and Regulations, then it should not be construed as conveying rights not conveyed by the Clean Water Act, EPA Policy, or the Rules and Regulations.

September 2003

# Introduction

Many collection systems have received minimal maintenance for many years. This has resulted in deteriorated sewers with a high potential for overflows, cave-ins, hydraulic overloads at treatment plants, and other problems. There are two central reasons for conducting an evaluation of a municipal collection system:

## Public and Environmental Health

Sanitary sewer overflows (SSOs) are a frequent cause of water quality violations. Beach closings, flooded basements, closed shellfish beds, and overloaded water treatment plants are a few of the symptoms of an inadequate collection system. Streams influenced by frequent SSOs support only the hardiest of species.



## Legal Considerations

A discharge permit issued through the National Pollutant Discharge Elimination System (NPDES) requires that the "permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit." SSOs may be considered a violation of this permit provision.



SSOs may also be considered an unpermitted discharge of pollutants from a point source, as defined in the Clean Water Act.

A goal of the collection system evaluation should be to discover if a utility is plagued by overflows and/or bypasses within its system of conveyance to a treatment facility. If so, what are the impacts? Is the utility aware of the problem? Are they taking appropriate steps to address the problem in a timely manner and prevent future reoccurrence?

# Management

The first stop on any evaluation should be the "home office." This location is a point of administration, and may include functions such as utility management, finance, engineering, planning, procurement, warehousing, personnel, or legal review. In a large city, this work may be split between different departments. A small town may have only one or two people doing some of these activities. Much of the information needed from this source can be obtained before the evaluation by a written request. Areas of review should include:



## ✓ *Financial Administration*

EPA and others have published guidance on the financial aspects of operating a wastewater utility. This is the single most important aspect of utility operation. Inadequate funding diminishes the chances for success.

### User Rate/User Charge

- What are the utility's current rates?
- How are user rates calculated?
- How often are user charges adjusted based on that evaluation?
- Does the utility receive full funding from its revenue?
- Are utility funds used for other government activities?



### Budget

The utility should be operating on an annual budget that details funding for all functions.



- Does the utility budget for annual operating costs?
- Does the budget provide sufficient itemization?
- Does the utility maintain a fund for future equipment and infrastructure replacement? How is work financed?

- Does the budget provide for sufficient funding?

#### **Public Education/Outreach**

The utility should be talking with the public on issues such as user rates and charges. It is up to the utility to educate the public on wastewater treatment, its impact on water resources, and the importance of keeping the user rates current. By maximizing resources and operating facilities efficiently, the utility may be able to delay increases in user rates for a short time. Adjustments for more efficient operation should be made before approaching the public on these issues.



- What type of public education/outreach programs does the utility have about the use of income from utility rates?
- Do these programs include communication with several groups such as local governments, community groups, the media, young people (schools, youth organizations)?

### **✓ Personnel Administration**

#### **Organization**

- Is an organizational chart available which shows the various positions budgeted and filled?
- Are position descriptions available?

#### **Operator Safety Program**

A utility can have several levels of a safety program. It should consist of top administration, a safety department, a safety committee, and field personnel. For a small utility, top administration could be the mayor while a large utility could employ a personnel manager. All utilities should have a safety program that includes a safety policy, safety training and promotion, and accident investigation and reporting.

- Is there a documented safety program supported by a top administration official?
- Is there a safety department that provides training,



equipment, and an evaluation of procedures?

- Are all operators required to follow safe work procedures, such as the use of protective clothing and headgear, confined spaces, lock-out/tag-out policies, etc.?
- Is there a confined space entry procedure for manholes, wet wells, etc.?
- How often are safety procedures reviewed and revised?
- Does the safety department communicate with field personnel on safety by a procedures memo, direct communication, a video, etc.?

### ✓ *Equipment and Tools Administration*

The amount and types of equipment and tools held by a utility depend on the size, age, and condition of the system. The decision as to the type and amount of equipment to have on hand is a difficult one. A small utility may find it hard to justify the purchase of expensive, specialized equipment. The utility must identify the problems in the collection system and arrange for the appropriate tools and equipment accordingly. An alternative to purchasing is leasing, contracting, or sharing costs with other communities.



- Is there a list of equipment and tools used for operation and maintenance?
- Do field personnel feel they have access to the necessary equipment and tools to do all aspects of the operation and maintenance of its collection system?
- Is there access to suitable equipment if the utility's equipment is down for repair?
- Does the utility own or have ready access to a sufficient number of emergency power generators?
- Where does the utility store its equipment?
- Is a detailed equipment maintenance log kept?
- Are written equipment maintenance procedures available?

- What is the procedure for equipment replacement?
- If an in-house motor pool is used, what is the turnaround time for service?

Equipment that has reached its useful life should be replaced. To reduce the financial burden of equipment replacement, a fund should be established for equipment replacement. A utility should keep detailed records on the cost of operating the equipment to make good decisions about equipment replacement.

### ✓ *Legal Administration*

The utility should have legal documents to protect its collection system. Typically, sewer ordinances exist to satisfy Clean Water Act pretreatment regulations and to assure the utility's compliance with its NPDES permit. A legally sound sewer ordinance will give the utility retribution when corrosive and/or toxic materials are introduced into the collection system. Another important element is a grease control ordinance. Grease traps should be inspected by the utility for compliance. Some utilities choose to permit each trap owner.

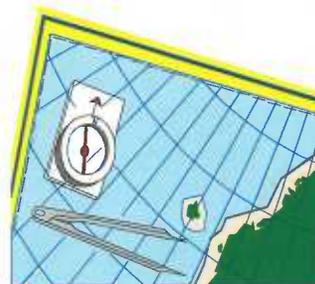


- Is there a sewer use and a grease control ordinance?
- Is there active enforcement of the sewer and grease control ordinances?
- Are all grease traps inspected regularly?
- How does the utility learn of new or existing grease traps?
- Who is responsible for enforcing the sewer ordinance and grease ordinance? Does this party communicate with the utility department on a regular basis?
- Are there any significant industrial dischargers to the system?
- Is there a pretreatment program in place?

✓ **Engineering Administration**

**System Mapping and As-Built Plans**

The utility should have an overall map of the collection system with sufficient detail to allow easy interpretation. There should be a collection system inventory organized by plant service areas that include the following information:



Gravity Lines:	Lineal feet by diameter
Manholes:	Number
Pump Stations:	Number by type
Force Mains:	Lineal feet by diameter
Air Release Valves:	Number and location
Inverted Syphons:	Number and location
Other Major Appurtenances:	Number and location
Service Population	By facility service area

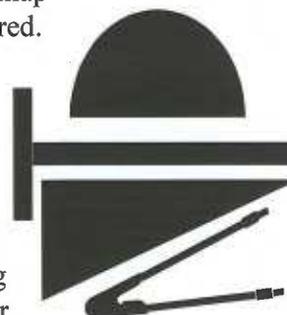
A sewer atlas detailing the location of the above items should be available. The type of sewer atlas used by the utility will depend on their needs and resources. A large metropolitan utility may find that a sophisticated, computerized mapping system is required. A small community may be satisfied with a hand-drafted version.

- What type of mapping/inventory system is used?
- Is there a procedure for recording changes and updating the mapping system?

Mapping and inventory revisions should occur when there are changes in the collection system such as additions or repairs. Comprehensive maps of the system should be printed annually for large utilities, and a staff of “mappers” will likely be required to keep the maps up to date. Utilities may alternatively choose to contract map services. This is especially true if much catch-up work is required.

**Design and Capacity Analysis**

Through the interview and document review process, the evaluator should discover design procedures and the criteria needed for new work. In particular, the evaluator should discover how the utility determines the adequacy of the existing system for transmitting and treating future flows. The evaluator should discover what control the utility has over new connections to the system.



- Is there a document which details the design criteria and standard construction details for gravity sewers, force mains, and pump stations?
- Is there a document that describes the procedures that the utility follows in conducting a design review? Are there any standard forms that guide the utility?
- What procedures are used in determining whether the existing sewer system capacity is adequate for new connections?
- Is any flow metering accomplished prior to allowing new connections?
- Is there a mathematical model of flow in the system used to predict the effects of new connections?
- Is any certification required which attests capacity is available for a new connection before it is made?

### **Construction**

Through the interview and document review process, the evaluator should determine what procedures the utility uses to inspect and test new construction. These activities are important to ensure that new facilities do not contribute to future operation and maintenance problems. Excessive infiltration and inflow problems can exist with new construction if not properly built.



- Is there a document that describes the procedures that the utility follows in conducting their construction inspection and testing program? Are there any standard forms that guide the utility in conducting their construction inspection and testing program?
- Is new construction inspected by the utility or others?
- What are the qualifications of the inspector(s)?
- Is inspection supervision provided by a registered Professional Engineer?
- How is new construction tested? (air, water, weirs, etc.)
- Is new construction televised using closed-circuit camera techniques?
- Is new construction built to standard specs set by the local utility and/or the State?

- Is there a warranty for new construction? If so, is there a warranty inspection done at the end of this period?

### **Sewer System Evaluation Survey (SSES) and Rehabilitation**

The SSES and sewer rehabilitation program is a structured methodology for finding the holes in a system and fixing them. Cost analysis is the major factor in determining the scope of rehabilitation. Due to the requirements of EPA's Construction Grants Program, many systems did evaluation surveys as a condition of their grant. Some systems also received grant funds for rehabilitation.

The SSES is a two-phase operation. The first phase is to gather preliminary information and technical data. Flow monitoring, records and map evaluations, and system inspection are some of the tasks to be completed. Prioritizing areas for further evaluation is the end result of phase one.

The second phase is to conduct further testing of the prioritized sewer areas identified in the preliminary phase and analyze these results. Rehabilitation recommendations based on a cost-effective analysis is the end result of phase two and concludes the SSES.

Rehabilitation may consist of a variety of techniques designed to reduce inflow and infiltration into the sewer system. Many methods are available with highly variable costs and service lives. Rehabilitation costs are usually significantly less than replacement costs.

SSES and rehabilitation activities are best described as a highly intensive program of operation and maintenance. Because over time many utilities have neglected proactive operation and maintenance of their sewer systems, these activities are often used to "catch-up" to a condition which can be maintained on a regular basis. Many of the techniques used in SSES and rehabilitation activities are described in the Operation and Maintenance section of this document, and should also be elements found in a proactive operation and maintenance program.

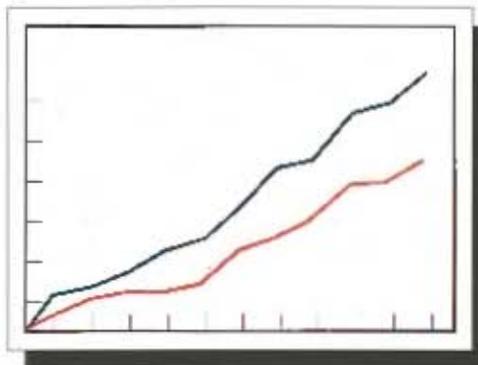
- Have SSES activities been performed in the past? If so, is documentation available?
- Has any sewer rehabilitation work been done in the past 15 years?
- How many sanitary sewer overflows have occurred in the last year?
- Is there a record?



### ✓ *Water Quality Monitoring*

Monitoring streams in the service areas can help identify problems in the collection system such as leaking pipes, washed-out stream crossings, and other pollution sources which could be attributed to the sewer system. Fecal Coliform is a common parameter monitored to detect potential contamination from sewers.

- Is there a water quality monitoring program in the service areas?
- If so, what parameters are monitored and at what frequency?
- How many locations are monitored?



### ✓ *Management Information Systems*

A management information system uses data from work reports prepared by field personnel to optimize the operation and maintenance of the collection system. A powerful tool, the information system is used as an aide to schedule preventive and reactive work on the system. It can also be used to measure efficiency, and track and develop costs.

- What types of work reports are prepared by the field personnel?

Examples include:

- Main Sewer Construction
- Main Sewer Maintenance
- Main Sewer Repair
- Structure Maintenance
- Structure Repair or Abandonment
- Building Sewer Maintenance
- Building Sewer Repair

- Do the work reports include complete and useful information?
- How are records kept?
- Does the facility use computer software to manage information? If so, what type of systems are used?

- What kind of management reports are generated from the work report data?

Examples include:

- Payroll
- Production
- Work Costs
- System Inventory
- Main line maintenance history
- Service line maintenance history
- Main and service line repair history

### **Performance Indicators**

Performance indicators are used to determine the condition of the system. These indicators are not absolute because there may be other reasons to suggest a less than adequate system condition. However, if several of the factors indicate possible problems, further investigation is warranted.

- What is the per capita wastewater flow for the maximum month, week, and day?

EPA considers Infiltration/Inflow (I/I) to be excessive if the total daily flow during periods of high groundwater exceeds 120 gallons per capita per day (gpcd), and during a storm event exceeds 275 gpcd.

- What is average annual BOD of the treatment facility influent?

An average of much less than 200 mg/L may indicate excessive I/I.

- What is the ratio of maximum wet weather flow to average dry weather flow?

A review of 10 case studies by EPA found that peak wet weather flow ranged from 3.5 to 20 times the average dry weather flow. Typically, as the ratio approaches 4 to 5, the likelihood of surcharge and overflow increases.

- What is the annual number of overflows, and what are the causes (i.e., grease blockages, debris blockages, pump malfunctions, overloaded sewers, lift station power loss, etc.)?
- What is the annual number of sewer cave-ins? What were the causes (i.e., pipe corrosion, root intrusion, leaks, etc.)

✓ ***Complaints***

- How are public complaints handled?
- What are the common complaints received?
- How often are these complaints reported?
- Is there a record?
- Does the utility have a procedure in place to evaluate and respond to complaints?

✓ ***Public Relations***

- Is there a public relations program in place?
- Are the employees of the utility trained in public relations?
- What type of public notification is given for treatment plant upsets or collection system overflows?
- Is the public notified prior to major construction or maintenance work?
- How often does the utility communicate with other municipal departments?

✓ ***Emergency Maintenance and/or Contingency Plans***

- Does the utility have a written emergency maintenance plan?
- What type of equipment does the utility have available for emergency maintenance?  
How quickly can the utility access that equipment in case of an emergency?

✓ ***Spare Parts Inventory Management***

- Does the utility have a central location for the storage of spare parts?
- Have spare parts which are difficult to obtain, but critical to operation been identified?
- Does the utility maintain a stock of common spare parts on its maintenance vehicles?

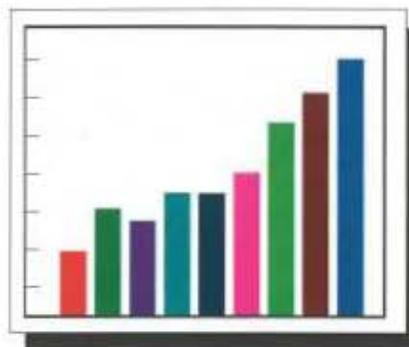
- What methods are employed to keep track of the location, usage, and reordering of spare parts? Are parts logged out when taken by maintenance personnel for use?
- Does the utility salvage specific equipment parts when equipment is placed out of service and not replaced?
- How often does the utility conduct a check of the inventory of parts to ensure their tracking system is working?
- Who has the responsibility to track the inventory?

## Operation and Maintenance

The operation and maintenance (O&M) of a wastewater collection system is a difficult undertaking. Besides keeping the system in good working order, a proper O&M program should convey all wastewater to the treatment plant. A well-operated system will employ many, if not all, of the techniques described in this section.

### ✓ *Maintenance Scheduling*

- Does the utility schedule its maintenance activities?
- How are priorities determined?
- How is the effectiveness of the maintenance schedule measured?



### ✓ *Sewer Cleaning*

Sewer utilities have been cleaning lines for a long time. Most sewer cleaning programs have been directed towards emergency situations which occur due to stoppages. A better O&M program will have regular cleaning schedules for the system.

- Is there a routine schedule established for cleaning sewer lines on a system-wide basis (e.g., "once every seven to twelve years," or "between 8% and 14% per year" ?

- Is there a process present to identify sewer line segments that have chronic problems and that should be cleaned on a more frequent schedule?

### **Cleaning Equipment**

Mechanical cleaning equipment, such as a rodding device or bucket machine, has been the mainstay of utility cleaning operations for a long time. Though this type of equipment is still in use, hydraulic cleaning equipment which uses water pressure directed through a nozzle has generally replaced the need for mechanical equipment.

- What type of cleaning equipment does the sewer utility use?
- How many cleaning units of each type does the utility have?
- How many cleaning crews and shifts does the utility employ?
- How many cleaning crews are dedicated to routine cleaning?
- How many cleaning crews are dedicated to emergency cleaning?
- What has the utility's experience been regarding pipe damage caused by mechanical cleaning equipment?
- Where is the cleaning equipment stationed?

### **Chemical Cleaning and Root Removal**

Roots are a major cause of stoppages in many systems, so root removal and control is an important utility operation.

- Does the utility have a root control program?
- Are chemical cleaners used? What types?
- How often are they applied?
- How are the chemical cleaners applied?
- What results are achieved through the use of chemical cleaners?

### ✓ *Hydrogen Sulfide Monitoring and Control*

The presence of hydrogen sulfide gas in gravity and pressure sewer lines can, and often does, lead to serious and catastrophic corrosion of concrete pipes and the metallic components of sewer systems. Hydrogen sulfide corrosion is usually a problem in areas having little topographic relief where there may be long travel times. Hydrogen sulfide corrosion can also be a problem downstream from pump stations having long wet well holding times.

- Are odors a frequent source of complaints?
- Has the sewer utility verified the existence/non-existence of a hydrogen sulfide problem, and if one is present, does it have in place corrosion control programs?
- What are the major elements of the utility's program?

A control program could be use of chemicals or aeration to prevent the formation of hydrogen sulfide. Pipe materials which resists corrosion are also effective. Often, a combination of approaches will be included in a program.



### ✓ *Lift Stations*

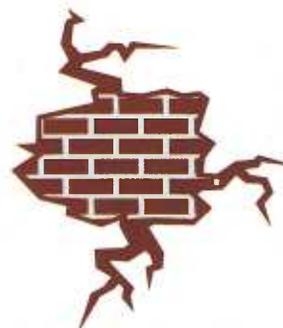
Lift stations are an important part of most wastewater systems. In coastal or other areas with little topographical relief, lift stations are a major O&M item. The effects of deteriorated collection systems are often realized at lift stations in the form of severe overflows during rain events.

#### **Operation**

- How many personnel are detailed to pump station operations and maintenance?
- Are these personnel assigned full-time or part-time to pump station duties?
- Is there sufficient redundancy of equipment?

#### **Emergencies**

- Who responds to lift station overflows? How are they notified?



- How is loss of power at a station dealt with? (e.g., on-site electrical generators, alternate power source, portable electric generators)

### **Alarms and Monitoring**

- How are lift stations monitored?

The answer to this question will depend on the station size, and the size and complexity of the system. In many systems, audible alarms or flashing lights are used to indicate a problem at the station. Reliance is placed on either the local populace or law enforcement to notice and report an alarm. In more modernized systems, alarm conditions are remotely monitored at a central location. This is particularly true for the larger stations. These SCADA (Supervisory Control and Data Acquisition) systems allow for real-time control, monitoring, and record keeping from remote locations.

### **Inspection**

- How often are lift stations visited?
- What is inspected during these visits?
- Is there a checklist?



### **Preventative and Routine Maintenance**

- Is there a preventive maintenance program for lift station equipment, and if so, what is involved in this program?
- Is an adequate parts inventory maintained for all equipment?
- Is there a sufficient number of trained personnel to properly maintain all stations?

### **Record keeping**

- Are O&M logs maintained for all pump stations?
- Are manufacturer's specifications and equipment manuals available for all equipment?
- Are run-times or ampere readings recorded for all pumps? How is this information used to assess performance?

### **Force Mains and Air Release/Vacuum Valves**

Force mains and air release/vacuum valves are an integral part of the transmission system. Force mains receive the lift station effluent and convey it to the gravity system or the treatment plant. Air release/vacuum valves are installed at the high points of the force main.

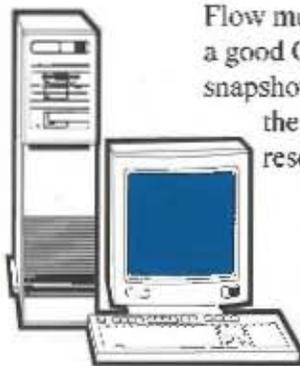
The route of force mains should be inspected regularly in order to determine if any leaks are present. This is particularly true where the route is through remote areas. Air release/vacuum valves should be identified and receive regular documented maintenance. Malfunctions of these valves can lead to overflows and/or a reduced hydraulic capacity of the force main.

- Does the utility schedule and conduct inspections of force main routes?
- Does the utility have a scheduled maintenance/inspection program for air release/vacuum valves?

### **✓ Sewer System Evaluation**

As discussed in the Management section, many of the techniques in use for SSES work should be a part of a utility's operation and maintenance program. Larger utilities can justify the purchase of much of the equipment used in this effort.

#### **Flow Monitoring**



Flow monitoring data collection and evaluation should be an important part of a good O&M program. A well-designed flow monitoring program will give a snapshot of the current condition of the system. By isolating the portions of the system that are making the greatest contribution to the problem, resources can be directed where they will be of greatest benefit.

Techniques used to monitor flow include continuous metering, nighttime field measurements, quantification of pump run-times, and flow measurements taken at the treatment plant. Continuous flow measurement at key locations throughout the collection system will give the most accurate indication of system integrity. The other techniques have been used to some advantage with smaller systems.

Use of meters which measure depth of flow and velocity will allow accurate results, even under surcharged conditions. Meters are available which allow continuous data recording

which can either be downloaded locally or transmitted to a remote location. Coupled with appropriate software, this is a powerful tool for sewer system evaluation.

- Does the utility have a flow monitoring program? If so, what methods are used?

### **Manhole Inspection**

Inspecting manholes is an important part of any maintenance program. Often utilities are unaware of the location of many of their manholes. This is unfortunate since manholes are an important source of I/I and are good indicators of problems in the system. Missing manhole lids and offset manhole cones are often the result of sewer overflows. Debris on manhole steps or high waterlines indicate the presence of surcharged conditions.

Some utilities use manhole inserts to reduce inflow to the system. A manhole insert is a small, tub-shaped plastic device installed at the top of the manhole and held in position by the manhole lid. Its purpose is to catch water that enters the manhole via holes in the lid or via the access pick holes.

- Does the utility have a routine manhole inspection program?
- Is there a data management system for documenting and tracking manhole inspection activities?
- What triggers whether a manhole needs rehabilitation?

### **Sewer Cleaning Related to I/I Reduction**

- Are sewers cleaned prior to flow monitoring?
- Are sewers cleaned prior to televised inspection?

### **Televised Inspection**

Inspecting sewers using closed-circuit television (CCTV) cameras is a powerful tool for I/I reduction. Leaking joints or punctures can be easily detected and often repaired at the time of inspection. CCTV is also a good method to inspect the integrity of new construction before the warranty expires.

- Does the utility use televised inspection? If so, in what context?

### **Smoke Testing and Dyed Water Flooding**

These techniques are useful to locate defects in the system and illegal connections.

- Does the utility use smoke testing to identify sources of inflow into the system?
- Does the utility use dyed water flooding to identify suspected sources (indirect connections) of inflow into the system when smoke testing yields inconclusive results?
- Is there a data management system for tracking these activities?
- Is there a document that describes the procedures that the utility follows? Are there any standard forms?

### ✓ *Rehabilitation*

Several techniques are available for sewer rehabilitation. A determination of the best techniques to apply to a particular situation should be made following the SSES and an economic analysis comparing the different options.



#### **Main Line Repairs**

##### Point and Replacement Repairs

Point repairs consist of repairing cracked, corroded, or broken gravity sewers and force mains. This work typically includes excavation to the location of the break, removal of the broken pipe section(s) and replacement with new pipe.

##### Joint Testing and Grouting

Joint testing and grouting are done on sewer line sections with leaking joints but no structural defects. This work can be done in conjunction with the routine televising of lines. Grouting has a limited life and must be repeated every 5-10 years.

##### Sewer Lining

Sewer lining is a technique which returns pipe to new condition. Many of the current systems can be used where pipe is structurally deficient. Due to the limited excavation required for these techniques, they are good choices where surface construction would cause much disruption.

- What type of main line repairs has the utility used in the past?
- Does the utility currently use any of above techniques for main line repairs?

### **Manhole Repairs**

Manhole repairs consist of repairing structural defects or leakage in individual manholes and castings. The structural repair work may include:

- Complete manhole replacement
  - Replacing castings (lid and frame)
  - Replacing defective adjusting rings or top segments
  - Spray relining the existing manhole
  - Grouting fissures to eliminate leakage
- What rehabilitation techniques are used for manhole repairs?
  - What type of documentation is kept?

### **✓ Service Laterals**

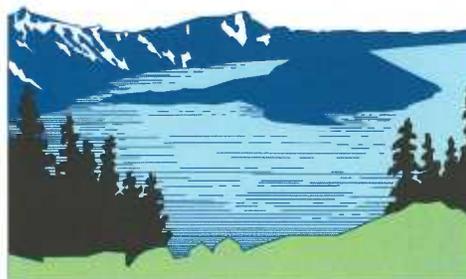
Service laterals can often be the largest source of I/I to a system. Taps, joints, and locations of structural damage are common points where I/I may be introduced into the collection system. Most utilities have legally established what part(s) of the service lateral they maintain. Jurisdiction may cover the tap only, cover all construction to the property line, or cover construction all the way to the building. The utility itself may not have direct control over installation of new service laterals. Typically the municipality's building inspectors have this responsibility. What is important is that there is communication and a consistency of standards between the utility and building departments.

- To what degree does the utility have responsibility for service laterals?
- Does the utility have a written procedure for the approval and inspection of new construction service laterals?
- Does the utility require service laterals to meet certain standards of construction? How are these standards made available to builders?
- Does the utility have a procedure to actively find and remove illegal tap-ins?
- What is the utility's jurisdiction related to repair/replacement of service laterals?
- Does the utility include I/I originating from service laterals as part of their system evaluations?

## ✓ *Alternative Collection Systems*

Alternative collection systems differ significantly from the conventional gravity sewer commonly employed to convey wastewater. Alternative systems include: grinder pump pressure systems, septic tank effluent pump (STEP) systems, small diameter gravity systems, and vacuum collection systems. Each system has its own unique operation and maintenance requirements and could be found as a subset of a system which is predominately gravity sewer or by itself as a stand-alone utility.

Although each alternative system operates differently and has different maintenance requirements, all require a similar management system. In each system appurtenances are located at each residence, so the utility needs to have ready access, maintain adequate spare parts, and install alarm systems to notify the utility of any problems between inspections.



### **Grinder Pump Systems**

Grinder systems employ a holding tank (typically up to 100 gallons and located near an individual residence) which houses a small pump with a grinder attached. Wastewater is discharged intermittently using float controls. The collection system is comprised mostly of 1½" and 2" PVC plastic lines. Manholes are generally not installed, but cleanouts should be installed at the ends of all lines and at critical points. Air release valves are installed at the downstream side of high points. Pressures are low.

A system serving 500 homes would include 500 individual pump stations so a utility needs to have an appropriate staffing level for maintenance. A minimum of two personnel should be available. Generally speaking, a staff including two full-time employees per 1,000 stations has been found sufficient for well-designed systems.

Major sources of emergency maintenance include electrical problems and grease buildup in the holding tanks, resulting in failure of the floats to activate the pumps. Corrosion within the holding tank can also be a problem. Grinding solids reduces the likelihood of solids deposition, but hydrogen sulfide may be a problem where the pressure line discharges to the treatment plant or into a gravity collection system.

Pump preventive maintenance is critical and adequate spare pumps should be in inventory. Pumps and grinders may require frequent replacement and overhaul. Pump life is limited and a plan to replace all pumps should be in place. Infiltration is generally not a problem, but exfiltration may occur through deteriorated joints.

### Septic Tank Effluent Pump Systems

STEP systems are similar to the grinder pump system except a septic tank replaces the holding tank and grinders are not present on the pumps. A greater range in pump types (centrifugal, progressive cavity, etc.) are common with these systems. Although the septic tank provides preliminary treatment and solids settlement, it is part of the collection system.



Significant infiltration may occur with poorly sealed and constructed septic tanks. Lines are generally sized assuming low infiltration rates. High infiltration rates will increase pump operation and may reduce pump life.

The wastewater is highly septic and can cause odor and corrosion problems where the pressure line discharges into a conventional manhole or treatment works. Proper operation and maintenance of the septic tank is essential for proper function of the collection system, so tanks should be pumped out on a set schedule.

### Small Diameter Gravity Sewers

Like STEP systems, small diameter gravity systems use septic tanks for preliminary treatment and solids removal. However, no pumps are used. The septic tank overflows into a small diameter (4" and up) pipe placed at a moderate grade. The lower solids concentration in the wastewater results in less deposition of solids in the pipe.

Cleanouts are generally used in place of manholes, and pipes are sized assuming low infiltration rates. Similar to the STEP system, the integrity and maintenance of the septic tank is a critical factor for proper operation.

### Vacuum Sewer Systems

Vacuum systems have a central vacuum station which includes vacuum pumps, holding tanks, and pressure pumps. The vacuum pumps provide a continuous suction in the collection line. A holding tank and vacuum valve are installed near each residence.

When the wastewater reaches a set level in the holding tank, the valve is opened to release a slug of liquid into the collection line. A loss of vacuum in the system will generally trigger a fault condition. Major breaks may cause the system to shut down, and leaks are difficult to locate. Once the wastewater arrives at a central vacuum station, it enters a holding tank and is pumped to the treatment facility through a force main.

- Does the utility have control of the near-residence portions of the collection system?
- Who owns the near-residence systems?
- Does the utility do periodic inspections of the near-residence facilities?
- What is the frequency of these inspections?
- Are pressure check valves installed on pumps?
- Are clean-outs installed at the end of each branch line?
- Is a pipe locating system installed?
- Are air release valves installed on the downstream side of high points?
- Does the system have a warning alarm system at each residence?
- How does the utility respond to the alarm system?
- Are odor control systems are installed?





### Useful References for Management, Operations, and Maintenance Programs

The following references may be obtained from their cited sources. Documents referenced to California State University, Sacramento may be obtained by contacting:

California State University, Sacramento  
Office of Water Programs  
6000 J Street  
Sacramento, California 95819-6025  
(Tel) 1-916-278-6142 (Fax) 1-916-278-5959  
(E-mail) [wateroffice@csus.edu](mailto:wateroffice@csus.edu)

Documents referenced to the Water Environment Federation may be obtained by contacting:

Water Environment Federation  
601 Wythe Street  
Alexandria, VA 22314-1994 USA  
(Member Services Center) 1-800-666-0206  
(Fax) 1-703-684-2492 (E-mail) [pubs@wef.org](mailto:pubs@wef.org)  
(Internet) <http://www.wef.org/TechResCatalog/marketplace/>

Documents referenced to the Environmental Protection Agency may be obtained by contacting either the NCEP (if in stock) or the NTIS:

U.S. Environmental Protection Agency  
National Service Center for Environmental Publications  
P.O. Box 42419  
Cincinnati, OH 45242  
(Tel) 1-800-490-9198 (Fax) 1-513-489-8695  
(Internet) <http://www.epa.gov/ncepihom/orderpub.html>

National Technical Information Service  
5285 Port Royal Road  
Springfield, VA 22161  
(Tel) 1-800-553-NTIS (Fax Orders) 1-703-605-6900  
(E-mail) [orders@ntis.fedworld.gov](mailto:orders@ntis.fedworld.gov)  
(Internet) <http://www.ntis.gov/ordering.htm>

The EPA Region 4 Guide may be obtained by contacting Region 4 directly:

U.S. Environmental Protection Agency, Region 4  
Water Management Division  
Water Programs Enforcement Branch  
61 Forsyth Street, SW  
Atlanta, GA 30303-8909

### Useful References for Management, Operations, and Maintenance Programs

- Sewer System Infrastructure Analysis and Rehabilitation, October 1991, United States Environmental Protection Agency, EPA/625/6-91/030
  - Collection Systems: Methods for Evaluating and Improving Performance, 1998, California State University, Sacramento Foundation, Rick Arbour and Ken Kerri, USEPA Grant No. CX924908-01-0
  - Wastewater Collection Systems Management, Manual of Practice 7, 1998, Water Environment Federation, 601 Wythe Street, Alexandria, Virginia, 22314
  - Operation and Maintenance of Wastewater Collection Systems. A Field Study Program, Fifth Edition, Volume 1, 1996, California State University, Sacramento
  - Operation and Maintenance of Wastewater Collection Systems. A Field Study Program, Fifth Edition, Volume 2, 1996, California State University, Sacramento
  - NPDES Compliance Inspection Manual, Chapters 4 and 9, September 1994, EPA 300-B-94-014
  - Handbook for Retrofitting POTWs, July 1989, EPA 625-689-020
  - Pretreatment Compliance Monitoring and Enforcement Guidance, September 1986, United States Environmental Protection Agency
  - Guidance for Conducting a Pretreatment Compliance Inspection, September 1991, EPA 300R-92-009
  - EPA Region 4 Guide for Conducting Evaluations of Municipal Wastewater Collection System Management, Operation, and Maintenance Programs, October 30, 1996
- = Available for viewing on-line at the National Environmental Publications Internet Site (NEPIS). Go to [www.epa.gov/nccep/ihom/nepishom](http://www.epa.gov/nccep/ihom/nepishom) and search using the document code (e.g., 625689020).

# APPENDIX E

## Appendix E

# Sewer Overflow Response Plan



Sewer Overflow Response Plan

Prepared By:  
City of Jackson  
Water/Sewer Utilities Division  
200 S. President Street, Rm 405  
P.O. Box 17  
Jackson, MS 39205-0017  
Voice: (601) 960-2090  
Fax: (601) 968-3502  
Submitted On: September 28, 2011  
Approved On: October 10, 2011  
Amended On: \_\_\_\_\_, 20\_\_

**Sewer System Owner:**

City of Jackson  
200 S. President Street, Room 405  
PO Box 17  
Jackson, MS 39205-0017

**Contact Persons:**

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(601) 960-1084

Chris Mims, Director of Communications  
Office of the Mayor  
(601) 960-1084  
Public Service Announcements

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(601) 960-2091  
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David Willis, Deputy Director of Public Works  
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Terry "Butch" Mayfield, Superintendent  
Sewer Maintenance Division  
(601) 960-1868

**Regulatory Agencies to Receive Sewer Overflow Report:**

MS Department of Environmental Quality  
Office of Pollution Control  
P. O. Box 2261  
Jackson, MS 39225  
Contact Person:  
Rusty Lyons, P.E., Manager,  
Compliance and Enforcement  
Phone: (601) 961-5588  
Fax: (601) 961-5674  
Email: [rusty\\_lyons@deq.state.ms.us](mailto:rusty_lyons@deq.state.ms.us)

Hinds County Health Department  
Environmental Health  
539 E Beasley Road  
PO Box 20  
Jackson, MS 39205-0020  
Sherrie Payne, Regional Environmentalist  
Marvin Bolden, County Environmentalist  
Lakeshia Paige, County Environmentalist  
Phone: (601)-957-1026  
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[sherrie.payne@msdh.state.ms.us](mailto:sherrie.payne@msdh.state.ms.us)  
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[lakeshia.paige@msdh.state.ms.us](mailto:lakeshia.paige@msdh.state.ms.us)

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## I. AUTHORITY

This Sewer Overflow Response Plan (SORP) is prepared to facilitate proper incident reporting procedures outlined in MDEQ Agreed Order No **5823 10** and Section 750-2.7 Incident Reporting of the NPDES permits.

## II. GENERAL

The Sewer Overflow Response Plan (SORP) is designed to facilitate the proper response to sewer overflows to by the appropriate City of Jackson (COJ) personnel and the proper reporting of such overflows to State and Local Authorities. For the purpose of this plan the City of Jackson or City of Jackson personnel includes all contractors who provide labor, materials, services or any other resource to comply with all applicable regulations and goals. Quick response will minimize the effects of the overflow with respect to impacts on public health, the environment, beneficial uses and water quality of surface waters and on customer service. The SORP further includes provisions for safety pursuant to the directions provided by the Mississippi Department of Environmental Quality (MDEQ) and that notification and reporting is made to the MDEQ and the Hinds County Department of Health (HCDH) when applicable.

### A. Purpose

The purpose of the SORP is to:

1. Develop a proactive procedure to identify potential and actual sewer overflows;
2. Develop an immediate response plan to minimize health and environmental impacts from overflows;
3. Establish procedures to quickly eliminate the overflow;
4. Develop protocols to report SSOs to MDEQ and other agencies as appropriate; and
5. Develop public notification procedures to be used as appropriate.

"Sanitary Sewer Overflow" or "SSO" shall mean any discharge of wastewater to waters of the United States or the State from the City's Sewer System through a point source not specified in any NPDES permit, as well as any overflow, spill, or release of wastewater to public or private property from the Sewer System that may not have reached waters of the United States or the State, including all Building Backups.

The "POTENTIAL" SSO location is defined as the manhole or point at which an SSO is likely to occur in the event of a pump station failure. These were located by observing the lowest manhole (usually the closest to the pump station if not the pump station itself) by United Water and the City. These were visual observations only and not surveyed at this time.

This SORP is developed to address the fundamental types of SSOs:

• **Wet Weather Overflows**

Wet weather overflows result from excessive flows during significant rain events and/or elevated ground and surface water conditions. They can be attributed to a number of factors, including, but not limited to, the following:

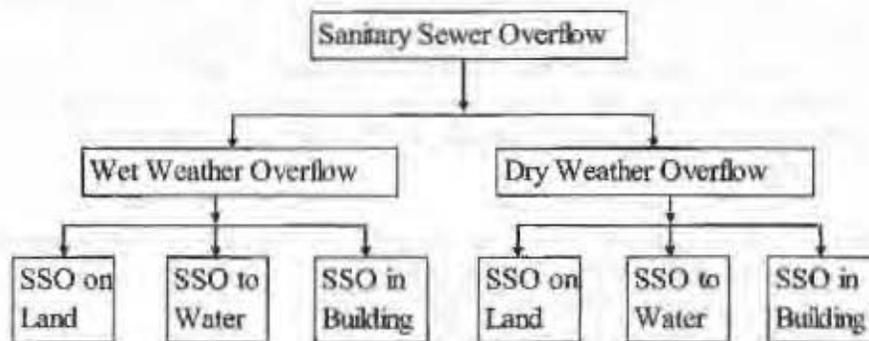
- Downspouts
- Footing drains
- Sump pumps
- Leaking service laterals
- System Infiltration
- Flooding from the stormwater system

• **Dry Weather Overflows**

Overflows during dry weather are most often caused by flow restrictions or system disruptions. Dry weather SSOs can be attributed to a number of factors including, but not limited to, the following:

- Bottlenecks and/or blockages
- Grease
- Roots
- Debris
- Mechanical failures
- Sewer main breaks

Additionally, each of these types of SSO can lead to a discharge to either land, water of the U.S. or State, or within a building. The protocols outlined in the following sections describe the appropriate response to a SSO based on its location as shown on the following chart.



The SORP Long Term Corrective Actions Procedures (Section VII) discusses the type, location, destination, cause, impact, and containment and remediation requirements of SSO, as well as prevention measures.

The effective date of this plan is October 10, 2011. All schedules/proposed deadlines within this plan begin on the effective date. A detailed implementation plan can be found in Appendix A.

## **B. Organization of Plan**

The key elements of the SORP are addressed individually as follows:

Section III	Overflow Identification and Response Procedure
Section IV	Building Backups Procedure
Section V	Public Advisory Procedure
Section VI	Regulatory Agency Notification Procedure
Section VII	Long Term Corrective Action Procedures
Section VIII	Personnel Training
Section IX	Maintenance of SORP
Section X	Appendices

## **III. OVERFLOW IDENTIFICATION AND RESPONSE PROCEDURE**

The Overflow Identification & Response Procedure presents a strategy for the COJ to identify and then mobilize labor, materials, tools and equipment to correct or repair conditions, which may cause or contribute to a sewer overflow. The plan considers a wide range of potential system failures that could create an overflow to surface waters, land or buildings.

### **A. Receipt of Information Regarding an SSO**

An overflow may be detected by COJ personnel or by others. COJ is diligent in attempting to identify SSOs before they become a public issue. After each significant rainfall event, COJ personnel shall remotely monitor or inspect potential and known SSO locations for problems. Significant rain events include those rain events that are known to be, or suspected of being, associated with, or contributing to SSO occurrences, regardless of the intensity, duration or measured rain gauge size of the event. In addition, other public offices such as police and fire departments are to report any SSOs encountered. COJ personnel are responsible to act based on received notification of sewage overflow from the wastewater collection system, and to provide immediate response to investigate and/or correct reported sewer overflow. Generally, telephone calls from the public reporting sewer overflows are received at the public offices identified in Appendix B. If received by another public office, that office will alert Public Works.

The call taker (person who received notice of an SSO) obtains all relevant information available regarding the overflow including:

- a. Time and date call was received;
- b. Caller's name and phone number;
- c. Specific location of problem;
- d. Description of problem;
- e. Time overflow was noticed by the caller;
- f. Observations of the caller such as odor and duration; and
- g. All relevant information that helps COJ personnel to quickly locate, assess and stop the overflow.

The call taker records initial information including their name in a Sewer System Work Order (Appendix C) and notifies Sewer Maintenance Division personnel. In addition to the Work Order form, which is used for sewer maintenance activities, reports of an overflow require additional information. Overflows are entered into a Wastewater SSO Assessment Form (Appendix C). In addition all information regarding a SSO is entered into the SSO database system.

#### **B. Dispatch of Personnel to Site of Reported Sewer Overflow**

The COJ will dispatch maintenance personnel to confirm reported overflows as soon as reasonably possible of receiving notification of the overflow(s). During the normal business hours, the goal of the City is for this confirmation to take place in less than one hour of the notification. During non-business hours, this confirmation should normally take place within two hours of the notification. In addition, the COJ proposes to divide the City, using existing police precincts, into sewer response zones. Each zone will have personnel and equipment assigned and located within that zone for SSO response. These zone response teams should be in place within 24 months. In the interim, COJ will continue to respond from existing maintenance facilities within the proposed time frame. These zones are shown on an Exhibit in Appendix D. The City is using the police precinct zones since these zones were previously defined and provided for a reasonable response area for each team. Until verified, the report of a possible spill will not be referred to as a "sewer overflow" only as a "maintenance activity". COJ personnel will complete the Wastewater SSO Assessment Form (Appendix C) within 24 hours of the reported activity and upon confirmation, provide the information orally to the MDEQ. The COJ Supervisor, Superintendent, Wastewater Collections engineer, or authorized designee is responsible for reviewing, updating and signing the final Sewage Overflow Report. Sewage overflow response internal notification and tracking protocol is summarized in Appendix D.

If the overflow will affect swimming areas during the swimming season, public drinking water intakes, or if it results in a fish kill, the COJ shall notify the MDEQ contact person and the HCHD contact person orally, immediately upon confirmation of the SSO. After business hours, any significant overflows should be reported to the MEMA 24 hour response number. An Exhibit showing the swimming areas can be found in Appendix D.

Failure of any element within the sanitary sewer collection system that threatens to cause or causes a SSO shall trigger an immediate response to isolate and correct the problem. Personnel and equipment shall be available to respond to any SSO locations. Additional maintenance personnel shall be "on call" in the event extra manpower is needed.

##### **1. Dispatching Maintenance Personnel**

- When COJ personnel receive notification of a potential sewer overflow, the COJ will dispatch maintenance personnel with appropriate resources as required.
- Maintenance personnel may be dispatched by telephone or radio or other means. The appropriate personnel, materials, supplies and equipment will be provided as needed.

2. Maintenance Personnel Instructions

- The call taker must verify that the entire message has been received and acknowledged by the maintenance personnel who were dispatched. All personnel being dispatched to the site of an SSO will proceed immediately to the site of the overflow. Any delays or conflicts in assignments will be reported immediately for resolution.
- In all cases responding maintenance personnel shall report their findings, including possible damage to private and/or public property, to their supervisor immediately upon completing their investigation. If the supervisor has not received findings from the field crew within one (1) hour of dispatch the supervisor will contact the responding maintenance personnel to determine the status of the investigation. The call time, dispatch time, and arrival time will be shown on the Wastewater Overflow Form.

3. Additional Resources

Should the superintendent or the wastewater collections engineer receive requests for additional personnel, material, supplies, and equipment from maintenance personnel working at the site of a sewer overflow, the request will be immediately forwarded to the appropriate supervisory personnel.

4. Preliminary Assessment of Damage to Private and Public Property

COJ personnel will take photographs of the sewer overflow impacted area in order to thoroughly document the nature and extent of impacts. Photographs will be retained for filing with the Overflow Report. COJ personnel shall only enter private property with permission from the property owner or tenant-in-possession.

5. Field Supervision and Inspection

- The COJ Superintendent, Wastewater Collections engineer, or authorized designee shall be responsible for verbally notifying MDEQ and HCDH within the specified 24 hour time period and submitting the Overflow Report to MDEQ. The contact information and required reporting timeframe can be found in Appendix E.
- The COJ Superintendent or Wastewater Collections engineer shall visit the site of the sewer overflow during and/or after work to ensure that provisions of this Overflow Response Plan and other directives are met.

#### 6. Coordination with Hazardous Materials Response

- Upon arrival at the scene of a sewer overflow, should a suspicious substance (e.g., oil sheen, foamy residue) be found on the ground surface, or should a suspicious odor (e.g., gasoline) not common to the sewer system be detected, the COJ sewer maintenance crew shall immediately contact the responsible supervisor for guidance before taking further action.
- Should the supervisor determine the need to alert the hazardous material response team, the maintenance personnel shall await the hazardous waste team response.
- Contact the MDEQ 24-hour Emergency Response after hours at 1-800-222-6362.
- Upon arrival of the Hazardous Material Response Team, the COJ sewer maintenance personnel will take direction from the person with the lead authority of that team. Only after that authority determines it is safe and appropriate, will the COJ sewer maintenance personnel proceed under the SORP with the containment, clean-up activities and correction.

#### C. Overflow Correction, Containment, and Clean-Up

This section describes specific actions to be performed by COJ sewer maintenance personnel once a SSO has been identified and confirmed according to the procedures outlined in previous sections.

The objectives of these actions are:

- To protect public health, environment and property from sewage overflows and restore surrounding areas back to normal as soon as possible;
- To establish perimeters and control zones with appropriate traffic cones and barricades, vehicles or use of natural topography (e.g. hills, berms);
- To promptly notify the regulatory agency with preliminary overflow information and potential impacts; and
- To contain the sewer overflow to the maximum extent possible including preventing the discharge of sewage into waters of the US and/or State.

##### 1. Responsibilities of Maintenance Personnel Upon Arrival

It is the responsibility of the first personnel who arrive at the site of a sewer overflow to protect the health and safety of the public by mitigating the impact of the overflow to the maximum extent possible. If the overflow is not the responsibility of The City of Jackson, but there is imminent danger to public health, public or private property, or to the quality of waters of the state, then the COJ Supervisor, Superintendent, Wastewater Collections engineer, or authorized designee shall take prudent emergency action.

Upon arrival at a SSO, the COJ sewer maintenance personnel perform the following:

- Determines the cause of the overflow, e.g. sewer line blockage, pump station mechanical or electrical failure, sewer line break, etc.;
- Takes immediate steps to stop the overflow, e.g. relieves pipeline blockage, manually operates pump station controls, utilize portable by-pass pump system, repairs pipe, etc. Extraordinary steps may be considered where overflows from private property threaten public health and safety (e.g., an overflow running off of private property into the public right-of-way). Record what the blockage material is. For example: grease, rags, etc.;
- Requests additional personnel, materials, supplies, or equipment that will expedite and minimize the impact of the overflow; and
- If needed, identifies and requests assistance or additional resources to correct the overflow or to assist in determination of its cause.

## 2. Initial Measures for Containment

When possible, initiate measures to contain the overflowing sewage and recover sewage that has already been discharged. Take all steps necessary to minimize the impact to public health and the environment

- Determine the immediate destination of the overflow, e.g. storm drain, street curb gutter, body of water, stream bed, inside building, etc.;
- Identify and request the necessary materials and equipment to contain or isolate the overflow, if not readily available;
- Establish control zones to help prevent public access using appropriate signs and barricades; and
- Take immediate steps to contain the overflow, e.g., block or bag storm drains, recover through vacuum truck, divert into downstream manhole, etc.

## 3. Additional Measures Under Potentially Prolonged Overflow Conditions

In the event of a prolonged sewer line blockage or a sewer line collapse, set up a portable by-pass pumping operation around the obstruction.

- Take appropriate measures to determine the proper size and number of pumps required to effectively handle the sewage flow.
- Implement continuous or periodic monitoring of the by-pass pumping operation as required.
- Address regulatory agency issues in conjunction with emergency repairs.

### Pump Station Emergency Procedures

Numerous pump stations throughout COJ's system have a pump station bypass into the force main. If the SSO is caused by pump failure at one of these stations, maintenance personnel should call for a portable by-pass pump system to be brought to the pump station so the station can utilize the bypass into the force main and continue to function while the station is being repaired. If the SSO occurs at a pump station without a pump station bypass into the force main a detailed plan for avoiding an additional SSO during the repair period will be included in the detailed resource plan for the SSO which is submitted to MDEQ. For example, COJ could utilize a temporary HDPE force main to transfer flow to the gravity system.

In addition, the COJ will conduct an evaluation and analysis to determine the storage volume and pump around procedures for each pump station. The COJ is currently reviewing existing documents to determine the extent of field work required to adequately estimate the storage volume for each pump station. The pump station emergency operations plan and volume inventory shall be completed within 180 days of MDEQ's approval of this SORP. This inventory will also include which stations have an emergency bypass into the force main. For those stations without a bypass a schedule will be submitted for the construction of the needed bypass within 12 months of the completed inventory. Appendix C contains a table of the potential overflow location for each pump station. These sites are shown on the included map as well.

#### 4. Cleanup

Sewer overflow sites shall be cleaned thoroughly after an overflow, so that no sewage related residue (e.g., sewage solids, papers, rags, plastics, and rubber products) remains.

- Whenever possible digital photos should be taken of the area before and after cleanup.
- Where practical, thoroughly flush the area clear of any sewage or wash-down water. Solids and debris are to be flushed, swept, raked, picked-up, and transported for proper disposal. Next the area shall be thoroughly flushed clear of any sewage or wash-down water.
- Secure the overflow area to prevent contact by members of the public until the site has been thoroughly cleaned.
- Where appropriate, disinfect and deodorize the overflow site.
- Where sewage has resulted in ponding, pump the pond dry and dispose of the residue in accordance with applicable regulations and policies.
- If a ponded area contains sewage, which cannot be pumped dry, it may be treated with lime and aerated. If sewage has discharged into a body of water that may contain fish or other aquatic life, do not use bleach. Contact the MDEQ for specific instructions. See Appendix E for contact information.
- When backup is in a building, follow the procedures outlined in Section IV.

#### 5. Minimize Transmitted Flows

Minimize the volume of untreated wastewater transmitted (via gravity or force main) into the portion of the sewer system impacted by the events precipitating the SSO.

- When an area is experiencing an SSO, determine the upstream (or tributary) areas that are contributing to the overflow and utilize the collection system for temporary storage. This may include temporary plugs in the gravity main or by manually controlling lift station pumps so as to pump on a delayed basis.
- When possible, utilize temporary pumps and force main to pump around the affected area.
- In extreme situations, it may be necessary to shut down commercial or industrial facilities that contribute high volumes of wastewater or to request the general public to limit water use. This action should only be performed by the Director of Public Works.

#### D. Sewage Overflow Report

The Wastewater SSO Assessment Form in Appendix C contains information which is required to be reported to MDEQ and possibly to HCDH depending upon the nature of the spill. The SSO Assessment Form will be provided to MDEQ within 5 days of the SSO. The COJ maintenance crew leader completes a Wastewater SSO Assessment Form then promptly notifies the COJ Water/Sewer Utilities Division and MDEQ when the overflow is eliminated. Along with the Assessment Form, when the corrective action is not a permanent one, the Superintendent, Wastewater Collections engineer, or authorized designee will prepare a detailed resource plan and milestone schedule for long term corrective action for the cause of the SSO. This plan and schedule will be submitted with the SSO Assessment form. Monitoring of compliance with the plan and schedule milestones will be conducted quarterly after the original occurrence.

If the overflow will affect swimming areas during the swimming season, public drinking water intakes, or results in a fish kill the COJ shall notify the MDEQ contact person and the HCDH contact person immediately upon confirming the discharge. See Appendix E for contact information.

In addition to the Assessment Form all information regarding a SSO will be entered into a Work Order and SSO database system which will be purchased and maintained by the City. This database system will allow the City to maintain long term records including, but not limited to, location, cause, date, volume, and corrective actions taken for SSOs throughout the City. The Work Order and SSO database will retain a minimum of five years of data. The City is purchasing and implementing a new data management system. This system shall be in place within 9-12 months of MDEQ's approval of this SORP. In the interim, the City will have all data entered into a MS Office database system by a contractor. At this time, the proposed contractor for data entry is WEI-AJA, LLC. Both the City and contractor will have access to the data. This data will be transferred to the new system once it is implemented. Information regarding the sewer overflow includes the following:

- Determination if the sewage overflow had reached waters of the State and/or waters of the US, i.e., all overflows where sewage was observed running to such waters, or there was obvious indication (e.g. sewage residue) that sewage flowed to these waters;
- Determination that the sewage overflow had not reached surface waters by describing conditions at the sewage overflow, which support this determination.
- Determination of the start date and time of the sewer overflow by one of the following methods:
  1. Date and time information received and/or reported to have begun and later substantiated by COJ sewer maintenance personnel; or
  2. Visual observation;
- Determination of the stop date and time of the sewer overflow by one of the following methods:
  1. When the blockage is cleared and/or flow is controlled or contained; or
  2. The arrival time of the COJ sewer maintenance personnel, if the overflow stopped between the time it was reported and the time of arrival.
- Determination of the volume of the sewer overflow using the "San Diego Method". This method uses image of overflowing manholes to provide a visual comparison. COJ shall complete its own image inventory for various flows within 180 days of MDEQ's approval of this SORP. Until the COJ image inventory is complete, the EPA provided images will be used.
- Photograph the event, when possible.
- Assessment of any damage to the exterior areas of public/private property. COJ sewer maintenance personnel shall not enter private property for purposes of estimating damage to structures, floor and wall coverings, and other personal property without authorization from their supervisor. Procedures for SSOs within an existing building are outlined in Section IV.

#### **E. Customer Satisfaction**

COJ personnel will follow up in person or by telephone with the entity who was reporting the overflow within five working days after work is complete. The cause of the overflow and its resolution will be disclosed.

#### **IV. BUILDING BACKUPS PROCEDURE**

##### **A. Communication Plan**

SSOs that backup into a building may be reported by any member of the public or customer served by the COJ's Wastewater Collection and Treatment System including homeowners, tenants in rental properties or personnel who work in commercial, industrial or institutional properties. Points of contact and phone numbers to call in the event of a building backup during normal working hours, Monday through Friday from 8:00 AM to 5:00 PM, are listed in the telephone directory. Customers can call the Utilities Division at 601-960-1189 or the Sewer Maintenance Division at 601-960-1875 to report building backups. After hours and on weekends, citizens should call the emergency number at 601-960-1875. In order to make customers aware of these numbers, the following will be added to all water/sewer bills: "To Report a Sewer Problem – Call 601-960-1189 or 601-960-1875 after business hours"

##### **B. Response Process**

Upon notification of a building backup, representatives of the COJ's Sewer Department will follow the timeframes and processes outlined in Section III of this plan entitled "Overflow Response Procedure". The personnel flow chart for this response can be found in Appendix D. Accordingly, COJ personnel will conduct a site investigation within the timelines outlined previously for business and non-business hours to determine if the cause is a problem in the COJ system or if it has occurred as a result of a failure on the customer's (private) side of the system.

If the building backup is found to be caused by a collection system failure on the public main, the COJ will immediately begin the response process to correct the problem and, in addition, will provide the property owner, property owner's representative or tenant with the names and contact information for authorized independent cleaning contractors who they may contact to clean and sanitize all indoor areas affected by the building backup. The independent cleaning contractor will use measures consistent with the standards in that industry to remove all waste and disinfect the affected areas. The work of the independent cleaning contractor is limited to cleaning the waste from the affected areas indoors and disinfecting those areas. The independent cleaning contractor will not be authorized to perform any services to repair or restore private property or the structure affected by the building backup. By providing the names of authorized independent cleaning contractors, the City does not assume responsibility for damages to the private property or structure affected by the building backup and will only pay the authorized independent cleaning contractor for costs associated with cleaning the waste from the affected building and for disinfecting the affected areas within the building. Neither this provision nor any other provision of the Sewer Overflow Response Plan shall be construed to create any private claim or cause of action against the City or other governmental entity, or to require the City or other governmental entity to compensate any private party for any loss or damage alleged to arise from or relate to a sanitary sewer overflow or building backup.

As part of the advanced planning and preparation, the Public Works Department will ensure that a list of authorized private contractors are maintained and that any such authorized

contractors are fully equipped to respond to building back-up events and perform various clean-up measures caused by sewage contamination. Those meetings will be conducted within 90 days of the adoption of the SORP. A list of authorized contractors will be created within 90 days after the completion of the interview process. Only contractors equipped to fully and quickly respond to a building backup will be included on the list of responding contractors. The City will expect all authorized contractors to respond as quickly as possible, but in no case longer than 6 hours, unless circumstances warrant and are documented. A list of authorized contractors can be found in Appendix B.

If a building backup is found to be caused by a private service lateral failure, the customer will be advised that the public collection system is functional and that they should seek the services of a plumber/professional cleaning service to remedy the problem at their expense.

### **C. System Repair Process**

The materials and construction procedures to be used to correct or repair conditions in the COJ Sewer System will be in accordance with all applicable federal, state and local laws and regulations. No safety regulations, materials requirements or quality of construction craftsmanship will be compromised in the interest of getting the problem repaired quickly. The repair process will follow the procedures outlined in Section III.

### **D. Response Follow-Up**

Measures taken to correct or repair conditions in the COJ sewer system that caused the building backup will be in accordance with those described in Section VII of this plan entitled "Long Term Corrective Actions Procedures". In addition, COJ personnel will follow up in person or by telephone with the entity who reported the overflow within five working days after cleaning work is complete. The cause of the overflow and its resolution will be discussed along with the adequacy of the clean-up. The City will annually review the effectiveness and timeliness of each contractor's performance in responding to building backups to determine whether the contractor should remain on the authorized list. Should the City receive any complaints about a contractor's performance, or should the contractor not respond within 6 hours of notification the City will immediately investigate and review the contractor's performance to determine whether the contractor should remain on the authorized list.

## **V. PUBLIC ADVISORY PROCEDURE**

This section describes the actions the City of Jackson will take, in cooperation with the MDEQ and/or HCDH, to limit public access to areas potentially impacted by sewer overflows from the wastewater collection system.

When evaluating the potential impact of an SSO on public health and the environment, sensitivity factors will be evaluated. These factors will determine the level of public notification and clean up activity required. These sensitivity factors include proximity or impact to:

- Streams, rivers, creeks, and other natural waterways
- Heavy pedestrian or inhabited areas
- Special facilities such as schools, public parks, walking trails, etc.
- Swimming Areas
- Drinking Water Intakes

#### **A. Control Zones**

The first COJ personnel on site will attempt to prevent public access by establishing a control zone around the perimeter of the affected surface area using appropriate signs and barricading practices. The temporary signs and barricades will warn passersby to avoid contact with this area. Barricading practices will include, but be not limited to, cones, warning tape, barrels, barricades, etc. The limits, duration, and most appropriate control zone plan will vary on a case-by-case situation.

##### **1. Location of Control Zones**

Although the location of temporary signs and barricades will vary for each site, the goal will always be to warn the public to avoid contact until the cleanup is complete. When possible, the control zone will be posted:

- Just beyond the limits of the impacted surface area
- Near high pedestrian and/or vehicular traffic areas
- Other appropriate locations.

##### **2. Duration of Control Zones**

Signs and barricades will be posted as soon as the overflow is confirmed and they will remain in place until clean up activities are complete. The timeframe may vary depending on the extent of the response activities, which may include significant mitigation and cleanup requirements. Example signs can be found in Appendix B.

##### **3. Public Information**

The Public Works Director or their designee will answer questions from customers about COJ response to SSOs and, when necessary, will respond to the customer reporting the SSO to explain COJ's response. The control zone signs also include the contact number {(601)-960-1875} for the public to call for additional information. Contact information for public offices to be notified can be found in Appendix B. When deemed appropriate, the Public Works Director or his designee will issue a news release to warn customers about the SSO.

##### **News Release [See Appendix B]**

COJ maintains a standard news release on SSOs that can be quickly adapted to the particular situation and issued if COJ determines there is a significant threat to

public health. Contact information for media outlets can also be found in Appendix A.

**Customer Letters [See Appendix B]**

In situations where a service line issue has been identified, COJ sends letters to residential and commercial customers in the affected area. The letters advise the customer of their service line condition and their responsibility in alleviating future SSO by removing roots, extraneous water, disposing of grease and other materials properly and including a brochure on proper disposal.

**Public Notification Decision Matrix**

<b>Event</b>	<b>Action</b>
Overflow into streams	COJ will place temporary signs along the stream at public access points unless posted otherwise. Additional notification will be considered in conjunction with MDEQ and HCHD.
Overflow in a residential or high traffic area, such as a school or public park.	COJ will place temporary signs in the area of the overflow. Additional notification will be considered in conjunction with MDEQ and HCHD.
<b>Overflow creating a significant health hazard or significant volume has reached waters of the US and/or State</b>	COJ will issue a news release and place temporary signs in the area of the overflow. Additional notification will be considered in conjunction with MDEQ and HCHD.

## **VL REGULATORY AGENCY NOTIFICATION PLAN**

The Regulatory Agency Notification Plan establishes procedures that the City of Jackson follows to provide formal notice to the MDEQ in the event of a SSO. Agency notifications will be performed in parallel with other internal notifications. Internal notification and mobilization of COJ sewer maintenance personnel are established in Section III - Overflow Response Procedure.

Using data supplied during the verification process and updates from the maintenance personnel, the Sewer Maintenance Superintendent prepares initial and final Overflow/Bypass Reports. Initial report will be provided orally to the MDEQ and if necessary the HCDH within 24 hours from the time the COJ became aware of the SSO. If the overflow will affect swimming areas during the swimming season, public drinking water intakes, or results in a fish kill the COJ shall notify the MDEQ contact person and the HCDH contact person orally, or MEMA, if after business hours, immediately upon confirming the discharge. Contact information can be found in Appendix E.

COJ shall prepare and provide the written final report (digital or hard copy) to the regulatory agency within five (5) days after the COJ becomes aware of the overflow. The wastewater collections engineer is responsible for meeting the notification requirement. The superintendent prepares written notification to the appropriate regulatory agency of any confirmed overflows. The wastewater collections engineer signs these notifications. In addition, the detailed resource plan and milestone schedule for long term corrective action regarding SSOs will be submitted with the written report. Regardless of other notifications, a Report of Noncompliance form is required to be submitted with the monthly Discharge Monitoring Report.

### **A. Immediate Notification**

If the overflow will affect swimming areas during the swimming season, public drinking water intakes, or results in a fish kill, the COJ shall notify the MDEQ contact person and the HCDH contact person orally, or MEMA if after business hours, immediately upon confirming the discharge.

COJ shall fax the initial and any updated Wastewater SSO Assessment Form to:

**MDEQ**

**Attn: Environmental Compliance and Enforcement Division  
Municipal and Private Facilities**

**Telephone: (601) 961-5171**  
**Fax: (601) 961-5674**

## B. Secondary Notification

Wastewater collections engineer, Superintendent, or authorized designee may contact other agencies, as necessary, as well as other interested and possibly impacted parties.

Hinds County Health Department	Sherri Payne, Regional Environmentalist
Environmental Health	Marvin Bolden, County Environmentalist
539 E Beasley Road	Lakeshia Paige, County Environmentalist
PO Box 20	Phone: (601)-957-1026
Jackson, MS 39205-0020	Fax: (601)-957-1053
Contact Person:	<a href="mailto:sherrie.payne@msdh.state.ms.us">sherrie.payne@msdh.state.ms.us</a>
	<a href="mailto:marvin.bolden@msdh.state.ms.us">marvin.bolden@msdh.state.ms.us</a>
	<a href="mailto:lakeshia.paige@msdh.state.ms.us">lakeshia.paige@msdh.state.ms.us</a>

## VII. LONG TERM CORRECTIVE ACTION PROCEDURES

The type of mitigation and remediation will vary depending on the cause of the SSO. Wet weather SSO are usually caused by inflow and infiltration (I/I), not by blockages or other problems in the system. Mitigation of wet weather overflows may not be possible until the overflow subsides, but when it does, the City will implement all necessary steps to clean up and disinfect the overflow site.

In addition, the City will remotely monitor or establish routine inspection routes to be completed after each significant rain event. Significant rain events include those rain events that are known to be, or suspected of being, associated with, or contributing to SSO occurrences, regardless of the intensity, duration or measured rain gauge size of the event. This inspection will look for visual signs of a SSO at locations having more than one SSO in the past two years and all pump stations not on a central monitoring system. A map of these locations and sample inspection form can be found in Appendix C. As the City begins these inspections, the most efficient inspection routes will be determined. The inspection program will be maintained by the City with the assistance of a contractor if needed. The City will supply the results of the inspection to the contractor to add to the appropriate database. The City will use the established rain gauges throughout the City to determine the intensity and duration of the rain event. The location of the rain gauges provides adequate coverage for each Police Precinct and is shown on the SSO Inspection Map in Appendix C. Initially, all sites will be inspected following each significant rain event. As rainfall information and inspection results are collected, these results will allow the COJ to evaluate the inspection list and determine when each site should be inspected based on rainfall intensity and duration. In addition any new sites where multiple SSOs have occurred will be added and those sites where permanent corrective action has been completed and SSOs are no longer occurring will be removed after demonstrating that the previously identified SSO is shown not to overflow during an average 2 year, 24 hour intensity rain storm. The Utility Manager will be responsible for the management of the inspection program. The SSO list will be reviewed monthly by the contractor to determine the appropriate status of each SSO.

Dry weather events will be addressed using several methods. COJ field professionals will identify the most effective method or combination of methods to return service to the system. Field crews will use television inspection to determine the most effective way to resolve any service disruption. CCTV inspection will identify the cause and location of the blockage and the necessary techniques needed to eliminate it. The following summarizes common abatement resolution activities. These resolution techniques can be used independently or combined based on field conditions and CCTV inspection.

- **Roots/Grease**

Combination cleaner/flusher equipment is used to remove any grease, roots, or other obstructions from the line. A root cutter attachment may be necessary to remove the obstruction. Heavy roots and related pipeline integrity problems (through CCTV inspections) are reviewed for replacement and/or rehabilitation. Heavy cleaning may also be achieved through third party services as appropriate.

- **Collapsed Pipe/Sewer Breaks**

An emergency pipe repair will be required to replace the defective or collapsed pipe. A work order will be initiated immediately and necessary containment and diversion procedures will be in place until the appropriate repairs are completed.

- **Mechanical Failures/Treatment Facility Malfunctions**

Portable by-pass pumping systems may be used until the repairs are completed at collapsed pipe, the pump station or treatment facility. The responding crews will notify their maintenance supervisor to acquire additional support from construction crews as soon as the emergency repairs are identified.

- **Remove I/I**

The City will evaluate systemic wet weather SSO and implement corrective measures as part of the Overflow Abatement Program. Currently the City is engaged in a program of I/I identification and repair as an ongoing SSES program.

The City's Work Order and SSO database tracking system will also be used to identify recurring problems within the system so each problem can be addressed properly.

## **VIII. PERSONNEL TRAINING**

COJ personnel will conduct training for the appropriate response crews and support staff to ensure their compliance with the SORP. These training sessions will be organized based on the latest SORP, as well as other reference materials. Training sessions will be supplemented with a practical hands-on field component to prepare response personnel for anticipated situations.

The Utility Manager will be responsible for management of the training program. This will include signing off on completed training as well as reviewing required and future training needs. The training will be conducted by the City's chosen training contractor. The first training sessions were conducted by WEI-AJA, LLC in December 2010.

Also, COJ will conduct refresher sessions annually or when changes are made to the SORP to ensure the same results. COJ will oversee the SORP to ensure that the established procedures are being followed during implementation and field operation.

A detailed training plan is included in Appendix F. Appropriate training materials are being prepared separately.

#### **IX. MAINTENANCE OF SORP**

COJ will review the SORP during the first quarter of each year and amend it as appropriate. Any changes or amendments to this SORP shall be sent to MDEQ by April 30 after each annual review. The review shall be conducted by the Public Works Director or his designee. Review shall include, at a minimum, the following activities:

- Conduct workshop with managers and key personnel to review response activities and gather suggestions for new or revised procedures
- Review all contact lists and update as necessary
- Update the SORP as needed in regard to updated regulatory requirements

**X. APPENDICES**

Appendix A – Detailed Implementation Plan

Appendix B - Public Offices, Media Contact, and Authorized Cleanup Contractors Contact Information

Appendix C – Wastewater SSO Assessment Forms & Maps

Appendix D - Sewer Overflow Response Internal Notification & Tracking Protocol

Appendix E – Regulatory Agency Contact Information and Notification Period

Appendix F – Personnel Training Documents

### SORP Implementation Plan

1. Personnel – Advertise all vacant positions within the Sewer Division – 31 Positions (See Attached Personnel Schedule). Positions will be advertised within 60 days of SORP adoption. (See Attached Crew Description for the general description of crew responsibilities regarding SORP).
2. Training – COJ and its subcontractors will begin preparing training materials to begin SORP Training Classes for all relevant personnel within 60 days.
3. PS Evaluation - COJ will begin an inspection of each pump station to determine the capacity and needed improvements. The storage capacity of each station will be determined within 180 days.
4. Post Rainfall Inspection – COJ will begin inspecting known and potential overflow locations after each rainfall immediately upon adoption of the SORP. Until all staffing needs are met, COJ will use subcontractors to complete these inspections.
5. Recordkeeping and Reporting - COJ will immediately begin sending all SSO reports to subcontractor for entry into a MS Office database. This system will be utilized until the new data management system is online.
6. Response Zones – Within 24 months, the COJ will establish response teams within each police precinct to respond to any SSO's. In the interim, existing staff and subcontractors will respond to all SSO's.
7. Equipment Needs – Existing aging equipment will have to be replaced in order for sewer crews to adequately perform. COJ will evaluate existing equipment and prioritize needed equipment purchases within 60 days.

### Sewer Division Crew Description

#### Construction Crews

The sewer division will include one superintendent and four-field supervisors. The field supervisors will manage eight construction crews. Each supervisor will manage one precinct with two construction crews. Each construction crew will include a crew leader, one heavy equipment operator II, two heavy equipment operators I, one equipment operator II, three maintenance workers II and two maintenance workers I. These crews will install paid taps, repair main lines, repair cave-ins, raise manholes top, etc.

#### SORP Crews

The supervisor will also manage two Sewer Overflow Response Crews. Each crew will include a crew leader, one heavy equipment operator II, two maintenance workers II, and a maintenance worker I. These crews will respond to any SSO reports, clean main lines, and televise main lines, locate manholes, smoke test, dye test, and inspect manholes.

#### Equipment Assignments:

Each Construction crew will need one crew/ tool truck, two 14 yd. dump trucks, one backhoe, one air compressor, small pumps 2-inch to 3-inch, pipe saws, backhoe trailer, and other construction equipment.

Each SORP Response Crew will need one tv truck, one combination jet truck, laptop, pumps, plugs, etc.

Two track excavators, two rubber tire backhoes (for back filling), and one bulldozer, will support all eight construction crews.

**CURRENT PERSONNEL SCHEDULE**

COST CENTER	OCCUPATION CODE	POSITION TITLE	FSLA	RANK	2013		2014		2015		2016		2017		2018		2019		2020		2021		2022		VACANT POSITIONS as of 12-31-2010	
					BUDGET		BUDGET																			
<b>5210 SEWER / ADMINISTRATION</b>																										
		0283-C-01 SENIOR CIVIL ENGINEER	S	E	031	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		0061-C-01 CIVIL ENGINEER I	S	E	025	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		0062-C-01 CIVIL ENGINEER II	S	E	027	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		8622-C-01 PROJECT/CONSTRUCTION MANAGER	S	E	027	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		6578-C-01 ENGINEERING GRADUATE	S	NE	026	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		0310-C-01 SEWER SYSTEMS SUPERINTENDENT	S	E	025	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		6577-0-01 ENGINEERING TECHNICIAN	S	NE	024	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		0435-0-01 METERS/STATION TECHNICIAN	S	NE	020	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		0112-0-01 ENGINEERING INSPECTOR	S	NE	019	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		0107-0-01 DRAFTING TECHNICIAN	S	NE	014	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
		0006-0-01 ADMINISTRATIVE SECRETARY	S	NE	014	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		0279-0-01 SECRETARY	S	NE	012	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		0393-0-01 SEWER METER MAINTENANCE WORKER	S	NE	009	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		Total Full-Time				10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
		Total Allocated Positions																								3
<b>5215 MAINTENANCE/SUBPLY</b>																										
		0260-0-01 PURCHASING MANAGER	S	E	026	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		0256-0-01 PURCHASING SUPERVISOR	S	E	023	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		0160-0-01 INVENTORY CONTROLLER	S	NE	016	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		0432-0-01 OFFICE COORDINATOR	S	NE	019	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		0149-0-01 HEAVY EQUIPMENT OPERATOR I	S	NE	012	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		0326-0-01 STOREKEEPER	S	NE	010	0	0	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
		0175-0-01 MAINTENANCE WORKER II	W	NE	009	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		Total Full-Time				0	0	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
		Total Allocated Positions																								0
<b>5220 SEWER / OPERATIONS &amp; MAINTENANCE</b>																										
		0310-0-01 SEWER SYSTEMS SUPERINTENDENT	S	E	025	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		0432-0-01 OFFICE COORDINATOR	S	NE	019	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		0074-0-01 CREW LEADER	S	E	018	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
		0068-0-01 ADMINISTRATIVE SECRETARY	S	NE	014	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		0160-0-01 HEAVY EQUIPMENT OPERATOR II	S	NE	014	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		0177-0-01 EQUIPMENT OPERATOR II	S	NE	012	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		0149-0-01 HEAVY EQUIPMENT OPERATOR I	S	NE	012	0	0	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
		0279-0-01 SECRETARY	S	NE	012	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		0247-0-01 PUBLIC SERVICE DISPATCHER	S	NE	011	0	0	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
		0116-0-01 EQUIPMENT OPERATOR I	S	NE	010	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
		0252-0-01 SENIOR MAINTENANCE WORKER	W	NE	011	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
		0179-0-01 MAINTENANCE WORKER II	W	NE	009	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
		0176-0-01 MAINTENANCE WORKER I	W	NE	007	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		0284-0-01 SENIOR C-STEWARD	W	NE	007	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		Total Full-Time				60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
		Total Allocated Positions																								24
<b>5225 SEWER EVALUATION SERVICES</b>																										
		0311-0-01 SEWER SYSTEMS SUPERVISOR	S	E	018	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		0074-0-01 CREW LEADER	S	NE	016	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
		0279-0-01 SECRETARY	S	NE	012	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		0149-0-01 HEAVY EQUIPMENT OPERATOR I	S	NE	012	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
		0252-0-01 SENIOR MAINTENANCE WORKER	W	NE	011	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		0175-0-01 MAINTENANCE WORKER II	W	NE	009	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
		Total Full-Time				35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
		Total Allocated Positions																								7
<b>SEWER DEPARTMENT TOTAL FULL-TIME</b>																										
		Total Full-Time				90	97	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101
		Total Allocated Positions																								31

**APPENDIX B- PUBLIC OFFICES, MEDIA CONTRACT, AUTHORIZED CLEANUP CONTRACTORS CONTACT INFORMATION**

<b>Contact Name</b>	<b>Telephone</b>
City of Jackson Water/Sewer Utilities Division:	(601) 960-2090
City of Jackson Sewer Maintenance Division:	(601) 960-1875
JWP Project Manager:	(601) 421 0610
Savanna Street Wastewater Treatment Plant (SSWWTP):	(601) 372-3439
Fire Department:	911 emergency or (601) 960-1234
COJ Police:	911 emergency or (601) 960-1234
Hinds County Health Department	(601)-957-1026

**MDEQ**

During Normal Operating Hours – 8:00 a.m. – 5:00 p.m.

MDEQ Operator – 601-961-5171

MDEQ ECED Municipal & Private Facilities Branch Manager – 601-961-5588

MDEQ ECED Engineer for Jackson – 601-961-5319

After Normal Operating Hours (non-emergency)

(Voice Mail)

MDEQ ECED Municipal & Private Facilities Branch Manager – 601-961-5588

MDEQ ECED Engineer for Jackson – 601-961-5319

After Normal Operating Hours (emergency)

MEMA 24-hour State Warning Point – 1-800-222-6362

**LIST OF MEDIA CONTACTS TO REPORT OVERFLOW**

<b>Contact Name</b>	<b>Telephone</b>
Clarion Ledger:	(601) 961-7250
WLBT:	(601) 948-3333
WJTV:	(601) 372-6311
WAPT:	(601) 922-1607

## STANDARD PRESS RELEASE

COJ maintains a standard press release on SSO that can be quickly adapted to the particular situation and issued if COJ determines there is a significant threat to public health.

### NEWS RELEASE

DATE XXXXXXXXX

For Immediate Release

For More Information

Contact: Public Works Director

601-960-2091

## COJ Alerts Customers to Sanitary Sewer Overflow

COJ issued an alert today to people in the [insert area(s)] concerning a sanitary sewer overflow. "The overflow occurred as a result of [significant rain event/ a blockage/ or other]," said Public Works Director or Authorized Designee. "COJ responds to overflows in a manner consistent with state and federal standards. We warn passersby to avoid contact by posting signs and using barricades, and we disinfect the area after the overflow stops."

- Location of overflow (by street address or other appropriate method)
- Cause of the SSO
- Destination of the SSO flow (e.g. waterbody, name of receiving water, MS4 system, etc.)
- Estimated Volume

Note: Use this paragraph if the overflow is in a recreational area or significantly affects a stream etc. The signs do not necessarily prohibit use of recreational areas, unless posted otherwise. The Mississippi Department of Environment (MDEQ) determines whether to post nearby waterways that may have been affected if water quality testing indicates a need.

Overflows pose hazards similar to those in public restrooms or even your own bathroom. If you, your family, or your pets do have contact with the overflow, wash thoroughly with soap and water. Remember: Washing your hands carefully and often is the best defense against illness carried by animal or human waste.

If you have questions or need to report an overflow, please call COJ at (601)-960-1875.

CUSTOMER NOTIFICATION LETTER

**Maintenance of Sewer Service Connection**

**These letters will be modified by the author per specific location and condition  
FIRST NOTIFICATION**

Date: XXXXX

Name: XXXXXXXX

Address: XXXXXXXX

RE: Notice of collection system non-compliance

The Municipal Code of the City of Jackson requires that owners maintain their sewer service line "in such a condition as to safeguard the property, life and health of others". Specifically this means that excess ground water overloading the public system through joint leaks, sump pumps, roof drain or surface water inlets or sewer line blockages due to root intrusion, grease and/or debris from the service line is prohibited.

The City has determined that your sewer service line is impacting the operating condition of the public system. In accordance with City Code, you must take action to ensure that your service line is in proper operating condition.

The City fully recognizes that you may not have been aware of problems in your service line and that you may not have experienced any service problem. Taking the necessary corrective action to restore your service line to its intended operating condition will protect your interests as well as the public.

In order to provide adequate time for you to address these service line problems, the City will reinvestigate the public main serving your property on or about \_\_\_\_\_ (sixty (60) days) from the date of this letter. If there is evidence that the condition affecting the public system is not corrected, the City will take appropriate action that may include interruption of water service to this address until such time as the sewer service line problem(s) is corrected. There may also be additional charges for water service disconnection and reinstatement.

COJ is willing to work with you to the extent possible on the correction of your service lateral problems. You may call to make an appointment to discuss by calling (601)-960-1875 and speak to the dispatcher on duty.

SAMPLE SEWER OVERFLOW SIGN

**CAUTION!**

**SEWER OVERFLOW**

**Avoid Bodily Contact With Water**

**For More Information Contact**

**City of Jackson- (601)-960-1875**

**APPENDIX C – WASTEWATER ASSESSMENT FORMS & MAPS**





**CITY OF JACKSON, MISSISSIPPI  
SEWER SYSTEM WORK ORDER FORM**

City Of Jackson, MS  
Dept. Of Public Works  
P.O. Box 17  
Jackson, MS 39205  
601-960-2091

Date: \_\_\_\_\_ Complainant #: \_\_\_\_\_ Utility Locate # \_\_\_\_\_

Reported by: \_\_\_\_\_ Owner's Name: \_\_\_\_\_

House #: \_\_\_\_\_ Street: \_\_\_\_\_ Plumber On Site: \_\_\_\_\_ Time In: \_\_\_\_\_ Time Out: \_\_\_\_\_

Serviced By: \_\_\_\_\_ Phone #: \_\_\_\_\_

<input type="checkbox"/> Sewer Stopped Up <input type="checkbox"/> Check Sewer Odor <input type="checkbox"/> Sewer Leak <input type="checkbox"/> Sewer In House <input type="checkbox"/> Toilet Overflow <input type="checkbox"/> Sewer In Tub <input type="checkbox"/> Sewer In Yard <input type="checkbox"/> Cleanout Overflow <input type="checkbox"/> Hydraulic Overflow <input type="checkbox"/> Sewer in Ditch <input type="checkbox"/> Sewer in Creek		<input type="checkbox"/> Sewer In Streets <input type="checkbox"/> Sewer In Storm Drain <input type="checkbox"/> Roots In Line <input type="checkbox"/> Hole In Street/Ground <input type="checkbox"/> Cave In in Yard <input type="checkbox"/> Cave In at Stub <input type="checkbox"/> Sewer In at Manhole <input type="checkbox"/> Cave In in Street <input type="checkbox"/> Cave In in Easements/Woods <input type="checkbox"/> Repair/Replace Cleanout <input type="checkbox"/> Install New Sewer Churnout		<b>Complaint Type</b> <input type="checkbox"/> Clean Sewer Line <input type="checkbox"/> Repair Service Line <input type="checkbox"/> Repair Main Line <input type="checkbox"/> Install New Sewer Line <input type="checkbox"/> Repair Sewer Tap <input type="checkbox"/> Install New Sewer Tap <input type="checkbox"/> Locate Manhole <input type="checkbox"/> Uncover Manhole <input type="checkbox"/> Raise/Lower Manhole <input type="checkbox"/> Repair MH <input type="checkbox"/> MH Ring Broken		<input type="checkbox"/> MH Lid Broken <input type="checkbox"/> MH Lid Missing <input type="checkbox"/> Seal Down MH Lid <input type="checkbox"/> Locate Sewer Lines <input type="checkbox"/> Check For Available Sewer Line <input type="checkbox"/> Disconnect Service Line <input type="checkbox"/> Plug/Disconnect Abandon Sewer <input type="checkbox"/> TV Sewer Line <input type="checkbox"/> Smoke Test Sewer Line <input type="checkbox"/> Check Air Release Valve <input type="checkbox"/> Check Stream Crossing		<input type="checkbox"/> Mainline Run/Easement <input type="checkbox"/> Clean/Drain-Up Yard <input type="checkbox"/> Sanitize/Flush Yard <input type="checkbox"/> Flush Out Ditch <input type="checkbox"/> Various Street WWTF <input type="checkbox"/> Audit Other Department <input type="checkbox"/> Other	
--	--	--	--	---	--	--	--	---	--

<b>Account Type</b> <input type="checkbox"/> Residential <input type="checkbox"/> Business <input type="checkbox"/> Gov. Federal <input type="checkbox"/> Gov. State <input type="checkbox"/> Gov. County <input type="checkbox"/> Gov. City <input type="checkbox"/> Other	<b>Location</b> <input type="checkbox"/> In House <input type="checkbox"/> Under Bldg. <input type="checkbox"/> Front Yard <input type="checkbox"/> Back Yard <input type="checkbox"/> Cleanout <input type="checkbox"/> Manhole <input type="checkbox"/> Storm Drain <input type="checkbox"/> Ditch/Creek <input type="checkbox"/> Other	<b>Problem Type</b> <input type="checkbox"/> Sewer Main <input type="checkbox"/> Sewer Tap <input type="checkbox"/> Manhole <input type="checkbox"/> Service Line <input type="checkbox"/> Pump Station <input type="checkbox"/> Force Main <input type="checkbox"/> Other	<b>No City Problem</b> <input type="checkbox"/> Main Line OK <input type="checkbox"/> Service Line OK <input type="checkbox"/> Advised Customer Needs Number
		<b>Service Line Problem</b> <input type="checkbox"/> City ROW <input type="checkbox"/> Customer	<b>Weather</b> Tap Goes To Manhole: <input type="checkbox"/> No <input type="checkbox"/> Yes Existing City Cleanout: <input type="checkbox"/> No <input type="checkbox"/> Yes

<input type="checkbox"/> Checked Sewer Odor <input type="checkbox"/> Unstopped Sewer Main <input type="checkbox"/> Unstopped Service Line <input type="checkbox"/> Unstopped Main and Service <input type="checkbox"/> Puddled Service Line <input type="checkbox"/> Cleaned Main Line <input type="checkbox"/> Point Repaired Sewer Line <input type="checkbox"/> Replaced Section of Line <input type="checkbox"/> Replaced Entire Line <input type="checkbox"/> Installed New Sewer Line	<input type="checkbox"/> Rebuilt/Replaced Cleanout <input type="checkbox"/> Install New Cleanout <input type="checkbox"/> Repaired/Replaced Sewer Tap <input type="checkbox"/> Installed New Sewer Tap <input type="checkbox"/> Located Manhole <input type="checkbox"/> Uncovered Manhole <input type="checkbox"/> Raised/Lowered Manhole <input type="checkbox"/> Replaced MH Ring <input type="checkbox"/> Replaced MH Lid <input type="checkbox"/> Sealed MH Lid	<b>Description of Repairs</b> <input type="checkbox"/> Required MH Cone/Wall <input type="checkbox"/> Rebuilt MH Invert <input type="checkbox"/> Put Barricade At Hole <input type="checkbox"/> Put Dirt/Asphalt In Hole <input type="checkbox"/> Televised Sewer Lines <input type="checkbox"/> Smoke Tested Sewer Lines <input type="checkbox"/> Checked Air Release Valve <input type="checkbox"/> Checked Stream Crossing <input type="checkbox"/> Located Sewer Line <input type="checkbox"/> Checked If Sewer Available	<input type="checkbox"/> Plugged/Removed Abandoned Sewer <input type="checkbox"/> Maintained ROW/Easement <input type="checkbox"/> Cleaned/Drained Up Yard <input type="checkbox"/> (Un)repaired/Flushed Yard/Ditch <input type="checkbox"/> Put Tag On Door <input type="checkbox"/> Assisted Other Dept. <input type="checkbox"/> No Action <input type="checkbox"/> Other (explain below)
--	---	---	---

**Pipe Material:**  Concrete  PVC  CIP  DIP  TRUSS  HDPE  Other: \_\_\_\_\_  
**Pipe Size:** \_\_\_\_\_ ins. **Pipe Depth:** \_\_\_\_\_ ins. **MH Size:** \_\_\_\_\_ ins. **MH Depth:** \_\_\_\_\_ ins.

**Other Needs/Explanation of Repairs:** \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Crew Leader: \_\_\_\_\_ Supervisor: \_\_\_\_\_ Complainant's Signature: \_\_\_\_\_ Date: \_\_\_\_\_





City Of Jackson, Mississippi  
Sewer System Overflow Inspection Form

City of Jackson, Mississippi  
Department of Public Works  
Form 3486a Rev 17  
October 18, 2009  
301-990-2891

Address	City	County	State	Zip	City	County	State	Zip	City	County	State	Zip
1	15 Soats				PS	Harty Creek		1				
2	Amarda Lane				PS	Big Creek		1				
3	Brookhollow Drive L 160				PS	Trabon Creek		1				
4	8675 Hwy 18				PS	Trabon Creek		1				
5	2102 Thousand Oaks				PS	Trabon Creek		1				
6	8404wy Dove				US	Trabon Creek		1				
7	461 Greenmount Drive				PS	Trabon Creek		1				
8	201 Cedarwood Drive				PS	Trabon Creek		1				
9	140 Chiswood Avenue				US	Trabon Creek		1				
10	1453 Country Club Drive				PS	Bogue Chitto Creek		2				
11	125 Dufay Avenue				PS	Causey Creek		1				
12	185 Durbinville Drive				PS	Trabon Creek		1				
13	553 Eden Downs				PS	Trabon Creek		1				
14	F-55 Frontage Road				PS	Causey Creek		1				
15	207 Elton Road				PS	Causey Creek		1				
16	0-55 Water Plant				PS	Belhaven Creek		1				
17	717 Flag Chapel Road				PS	Bogue Chitto Creek		2				
18	992 Flag Chapel Road				PS	Bogue Chitto Creek		2				
19	1451 Forest Avenue				PS	Purbarke Creek		3				
20	155 Forest Hill Drive				PS	Trabon Creek		1				
21	3557 Forest Hill Road				PS	Trabon Creek		1				
22	2387 Forest Park Drive				PS	Trabon Creek		1				
23	Greenway Court				PS	Purple Creek		1				
24	2130 Hickory Drive				PS	Causey Creek		1				
25	561 Hilldale Drive				PS	Trabon Creek		1				
26	174 Lakeside Road				PS	Trabon Creek		1				
27	4658 Vesun Avenue				PS	Trabon Creek		1				
28	4391 Terry Road				PS	Causey Creek		1				
29	201 Red Hill Drive				PS	Trabon Creek		1				
30	180 Marshall Avenue				PS	Trabon Creek		1				
31	Holly Hills Drive				PS	Trabon Creek		1				
32	Robinwood Drive				PS	Trabon Creek		1				
33	500 McCheser Road				PS	Causey Creek		1				
34	2890 McCheser Road				PS	Causey Creek		1				
35	647 McCheser Road				PS	Trabon Creek		1				
36	1073 McCheser Road				PS	Trabon Creek		1				
37	1663 McCheser Road				PS	Trabon Creek		1				
38	2694 Moore Drive				PS	Causey Creek		1				
39	135 Hillview				PS	Causey Creek		1				
40	4810 McRayon Road				PS	Lynch Creek		2				
41	4660 McRayon rd				PS	Lynch Creek		2				
42	5186 McRayon rd				PS	Lynch Creek		2				
43	600 McRayon road				PS	Lynch Creek		2				
44	6112 Floral Drive				PS	Hanging Moss Creek		3				
45	3702 W. Northside Drive				PS	Bogue Chitto Creek		2				
46	4837 Old Barnum Road				PS	Trabon Creek		1				
47	4681 Old Dwyam Road				PS	Trabon Creek		1				
48	Palum Street				PS	Bogue Chitto Creek		3				
49	Plantation Court				PS	White Oak Creek		4				
50	155 Portwood Drive				PS	Trabon Creek		1				
51	2108 Raymond Road				PS	Causey Creek		1				
52	3440 River Thames Road				PS	White Oak Creek		4				
53	3407 River Thames Road				PS	White Oak Creek		4				
54	5293 Robinson Road				PS	Causey Creek		1				
55	10 Rob Lane				PS	Trabon Creek		1				
56	2238 Sheffield Drive				PS	Hanging Moss Creek		4				
57	2540 Country Club				PS	Bogue Chitto Creek		3				
58	245 S. Sheltrick				PS	Bogue Chitto Creek		3				
59	3453 Dixie Syles Road				PS	Bogue Chitto Creek		3				
60	1466 Short Avenue				PS	Trabon Creek		1				
61	4091 Sward Road				PS	Big Creek		1				
62	4071 Sward Road				PS	Trabon Creek		1				
63	139 Stratford Drive				PS	Trabon Creek		1				
64	6065 Clifton Boulevard				PS	Lynch Creek		3				
65	151 Sylvan Trail				PS	Lynch Creek		3				
66	351 Sylvan Trail				PS	Lynch Creek		3				
67	498 Sylvan Trail				PS	Trabon Creek		3				
68	4640 Terry Road				PS	Trabon Creek		3				
69	6115 Hwy. 18				PS	Trabon Creek		1				
70	132 Timberlain Road				PS	Trabon Creek		1				
71	5150 US Hwy. 49 North				PS	Bogue Chitto Creek		3				
72	Weston Hills Drive				PS	Trabon Creek		1				
73	1900 Wallace Street				PS	Lynch Creek		1				
74	1790 Wallace Street				PS	Lynch Creek		2				
75	1681 Wallace Street				PS	Lynch Creek		2				
76	1914 US Hwy. 30 West				PS	Lynch Creek		2				
77	4210 Claunch Circle				PS	Lynch Creek		2				
78	500 E. Gumming Drive				PS	Lynch Creek		2				
79	1230 Zephyr Street				PS	Lynch Creek		2				
80	6215 Yarbrough Street				PS	Lynch Creek		2				
81	4130 Wrenhall Road				PS	Lynch Creek		2				
82	Whitestone Road				PS	Hanging Moss Creek		3				
83	Sharnoodle Drive				PS	Trabon Creek		1				
84	3855 Yalco				PS	Lynch Creek		2				
85	H. River Place				PS	Belhaven Creek		2				



**City Of Jackson, Mississippi  
Sewer System Overflow Inspection Form**

City of Jackson, Mississippi  
Department of Public Works  
4601 Old Hwy 17  
Jackson, MS 39205  
(601) 956-3001

Address	Inspection Date	Inspection Status	Overflow Location	Overflow Volume	Overflow Date
86 Old River Place		PS	Belhaven Creek	2	
87 Apache Road #1		PS	Big Creek	1	
88 Apache Road #2		PS	Big Creek	1	
89 Presidential Hills		PS	Angie Cline Creek	1	
90 2010 Chadwick Drive		PS	Caney Creek	1	
91 1233 Echelon Parkway		PS	Hanging Moss Creek	3	
92 677 Woods Dr. Jackson, MS 39212		EPA List	Caney Creek	1	
93 473 Woods Dr. Jackson, MS 39212		EPA List	Caney Creek	1	
94 136 Shiloh Dr. Jackson, MS 39212		EPA List	Hardy Creek	1	
95 170 Shiloh Dr. Jackson, MS 39212		EPA List	Hardy Creek	1	
96 5400 Interstate 55 Frontage Rd. Jackson, MS 39212		EPA List	Caney Creek	1	
97 5406 Interstate 55 Frontage Rd. Jackson, MS 39212		EPA List	Caney Creek	1	
98 4829 Old Byron Rd. Jackson, MS 39212		EPA List	Enchon Creek	1	
99 835 Rivers St 8/26/2010		posted	Hardy Creek	1	2010.1
100 Monroe & Charlie 8/3/2010		posted	Belhaven Creek	4	2010.2
101 159 Holly Hill Dr. Jackson, MS 39212		EPA List	Enchon Creek	1	
102 Hanging Moss Creek crossing near JA 9/29/2010		posted	Hanging Moss Creek	3	2010.3
103 Hwy 80 near Wiggins Rd & Shaw Rd		posted	Lynch Creek	2	2010.4
104 159 Holly Hill Dr. Jackson, MS 39212		EPA List	Enchon Creek	1	
105 Adams Ave behind the Grace Homes 10/1/2010		posted	Town Creek	4	2010.5
106 201 Courtney Club Dr		posted	Lynch Creek	1	2010.6
107 3427 Wheatley St. Jackson, MS 39212		EPA List	Caney Creek	1	
108 3725 Joyce Ave.		posted	Lynch Creek	2	2010.7
109 4909 Ramsey Dr. 10/13/2010		posted	Lynch Creek	2	2010.8
110 2884 Maryland Dr. Jackson, MS 39212		EPA List	Caney Creek	1	
111 Ritchey & Holden St. 10/20/2010		posted	Lynch Creek	2	2010.9
112 Cahoon & South Dr. 10/29/2010		posted	Lynch Creek	2	2010.10
113 2937 Maryland Dr. Jackson, MS 39212		EPA List	Caney Creek	1	
114 James & Sanford St. 10/23/2010		posted	Lynch Creek	2	2010.11
115 2926 Greenwood Ave. 10/20/2010		posted	Jenny Creek	1	2010.12/20
116 3982 Nassau St. 10/20/2010		posted	Roberts Creek	4	2010.12/22
117 2410 Belvedere Dr. 10/20/2010		posted	Three Mile Creek	1	2010.14/10
118 825 Carver St. 10/25/2010		posted	Town Creek	1	2010.15/06
119 1425 Tapp Ave. 10/25/2010		posted	Lynch Creek	2	2010.15/10
120 2424 Belvedere Dr. Jackson, MS 39204		EPA List	Three Mile Creek	1	
121 1295 Parkway St. 10/28/2010		posted	Town Creek	3	2010.15/42
122 563 Dellwood Dr. 10/28/2010		posted	Caney Creek	1	2010.15/43
123 2334 Belvedere Dr. Jackson, MS 39204		EPA List	Three Mile Creek	1	
124 540 Houston Ave. 10/08/2010		posted	Lynch Creek	2	2010.15/49
125 2111 East Dr. Jackson, MS 39204		EPA List	Three Mile Creek	1	
126 150 Leavelle Wanda Dr. 10/29/2010		posted	Caney Creek	1	2010.15/59
127 1101 East Dr. Jackson, MS 39204		EPA List	Three Mile Creek	1	
128 Alta Woods Blvd. 10/29/2010		posted	Three Mile Creek	1	2010.15/62
129 1954 Skyline Dr. 10/30/2010		posted	Town Creek	3	2010.15/85
130 2012 Willow Way. Jackson, MS 39204		EPA List	Three Mile Creek	1	
131 4540 Woodland Ave. 10/30/2010		posted	Roberts Creek	3	2010.15/87
132 2014 Willow Way. Jackson, MS 39204		EPA List	Three Mile Creek	1	
133 6118 Rand St. 10/30/2010		posted	Hanging Moss Creek	3	2010.15/91
134 811 Ford Ave 10/30/2010		posted	Town Creek	3	2010.15/92
135 4133 South Dr. 10/30/2010		posted	Lynch Creek	2	2010.15/93
136 1855 A Boone Dr. 11/1/2010		posted	Hanging Moss Creek	4	2010.16/12
137 2113 East Dr. Jackson, MS 39204		EPA List	Three Mile Creek	1	
138 1942 O'Bannon Dr. 11/1/2010		posted	Town Creek	3	2010.16/11
139 1833 Avenue H 11/1/2010		posted	Town Creek	3	2010.16/23
140 124 Rollingwood Dr. 11/1/2010		posted	Hanging Moss Creek	4	2010.16/29
141 1234 Cornet Pl. Jackson, MS 39204		EPA List	Three Mile Creek	1	
142 124 Rollingwood Dr. 11/2/2010		posted	Hanging Moss Creek	4	2010.16/14
143 1234 Cornet Pl. Jackson, MS 39204		EPA List	Three Mile Creek	1	
144 4461 Maryland Dr. 11/2/2010		posted	Lynch Creek	3	2010.16/16
145 2261 Belvedere Dr. Jackson, MS 39204		EPA List	Three Mile Creek	1	
146 1253 Woodbridge Dr. 11/2/2010		posted	Lynch Creek	2	2010.16/19
147 619 Forest Ave.		posted	Roberts Creek	3	2010.16/40
148 3523 Nashville St.		posted	Town Creek	3	2010.16/43
149 1653 Gammill St. 11/6/2010		posted	Town Creek	3	2010.16/75
150 3147 Sage St. 11/6/2010		posted	Town Creek	3	2010.16/80
151 124 Sewanee Dr. 11/5/2010		posted	Lynch Creek	2	2010.17/08
152 2231 Forest Glen Ln. 11/6/2010		posted	Roberts Creek	3	2010.17/13
153 Briarwood Dr. & State R. 11/6/2010		posted	Hanging Moss Creek	4	2010.17/23
154 1545 Maria Dr. Jackson, MS 39204		EPA List	Hardy Creek	1	
155 8245 Mossline Dr. 11/6/2010		posted	Purple Creek	4	2010.17/28
156 Maria Dr. Jackson, MS 39204		EPA List	Caney Creek	1	
157 3996 Skyline Dr. 11/6/2010		posted	Town Creek	3	2010.17/26
158 206 Sheila Dr. 11/6/2010		posted	Lynch Creek	2	2010.17/33
159 314 Rollingwood Dr. 11/6/2010		posted	Hanging Moss Creek	4	2010.17/33
160 540 Bruce/Chf Cir. 11/7/2010		posted	Caney Creek	1	2010.17/39
161 101 Grover Cleveland Cir. 11/7/2010		posted	Bayou Chitto Creek	3	2010.17/41
162 3549 Queen Christina Ln. 11/7/2010		posted	Lynch Creek	3	2010.17/50
163 3910 Skyview Dr.		posted	Town Creek	3	2010.17/53
164 4580 Old Canton Rd		posted	Backover Creek	4	2010.17/59
165 311 Quail St. Jackson, MS 39204-5300 11/8/2010		posted	Lynch Creek	3	2010.17/69
166 645 Mercury St. 6/3/09		posted	Three Mile Creek	1	2010.17/72
167 Huey Ave & Pomer St. 11/8/2010		posted	Lynch Creek	2	2010.17/77
168 145 Lorena Blvd. 11/8/2010		posted	Town Creek	4	2010.17/87
169 1724 Gibraltar Dr. 11/8/2010		posted	Lynch Creek	1	2010.17/83
170 1616 Main St. 11/9/2010		posted	Town Creek	3	2010.17/93



City Of Jackson, Mississippi  
Sewer System Overflow Inspection Form

City of Jackson, Mississippi  
Department of Public Works  
Post Office Box 15  
Jackson, MS 39205  
(601) 253-1234

Inspection No.	Address	Inspection Date	Inspection Status	City	Watershed	Flow	Flow Date	Flow Volume	Flow Type
171	1413 W Northside Dr. 11/9/2010		normal		Federick Creek	3	2010	5996	
172	1634 McElroy Rd. Jackson, MS 39212		EPA List		Trabon Creek	1			
173	1850 Central Dr. 11/11/2010		poised		Casey Creek	1	2010	5835	
174	609 Mann Blvd. 11/11/2010		poised		Casey Creek	1	2010	5888	
175	2293 Forest Park Dr. Phungson Station 11/13/2010		poised		Trabon Creek	1	2010	5050	
176	154 Cherokee Ctr. 11/13/2010		poised		Town Creek	3	2010	5807	
177	1119 Princeton St. 11/13/2010		poised		Casey Creek	1	2010	5904	
178	1244 Gallatin St. 11/15/10		poised		Lynch Creek	2	2010	5910	
179	2793 Newport St. 11/15/2010		poised		Town Creek	3	2010	5913	
180	121 Quinlan Dr. Jackson, MS 39212		EPA List		Trabon Creek	1			
181	244 Northpointe Place 11/16/2010		poised		Purple Creek	4	2010	5944	
182	Palmetto St. & Capital St 11/16/2010		poised		Town Creek	2	2010	5946	
183	2619 Oakmont Dr. 11/19/2010		poised		Lynch Creek	2	2010	5867	
184	1145 Woodfield Dr. 11/19/2010		poised		White Oak Creek	4	2010	5963	
185	809 Woodr Dr. 11/20/2010		poised		Casey Creek	1	2010	6013	
186	1114 Woodville Cir. Jackson, MS 39212		EPA List		Casey Creek	1			
187	1720 Mt. Zion Rd. 11/24/2010		poised		Trabon Creek	1	2010	6022	
188	604 Capital Cir. 11/23/2010		poised		Casey Creek	1	2010	6041	
189	Cassell Dr. 11/23/2010		poised		Federick Creek	4	2010	6062	
190	1117 Oak St. 11/23/2010		poised		Casey Creek	2	2010	6020	
191	690 Paulina Dr. 11/23/2010		poised		Lynch Creek	2	2010	6029	
192	1171 Robinson St. Jackson, MS 39204		EPA List		Casey Creek	2			
193	995 Cedar Springs Dr. 11/23/2010		poised		Trabon Creek	4	2010	6060	
194	1908 W Ingfield Cir. Jackson, MS 39206		EPA List		Lynch Creek	2			
195	Woodbury Dr. & N. State St. 11/23/2010		poised		Hanging Moss Creek	4	2010	6064	
196	1908 W Ingfield Cir. Jackson, MS 39206		EPA List		Lynch Creek	2			
197	1210 Wacker Dr. 11/23/2010		poised		Federick Creek	1	2010	6067	
198	174 E South St. Jackson, MS 39201		EPA List		Town Creek	2			
199	1339 Valley St. 11/26/2010		poised		Lynch Creek	2	2010	6119	
200	1150 Brentwood Rd. Jackson, MS 39204		EPA List		Casey Creek	2			
201	Wood St. & Bell St. 11/27/2010		poised		Town Creek	1	2010	6136	
202	463 Boland St. Jackson, MS 39204		EPA List		Lynch Creek	2			
203	Woodr Dr. near 961 Woodr 11/27/2010		poised		Casey Creek	1	2010	6137	
204	455 Boland St. Jackson, MS 39209		EPA List		Lynch Creek	2			
205	1037 Willard Dr. 11/28/2010		poised		Three Mile Creek	1	2010	6200	
206	911 W Porter St. Jackson, MS 39204		EPA List		Lynch Creek	2			
207	678 S. Valley Falls Rd. 11/30/2010		poised		Casey Creek	1	2010	6205	
208	1311 W Pearl St. Jackson, MS 39201		EPA List		Town Creek	2			
209	Hanging Moss & Heather Ln. 11/30/2010		poised		Hanging Moss Creek	3	2010	6217	
210	134 Oakley St. Jackson, MS 39209		EPA List		Lynch Creek	3			
211	1805 Jameson Dr. 11/30/2010		poised		Eastover Creek	4	2010	6219	
212	4201 Oakmont Dr. Jackson, MS 39209		EPA List		Lynch Creek	2			
213	Michael Clay Dr. & E. Lake Cir. 12/0/2010		poised		Town Creek	2	2010	6229	
214	4201 Oakmont Dr. Jackson, MS 39209		EPA List		Lynch Creek	2			
215	Clinton Ave. & Fryant Ave. 12/10/2010		poised		Lynch Creek	2	2010	6274	
216	North Boulevard St. Jackson, MS		EPA List		Town Creek	2			
217	933 Houston Ave. 12/22/2010		poised		Lynch Creek	2	2010	6280	
218	4271 Woodmont Dr. Jackson, MS 39209		EPA List		Casey Creek	2			
219	114 Woodr Dr. 12/5/2010		poised		Subaska Creek	1	2010	6226	
220	North St & Forestview St. Jackson, MS		EPA List		Belhaven Creek	2			
221	Raymond Rd. & Elm Court Cir. 12/5/2010		poised		Hardy Creek	1	2010	6279	
222	104 1st Victoria Ave. Jackson, MS 39209		EPA List		Lynch Creek	2			
223	1418 Forest Hill Rd. 12/5/2010		poised		Trabon Creek	1	2010	6278	
224	6372 Woodmont Dr. Jackson, MS 39209		EPA List		Lynch Creek	2			
225	5535 Queen Mary Ln. 12/5/2010		poised		Lynch Creek	1	2010	6311	
226	4301 Woodmont Dr. Jackson, MS 39209		EPA List		Lynch Creek	2			
227	915 Cedar Spring Dr. 12/5/2010		poised		Trabon Creek	1	2010	6312	
228	1695 High St. Jackson, MS 39202		EPA List		Belhaven Creek	2			
229	630 St. Jefferson St. 12/5/2010		poised		Town Creek	2	2010	6316	
230	744 Georgia Ave. Jackson, MS 39209		EPA List		Town Creek	2			
231	Allen St. & Beatty St. 12/6/2010		poised		Town Creek	2	2010	6330	
232	143 Barrens St. Jackson, MS 39209		EPA List		Lynch Creek	2			
233	Bailey Ave. near 1020 13th/2010		poised		Town Creek	2	2010	6333	
234	9577 Dwyland Dr. Jackson, MS 39209		EPA List		Lynch Creek	2			
235	1524 Fulton Ave. 12/7/2010		poised		Hanging Moss Creek	1	2010	6340	
236	1731 Corbett St. Jackson, MS 39209		EPA List		Lynch Creek	2			
237	162 St. Andrews Dr. 12/7/2010		poised		Purple Creek	4	2010	6347	
238	1236 Carolyn St. Jackson, MS 39209		EPA List		Lynch Creek	2			
239	Beatty St. & Allen St. 12/7/2010		poised		Town Creek	2	2010	6336	
240	1377 Colman St. Jackson, MS 39206		EPA List		Town Creek	2			
241	3472 Meadow Heights Dr. 12/8/2010		poised		Subaska Creek	4	2010	6366	
242	1592 Canal Dr. Jackson, MS 39209		EPA List		Lynch Creek	2			
243	1408 Birch Baywood Rd. near 1440 12/9/2010		poised		Casey Creek	1	2010	6384	
244	434 Paulina St. 12/9/2010		poised		Lynch Creek	2	2010	6387	
245	5241 Capital Dr. 12/11/2010		poised		Lynch Creek	2	2010	6401	
246	1121 Longview St. 12/11/2010		poised		Town Creek	4	2010	6402	
247	1070 Oakway Dr. 12/13/2010		poised		Subaska Creek	4	2010	6415	
248	Baymontage Dr. & Ashburn St. 12/13/2010		poised		Town Creek	3	2010	6423	
249	403 Canton Ave. 12/13/2010		poised		Casey Creek	1	2010	6430	
250	Bayley Dr. & Ernie Blvd. 12/14/2010		poised		Subaska Creek	4	2010	6439	
251	179 Gossamer Cir. 12/14/2010		poised		Casey Creek	1	2010	6450	
252	Linwood Dr. & North State St. 12/15/2010		poised		Hanging Moss Creek	4	2010	6514	
253	1-55 North & Northside Drive 12/15/2010		poised		Eastover Creek	4	2010	6521	
254	1645 Wiggins Rd. 12/16/2010		poised		Lynch Creek	2	2010	6532	
255	2018 Capital St. 12/17/2010		poised		Town Creek	2	2010	6573	



**City Of Jackson, Mississippi  
Sewer System Overflow Inspection Form**

City of Jackson, Mississippi  
Department of Public Works  
Post Office Box 11  
Jackson, MS 39202  
(601) 968-2641

Address	Date	Inspector	Overflow Type	Flow	Flow Rate	Flow Duration	Flow Volume
256 2430 Albemarle Rd. 12/17/2010			posted	Town Creek	3		2010 6577
257 354 St. Andrews Dr. 12/18/2010			posted	Purple Creek	4		2010 6582
258 185 Woody Dr. 12/20/2010			posted	Hardy Creek	1		2010 6613
259 1244 N. L. King Dr. 12/20/2010			posted	Town Creek	3		2010 6614
260 Avataa Dr. & Wiscell Rd. 12/20/2010			posted	Tubanks Creek	3		2010 6620
261 1251 Woodvillage Dr. 12/21/2010			posted	Lynch Creek	2		2010 6649
262 550 Houston Ave. 12/21/2010			posted	Lynch Creek	2		2010 6655
263 McCreath Road Pk. (NO ADDRESS GIVEN) 12/22/2010			posted	Casey Creek	1		2010 6655
264 2900 St. Charles St & Culbertson Ave. 12/24/2010			posted	Lynch Creek	2		2010 6737
265 595 Cedar Springs Rd. 12/28/2010			posted	Trabon Creek	1		2010 6817
266 Dead end Fox Orchard Pt 12/29/2010			posted	Purple Creek	4		2010 6818
267 1801 Hill Dr 12/29/2010			posted	Trabon Creek	1		2010 6822
268 1068 Combs St 12/28/2010			posted	Hardy Creek	1		2010 6782
269 668 Chelsea Dr 1/1/2011			posted	Casey Creek	1		2010 6901
270 1754 Brecon Dr. 1/3/2011			posted	Hardover Creek	4		2010 6942
271 308 Will O Wisp Way 1/4/2011			posted	Three Mile Creek	1		2010 6973
272 618 Lovell Dr. 1/4/2011			posted	Lynch Creek	5		2010 6979
273 840 Deland Cir. 1/5/2011			posted	Casey Creek	1		2010 7000
274 1754 Brecon Dr. 12/27/2010			posted	Eastover Creek	4		2010 6769
275 1800 Walter Dutch Welch Dr. 1/4/2011			posted	Town Creek	3		2010 6971
276 8102 Wayland Dr. 1/4/2011			posted	Hanging Moss Creek	4		2010 6926
277 415 Armour Dr. 1/5/2011			posted	Hanging Moss Creek	4		2011 8
278 120 Colonial Dr. 1/5/2011			posted	Three Mile Creek	1		2011 8
279 3875 135 S Timber Ridge Alle. 1/6/2011			posted	Casey Creek	1		2011 14
280 Belvedere Dr. & Fremont St. 1/6/2011			posted	Hardy Creek	1		2011 43
281 2625 Belvedere Dr. 1/7/2011			posted	Hardy Creek	1		2011 22
282 6990 State Highway 18 1/7/2011			posted	Casey Creek	1		2011 32
283 5749 Queen Christina Ln. 1/10/2011			posted	Lynch Creek	2		2011 128
284 540 Briarcliff Cir. 1/10/2011			posted	Casey Creek	1		2011 129
285 McWillie Dr. & Garvin St. 1/11/2011			posted	Hanging Moss Creek	6		2011 156
286 Beechwood Dr. 1/13/2011			posted	Hanging Moss Creek	3		2011 166
287 500 Wilman St. 1/13/2011			posted	Lynch Creek	2		2011 189
288 2961 McDowell DR. 1/14/2011			posted	Casey Creek	1		2011 201
289 Bailey Ave. & Woodrow Wilson Ave. 1/15/2011			posted	Town Creek	3		2011 216
290 5549 Queen Christina Ln 1/17/2011			posted	Lynch Creek	3		2011 241
291 431 Alder St. 1/18/2011			posted	Town Creek	2		2011 281
292 Bailey Ave. & Woodrow Wilson Ave. 1/20/2011			posted	Town Creek	2		2011 313
293 4829 Sheridan Dr. 1/20/2011			posted	Tubanks Creek	4		2011 325
294 104 Elmore St. 1/23/2011			posted	Lynch Creek	5		2011 472
295 834 Combs St. 1/28/2011			posted	Three Mile Creek	1		2011 501
296 540 Birchcliff Cir. 1/31/2011			posted	Casey Creek	1		2011 559
297 2424 Bailey Ave. 2/1/2011			posted	Town Creek	2		2011 592
298 724 Raymond Rd. 2/2/2011			posted	Three Mile Creek	1		2011 616
299 462 Floyd Ave. 2/2/2011			posted	Hardy Creek	1		2011 617
300 4025 Marham St. Jackson, MS 39209			EPA List	Town Creek	2		2011 635
301 2971 McDowell Rd. 2/3/2011			posted	Casey Creek	1		2011 635
302 430 Browning St. 2/3/2011			posted	Lynch Creek	3		2011 686
303 51 Northaven Rd 2/9/2011			posted	Purple Creek	4		2011 702
304 513 Queen Isabella Ln. Jackson, MS 39206			EPA List	Lynch Creek	2		2011 722
305 301 Elean Rd. 2/9/2011			posted	Casey Creek	1		2011 722
306 1072 Cooper Rd. 2/11/2011			posted	Casey Creek	1		2011 726
307 415 Merigold St (in the park) 2/16/2011			posted	Three Mile Creek	1		2011 888
308 5435 Queen Mary Ln. Jackson, MS 39209			EPA List	Lynch Creek	3		2011 909
309 1119 McLenn St. 2/17/2011			posted	Lynch Creek	2		2011 909
310 519 Queen Juliana Ln. Jackson, MS 39206			EPA List	Lynch Creek	3		2011 947
311 1715 Jayne Ave.			posted	Lynch Creek	2		2011 947
312 491 Edison Drive 2/2/2011			posted	Casey Creek	1		2011 1024
313 5408 Queen Mary Ln. Jackson, MS 39209			EPA List	Lynch Creek	3		2011 1038
314 207 Johnston Ave. 2/22/2011			posted	Lynch Creek	2		2011 1038
315 1540 Sunset Drive 2/28/2011			posted	Town Creek	3		2011 1141
316 2113 Lincoln Ave. 2/28/2011			posted	Lynch Creek	3		2011 1137
317 340 Brantford Cir. 2/28/2011			posted	Casey Creek	1		2011 1161
318 Garvin St. & McWillie Dr. 2/28/2011			posted	Hanging Moss Creek	4		2011 1099
319 2937 Maydale Dr. 2/24/2011			posted	Casey Creek	1		2011 1065
320 415 E. Capitol St 2/24/2011			posted	Town Creek	2		2011 1080
321 117 Clinton Park Dr. 2/23/2011			posted	Lynch Creek	4		2011 1044
322 5134 Queen Eleanor Ln. Jackson, MS 39209			EPA List	Lynch Creek	3		2011 1159
323 West Bank Interspace Dead End off N Cheryl Dr. 2/24/2011			posted	Hanging Moss Creek	4		2011 1159
324 5148 Queen Eleanor Ln. Jackson, MS 39209			EPA List	Lynch Creek	3		2011 1155
325 5349 Queen Christina Lane 3/1/2011			posted	Lynch Creek	5		2011 1155
326 125 Taylor Street 1/30/2011			posted	Town Creek	4		2011 1191
327 417 Windsor Dr. Jackson, MS 39209			EPA List	Lynch Creek	3		2011 1185
328 109 Glen Eric St. 3/2/2011			posted	Casey Creek	1		2011 1185
329 Behind ballfield on Lakeland Dr. 1/9/2011			posted	Tubanks Creek	4		2011 1374
330 260 Cobdenbrook Ave. Jackson, MS 39209			EPA List	Lynch Creek	3		2011 1394
331 255 Meadowbrook Rd. 3/10/2011			posted	Tubanks Creek	4		2011 1394
332 259 Cobdenbrook Ave. Jackson, MS 39209			EPA List	Lynch Creek	3		2011 1494
333 908 Fairway Rd. 3/16/2011			posted	Three Mile Creek	1		2011 1494
334 Dean end off N Cheryl (West Bank Interspace) 3/21/2011			posted	Hanging Moss Creek	4		2011 1490
335 207 Courtly Clay Dr. Jackson, MS 39209			EPA List	Lynch Creek	2		2011 1635
336 154 Houston Ave. 1/23/2011			posted	Lynch Creek	2		2011 1635
337 Country Club Dr. Jackson, MS			EPA List	Hogus Chim Creek	3		2011 1700
338 8210 Briard Oak Dr. 3/28/2011			posted	Purple Creek	4		2011 1700
339 Country Club Dr. Jackson, MS			EPA List	Lynch Creek	3		2011 1723
340 3728 Bailey Ave. 3/29/2011			posted	Town Creek	3		2011 1723



City Of Jackson, Mississippi  
Sewer System Overflow Inspection Form

City of Jackson, Mississippi  
Department of Public Works  
P.O. Box 200  
Jackson, MS 39201  
601-955-3300

NO.	ADDRESS	STATUS	DATE	TYPE	LOCATION	NO. OF OVERFLOWS	DATE	REMARKS
341	4073 Weston Dr, Jackson, MS 39208			EPA List	Lynch Creek	1		
342	West Chapel Dr. & Hastings Hill Dr. 4/8/2011			posted	Hanging Moss Creek	4	3/11/2011	
343	Queen Mary Ln. 4/21/2011			posted	Lynch Creek	3	3/11/2011	
344	3171 Santa Clara Cir. 4/21/2011			posted	Hardy Creek	1	3/11/2011	
345	139 Maple Ridge Dr. 4/19/2011			posted	Hardy Creek	1	3/11/2011	
346	1105 J.R. Lynn St. 4/20/2011			posted	Town Creek	2	3/11/2011	
347	Wired St. & Bell St. 1/16/2010			posted	Town Creek	2		
348	Fant Dr & Willow Way 4/20/2011			posted	Three Mile Creek	1	3/11/2011	
349	102 Ridgeway St. 4/21/2011			posted	Town Creek	4	3/11/2011	
350	Bobby Ave/Madison East Blvd, Jackson, MS			EPA List	Town Creek	3		
351	Packer St. & Walnut St. 4/21/2011			posted	Lynch Creek	2	3/11/2011	
352	Fant Dr. & Willow Way 4/20/2011			posted	Three Mile Creek	1	3/11/2011	
353	901 E. Fair/Fountain St. 4/20/2011			posted	Town Creek	2	3/11/2011	
354	3334 Brevard/How Dr. 4/20/2011			posted	Trabon Creek	1	3/11/2011	
355	311 John St, Jackson, MS 39203			EPA List	Town Creek	2		
356	2182 Stearns Lane Rd 4/20/2011			posted	Candy Creek	1	3/11/2011	
357	Bowers Ave/Jones St., Jackson, MS			EPA List	Town Creek	1		
358	Walden St. & Elm St. 4/20/2011			posted	Town Creek	3	3/11/2011	
359	West end of N. Cheryl Dr. (West Bank Interceptor) 4/20/2011			posted	Hanging Moss Creek	4	3/11/2011	
360	Delann St. & E. Lynch St. 4/27/2011			posted	Town Creek	1	3/11/2011	
361	1853 Boulder Washington St, Jackson, MS 39213			EPA List	Town Creek	3		
362	Providence St. & E. Lynch St. 4/27/2011			posted	Town Creek	2	3/11/2011	
363	1853 Boulder Washington St, Jackson, MS 39213			EPA List	Town Creek	3		
364	3154 Queen Mary Lane 4/27/2011			posted	Trabon Creek	5	3/11/2011	
365	1853 Boulder Washington St, Jackson, MS 39213			EPA List	Town Creek	3		
366	1173 Longwood Dr. 4/20/2011			posted	Candy Creek	1	3/11/2011	
367	1014 Old Highway 93 W 4/20/2011			posted	Lynch Creek	2	3/11/2011	
368	112 Acorn/late Dr. 4/27/2011			posted	Fisher Creek	1	3/11/2011	
369	4447 Highland Drive Blvd. 4/20/2011			posted	Town Creek	3	3/11/2011	
370	1318 S. Gullhorn St. 4/20/2011			posted	Lynch Creek	2	3/11/2011	
371	West Bank Interceptor, dead end of N. Cheryl 3/9/2011			posted	Hanging Moss Creek	4	3/11/2011	
372	2812 Marion Dunbar St. 4/28/2011			posted	Town Creek	3	3/11/2011	
373	Lorain Hill & Winkler Ave. 4/20/2011			posted	Town Creek	4	3/11/2011	
374	1301 Hawthridge Dr. 5/2/2011			posted	Town Creek	3	3/11/2011	
375	1314 Livingston Rd. 5/2/2011			posted	Town Creek	3	3/11/2011	
376	13003 McCarty St 500 S&C/Car Rd 5/3/2011			posted	Candy Creek	1	3/11/2011	
377	130004 Howell St 111 Swood Rd & McCluer Rd. 5/3/2011			posted	Trabon Creek	1	3/11/2011	
378	130032 Howell St 111 Swood Rd & McCluer Rd.			posted	Trabon Creek	1	3/11/2011	
379	1600 water church watch dr, Jackson, MS 39211			EPA List	Town Creek	3		
380	5010 193 South Sautons WWTP 5/3/2011 - 5/4/2011			posted	Hardy Creek	1	3/11/2011	
381	4126 Parkway Ave, Jackson, MS 39213			EPA List	Town Creek	3		
382	1011 James Dr. 5/4/2011			posted	Hanging Moss Creek	4	3/11/2011	
383	Monroe St. & Gwynn St. 5/4/2011			posted	Bellhaven Creek	2	3/11/2011	
384	1313 Canal Hill Dr. 5/5/2011			posted	Hardy Creek	1	3/11/2011	
385	1808 Taylor Dr. 5/3/2011			posted	Lynch Creek	1	3/11/2011	
386	1900 Lawrence Dr. 5/5/2011			posted	Eastover Creek	4	3/11/2011	
387	243 Lawrence Blvd. 5/5/2011			posted	Town Creek	4	3/11/2011	
388	1442 Rowland Dr. 5/4/2011			posted	Bellhaven Creek	3	3/11/2011	
389	1315 Redfish Dr & E. St. Forestry Rd. 5/4/2011			posted	Hanging Moss Creek	4	3/11/2011	
390	West St. near 201 E. Ridgeway St. 5/7/2011			posted	Town Creek	4	3/11/2011	
391	1011 Commonwealth Ln. 5/7/2011			posted	Trabon Creek	1	3/11/2011	
392	101 Ridgeway St. 5/6/2011			posted	Town Creek	4	3/11/2011	
393	1212 Mulwood Pl. 5/9/2011			posted	Eastover Creek	4	3/11/2011	
394	1629 W Northside Dr, Jackson, MS 39213			EPA List	Sugar Chimney Creek	3		
395	1010 Overholt St. 5/9/2011			posted	Town Creek	1	3/11/2011	
396	135 Abram Ford Dr, Jackson, MS 39213			EPA List	Town Creek	1		
397	3556 Harvard Ave. 5/10/2011			posted	Candy Creek	1	3/11/2011	
398	140 Abram Ford Dr, Jackson, MS 39213			posted	Candy Creek	1	3/11/2011	
399	147 East Woodmont Dr. 5/10/2011			posted	Candy Creek	1	3/11/2011	
400	130 Abram Ford Dr, Jackson, MS 39213			EPA List	Town Creek	3		
401	1338 N. State St. 5/10/2011			posted	Bellhaven Creek	4	3/11/2011	
402	4256 Overbrook Dr, Jackson, MS 39213			EPA List	Town Creek	2		
403	2524 Clinton Blvd. 5/11/2011			posted	Lynch Creek	3	3/11/2011	
404	1943 Cahill Dr. 5/11/2011			posted	Lynch Creek	3	3/11/2011	
405	117 Calwood St. 5/11/2011			posted	Bellhaven Creek	4	3/11/2011	
406	4061 Oaklawn Dr, Jackson, MS 39204			EPA List	Bellhaven Creek	3		
407	518 Canton Club Cir. 5/11/2011			posted	Purple Creek	4	3/11/2011	
408	1017 Congressional Ln. 5/11/2011			posted	Trabon Creek	1	3/11/2011	
409	Capitol St. & Proctor St. 5/11/2011			posted	Town Creek	2	3/11/2011	
410	4249 Mandeville Rd, Jackson, MS 39206			EPA List	Bellhaven Creek	2		
411	401 Lawrence Blvd. 5/12/2011			posted	Town Creek	4	3/11/2011	
412	1320 Boardwalk Dr. 5/12/2011			posted	Town Creek	3	3/11/2011	
413	1771 Woodhew Dr. 5/12/2011			posted	Town Creek	4	3/11/2011	
414	145 Sunwood Dr, Jackson, MS 39206			EPA List	Bellhaven Creek	1		
415	101 E. Ridgeway St. 5/12/2011			posted	Town Creek	4	3/11/2011	
416	1628 Jackson Park Cir. 5/16/2011			posted	Candy Creek	1	3/11/2011	
417	2875 W. McCrawall Rd. 5/16/2011			posted	Candy Creek	1	3/11/2011	
418	1781 Woodway Dr. 5/16/2011			posted	Hanging Moss Creek	3	3/11/2011	
419	Proctor St. & Capitol St. 5/16/2011			posted	Town Creek	2	3/11/2011	
420	1601 E. Ave. St. 5/16/2011			posted	Town Creek	2	3/11/2011	
421	518 Woodlawn Dr, Jackson, MS 39206			EPA List	Hanging Moss Creek	3		
422	1814 Columbia Ave. 5/21/2011			posted	Green Creek	3	3/11/2011	
423	518 Woodlawn Dr, Jackson, MS 39206			EPA List	Hanging Moss Creek	3		
424	2409 Queen Mary Lane 5/24/2011			posted	Lynch Creek	3	3/11/2011	
425	518 Woodlawn Dr, Jackson, MS 39206			EPA List	Hanging Moss Creek	3		



City Of Jackson, Mississippi  
Sewer System Overflow Inspection Form

City of Jackson, Mississippi  
Department of Public Works  
P.O. BOX 30017  
JACKSON, MS 39210  
601-966-3800

416	Waino St. & Forest St. 5/23/2011	poisoned	Lynch Creek	2	2011 2657
417	No. 1 DuPont/Row 6/12/2011	poisoned G Half	Lynch Creek	3	2011 2758
418	5227 Commodore Ln. 6/1/2011	poisoned G Half	Trotter Creek	3	2011 3166
419	1548 Greyhound Ave. 6/1/2011	poisoned G Half	Belhaven Creek	2	2011 2927
420	1007 Beane St. 6/22/2011	poisoned G Half	Boquet Collins Creek	3	2011 2774
421	1007 Chicago Plaza, Jackson, MS 39211	JPA Lint	Purple Creek	4	2011 2784
422	Orange St. & Osborn St. 6/22/2011	poisoned G Half	Belhaven Creek	2	2011 2928
423	817 Oakwood St. 6/30/2011	poisoned G Half	Belhaven Creek	4	2011 3019
424	4612 Belmonte Pl. 6/5/2011	poisoned G Half	Palmetto Creek	3	2011 2915
425	Glennwood Dr. & Bayberry Dr. 6/10/2011	poisoned G Half	Lynch Creek	3	2011 2914
426	414 Loxwood Blvd. 6/6/2011	poisoned G Half	Belhaven Creek	4	2011 2823
427	350 Belhaven St. 6/6/2011	EPA Lint	Purple Creek	4	2011 2829
428	4825 Chubbart Vista Dr. Jackson, MS 39211	poisoned G Half	Purple Creek	1	2011 2829
429	1489 Fairmount Rd. 6/22/2011	EPA Lint	Purple Creek	4	2011 2941
430	7381 Colonial Cir. Jackson, MS 39211	poisoned G Half	Purple Creek	3	2011 3008
442	121 Oak Canyon Hill Dr. Jackson, MS 39211	poisoned G Half	Purple Creek	4	2011 3008
443	1034 Graymont Ave. 6/7/2011	poisoned G Half	Belhaven Creek	3	2011 2872
444	Blg. St. & Ridgeway St. 6/10/2011	poisoned G Half	Boquet Collins Creek	4	2011 2853
445	1913 Boling St. 6/12/2011	EPA Lint	Hanging Moss Creek	4	2011 2983
446	5118 Hamway Dr. Jackson, MS 39211	poisoned G Half	Fanny Creek	1	2011 2983
447	1491 Lee Cir. 6/12/2011	EPA Lint	Hanging Moss Creek	4	2011 2922
448	2540 Herrow Dr. Jackson, MS 39211	poisoned G Half	Fanny Creek	1	2011 2922
449	1066 Macklowe Heights Dr. 6/13/2011	poisoned G Half	Palmetto Creek	3	2011 2926
450	375 Rollingwood Dr. Jackson, MS 39211	poisoned G Half	Palmetto Creek	4	2011 3023
451	Birch Rd. & MacClear Rd. 6/23/2011	EPA Lint	Hanging Moss Creek	4	2011 3029
452	563 Rollingwood Dr. Jackson, MS 39211	poisoned G Half	Lynch Creek	2	2011 2956
453	240 Penitence Pl 6/14/2011	EPA Lint	Hanging Moss Creek	4	2011 2957
454	201 E. Northside Cir. 6/14/2011	poisoned G Half	Hanging Moss Creek	4	2011 2922
455	300 E. Capitol St. 6/14/2011	poisoned G Half	Lynch Creek	3	2011 2922
456	200 Chatham St. 6/14/2011	poisoned G Half	Palmetto Creek	3	2011 3002
457	5545 Foothill Dr. Jackson, MS 39211	poisoned G Half	Palmetto Creek	4	2011 3002
458	170 Trethowan Dr. 6/14/2011	EPA Lint	Three Mile Creek	1	2011 3023
459	2200 Dorian Dr. 6/23/2011	poisoned G Half	Three Mile Creek	1	2011 3029
460	Brace Ave. & Lacey Dr. in creek 6/18/2011	poisoned G Half	Lynch Creek	2	2011 2956
461	230 Pinhook Pl. Jackson, MS 39211	EPA Lint	Hanging Moss Creek	4	2011 2957
462	4920 N. Wood St. 6/16/2011	poisoned G Half	Palmetto Creek	3	2011 2962
463	374 Queen Mary Lane 6/17/2011	poisoned G Half	Lynch Creek	3	2011 2980
464	250 Walker Dr. 6/18/2011	poisoned G Half	Palmetto Creek	3	2011 3002
465	3861 McDowell Rd. 6/19/2011	poisoned G Half	Lynch Creek	1	2011 3002
466	1770 Shady Lane 6/22/2011	poisoned G Half	Lynch Creek	1	2011 3002
467	374 Barnes St. 6/10/2011	poisoned G Half	Lynch Creek	1	2011 3002
468	1325 Shelton Dr. 6/21/2011	poisoned G Half	Hanging Moss Creek	4	2011 3015
469	812 Canale St. 6/23/2011	poisoned G Half	White Oak Creek	4	2011 3050
470	1031 Plumtree St. 6/24/2011	poisoned G Half	Three Mile Creek	1	2011 3051
471	6012 Colburn Dr. 6/24/2011	poisoned G Half	Lynch Creek	3	2011 3064
472	1700 Oak Cir. 6/23/2011	poisoned G Half	Lynch Creek	2	2011 3070
473	821 Memphis St. 6/26/2011	EPA Lint	Hanging Moss Creek	4	2011 3084
474	8211 Whitson St. 6/26/2011	poisoned G Half	Belhaven Creek	3	2011 3092
475	1030 Lakewood Dr. Jackson, MS 39211	poisoned G Half	Belhaven Creek	3	2011 3092
476	1111 Wilcox Ave. 6/20/2011	EPA Lint	Palmetto Creek	4	2011 3086
477	1113 E. Northside Dr. Jackson, MS 39211	poisoned G Half	Palmetto Creek	4	2011 3107
478	602 Osborn Dr. 6/23/2011	poisoned G Half	Three Mile Creek	1	2011 3107
479	625 Crestline Ave. 6/23/2011	poisoned G Half	Lynch Creek	1	2011 3108
481	4570 Oak Canyon Rd. Jackson, MS 39211	EPA Lint	Palmetto Creek	4	2011 3108
482	2840 Redmont Rd. 6/27/2011	poisoned G Half	Lynch Creek	2	2011 3109
483	5160 E-5 Frontage Rd. 6/27/2011	poisoned G Half	White Oak Creek	4	2011 3110
484	4580 Oak Canyon Rd. & Northside, Jackson, MS 39211	EPA Lint	Palmetto Creek	4	2011 3111
485	3520 Lane Dr. 6/27/2011	poisoned G Half	Palmetto Creek	1	2011 3111
486	1220 E. Northside Dr. Jackson, MS 39211	EPA Lint	Palmetto Creek	4	2011 3111
487	520 Breverton Cir. 6/27/2011	poisoned G Half	Palmetto Creek	1	2011 3111
488	3741 Wycosa Dr. 6/16/2011	poisoned G Half	Palmetto Creek	4	2011 3116
489	4207 Michael Pkwy St. 6/10/2011	poisoned G Half	Lynch Creek	1	2011 3162
490	Jefferson St. & Tompkins St. 6/29/2011	poisoned G Half	Lynch Creek	2	2011 3166
491	1310 McLeod Pl. Jackson, MS 39206	poisoned G Half	Belhaven Creek	3	2011 3172
492	5088 700 & Walker Dr. 7/5/2011	EPA Lint	Palmetto Creek	4	2011 3204
493	5088 700 & Walker Dr. 7/5/2011	poisoned G Half	Palmetto Creek	4	2011 3204
494	4401 Hainsworth Dr. 7/5/2011	poisoned G Half	Palmetto Creek	3	2011 3206
495	6035 Newland Ave. 7/5/2011	poisoned G Half	Palmetto Creek	2	2011 3206
496	1943 Willow Walk 7/4/2011	poisoned G Half	Hanging Moss Creek	4	2011 3206
497	4115 Hamway Dr. 7/5/2011	poisoned G Half	Lynch Creek	1	2011 3211
498	1111 Glenhurst Cir. 7/5/2011	poisoned G Half	Palmetto Creek	4	2011 3207
499	4130 Olive Blvd. Jackson, MS 39211	EPA Lint	Palmetto Creek	3	2011 3206
500	Greenway St. & Hill St. 7/6/2011	poisoned G Half	Palmetto Creek	2	2011 3206
501	822 Chestnut St. 7/5/2011	poisoned G Half	Palmetto Creek	3	2011 3234
502	14506 St. & Fiddling Ave. 7/6/2011	poisoned G Half	Palmetto Creek	1	2011 3234
503	4631 Churchhill Dr. Jackson, MS 39206	EPA Lint	Palmetto Creek	4	2011 3234
504	3035 Northside Dr. 7/6/2011	poisoned G Half	Palmetto Creek	3	2011 3234
505	1665 Churchhill Dr. Jackson, MS 39206	EPA Lint	Palmetto Creek	4	2011 3234
506	543 Broadmoor Dr. 7/2/2011	poisoned G Half	Palmetto Creek	3	2011 3237
507	Forest Ave. & Walker Dr. 7/2/2011	poisoned G Half	Palmetto Creek	3	2011 3237
508	4800 Winterstone Terrace, Jackson, MS 39206	EPA Lint	Palmetto Creek	3	2011 3237
509	1333 Turp Ave. 1/22/2011	poisoned G Half	Lynch Creek	2	2011 3232
510	1623 Westminster Terrace, Jackson, MS 39206	EPA Lint	Palmetto Creek	4	2011 3232



**City Of Jackson, Mississippi**  
**Saner System Overflow Inspection Form**

City of Jackson, Mississippi  
Department of Public Works  
Sanitation Division  
Jackson, MS 39201  
601-792-2811

Address	Inspection Date	Inspector	Overflow Type	Overflow Location	Overflow Volume (Gallons)	Overflow Duration (Hours)	Notes
511 024 Northwood Dr. 7/8/2011			posted G Huff	Caney Creek	1	2011 1212	
512 621 Houston Ave. 7/8/2011			posted G Huff	Lynch Creek	2	2011 1214	
513 Palmetto St. & Elm St. 7/14/2011			posted G Huff	Town Creek	1	2011 1245	
514 901 Pearl St. 7/17/2011			posted G Huff	Town Creek	2	2011 1281	
515 4521 Ridgeway Rd. 7/19/2011			posted G Huff	Eastern Creek	4	2011 1340	
516 2150 Northbank Dr. Jackson, MS 39206			EPA List	Eastern Creek	4		
517 0300 Block Palmetto St. 7/19/2011			posted G Huff	Town Creek	1	2011 1374	
518 4148 Robin Ln. Jackson, MS 39206			EPA List	Eastern Creek	4		
519 Picket Ave. & Wetline Dr. 7/8/2011			posted G Huff	Eastern Creek	1	2011 1245	
520 4106 Robin Dr. Jackson, MS 39206			EPA List	Eastern Creek	4		
521 0300 Harrison Ave. 7/12/2011			posted G Huff	Lynch Creek	1	2011 1222	
522 2015 McAlpin Rd. - Deal end of Brookridge Rd. 7/8/2011			posted G Huff	Flowy Creek	1	2011 1312	
523 Mississippi St. & Jefferson St. 7/12/2011			posted G Huff	Belhaven Creek	2	2011 1249	
524 S. W. Harris Dr. 7/12/2011			posted G Huff	Hanging Moss Creek	4	2011 1267	
525 Jefferson St. & Volusia St. 7/13/2011			posted G Huff	Three Mile Creek	1	2011 1238	
526 744 Postburg Dr. 7/12/2011			posted G Huff	Belhaven Creek	4	2011 1311	
527 600 Houston Dr. - Pump Station 7/12/2011			posted G Huff	Caney Creek	1	2011 1228	
528 2614 Oakleaf Dr. 7/13/2011			posted G Huff	Three Mile Creek	1	2011 1250	
529 2611 Greenwood Ave. 7/14/2011			posted G Huff	Flowy Creek	1	2011 1345	
530 2536 Livingston Rd. 7/13/2011			posted G Huff	Town Creek	1	2011 1342	
531 Aurora Christian Lane 7/14/2011			posted G Huff	Lynch Creek	1	2011 1302	
532 Ridgeway St. & Fairview St. 7/14/2011			posted G Huff	Belhaven Creek	4	2011 1324	
533 2200 N. State St. Jackson, MS 39204			EPA List	Belhaven Creek	4		
534 501 Commercial Ave. 7/12/2011			posted G Huff	Lynch Creek	2	2011 1372	
535 2111 Riverside Dr. Jackson, MS 39201			EPA List	Belhaven Creek	4		
536 814 Hickman Rd. 7/13/2011			posted G Huff	Eastern Creek	1	2011 1272	
537 1401 Ogden St. - Ridgeway 20 Frontage 7/13/2011			posted G Huff	Lynch Creek	2	2011 1335	
538 010 S. M. Lane Ave. Jackson, MS 39201			EPA List	Caney Creek	4		
539 0200 Block Robin Dr. 7/17/2011			posted G Huff	Caney Creek	1	2011 1377	
540 205 McLean Ave. Jackson, MS 39201			EPA List	Town Creek	4		
541 Churchhill Dr. & Robinson Rd. 7/18/2011			posted G Huff	Eastern Creek	4	2011 1332	
542 211 McLean Ave. Jackson, MS 39201			EPA List	Town Creek	4		
543 060 Carter Ave. 7/18/2011			posted G Huff	Town Creek	2	2011 1351	
544 Visiting in seat 1011 Gentry St. 7/18/2011			posted G Huff	Town Creek	1	2011 1380	
545 Maynard Dr. near 8432 7/18/2011			posted G Huff	Lynch Creek	3	2011 1395	
546 2130 Riverside Dr. - Water Plant - Pearl River 7/18/2011			posted G Huff	Eastern Creek	4	2011 1402	
547 1011 N. State St. & Memphis St. Jackson, MS 39201			EPA List	Town Creek	4		
548 Tang Rd. & Carlton St. 7/18/2011			posted G Huff	Lynch Creek	1	2011 1394	
549 1034 N. Hwy. 54 & Marine St. Jackson, MS 39202			EPA List	Town Creek	4		
550 172 E. Woodland Dr. 7/18/2011			posted G Huff	Caney Creek	1	2011 1387	
551 Apple Blvd. & Kennard Pl. 8/3/2011			posted G Huff	Belhaven Creek	4	2011 1272	
552 1492 1860 St. 8/3/2011			posted G Huff	Town Creek	2	2011 1320	
553 1215 Vermont Dr. 8/3/2011			posted G Huff	Purple Creek	4	2011 1231	
554 884 Oak Canyon Rd. 8/3/2011			posted G Huff	Purple Creek	4	2011 1250	
555 815 1/2 Maple 8/2/2011			posted G Huff	White Oak Creek	4	2011 1313	
556 1881 Maple Ln. 8/2/2011			posted G Huff	Three Mile Creek	1	2011 1287	
557 1413 Kensington Ave. 8/2/2011			posted G Huff	Town Creek	1	2011 1312	
558 1515 First Ave. 8/2/2011			posted G Huff	Caney Creek	2	2011 1288	
559 2136 Grande Dr. 8/2/2011			posted G Huff	Caney Creek	1	2011 1312	
560 1813 Pearl Dr. 8/2/2011			posted G Huff	Hanging Moss Creek	1	2011 1371	
561 2541 Queen Christina Ln. Queen Eleanor Ln. 8/2/2011			posted G Huff	Lynch Creek	1	2011 1267	
562 805 McLean Ave. 8/2/2011			posted G Huff	Town Creek	4	2011 1225	
563 3021 Woodside Dr. 8/4/2011			posted G Huff	Caney Creek	1	2011 1281	
564 2034 Butler Blvd. & Kennard Pl. 8/4/2011			posted G Huff	Belhaven Creek	4	2011 1281	
565 2224 Madison Dr. 8/5/2011			posted G Huff	Eastern Creek	4	2011 1298	
566 2239 Livingston Rd. 8/5/2011			posted G Huff	Town Creek	1	2011 1273	
567 848 Chelsea Dr. 8/3/2011			posted G Huff	Caney Creek	1	2011 1268	
568 104 E. Pumpstation St. 8/3/2011			posted G Huff	Belhaven Creek	4	2011 1267	
569 174 Pine Lawn Pl. 8/2/2011			posted G Huff	Three Mile Creek	1	2011 1240	
570 731 Volusia St. 8/2/2011			posted G Huff	Three Mile Creek	1	2011 1239	
571 1610 Palmyra Rd. 8/2/2011			posted G Huff	Caney Creek	1	2011 1217	
572 1644 Cornelia Dr. 8/2/2011			posted G Huff	Lynch Creek	1	2011 1225	
573 4715 Derrigan Manor 8/2/2011			posted G Huff	Town Creek	1	2011 1210	
574 Solway Dr. & Old Canton Rd. 8/1/2011			posted G Huff	Hanging Moss Creek	4	2011 2016	
575 1644 Laurel Dr. 8/1/2011			posted G Huff	Lynch Creek	1	2011 2007	
576 135 Ross St. 8/1/2011			posted G Huff	Town Creek	2	2011 1202	
577 2301 St. Charles St. 8/1/2011			posted G Huff	Lynch Creek	2	2011 1202	
578 301 East Washington 8/1/2011			posted G Huff	Belhaven Creek	2	2011 1205	
579			posted G Huff	Town Creek	3	2011 1211	
580			posted G Huff	Town Creek	3	Unlabeled Photographs	
581			posted G Huff	Lynch Creek	3	Unlabeled Photographs	
582 1071 Maple Lane 7/14/2011			posted G Huff	Three Mile Creek	1	2011 1282	
583 1407 Orange Ave. 7/14/2011			posted G Huff	Town Creek	2	2011 1281	
584 6331 Cherokee Dr. 7/14/2011			posted G Huff	Belhaven Creek	4	2011 1242	
585 732 Woodland Dr. 7/22/2011			posted G Huff	Three Mile Creek	1	2011 1281	
586 1491 Elm Cir. 7/22/2011			posted G Huff	Caney Creek	1	2011 1245	
587 225 W. McDowell Rd. 7/22/2011			posted G Huff	Flowy Creek	1	2011 1249	
588 478 Bailey Ave. 7/21/2011			posted G Huff	Town Creek	1	2011 1242	
589 125 St. McDowell Rd. 7/20/2011			posted G Huff	Flowy Creek	1	2011 1218	
590 120 Colonial Dr. 7/15/2011			posted G Huff	Three Mile Creek	1	2011 1204	
591 1960 Memphis Dr. 7/14/2011			posted G Huff	Caney Creek	4	2011 1210	
592 Colburn Dr. & Woodbury Rd. 7/26/2011			posted G Huff	Belhaven Creek	4	2011 1227	
593 1944 Grand Ave. 7/26/2011			posted G Huff	Town Creek	1	2011 1225	
594 0020 Woodburn Dr. 7/27/2011			posted G Huff	Caney Creek	1	2011 1247	
595 4948 Highway 15 7/27/2011			posted G Huff	Caney Creek	1	2011 1238	
596 227 Copper Rd. 7/27/2011			posted G Huff	Caney Creek	1	2011 1252	
597 2802 Angela Cir. 7/27/2011			posted G Huff	Lynch Creek	2	2011 1227	
598 129 Woodland Terrace 7/27/2011			posted G Huff	Caney Creek	1	2011 1239	



**City Of Jackson, Mississippi  
Sewer System Overflow Inspection Form**

City of Jackson, Mississippi  
Department of Public Works  
3150 Jefferson Ave. 12  
Jackson, MS 39201  
601-968-2551

599	4156 Crane Blvd. 7/21/2011	posted G Huff	Caney Creek	4	2011 9659
600	3007 Lamar St. 7/26/2011	posted G Huff	Town Creek	4	2011 1567
601	1654 Carmilla Dr. 7/30/2011	posted G Huff	Lynch Creek	1	2011 9972
602	2811 Bay Ave. 7/26/2011	posted G Huff	Town Creek	5	2011 9930
603	178 E. Woodcrest Dr. 8/2/2011	posted G Huff	Caney Creek	1	2011 1650
604	178 E. Woodcrest Dr. 7/27/2011	posted G Huff	Caney Creek	1	2011 52015
605	3111 Lee Cir. 7/31/2011	posted G Huff	Hardy Creek	1	2011 4998
606	Catalina Dr. & Boulevard Rd. 7/31/2011	posted G Huff	Eubanks Creek	4	2011 10060
607	S.A. 056 Franklin D Roosevelt Dr. 7/14/2011	posted G Huff			2011 20015
608	S.A. 056 Franklin D Roosevelt Dr. 7/5/2011	posted G Huff			2011 20016
609	S.A. 084 Westside # 1 1901 Wallace St. 7/14/2011	posted G Huff	Lynch Creek	2	2011 95018
610		posted G Huff	Lynch Creek	2	2011 30022
611	209 N. McDaniel Rd. 8/5/2011	posted G Huff	Three Mile Creek	1	2011 3711
612	Adelle St. & Adelle Ct. 8/5/2011	posted G Huff	Town Creek	4	2011 1708
613	5136 Gertrude Dr. 8/1/2011	posted G Huff	Caney Creek	1	2011 1727
614	5136 Gertrude Dr. 8/1/2011	posted G Huff	Caney Creek	1	2011 1131
615	2749 Woodside Dr. 8/8/2011	posted G Huff	Caney Creek	1	2011 1750
616	887 Brandon Ave. 8/9/2011	posted G Huff	Lynch Creek	2	2011 1741
617	California Ave. & Duro St. 8/8/2011	posted G Huff	Town Creek	3	2011 1740
618	Willow Way 8/9/2011	posted G Huff	Three Mile Creek	1	2011 10563
619	5951 California Ave. 8/12/2011	posted G Huff	Town Creek	3	2011 1815
620	4111 W Capital St. 8/12/2011	posted G Huff	Lynch Creek	2	2011 1814
621	3411 M. L. King Dr. 8/10/2011	posted G Huff	Town Creek	3	2011 1175
622	1644 Camellian Ln. 8/10/2011	posted G Huff	Lynch Creek	1	2011 1770
623	270 Lee Cir. 8/10/2011	posted G Huff	Hardy Creek	1	2011 1784
624	2840 Robinson Rd. 8/19/2011	posted G Huff	Lynch Creek	1	2011 1848
625	689 Wesley Dr. 8/15/2011	posted G Huff	Caney Creek	1	2011 1853
626	138 Valley St. 8/15/2011	posted G Huff	Lynch Creek	3	2011 1857
627	715 Barkley Dr. 8/16/2011	posted G Huff	Eubanks Creek	2	2011 1863
628	1590 Whiting Rd. 8/16/2011	posted G Huff	Lynch Creek	2	2011 1872
629	1725 Camilla Dr. 8/16/2011	posted G Huff	Lynch Creek	1	2011 1870
630	812 Williams Dr. 8/19/2011	posted G Huff	Three Mile Creek	1	2011 1895
631	1011 Belle Glade 8/19/2011	posted G Huff	Eastover Creek	4	2011 1899
632	Phoenia Ave & Bell St. 8/17/2011	posted G Huff	Town Creek	3	2011 1899
633	Monument St. & Capitol St. 8/17/2011	posted G Huff	Town Creek	2	2011 1899
634	1444 Kensington Ave. 8/18/2011	posted G Huff	Town Creek	1	2011 1893
635	232 Lee Cir. 8/18/2011	posted G Huff	Hardy Creek	1	2011 1111
636	2692 Kay St. 8/18/2011	posted G Huff	Hardy Creek	1	2011 1099
637	1726 Camilla Dr. 8/22/2011	posted G Huff	Lynch Creek	1	2011 1109
638	1918 Cantha Dr. 8/22/2011	posted G Huff	Three Mile Creek	1	2011 1185
639	1637 McDaniel Rd. 8/22/2011	posted G Huff	Caney Creek	1	2011 1145
640	Dead End of Eleanor Ave. 8/31/2011	posted G Huff	Town Creek	3	2011 1977
641	1023 Carter Ave. 8/21/2011	posted G Huff	Town Creek	1	2011 1983
642	815 Sumner Ave. 8/21/2011	posted G Huff	Three Mile Creek	1	2011 1964
643	1411 Belle Glade 8/24/2011	posted G Huff	Eastover Creek	4	2011 11075
644	Behind Westford Plaza 8/24/2011	posted G Huff	Lynch Creek	2	2011 11530
645	595 Cedar Springs Dr. 8/24/2011	posted G Huff	Trabon Creek	1	2011 11592
646	813 Walnut Rd. 8/28/2011	posted G Huff	Eubanks Creek	1	2011 4011
647	5145 Ridgewood Rd. 8/28/2011	posted G Huff	Hanging Moss Creek	4	2011 4028
648	102 E. Ridgewood St. 8/29/2011	posted G Huff	Town Creek	4	2011 4022
649	117 Clinton Park Dr. 8/29/2011	posted G Huff	Lynch Creek	1	2011 4042
650	1451 Shady Lane Dr. 8/29/2011	posted G Huff	Three Mile Creek	1	2011 4046
651	1681 Ramey Rd. 8/29/2011	posted G Huff	Caney Creek	1	2011 4036
652	Dongan St. & Gunda St. 8/29/2011	posted G Huff	Hardy Creek	1	2011 4038
653	6112 Floral Dr. 8/29/2011	posted G Huff	Hanging Moss Creek	1	2011 4047
654	616 Robinson Dr. 8/30/2011	posted G Huff	Trabon Creek	1	2011 4055
655	826 North St. 8/30/2011	posted G Huff	Town Creek	2	2011 4056
656	1251 Wood Village Dr. 8/30/2011	posted G Huff	Lynch Creek	2	2011 4049
657	3111 Castle Hill Dr. 8/29/2011	posted G Huff	Hardy Creek	1	2011 7770
658	4004 Northwest Dr. 8/27/2011	posted G Huff	Eubanks Creek	4	2011 1278
659	4615 Southside Dr. 8/11/2011	posted G Huff	Hanging Moss Creek	4	2011 10694
660	4358 California Ave. 7/28/2011	posted G Huff	Town Creek	3	2011 13907
661	4358 California Ave. 7/29/2011	posted G Huff	Town Creek	3	2011 20019
662	6112 Floral Dr. 8/30/2011	posted G Huff	Hanging Moss Creek	3	2011 20018
663	Broadmeor Dr. 8/31/2011	posted G Huff	Eubanks Creek	4	2011 12010
664	7816 Guster Road Ave. 8/31/2011	posted G Huff	Town Creek	3	2011 12028
665	1200 Newman Ave. 8/31/2011	posted G Huff	Eubanks Creek	3	2011 12082
666	S.S. 0126 Omgrowth Ct. & River Oaks Blvd. 8/4/2011	posted G Huff	Purple Creek	4	2011 31023
667	S.S. 0187 Westside #4 4919 Hwy 80 West & Westhaven Blvd.	posted G Huff	Lynch Creek	2	2011 31024
668	339 Magnolia Rd. 9/5/2011	posted G Huff	Lynch Creek	2	2011 4144
669	150 Carter Ave. 9/5/2011	posted G Huff	Town Creek	3	2011 4139
670	241 Stokes Robertson Rd. 9/5/2011	posted G Huff	Caney Creek	1	2011 4137
671	1005 Auburn Dr. 9/5/2011	posted G Huff	White Oak Creek	4	2011 4145
672	2441 Martin Luther King, Jr. Drive 9/5/2011	posted G Huff	Town Creek	3	2011 4120
673	525 Northside Cir. 9/5/2011	posted G Huff	Eubanks Creek	3	2011 4117
674	2025 Raymond Rd. 9/5/2011	posted G Huff	Caney Creek	1	2011 4119
675	3005 Raymond Rd. 9/5/2011	posted G Huff	Caney Creek	1	2011 4121
676	3245 Westgate Oaks Blvd. 9/4/2011	posted G Huff	Town Creek	3	2011 4114
677	Hartfield St. & West St. 9/1/2011	posted G Huff	Town Creek	4	2011 22065
678	976 Motarie Rd. 9/6/2011	posted G Huff	Lynch Creek	2	2011 12377
679	N. Watson Ave. & Ridgeway St. 9/6/2011	posted G Huff	Town Creek	1	2011 12486
680	617 N Park Ln. 9/6/2011	posted G Huff	Eubanks Creek	1	2011 12481
681	145 Lake of Pines Dr. 9/6/2011	posted G Huff	Hanging Moss Creek	3	2011 4681





**City Of Jackson, Mississippi  
Pump Station Potential Overflow Locations**

City of Jackson, Mississippi  
Department Of Public Works  
Post Office Box 17  
Jackson, MS 39205  
601-455-2000

PS#	Address/Property/Other Location	PS#	Address/Property/Other Location	Type	Receiving Waterway	Potential Frequency
1	3539 Shellrock Drive	PS61	255 S. Shellrock	Potential	Bogue Chitto Creek	3
2	Cynthia Road	PS93	Presidential Hills	Potential	Bogue Chitto Creek	3
3	956 Flag Chapel Road	PS18	992 Flag Chapel Road	Potential	Bogue Chitto Creek	3
4	1820 Greenwood Drive	PS39	2694 Moore Drive	Potential	Caney Creek	1
5	150 Hillview Drive	PS40	155 Hillview	Potential	Caney Creek	1
6	2117 Hickory Drive	PS24	2140 Hickory Drive	Potential	Caney Creek	1
7	2101 Raymond Road	PS53	2108 Raymond Road	Potential	Caney Creek	1
8	150 Timberlawn Road	PS73	132 Timberlawn Road	Potential	Trahan Creek	1
9	Highway 18	PS72	6115 Hwy. 18	Potential	Trahan Creek	1
10	120 Delray Drive	PS12	125 Delray Avenue	Potential	Caney Creek	1
11	1405 Canterbury Lane	PS87	Shannondale Drive	Potential	Trahan Creek	1
12	430 McClure Road	PS34	500 McClure Road	Potential	Caney Creek	1
13	4316 Lake Vista	PS15B	207 Elton Road	Potential	Caney Creek	1
14	893 Winthrop Circle	PS86	Whitestone Road	Potential	Hanging Moss Creek	3
15	6054 Floral Drive	PS46	6112 Floral Drive	Potential	Hanging Moss Creek	3
16	1396 Forest Avenue	PS19	1851 Forest Avenue	Potential	Eubanks Creek	3
17	2248 Sheffield Drive	PS59	2238 Sheffield Drive	Potential	Hanging Moss Creek	4
18	2 Old River Place	PS90	Old River Place	Potential	Behaven Creek	2
19	1236 Zephyr Road	PS83	1914 US Hwy. 89 West	Potential	Lynch Creek	2
20	5551 Shaw Road	PS82	500 E. Browning Drive	Potential	Lynch Creek	2
21	Yarborough Street	PS84	6325 Yarborough Street	Potential	Lynch Creek	2
22	4218 Church Circle	PS81	4210 Church Circle	Potential	Lynch Creek	2
23	1801 Wallace Street	PS78	1790 Wallace Street	Potential	Lynch Creek	2
24	1885 Wallace Street	PS77	1900 Wallace Street	Potential	Lynch Creek	2
25	1911 Siwell Road	PS43	6186 McClure Road	Potential	Lynch Creek	2
26	4862 McRaven Road	PS41	4813 McRaven Road	Potential	Lynch Creek	2
27	4706 McRaven Road	PS42	4660 McRaven Road	Potential	Lynch Creek	2
29	1139 Plantation Court	PS51	Plantation Court	Potential	White Oak Creek	4
30	10 Greenwood Court	PS23	Greenwood Court	Potential	Purple Creek	4
31	1728 Brookhollow Circle	PS4	6675 Hwy 18	Potential	Trahan Creek	1
32	313 Woodcliff Drive	PS8	201 Cedarwood Drive	Potential	Trahan Creek	1
33	255 Western Hills Drive	PS25	561 Hilldale Drive	Potential	Trahan Creek	1
34	170 Duranville	PS13	185 Duranville Drive	Potential	Trahan Creek	1
35	135 Stratford Drive	PS66A	139 Stratford Drive	Potential	Trahan Creek	1
36	137 Marshal Drive	PS31	166 Marshall Avenue	Potential	Trahan Creek	1
37	15 Nelson Circle	PS38	1665 McCluer	Potential	Trahan Creek	1
38	883 McCluer	PS36	887 McCluer	Potential	Trahan Creek	1
39	1074 McCluer	PS37	1077 McCluer	Potential	Trahan Creek	1
40	4052 Venus Drive	PS27	4058 Venus Avenue	Potential	Trahan Creek	1
41	201 Red Hill	PS29	201 Red Hill Drive	Potential	Trahan Creek	1
42	176 Lakeshore Drive	PS26	174 Lakeshore Road	Potential	Trahan Creek	1
71	4630 Terry Road	PS71	174 Lakeshore Road	Potential	Trahan Creek	1
44	154 Holly Hill Drive	PS32	Holly Hill Drive	Potential	Trahan Creek	1
45	4838 Old Byram	PS48	4837 Old Byram Road	Potential	Trahan Creek	1
46	113 Scottdale Drive	PS57	112 Scottdale Drive	Potential	Trahan Creek	1
47	7 Rob Lane	PS58	10 Rob Lane	Potential	Trahan Creek	1
48	342 Amanda Lane	PS2	Amanda Lane	Potential	Big Creek	1
49	837 Robinwood Drive	PS33	Robinwood Drive	Potential	Trahan Creek	1
50	4351 Patann Street	PS30	Patann Street	Potential	Bogue Chitto Creek	3
51	3844 Northside Drive	PS47	3700 W. Northside Drive	Potential	Bogue Chitto Creek	3
52	1205 Country Club Drive	PS11	1452 Country Club Drive	Potential	Bogue Chitto Creek	3
53	15 South	TP1	15 South	TP	Hardy Creek	1
54	Amanda Lane	PS2	Amanda Lane	PS	Big Creek	1
55	Brookhollow Drive L 160	PS3	Brookhollow Drive L 160	PS	Trahan Creek	1
56	6675 Hwy 18	PS4	6675 Hwy 18	PS	Trahan Creek	1
57	2102 Thousand Oak	PS5	2102 Thousand Oak	PS	Trahan Creek	1
58	Robway Cove	PS6A	Robway Cove	PS	Trahan Creek	1
59	201 Cedarwood Drive	PS6B	201 Cedarwood Drive	PS	Trahan Creek	1
60	461 Greenmount Drive	PS7	461 Greenmount Drive	PS	Trahan Creek	1
61	201 Cedarwood Drive	PS8	201 Cedarwood Drive	PS	Trahan Creek	1
62	140 Chasewood Avenue	PS9	140 Chasewood Avenue	PS	Trahan Creek	1



**City Of Jackson, Mississippi**  
**Pump Station Potential Overflow Locations**

City of Jackson, Mississippi  
Department of Public Works  
1000 North I-10  
Jackson, MS 39201  
6/1/2010/2011

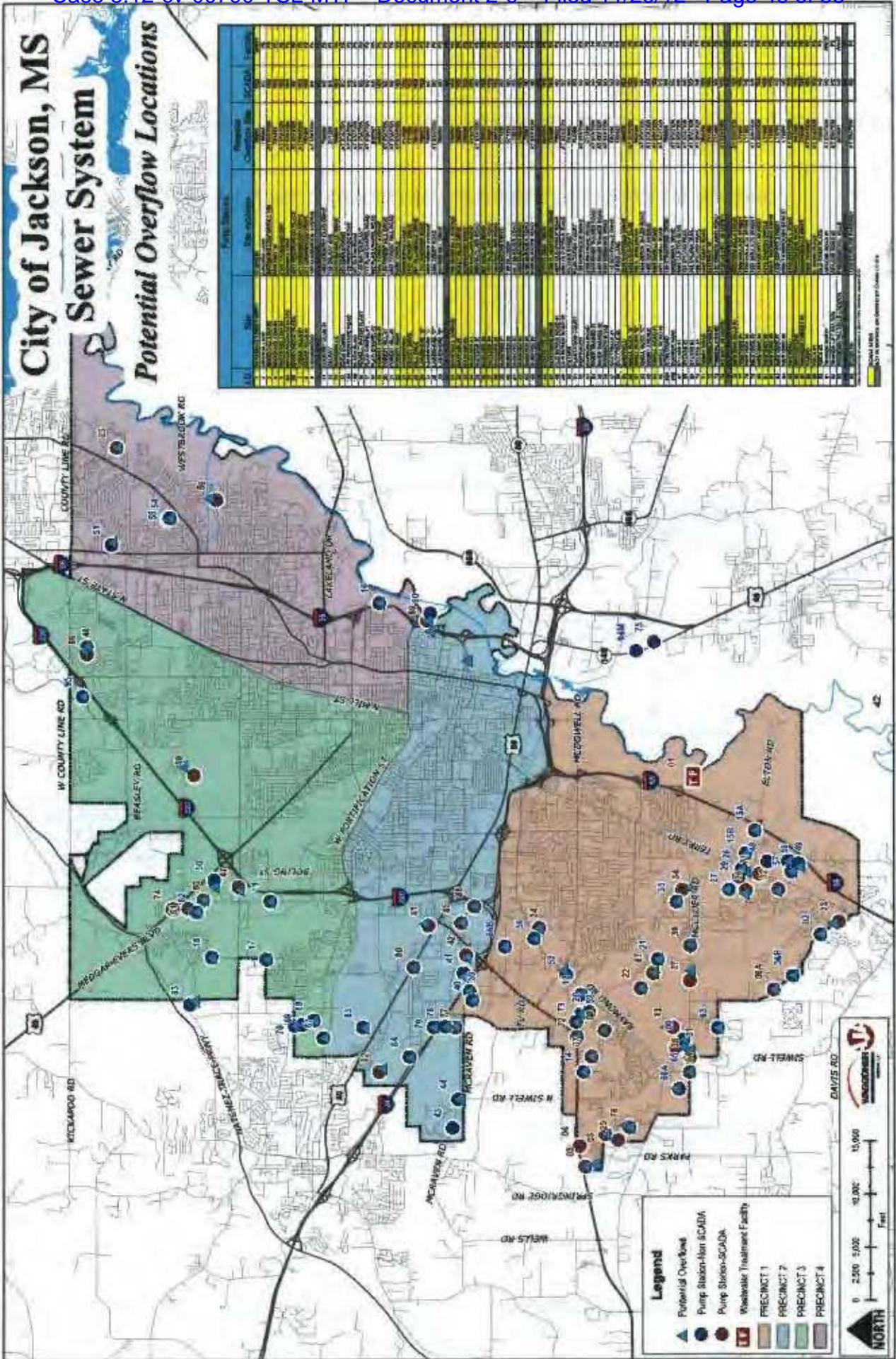
PS#	Address	PS#	Address	PS#	Address	PS#	Address
63	1452 Country Club Drive	PS11	1452 Country Club Drive	PS1	Bogus Chitto Creek		3
64	125 Delray Avenue	PS12	125 Delray Avenue	PS	Carney Creek		1
65	185 Doranville Drive	PS13	185 Doranville Drive	PS	Trilhon Creek		1
66	553 Edna Downs	PS14	553 Edna Downs	PS	Trilhon Creek		1
67	1-55 Frontage Road	PS15A	1-55 Frontage Road	PS	Carney Creek		1
68	207 Elton Road	PS15B	207 Elton Road	PS	Carney Creek		2
69	1-55 Water Plant	PS16	1-55 Water Plant	PS	Ballhaven Creek		2
70	717 Flag Chapel Road	PS17	717 Flag Chapel Road	PS	Bogus Chitto Creek		3
71	692 Flag Chapel Road	PS18	692 Flag Chapel Road	PS	Bogus Chitto Creek		3
72	1851 Forest Avenue	PS19	1851 Forest Avenue	PS	Edwards Creek		3
73	155 Forest Hill Drive	PS20	155 Forest Hill Drive	PS	Trilhon Creek		1
74	3557 Forest Hill Road	PS21	3557 Forest Hill Road	PS	Trilhon Creek		1
75	5285 Forest Park Drive	PS22	5285 Forest Park Drive	PS	Trilhon Creek		1
76	Greening Court	PS23	Greening Court	PS	Purple Creek		4
77	2130 Hickory Drive	PS24	2130 Hickory Drive	PS	Carney Creek		1
78	561 Hillside Drive	PS25	561 Hillside Drive	PS	Trilhon Creek		1
79	174 Lakeside Road	PS26	174 Lakeside Road	PS	Trilhon Creek		1
80	4638 Venus Avenue	PS27	4638 Venus Avenue	PS	Carney Creek		1
81	4393 Terry Road	PS28	4393 Terry Road	PS	Carney Creek		1
82	201 Red Hill Drive	PS29	201 Red Hill Drive	PS	Trilhon Creek		1
83	160 Marshall Avenue	PS31	160 Marshall Avenue	PS	Trilhon Creek		1
84	Holly Hills Drive	PS32	Holly Hills Drive	PS	Trilhon Creek		1
85	Robinswood Drive	PS33	Robinswood Drive	PS	Trilhon Creek		1
86	500 McCluer Road	PS34	500 McCluer Road	PS	Clancy Creek		1
87	3190 McCluer Road	PS35	3190 McCluer Road	PS	Carney Creek		1
88	817 McCluer Road	PS36	817 McCluer Road	PS	Trilhon Creek		1
89	1077 McCluer Road	PS37	1077 McCluer Road	PS	Trilhon Creek		1
90	1665 McCluer Road	PS38	1665 McCluer Road	PS	Trilhon Creek		1
91	2194 Moete Drive	PS39	2194 Moete Drive	PS	Carney Creek		1
92	155 Hill-Jew	PS40	155 Hill-Jew	PS	Carney Creek		1
93	4813 McRaven Road	PS41	4813 McRaven Road	PS	Lynch Creek		2
94	4660 McRaven Road	PS42	4660 McRaven Road	PS	Lynch Creek		2
95	6136 McRaven Road	PS43	6136 McRaven Road	PS	Lynch Creek		2
96	6000 McRaven Road	PS44	6000 McRaven Road	PS	Lynch Creek		2
97	5112 Floral Drive	PS46	5112 Floral Drive	PS	Hanging Moss Creek		3
98	3796 W. Northside Drive	PS47	3796 W. Northside Drive	PS	Bogus Chitto Creek		3
99	4837 Old Byram Road	PS48	4837 Old Byram Road	PS	Trilhon Creek		1
100	4681 Old Byram Road	PS49	4681 Old Byram Road	PS	Trilhon Creek		1
101	Palmer Street	PS50	Palmer Street	PS	Bogus Chitto Creek		3
102	Plantation Court	PS51	Plantation Court	PS	White Oak Creek		4
103	153 Purwood Drive	PS52	153 Purwood Drive	PS	Trilhon Creek		1
104	2108 Raymond Road	PS53	2108 Raymond Road	PS	Carney Creek		1
105	5440 River Thames Road	PS54	5440 River Thames Road	PS	White Oak Creek		4
106	5407 River Thames Road	PS55	5407 River Thames Road	PS	White Oak Creek		4
107	5297 Robinson Road	PS56	5297 Robinson Road	PS	Carney Creek		1
108	112 Seaside Drive	PS57	112 Seaside Drive	PS	Trilhon Creek		1
109	10 Rob Lane	PS58	10 Rob Lane	PS	Trilhon Creek		1
110	2238 Sheffield Drive	PS59	2238 Sheffield Drive	PS	Hanging Moss Creek		4
111	6340 Country Club	PS60	6340 Country Club	PS	Bogus Chitto Creek		3
112	255 S. Shellrock	PS61	255 S. Shellrock	PS	Bogus Chitto Creek		3
113	3458 Dickson Syles Road	PS62	3458 Dickson Syles Road	PS	Bogus Chitto Creek		3
114	1465 Short Avenue	PS63	1465 Short Avenue	PS	Trilhon Creek		1
115	6095 Swell Road	PS64	6095 Swell Road	PS	Big Creek		1
116	4071 Swell Road	PS65	4071 Swell Road	PS	Trilhon Creek		1
117	139 Stairford Drive	PS66A	139 Stairford Drive	PS	Trilhon Creek		1
118	2016 Chadwick Drive	PS66B	2016 Chadwick Drive	PS	Trilhon Creek		1
119	6065 Clinton Boulevard	PS67	6065 Clinton Boulevard	PS	Carney Creek		3
120	151 Sylvan Trail	PS68	151 Sylvan Trail	PS	Lynch Creek		3
121	351 Sylvan Trail	PS69	351 Sylvan Trail	PS	Lynch Creek		3
122	408 Sylvan Trail	PS70	408 Sylvan Trail	PS	Trilhon Creek		3
123	4646 Terry Road	PS71	4646 Terry Road	PS	Trilhon Creek		1



**City Of Jackson, Mississippi**  
**Pump Station Potential Overflow Locations**

City of Jackson, Mississippi  
 Department of Public Works  
 Post Office Box 17  
 Jackson, MS 39205  
 601-261-2991

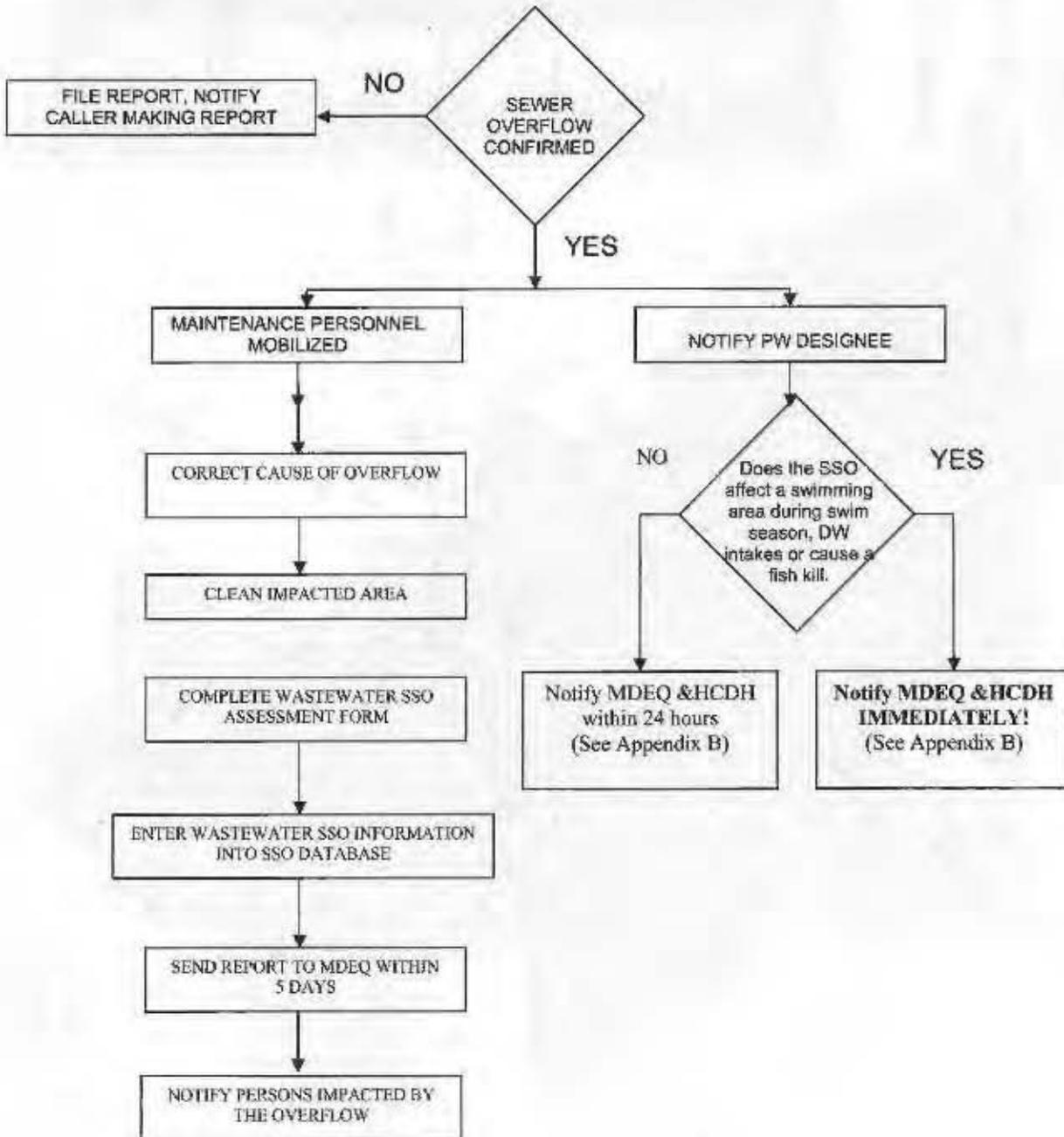
No.	Potential Overflow Location	PS No.	Pump Station Location	Type	Receiving Waterway (Channel)	Index Modified
124	6115 Hwy. 18	PS72	6115 Hwy. 18	PS	Trahan Creek	1
125	132 Timberlawn Road	PS73	132 Timberlawn Road	PS	Trahan Creek	1
126	6159 U.S. Hwy. 49 North	PS74	6159 U.S. Hwy. 49 North	PS	Bugus Chitto Creek	3
127	Western Hills Drive	PS75	Western Hills Drive	PS	Trahan Creek	1
128	1900 Wallace Street	PS76	1900 Wallace Street	PS	Lynch Creek	1
129	1799 Wallace Street	PS77	1799 Wallace Street	PS	Lynch Creek	2
130	1651 Wallace Street	PS78	1651 Wallace Street	PS	Lynch Creek	2
131	1914 U.S. Hwy. 80 West	PS79	1914 U.S. Hwy. 80 West	PS	Lynch Creek	2
132	4210 Church Circle	PS80	4210 Church Circle	PS	Lynch Creek	2
133	500 E. Browning Drive	PS81	500 E. Browning Drive	PS	Lynch Creek	2
134	1238 Zephyr Street	PS82	1238 Zephyr Street	PS	Lynch Creek	2
135	6223 Yarbrough Street	PS83	6223 Yarbrough Street	PS	Lynch Creek	2
136	4180 Whitehall Road	PS84	4180 Whitehall Road	PS	Lynch Creek	2
137	Whitestone Road	PS85	Whitestone Road	PS	Hanging Moss Creek	2
138	Shamondale Drive	PS86	Shamondale Drive	PS	Trahan Creek	3
139	3853 Yarbro	PS88	3853 Yarbro	PS	Lynch Creek	2
140	E. River Place	PS89	E. River Place	PS	Balthaven Creek	2
141	Old River Place	PS90	Old River Place	PS	Balthaven Creek	2
142	Apache Road #1	PS91	Apache Road #1	PS	Big Creek	1
143	Apache Road #2	PS92	Apache Road #2	PS	Big Creek	1
144	Presidential Hills	PS93	Presidential Hills	PS	Sagin Chitto Creek	3
145	1235 Echelon Parkway	PS95	1235 Echelon Parkway	PS	Hanging Moss Creek	3



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**APPENDIX D – SEWER OVERFLOW RESPONSE INTERNAL NOTIFICATION AND TRACKING PROTOCOL**

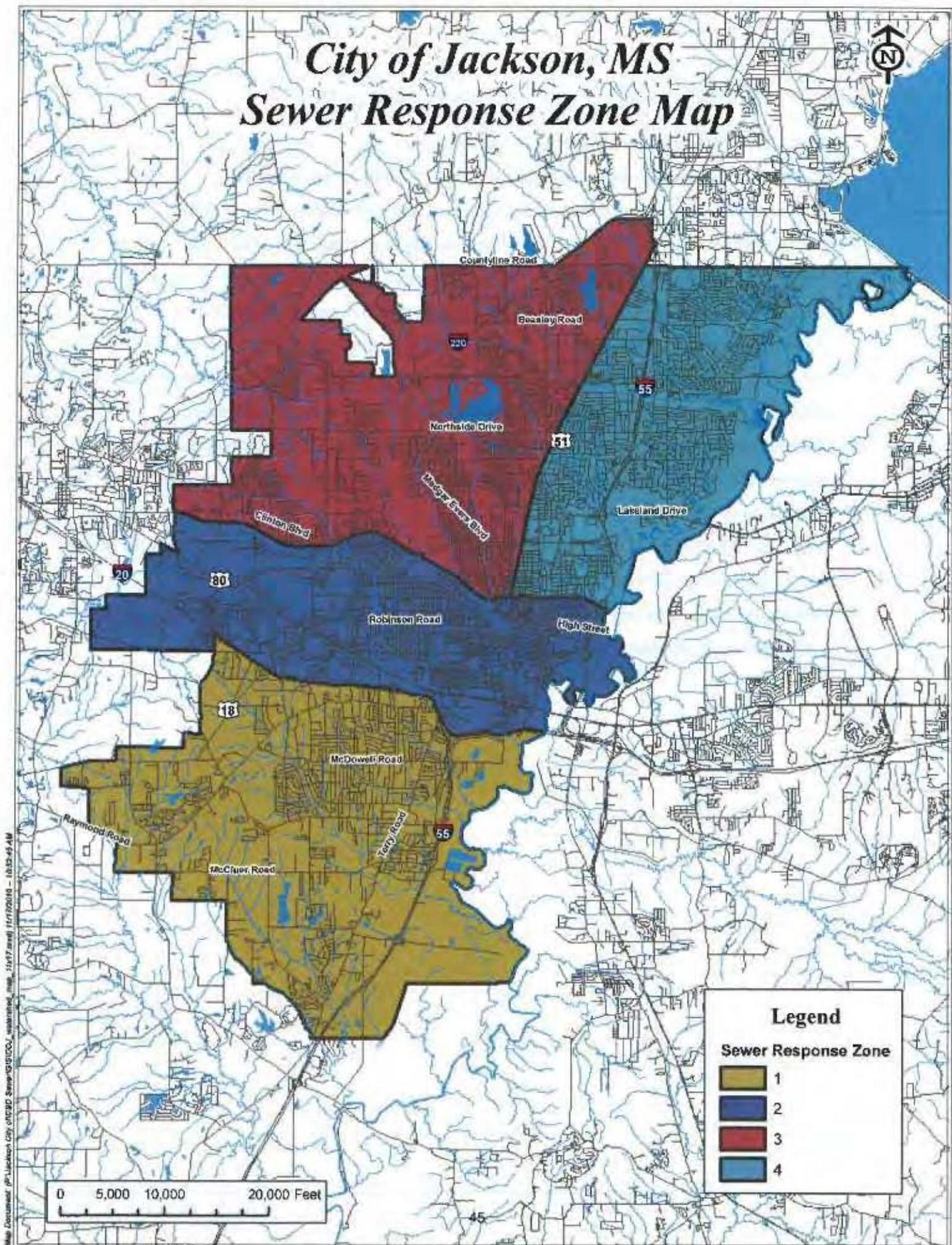
**SEWER OVERFLOW INTERNAL NOTIFICATION FLOW CHART**



### **SEWER OVERFLOW (SSO) RESPONSE TRACKING PROTOCOL**

1. Report of possible SSO received by the COJ personnel.
2. COJ dispatch office deploys maintenance personnel to confirm reported SSO.
3. Maintenance personnel report back to the supervisor the significance of the overflow.
4. The COJ Superintendent, Wastewater Collections Engineer or authorized designee shall provide oral report to MDEQ within 24 hours. MDEQ becomes aware of the SSO notifying them of the location by street address or any other appropriate method (i.e. latitude-longitude)
5. If the overflow will affect recreational areas, public drinking water intakes, or results in a fish kill the COJ shall notify the MDEQ contact person and the HCDH contact person orally, and MEMA if after normal business hours, immediately upon confirming the discharge.
6. Within 5 days the COJ Superintendent, Wastewater Collections Engineer or authorized designee prepares the Wastewater SSO Assessment Form. The Utilities Manager is responsible for submission to MDEQ.
7. Data from Wastewater SSO Assessment Form are entered into a permanent record on file at the Sewer Maintenance Division. Records are maintained for a minimum of five years.
8. Detailed resource plan and milestone schedule for permanent corrective action are submitted with the monthly Discharge Monitoring Report.

# City of Jackson, MS Sewer Response Zone Map



Map Downloaded: 8/1/2012 10:35:45 AM  
City of Jackson, MS  
Sewer Response Zone Map  
11/17/2010 10:35:45 AM

Legend	
Sewer Response Zone	
	1
	2
	3
	4

0 5,000 10,000 20,000 Feet



## **APPENDIX E - REGULATORY AGENCY CONTACT INFORMATION AND NOTIFICATION PERIOD**

### **Overflows requiring 24-Hour Verbal Notification (MDEQ, HCDH, & MEMA)**

- impact or closure of swimming area during swimming season
- impact of closure of public drinking water intake
- results in a fish kill

### **Overflows Requiring 24-Hour Verbal Notification (MDEQ only)**

- gravity sewer manhole
- pump station
- sewer siphon
- treatment plant bypass

### **MDEQ**

#### During Normal Operating Hours – 8:00 a.m. – 5:00 p.m.

MDEQ Operator – 601-961-5171

MDEQ ECED Municipal & Private Facilities Branch Manager – 601-961-5588

MDEQ ECED Engineer for Jackson – 601-961-5319

#### After Normal Operating Hours (non-emergency)

(Voice Mail)

MDEQ ECED Municipal & Private Facilities Branch Manager – 601-961-5588

MDEQ ECED Engineer for Jackson – 601-961-5319

#### After Normal Operating Hours (emergency)

MEMA 24-hour State Warning Point – 1-800-222-6362

### **HCDH**

Hinds County Health Department

Environmental Health

539 E Beasley Road

PO Box 20

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Emergency Contact Numbers:

- Mississippi Department of Environmental Quality (MDEQ): - (601) 961 5171
- Entergy (Power Loss); Customer service and emergencies: 1-800-368-3749 (1-800-ENTERGY). Power outages: 1-800-968-8243 (1-800-9OUTAGE).
- Highway Patrol & Fire Department: - 911
- United States Environmental Services (USES): - (601) 372 3232
- Hinds County - (601)957-1026

City of Jackson

- Wastewater Operations Engineer: Anthony Harkless: -- (601) 720-5944
- Wastewater Collections Engineer: Vacant
- Sewer Maintenance Superintendent: Butch Mayfield -- (601)-960-1875

United Water

- Project Manager: - Jerry Jones - (317) 490-6854
- Operations Manager: Ralph Gorenflo - (601) 340-2803
- Maintenance Manager: - Jackie Kiser - (601) 287-6116
- Maintenance Assistant Manager: - Darnell Gray (601) 896-6365
- Lift Station Supervisor: - Willie Wilson (601) 896-6380

**APPENDIX F – PERSONNEL TRAINING DOCUMENTS**

***Sewer Overflow Response  
Plan (SORP) Training Plan***

***Training Topics***

- I. What are Sanitary Sewer Overflows?
- II. Why do Sewers Overflow?
  1. Infiltration and Inflow
  2. Undersized Systems
  3. Pipe Failures
  4. Equipment Failures
  5. Lack of Maintenance
  6. Deteriorating Sewer System
- III. Why Control Sanitary Sewer Overflows?
  - I. Environmental Concerns and Health Risk
    - A. Contaminated Drinking Water Supply
    - B. Contaminated Fish and Shellfish
    - C. Direct Contact
      - Recreation Activities in Contaminated Waters
      - Sewer Backups in Homes
      - SSOs in Streets and Public Access Areas (e.g. Parks, Schoolyards, etc.)
    - D. Natural Resources Impacted
      - Waterways
      - Aquatic Life
- IV. What is SORP?
- V. Who needs SORP Training?
- VI. SORP Requirements
  1. Preventive Maintenance
    - A. Collection System Maintenance
    - B. Equipment Maintenance
  2. Overflow Response, Containment, and Recovery
    - A. Sewer Overflow Response Tracking Protocol
    - B. Directions for Completing Wastewater Assessment Forms
      - Sewer System Work Order Form
      - Wastewater Overflow Assessment Form

- C. Estimating Sanitary Sewer Overflow Volume
  - San Diego Method
  - Measured Volume
    - i. Units
    - ii. Conversion factors
    - iii. Wastewater Formulas (Area, Volume, Flow, etc.)
  - Duration and Flow
- 3. Reporting and Record Keeping
  - A. Notification – When, Who, and How?
  - B. Importance of Proper Record Keeping

#### *Training Sessions*

4 Hr Session Covering Overflow Response Procedures

2 Hr Session Covering Reporting Procedures

Training Sessions shall begin within 60 days of MDEQ's approval of this SORP

#### *Training Attendees*

The attached personnel chart shows all positions in the Wastewater Division. All employees from Public Works Director to Crew Leader will receive SORP Training.



# APPENDIX F

## APPENDIX F

### SUPPLEMENTAL ENVIRONMENTAL PROJECT

#### A. PURPOSE OF THE SEP

The purpose of the Supplemental Environmental Project ("SEP") is to reduce extraneous flows entering the WCTS through defective residential Private Laterals and through illicit connections from residential properties of eligible property owners. For purposes of this SEP, an illicit connection is any residential connection to the WCTS that discharges any substance or solution that is not intended to be transferred via the WCTS, such as stormwater, surface water runoff and roof runoff. The WCTS becomes a conduit for stormwater when defective Private Laterals or illicit connections allow rain or groundwater to enter the WCTS. Certain components of the WCTS Evaluation Plan required by Section VIII. of the Consent Decree will assist the City in identifying defective Private Laterals in need of repair or replacement and illicit connections to the WCTS.

#### B. SEP WORK

The City may perform the repair or replacement of defective Residential Private Laterals of eligible property owners itself or may use contractors or consultants in implementing this SEP.

In implementing this SEP, the City shall do the following, in accordance with the schedule set forth below:

- Draft and submit a proposed Escrow Agreement for EPA review.
- Establish and fund the Escrow Account and provide EPA with a copy of the Escrow.

- Provide information to residential property owners advising of the potential availability of the SEP work and contact information if they are interested in participating; develop financial hardship qualifications to identify eligible residential property owners for work under this SEP, using 2010 census information to identify moderate, low and very low income levels eligible; and determine which residential property owners meet the financial hardship qualifications and are accepted to participate in the SEP and notify the owners. In the event that more eligible residents apply for the SEP than there are funds available, preference shall be given to eligible very low income residents, then eligible low income residents and then eligible moderate income residents.
- Direct the Contractor performing the repair or replacement of a Private Lateral under this SEP to secure appropriate permits for the work.
- Determine actions necessary to repair or replace Private Laterals or remove illicit connections pursuant to this SEP and ensure that all work is undertaken in a timely manner and in conformity with appropriate standards.
- Ensure SEP completion on time.
- Report as required by Consent Decree.
- Maintain records of deposits into the SEP Escrow; work performed; and payments made from the Escrow.
- Prepare monthly status reports to provide City program manager with pertinent information for preparation of Consent Decree progress reports to allow City program manager to monitor compliance with SEP.

#### C. SEP COSTS

The City shall spend at least \$875,000.00 in eligible SEP costs for the repair and/or replacement of Private Laterals or removal of illicit connections for eligible residential property owners. Eligible SEP costs cover only the costs of actual plumbing services on Private Laterals and illicit connections owned by private residential customers only. If the City utilizes its own employees and equipment to perform the SEP, the City shall only be given credit against the total funding obligation if the activity is not something that otherwise would have been performed by the City's employees and if any such work is supported by time and expense records which are subject to review by EPA. The credit received by the City for using its own employees and equipment to perform the SEP will be reflected as a reduction in the next

scheduled Escrow deposit following the performance of the SEP activities. The intention is that the funds deposited into Escrow for the SEP, combined with any eligible SEP costs for SEP activities performed using City employees and equipment will total at least \$875,000.00.

The average cost of the Services on each private residential property is expected to range from \$1,500 to \$2,500 for repair or replacement of a defective Private Lateral and \$750 to \$1,000 for removal of an illicit connection. Actual costs will depend on negotiated costs with Plumbers, length of Private Lateral, surface and sub-surface interferences to the Private Lateral, and other pertinent factors. While initial expectations anticipate repair or replacement of 394 Private Laterals and removal of 100 illicit connections, the actual number of Private Laterals repaired or replaced and illicit connections removed pursuant to this SEP may be higher or lower.

#### D. PROGRAM SCHEDULE

##### 1. Payments into the SEP Escrow

The City shall deposit \$875,000.00 to an interest-bearing escrow account ("SEP Escrow") to be used for performance of the SEP, in accordance with the schedule below, and subject to any credit for eligible SEP costs of City employees or equipment under Paragraph C. The City shall allow the United States to review the proposed Escrow Agreement prior to depositing any funds in the SEP Escrow. The City shall provide a copy of the executed Escrow Agreement within thirty (30) Days of the City's initial deposit to the SEP Escrow. The City shall provide EPA with documentation of the deposits to the SEP Escrow within thirty (30) Days of each such deposit. The interest earned on the SEP Escrow funds, along with the City's deposits

equaling \$875,000.00 shall be used in performance of this SEP. The City shall make deposits to the SEP Escrow according to the following schedule:

Six (6) Months after Date of Entry	\$175,000.00
Eighteen (18) Months after Date of Entry	\$100,000.00
Thirty (30) Months after Date of Entry	\$100,000.00
Forty-two (42) Months after Date of Entry	\$100,000.00
Fifty-four (54) Months after Date of Entry	\$100,000.00
Sixty-six (66) Months after Date of Entry	\$100,000.00
Seventy-eight (78) Months after Date of Entry	\$100,000.00
Ninety (90) Months after Date of Entry	\$100,000.00

Provided, however, that the City shall make accelerated deposit of an upcoming payment if the amount of funds in the SEP Escrow account drops below \$100,000.00 due to disbursements.

## 2. Project Implementation

The City shall perform the following tasks according to the following schedule:

### **Months 1 through 24 after Date of Entry:**

- Develop list of Plumbers who will perform Services at agreed-upon costs for standard scopes of work and in accordance with current plumbing code requirements.
- Develop scopes of work, fee schedule, forms, and contracts to be used in implementation of the SEP.
- Notify property owners of the program.
- Develop financial hardship qualifications for eligibility for the SEP.
- Determine which residents will be included in the SEP and notify those residents.
- Develop a system to maintain records of disbursement of funds from escrow and records of location data of residential property owners who have had Services performed on their property as part of the SEP program.

### **No later than 25 Months after Date of Entry and ongoing until completion of the SEP:**

- Begin performing work under the SEP.

- Track work performed pursuant to the SEP and maintain records of all work performed, including, at a minimum, the names and addresses of all property owners receiving services.
- Track amounts disbursed from the SEP Escrow and maintain records of all deposits to the SEP Escrow, disbursements from the SEP Escrow, and eligible SEP Costs for SEP activities performed using City employees and equipment which may be eligible for a credit towards the SEP Escrow under Paragraph C.

**No Later than 72 Months after Date of Entry:**

- The City shall use best efforts to ensure that the SEP is performed expeditiously and that approximately 50% (\$437,500) of the SEP funds are made available to eligible participants within 72 months after the Date of Entry.

**3. Reporting Schedule**

The City shall provide semiannual reports to EPA within one (1) Month after the second and fourth Calendar Quarters of each year on the status of implementation of the SEP, including documentation of the following that has occurred during the preceding six (6) Months:

- Deposit of funds to the SEP Escrow by the City.
- Disbursement of funds from the SEP Escrow by the Escrow Agent to pay Plumbers for Services completed.
- The balance of funds in the SEP Escrow.
- Locations of private residential properties where Services have been performed under the SEP program, including the property address and the name and address of the owner of the property.
- Description of other tasks required performed to implement the SEP during the past two (2) Calendar Quarters.

On or before nine (9) years after Date of Entry, the City shall submit a Final Completion Report to EPA as provided in the Consent Decree, Paragraph 50.