United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Water Microbiology Laboratory Report

September 24, 2009

Tim Bridges - ECA / OEME
US EPA New England Regional Laboratory
11 Technology Drive
N. Chelmsford, MA 01863 - 2431

Project Number: 09080051
Project: Urban Rivers
Analysis: E. Coli Defined Substrate
Analyst: Nathan Raines

Date Samples Received by the Laboratory: 08/26/2009

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I method, A107 / 9223.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8609.

Sincerely,

David F. McDonald
Biology Quality Assurance Officer

Water Microbiology Laboratory
Data Qualifier Codes

J = Estimate
H = Exceeds holding time
I = Exceeds incubation time
At = Atypical overgrowth
S = Lost sample
V = Insufficient sample volume
TNTC = Too numerous to count
MB = Media blank
+++ = Positive control
- - - = Negative control
SP = Spiked Sample
L = Estimated, result below reporting limit (RL)
ND = Not Detected, result less than RL
D = Lab Duplicate
P = Plate counts outside preferred range

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

Urban Rivers

E. Coli Defined Substrate

Matrix: Water

Sample Number	Lab ID	Date of Colle		Date of Analysis		Compound	Concentration MPN/100 mL	RL MPN/100 mL	Qualifier
Bos 5049	AA97447	08/26/09	9:50 an	08/26/09	2:00 pm	E. Coli Defined Substrate	ND	4	
MB03	AA97449	08/26/09	12:00 p	08/26/09	2:00 pm	E. Coli Defined Substrate	**345**	4	
MiH05A	AA97453	08/26/09	9:15 an	08/26/09	2:00 pm	E. Coli Defined Substrate	**132**	4	
Mitt01	AA97441	08/26/09	8:10 an	08/26/09	2:00 pm	E. Coli Defined Substrate	**689**	4	
Mitt02	AA97442	08/26/09	8:35 an	08/26/09	2:00 pm	E. Coli Defined Substrate	**407**	4	
Mitt03	AA97443	08/26/09	8:36 an	08/26/09	2:00 pm	E. Coli Defined Substrate	**32550**	100	
Mitt04	AA97444	08/26/09	8:50 an	08/26/09	2:00 pm	E. Coli Defined Substrate	**302**	4	
Mitt05	AA97445	08/26/09	9:20 an	08/26/09	2:00 pm	E. Coli Defined Substrate	**232**	4	
Mother01	AA97450	08/26/09	12:05 p	08/26/09	2:00 pm	E. Coli Defined Substrate	**80**	4	
NR160	AA97451	08/26/09	12:35 p	08/26/09	2:00 pm	E. Coli Defined Substrate	**518**	4	
NR160A	AA97452	08/26/09	12:40 p	08/26/09	2:00 pm	E. Coli Defined Substrate	**113**	4	
NR285	AA97448	08/26/09	10:40 a	08/26/09	2:00 pm	E. Coli Defined Substrate	**9678**	4	
UR014	AA97446	08/26/09	8:36 an	08/26/09	2:00 pm	E. Coli Defined Substrate	**46110**	100	

Number of Samples: 13

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region I - EPA New England

Inspection Report – MS4 Compliance at the West Roxbury VA Hospital

Author: Andrew Spejewski

I. Facility Information

A. Facility Name: West Roxbury Veterans Administration Hospital
B. Facility Location: 1400 VFW Parkway
West Roxbury, MA 02132
C. Facility Contact: Bryan Soltysik, Environmental Manager
D. Contact Mailing Address: as above
E. Permit #:

II. Background Information

A. Date of inspection: March 17, 2010
B. Weather Conditions: clear, dry

III Purpose of Inspection

The inspection was part of a multi-media federal facilities inspection. This portion of the inspection focused on compliance with the General Permit for Small Municipal Separate Storm Sewer Systems in Massachusetts, known as the MS4 permit.

IV Inspection

Mr. Spejewski arrived at the facility and met Bryan Soltysik, Environmental Manager for the three Boston VA facilities (including West Roxbury, Jamaica Plain and Brockton).

Mr. Soltysik stated that the West Roxbury facility had no direct water discharges. The facility does have a pretreatment permit from the MWRA for discharges to the sanitary sewer, an SPCC plan and an MS4 permit.

Mr. Spejewski explained that he was focusing on the MS4 permit for this inspection. Mr. Spejewski asked about annual reports, Mr. Soltysik stated that he began his current position in January 2010, and was unaware of whether any reports had been submitted.

Bill Gavazzi, the facility engineer, was brought in to answer questions about the storm sewer system. The facility includes a large central building complex, a set of small buildings to the east including a power plant and garage, and a new building to the west designed for lodgings for families of patients.

Mr. Spejewski stated that roof drains and catchbasins in the parking lots all go to two pipes that leave the facility; one to the west underneath the VFW Parkway and one to the east that connects to the City of Boston storm sewers at Spring Street.

Mr. Gavazzi stated that the western pipe goes to an outfall on the other side of the VFW Parkway, and he observed the outfall in June 2007. Mr. Gavazzi stated that he believes that the pipe from the VA facility joins other drainage from the parkway before the outfall. The parkway is owned by the Massachusetts Department of Conservation and Recreation(DCR), as it is a former Metropolitan District Comission road. Mr. Gavazzi cannot recall any specific conversations with DCR, but assumes they own the outfall and the pipe underneath the parkway.

Mr. Spejewski asked about any investigations of sanitary cross-connections to the storm sewer system. Mr. Gavazzi stated that the Boston Water and Sewer Commission did an inspection in January, focusing mostly on drinking water cross connections, that found no problems (there had been no changes since a similar survey nine years ago).

Mr. Gavazzi stated that the facility was in the process of examining the storm drains, and tentatively planning to eliminate or relocate some catchbasins.

Mr. Spejewski asked about catchbasins cleaning; Mr. Gavazzi stated that they were cleaned every spring by an outside contractor. Mr. Gavazzi stated the facility bought its own street sweeper in 2006.

Mr. Gavazzi stated that the facility has stenciled catchbasins with 'Do Not Dump' signs.

Mr. Spejewski asked about the maintenance facilities and garage. Mr. Gavazzi stated that they do light service on vehicles and equipment, and that for heavy service typically a contractor will come in and do the work on site.

Mr. Spejewski and Mr. Gavazzi then went on a tour of the maintenance areas. The area included gas pumps and several bays in a garage. There were spill kits present and accessible in the garage. There were no lips or other containment at the garage bay doors, and no containment around the pumps. Mr. Gavazzi stated there were covers for the catchbasins that could be deployed in the event of a spill. A small drum (about 15 gallon sized) of unknown liquid was present outside the building, exposed to the elements. (After Mr. Spejewski pointed this out to Mr. Gavazzi, Mr. Gavazzi immediately called a facility employee; later on the tour Mr. Spejewski saw the drum being moved).

A slope above the maintenance area had been regraded in the last couple years; the slope was grassed and stabilized.

To the southeast of the maintenance area a new building was under construction. Mr. Gavazzi stated that the work was being done completely by outside contractors and that the site was less than an acre disturbed. At one point a short section of silt fence had failed with small amounts of sediment deposited on the facility grounds below the construction site. Mr. Gavazzi stated he would contact the contractor to have them repair the fence.

At this point Mr. Spejewski and Mr. Gavazzi returned to the conference room.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region I - EPA New England

Author: Andrew Spejewski

Drafted Date: April 1, 2010

I. Facility Information
A. Facility Name: Veterans Administration Hospital, Bedford, MA
B. Facility Location:
C. Facility Contact:
D. Contact Mailing Address:
E. Permit #:

II. Background Information
A. Date of inspection: March 31, 2010
B. Weather Conditions: clear, dry
C. US EPA Representative(s): For MS4 Compliance, Andrew Spejewski [Other EPA personnel examined compliance with other requirements]
D. State/Local Representative(s): None
E. Previous Enforcement Actions: None known

III Purpose of Inspection
The inspection was a multi-media inspection. This report covers compliance with the MS4 Stormwater General Permit.

IV Facility Description
The facility is mostly older buildings straddling Springs Road. To the west are the medical buildings, administrative offices, and the power plant and maintenance garage. East of Springs road are parking lots, a group of residences, and farther to the east an area operated as a golf course by the Air Force. The facility employs 1100 staff, covers over 100 acres, and is 82 years old.

The storm sewer system includes catchbasins and roof drains from the hospital and residence buildings and roads, and two or three (town-owned) catchbasins on Springs Road that connect to the facility's storm sewer system. There are no other connections to the Town of Bedford storm sewers. Outfalls are present on all sides of the facility.

V. Inspection
After an opening conference involving all members of the team, Mr. Spejewski met with Lili Griffin, who stated she was responsible for MS4 implementation. Ms. Griffin stated that she had only been in the position for a year, so did not know why actions were taken in the past. She acknowledged that an NOI had been submitted, but no formal StormWater Management Plan had been prepared [a list of proposed BMPs had been prepared], and no annual reports had been submitted.

Ms. Griffin expressed doubt about whether the facility was actually subject to the MS4 permit. She stated that she had spoken with Thelma Murphy at EPA Region I, and had been told that facilities with less than 1,000 employees were not subject to the permit. Ms. Griffin stated that while the facility currently employed more than 1,000 staff, many had been hired recently and at the time of the NOI in 2003, there were less than 1,000 staff.

Ms. Griffin described the facility and system. She stated that the golf course was on land owned by the VA facility, but was completely run by the Air Force, with no VA involvement. She was unaware of what stormwater systems, if any, were in place on the golf course.

Ms. Griffin produced a map of the storm sewer system dated November 2008, showing catchbasins, manholes, pipes, and outfalls.

Mr. Spejewski and Ms. Griffin then met with <Roland lastname>, chief facility engineer. Also present was Timothy Wade, an engineering department employee. Mr. Wade stated that he had been tracking all the facility piping (sanitary and storm sewer) in the last couple years. Mr. Wade pointed out a storm sewer pipe on the Nov 2008 map that he had recently discovered was incorrectly placed on the map (immediately after the interview, Mr. Wade pointed this out to another engineering employee, asking him to correct the map). Mr. Wade stated that he had last year found a storm sewer improperly discharging to the sanitary sewer line, but no improper connections in the other direction. He stated that he had viewed 'nearly all' of the outfalls. Mr. Spejewski asked if Mr. Wade would have reported any problems with the outfalls. Mr. Wade said the outfalls were all in good shape, except for some silting up in places. Mr. Spejewski asked if Mr. Wade would have reported any signs of illicit discharges, and Mr. Wade said of course he would have.

Mr. Spejewski then asked about street sweeping. <Mr Roland> stated that the facility has two sweeper attachments for bobcats, and they sweep as needed. The sweepings are brought back to the sand/salt pile and re-used. The Town of Bedford sweeps Springs Road.
<MR> stated that a contractor cleans catchbasins twice a year. The facility does not have records of the amount removed. <MR> was unaware of how the contractor disposed of the sediment. <MR> showed a purchase order for the cleaning on a computerized database of contracts for the facility. <MR> stated the town cleans the catchbasins on Springs Road.

Mr. Spejewski asked if the facility had a pesticide and fertilizer plan. Ms. Griffin said that there was no formal plan, but the facility uses very little pesticides, as due to Agent Orange, the VA is very concerned about pesticides.

Mr. Spejewski and Ms. Griffin then left for a partial tour of the facility. Three small areas were under construction: a water tower was being prepared for demolition and removal, another similar-sized area was being redone a short distance away, and a large underground storage tank was being removed from a parking lot south of the maintenance garage. All areas had adequate silt fencing surrounding them with no signs of sediment escaping.

Accumulations of sand and sediment were observed in a roadway, and below the outfall near a

roadway. The sediment seemed similar to the soil adjacent to the roadway, which was very sandy across the facility, and often with little or no grass stabilizing it adjacent to roads and walkways.

The facility's maintenance garage included about six bays, arranged along two sides of the building. Original floor drains had been filled with cement or other filler. One set of bays included a cement lip at the garage doors (preventing spills from leaving the building), while one set did not have any immediate containment. The entire facility was neat and floors were very clean. Kitty litter was present in several places, and a spill kit was present near the oil storage area. The used oil storage was a barrel sitting on a secondary containment pallet.

At this point, Mr. Spejewski and Ms. Griffin returned to her office, Mr. Spejewski thanked her for her time, informed her of preliminary conclusions and left the facility.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region I - EPA New England

Author: Andrew Spejewski

Drafted Date: April 1, 2010

I. Facility Information
A. Facility Name: Veterans Administration Hospital, Bedford, MA
B. Facility Location:
C. Facility Contact:
D. Contact Mailing Address:
E. Permit #:

II. Background Information
A. Date of inspection: March 31, 2010
B. Weather Conditions: clear, dry
C. US EPA Representative(s): For MS4 Compliance, Andrew Spejewski [Other EPA personnel examined compliance with other requirements]
D. State/Local Representative(s): None
E. Previous Enforcement Actions: None known

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roadway. The sediment seemed similar to the soil adjacent to the roadway, which was very sandy across the facility, and often with little or no grass stabilizing it adjacent to roads and walkways.

The facility's maintenance garage included about six bays, arranged along two sides of the building. Original floor drains had been filled with cement or other filler. One set of bays included a cement lip at the garage doors (preventing spills from leaving the building), while one set did not have any immediate containment. The entire facility was neat and floors were very clean. Kitty litter was present in several places, and a spill kit was present near the oil storage area. The used oil storage was a barrel sitting on a secondary containment pallet.

At this point, Mr. Spejewski and Ms. Griffin returned to her office, Mr. Spejewski thanked her for her time, informed her of preliminary conclusions and left the facility.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1
5 Post Office Square, Suite 100
Boston, MA 02109-3912

Memorandum - Enforcement Confidential

Date: 6 October 2010

Subj: NPDES Compliance Sampling Inspection
Municipal Separate Storm Sewer System (MS4)
Town of Watertown, MA

From: Todd Borci

To: File

On Tuesday, 5 October 2010, EPA inspector Todd Borci conducted a Compliance Sampling Inspection (CSI) of the Town of Watertown's (the "Town") Municipal Separate Storm Sewer System ("MS4"). EPA collected water quality samples from six storm water outfalls located along the Charles River, along with two samples collected from Sawins Brook, a tributary stream to the Charles River that receives flow from multiple Town outfalls.

At approximately 0730 hours EPA observed portions of the Sawins Brook north of Arsenal Street. At 0815 hours EPA collected samples "Saw01" and duplicate sample "UR037" from a location approximately 200 feet north of Arsenal Street (Photo 1). Previous EPA data from this location in 2009 indicated elevated levels of pharmaceutical compounds. Using Hach brand test strips for ammonia and a Chemetrics K-9400 field kit for surfactants, and a Hach total residual chlorine field kit, EPA personnel processed a surface water sample collected at this location. Field kits indicated low levels of ammonia (0.25 mg/l) and surfactants (0.2 mg/l) in the sample, just at or below EPA screening thresholds of 0.5 mg/l for ammonia and 0.25 mg/l for surfactants. Samples were sent back to the EPA laboratory for enterococcus and E.coli bacteria, optical brighteners, and pharmaceutical compounds.

At approximately 0835 hours EPA collected sample "ARLEast" from a location approximately 20 feet downstream of where Sawins Brook passes through three large culverts beneath Arlington Street (Photo 2). Using Hach brand test strips for ammonia and a Chemetrics K-9400 field kit for surfactants, and a Hach total residual chlorine field kit, EPA personnel processed a surface water sample collected at the location. Field kits indicated low levels of ammonia (0.3 mg/l) and surfactants (0.25 mg/l) in the sample, just at or below EPA screening thresholds of 0.5 mg/l for ammonia and 0.25 mg/l for surfactants. A trace level of chlorine was also detected at 0.04 mg/l. Samples were sent back to the EPA laboratory for enterococcus and E.coli bacteria, optical brighteners, and pharmaceutical compounds. Since flowing water could be heard in the southern and northern culverts, EPA collected three additional e. coli/enterococcus bacteria samples, one from each of the three culverts. Sample IDs for the three bacteria samples, starting with the southern most culvert, were ARL01, ARL02, and ARL03.

At approximately 0920 hours EPA collected samples at location “Wat13”approximately 600 feet downstream of Galen Street (Photo 3). Using Hach brand test strips for ammonia and a Chemetrics K-9400 field kit for surfactants, and a Hach total residual chlorine field kit, EPA personnel processed a surface water sample collected at the location. Field kits indicated elevated levels of ammonia (5.0 mg/l) and surfactants (0.25 mg/l) in the sample, at or above EPA screening thresholds of 0.5 mg/l for ammonia and 0.25 mg/l for surfactants. Low levels of chlorine (0.08 mg/l) were also detected in the sample. Samples were sent back to the EPA laboratory for enterococcus and E.coli bacteria, optical brighteners, and pharmaceutical compounds.

At approximately 0930 hours EPA collected samples at location “Wat12”approximately 400 feet downstream of Galen Street (Photo 4). Using Hach brand test strips for ammonia and a Chemetrics K-9400 field kit for surfactants, and a Hach total residual chlorine field kit, EPA personnel processed a surface water sample collected at the location. Field kits indicated elevated levels of ammonia (4.0 mg/l) and surfactants (0.6 mg/l) in the sample, above EPA screening thresholds of 0.5 mg/l for ammonia and 0.25 mg/l for surfactants. Samples were sent back to the EPA laboratory for enterococcus and E.coli bacteria, optical brighteners, and pharmaceutical compounds.

At approximately 0940 hours EPA collected samples at location “Wat11”approximately 200 feet downstream of Galen Street (Photo 5). The outfall is a large 4-foot by 3-foot culvert that was under water. Using a YSI temperature/conductivity/salinity probe, it was determined that colder, higher conductivity flow was exiting from the lower portion of the pipe, therefore EPA collected samples by using a sample pole and plunging the sample container to just above the bottom of the culvert. Using Hach brand test strips for ammonia and a Chemetrics K-9400 field kit for surfactants, and a Hach total residual chlorine field kit, EPA personnel processed a surface water sample collected at the location. Field kits indicated elevated levels of ammonia (0.3 mg/l) and surfactants (0.1 mg/l) in the sample, below EPA screening thresholds of 0.5 mg/l for ammonia and 0.25 mg/l for surfactants. Elevated levels of chlorine (0.14 mg/l) were also detected in the sample. Samples were sent back to the EPA laboratory for enterococcus and E.coli bacteria, optical brighteners, and pharmaceutical compounds.

At approximately 1035 hours EPA collected samples at location “LB1”approximately 400 feet west of the intersection of Watertown Street and California Street (Photo 6). Using Hach brand test strips for ammonia and a Chemetrics K-9400 field kit for surfactants, and a Hach total residual chlorine field kit, EPA personnel processed a surface water sample collected at the location. Field kits indicated low levels of ammonia (0.0 mg/l) and surfactants (0.2 mg/l) in the sample, below EPA screening thresholds of 0.5 mg/l for ammonia and 0.25 mg/l for surfactants. Elevated levels of chlorine (0.11 mg/l) were also detected in the sample. Samples were sent back to the EPA laboratory for enterococcus and E.coli bacteria, optical brighteners, and pharmaceutical compounds.

At approximately 1107 hours EPA collected samples at location “Wat5” approximately 200 feet south of the intersection of Pleasant Street and Rosedale Road (Photo 7). Using Hach brand test strips for ammonia and a Chemetrics K-9400 field kit for surfactants, and a Hach total residual chlorine field kit, EPA personnel processed a surface water sample collected at the location. Field kits indicated no detectable levels of ammonia (0.0 mg/l) and low levels of surfactants (0.2 mg/l) in the sample, below EPA screening thresholds of 0.5 mg/l for ammonia and 0.25 mg/l for surfactants. A trace level of chlorine (0.02 mg/l) was also detected in the sample. Samples were

sent back to the EPA laboratory for enterococcus and E.coli bacteria, optical brighteners, and pharmaceutical compounds.

Adjacent to outfall “Wat5” was outfall “Wat6”, where EPA collected samples at approximately 1110 hours. Using Hach brand test strips for ammonia and a Chemetrics K-9400 field kit for surfactants, and a Hach total residual chlorine field kit, EPA personnel processed a surface water sample collected at the location. Field kits indicated no detectable levels of ammonia and low levels of surfactants (0.25 mg/l) in the sample, below EPA screening thresholds of 0.5 mg/l for ammonia and 0.25 mg/l for surfactants. A low level of chlorine (0.08 mg/l) was also detected in the sample. Samples were sent back to the EPA laboratory for enterococcus and E.coli bacteria, optical brighteners, and pharmaceutical compounds.

Once received from EPA laboratory, the analytical data for this sampling effort will be attached to this report.

The inspection occurred during wet conditions, as according to the National Oceanic and Atmospheric Administration (Boston Logan Airport gauge), 0.51 inches of precipitation fell in the 24 hour period preceding sampling. During the inspection, precipitation generally consisted of mist with occasional light showers.

Photo 1: 10/5/10 Approximately 0815 - View facing NE of “SawB01” location in Sawins Brook. Water pipe crossing over stream visible at upper left.

Photo 2: 10/5/10 Approximately 0835 - View facing SW of triple culverts conveying Sawins Brook beneath Arlington Street. Full suite Sample “ARLEast” was collected 20 feet downstream, and bacteria samples “ARL01”, “ARL02”, and “ARL03” were collected from individual culverts from left to right in photo.

Photo 3: 10/5/10 Approximately 0920 – View of “Wat13” sample location. Location is Watertown MS4 outfall No. 13.

Photo 4: 10/5/10 Approximately 0930 – View of “Wat12” sample location. Location is Watertown MS4 outfall No. 12. Note grayish discharge.

Photo 5: 10/5/10 Approximately 0940 – "Wat11" sample location. Watertown MS4 outfall No. 11 is a large 4'x3' culvert, with the cement ledge as the top of the culvert.

Photo 6: 10/5/10 Approximately 1035 – Sample location "LB1". Location is the outfall for Laundry Brook and is Watertown MS4 outfall No. 33.

Photo 7: 10/5/10 Approximately 1111 – Sample location “Wat05” on left and sample location “Wat06” on right. Locations are Watertown MS4 outfalls No. 5 and 6.

5-4-06

EPA

United States Environmental Protection Agency
Washington, D.C. 20460

Water Compliance Inspection Report

Section A: National Data System Coding (i.e., PCS)

Transaction Code	NPDES	yr/mo/day	Inspection Type	Inspector	Fac Type
1 W 2 5	3 MA R04 10712 11	12 09 07 15 17	18 S	19 R	20 1

Remarks

21 Stormwater MS4 Sampling 66

Inspection Work Days	Facility Self-Monitoring Evaluation Rating	BI	QA	Reserved
67 0 1 69	70	71	72	73 74 75 80

Section B: Facility Data

Name and Location of Facility Inspected *(For industrial users discharging to POTW, also include POTW name and NPDES permit number)*	Entry Time/Date	Permit Effective Date
City of Winchester, Massachusetts 15 Lake Street Winchester, MA 01890	0730 7/15/09	May 2003
	Exit Time/Date	**Permit Expiration Date**
	0845 7/15/09	May 2008

Name(s) of On-Site Representative(s)/Title(s)/Phone and Fax Number(s)	Other Facility Data *(e.g., SIC NAICS, and other descriptive information)*
—	

Name, Address of Responsible Official/Title/Phone and Fax Number
Edward Grant, Director of Public Works
781-721-7160

Contacted ☐ Yes ☒ No

Section C: Areas Evaluated During Inspection *(Check only those areas evaluated)*

☐ Permit	☐ Self-Monitoring Program	☐ Pretreatment	☐ MS4
☐ Records/Reports	☐ Compliance Schedules	☐ Pollution Prevention	
☐ Facility Site Review	☐ Laboratory	☒ Storm Water	
☐ Effluent/Receiving Waters	☐ Operations & Maintenance	☐ Combined Sewer Overflow	
☐ Flow Measurement	☐ Sludge Handling/Disposal	☐ Sanitary Sewer Overflow	

Section D: Summary of Findings/Comments

(Attach additional sheets of narrative and checklists, including Single Event Violation codes, as necessary)

SEV Codes	SEV Description
☐☐☐☐☐	
☐☐☐☐☐	
☐☐☐☐☐	
☐☐☐☐☐	

Name(s) and Signature(s) of Inspector(s)	Agency/Office/Phone and Fax Numbers	Date
Todd Borm	US. EPA R1 617-918-1358	8/10/09

Signature of Management Q A Reviewer	Agency/Office/Phone and Fax Numbers	Date

5-4-06

EPA

United States Environmental Protection Agency
Washington, D.C. 20460

Water Compliance Inspection Report

Section A: National Data System Coding (i.e., PCS)

Transaction Code	NPDES	yr/mo/day	Inspection Type	Inspector	Fac Type
1 M 2 5	3 MA R04 1 0 7 2 11	12 09 08 04 17	18 S	19 B	20 1

Remarks

21 Stormwater MS4 Sampling 66

Inspection Work Days	Facility Self-Monitoring Evaluation Rating	BI	QA	Reserved
67 01 69	70	71	72	73 74 75 80

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Name and Location of Facility Inspected *(For industrial users discharging to POTW, also include POTW name and NPDES permit number)*	Entry Time/Date	Permit Effective Date
City of Winchester, Massachusetts 15 Lake Street Winchester, MA 01890	0745 8/4/09	May 2003
	Exit Time/Date	**Permit Expiration Date**
	0830 8/4/09	May 2008

Name(s) of On-Site Representative(s)/Title(s)/Phone and Fax Number(s)	Other Facility Data *(e.g., SIC NAICS, and other descriptive information)*
—	

Name, Address of Responsible Official/Title/Phone and Fax Number
Edward Grant Director of Public Works
781-721-7100

Contacted ☐ Yes ☒ No

Section C: Areas Evaluated During Inspection *(Check only those areas evaluated)*

☐ Permit	☐ Self-Monitoring Program	☐ Pretreatment	☐ MS4
☐ Records/Reports	☐ Compliance Schedules	☐ Pollution Prevention	
☐ Facility Site Review	☐ Laboratory	☑ Storm Water	
☐ Effluent/Receiving Waters	☐ Operations & Maintenance	☐ Combined Sewer Overflow	
☐ Flow Measurement	☐ Sludge Handling/Disposal	☐ Sanitary Sewer Overflow	

Section D: Summary of Findings/Comments

(Attach additional sheets of narrative and checklists, including Single Event Violation codes, as necessary)

SEV Codes	SEV Description
☐☐☐☐☐	
☐☐☐☐☐	
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Name(s) and Signature(s) of Inspector(s)	Agency/Office/Phone and Fax Numbers	Date
Todd Doan	US EPA R1 617-918-1358	8/10/09

Signature of Management Q A Reviewer	Agency/Office/Phone and Fax Numbers	Date

EPA Form 3560-3 (Rev 1-06) Previous editions are obsolete.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1
One Congress Street, Suite 1100
Boston, MA 02114-2023

Memorandum - Enforcement Confidential

Date: 10 December 2012

Subj: NPDES Compliance Inspection
Municipal Separate Storm Sewer System (MS4)
City of Woburn, MA

From: Todd Borci

To: File

On Wednesday, 5 December 2012, EPA inspector Todd Borci conducted an unannounced inspection of the City of Woburn, Massachusetts's (the "City") Municipal Separate Storm Sewer System ("MS4") at several locations along an unnamed stream that discharges into the northern end of Horn Pond in the City.

EPA observed Woburn outfalls OF159 and OF159A, located on the south of Harrison Avenue on the north western corner of Library Park. EPA noted clear flow with no noticeable odor coming from both pipes. EPA also noted a heavy accumulation of orange bacterial "flocc" along the bottom of both pipes and the streambed downstream of the outfalls.

EPA then observed Woburn outfall OF161, located approximately 60 feet south of the gazebo in the southwest corner of Library Park. Flow from the outfall had no noticeable odor; however, the color of the water had a slight bluish-gray tint. No floatable debris was present. Since leaf drop had occurred and most vegetation had died off, the perimeter of the wetland area was observed. EPA noted an accumulation of sediment not seen previously on the southern side of the wetland, approximately 30 feet southwest of outfall OF161. Upon further examination, there appears to be a second outfall that was submerged under water at this location. EPA noted the location and will consult City outfall maps to identify the outfall. Water in the vicinity of the outfall was slightly opaque with no noticeable odor.

EPA crossed back over Harrison Avenue to the north and examined the upstream portion of flow that apparently enters a culvert beneath Harrison Avenue and discharges through outfall OF159. A park and the City police station exist along the southern portion of the stream, and combined with the lack of vegetation allowed for detailed examination of the area. Some orange "flocc" was observed along the stream channel just prior to the stream entering the drainage pipe that appears to pass below a house and then Harrison Avenue before discharging through OF159. Upstream, less orange "flocc" was observed but a moderately-sized ponded area was observed to have a very dark green tint to the water. A portion of the City DPW yard borders the stream and pond to the north. EPA could observe some open storage areas for dirt or other materials, with some spillage over the concrete block retaining structure in close proximity to the stream. No silt fence or other controls were observed between the storage structures and the stream.

EPA traveled to New Boston Street in north Woburn. EPA observed locations behind 185 New Boston Street, including a concrete pipe that had been a source of suspected illicit discharges. EPA had not observed the pipe since it was reported to and investigated by the City. The pipe was observed to be dry with no evidence of discharges evident.

EPA will review most recent sample data and information submitted by the City and take follow-up actions as appropriate.

End of Inspection.

Photo 1: 12/5/12 1:17 PM Photo taken on south side of Harrison Ave., view facing east toward Library Field. Note orange material along streambed.

Photo 2: 12/5/12 Photo taken approximately 60 feet south of gazebo in SW corner of Library Field, view facing north of OF161. Note opaque and slightly tinted flow.

Photo 3: 12/5/12. Photo taken approximately 30 feet SW of photo 2. Dark area at left center is submerged outfall opening.

Photo 4: 12/5/12. Photo taken north of Harrison Ave. from western side of police playground, view facing southwest toward Harrison Ave. Culvert opening with orange material in stream bed. Flows from this location discharge through OF159 on southern side of Harrison Ave.

Photo 5: 12/5/12. Photo taken behind 185 New Boston Street in Woburn, MA. Concrete pipe at left center had been source of suspected illicit discharge in past and investigated by City. Pipe now observed to be dry with no evidence of illicit discharge.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1
One Congress Street, Suite 1100
Boston, MA 02114-2023

Memorandum - Enforcement Confidential

Date: 22 July 2009

Subj: NPDES Compliance Sampling Inspection
Municipal Separate Storm Sewer System (MS4)
City of Woburn, MA

From: Todd Borci

To: File

On Wednesday, 22 July 2009, EPA inspector Todd Borci conducted a Compliance Sampling Inspection (CSI) of the City of Woburn, Massachusetts's (the "City") Municipal Separate Storm Sewer System ("MS4"). EPA collected water quality samples from three stormwater outfalls located between Woburn Parkway and Water Street; one stormwater outfall off Harrison Avenue, near the corner of N Warren Street; two locations on Shaker Glen Brook; two locations on Little Brook; and two locations on Cummings Brook in the City. EPA notified John Corey, the City's Chief Engineer in advance of the inspection.

At approximately 8:25 hours EPA sampled the Woburn Parkway stormwater outfall (sample id "OF119"). This outfall is approximately 12" corrugated black plastic pipe discharging to waters from "OF118" with an estimated flow of 5-6 gallons/minute. EPA noted a sewage odor. Using Hach brand test strips for ammonia and a Chemetrics K-9400 field kit for surfactants, EPA personnel processed a surface water sample collected at the location. A sample was collected and sent back to the EPA laboratory for Escherichia coli (E. coli) bacteria and pharmaceuticals and personal care products ("PPCP").

At approximately 8:30 hours EPA sampled an outfall (sample id "OF118") located along the northern bank of the stream flowing along Woburn Parkway just upstream of "OF119" and "OF119a". This outfall is a large concrete circle with an estimated diameter of 5' and an approximate flow of 30 gallons/minute. EPA noted a warm musty odor, some suds on water surface, gray and cloudy water, and orange rust color covering surrounding rocks. Using Hach brand test strips for ammonia and a Chemetrics K-9400 field kit for surfactants, EPA personnel processed a surface water sample collected at the location. A sample was collected and sent back to the EPA laboratory for E. coli bacteria and PPCP.

At approximately 8:40 hours City Engineer John Corey arrived on site with two Department of Public Works employees.

At approximately 9:05 hours EPA sampled an outfall located just downstream of "OF119" (sample id "OF119a"). This outfall is approximately 12" corrugated black plastic pipe discharging to waters from "OF118" with an estimated flow of 10 gallons/minute. EPA noted a slight sewage odor. Using Hach brand test strips for ammonia and a Chemetrics K-9400 field kit

for surfactants, EPA personnel processed a surface water sample collected at the location. A sample was collected and sent back to the EPA laboratory for E. coli bacteria

At approximately 9:28 hours EPA sampled an outfall located off Harrison Avenue near the baseball diamond (sample id “OF118up”). This outfall is approximately 18-20” corrugated metal pipe with an estimated flow of 20 gallons/minute. EPA noted a slight sewage odor. Using Hach brand test strips for ammonia and a Chemetrics K-9400 field kit for surfactants, EPA personnel processed a surface water sample collected at the location. Field kits indicated elevated levels of ammonia (2.0 mg/l) and surfactants (0.30 mg/l) in the sample. EPA personnel typically use 0.5 mg/l ammonia and 0.25 mg/l surfactants as threshold level screening concentrations, where sample results equal to or greater than these concentrations may be indicative of illicit discharges. A sample was collected and sent back to the EPA laboratory for E. coli bacteria and PPCP.

At approximately 9:55 hours EPA sampled an outfall located near the corner of Willow Street and Lexington Street near fire station (sample id “Cummings1”). This open stream leads into a pair of 5’ stone culverts. Using Hach brand test strips for ammonia and a Chemetrics K-9400 field kit for surfactants, EPA personnel processed a surface water sample collected at the location. A sample was collected and sent back to the EPA laboratory for E. coli bacteria and PPCP.

At approximately 10:16 hours EPA sampled an outfall located on the corner of South Bedford and Bedford Street, about 150 feet from “Cummings2” (sample id “LB1”). This outfall is approximately 2’x 3’ cement box culvert. Using Hach brand test strips for ammonia and a Chemetrics K-9400 field kit for surfactants, EPA personnel processed a surface water sample collected at the location. A sample was collected and sent back to the EPA laboratory for E. coli bacteria.

At approximately 10:17 hours EPA sampled an outfall located off South Bedford about 150 feet from “LB1” (sample id “Cummings2”). This outfall is approximately 2’x 3’ cement box culvert with an estimated flow of 30 gallons/minute. Using Hach brand test strips for ammonia and a Chemetrics K-9400 field kit for surfactants, EPA personnel processed a surface water sample collected at the location. A sample was collected and sent back to the EPA laboratory for E. coli bacteria.

At approximately 10:35 hours EPA sampled an outfall located on Bedford Street, near Route 3 (sample id “LB2”). This outfall is approximately 2’x 3’ stone culvert with an estimated flow of 60-75 gallons/minute. Using Hach brand test strips for ammonia and a Chemetrics K-9400 field kit for surfactants, EPA personnel processed a surface water sample collected at the location. A sample was collected and sent back to the EPA laboratory for E. coli bacteria.

At approximately 10:50 hours EPA sampled Shaker Glen Brook under a bridge off Route 3 (sample id “SGB1”). This outfall is approximately 7’ cement culvert. Using Hach brand test strips for ammonia and a Chemetrics K-9400 field kit for surfactants, EPA personnel processed a surface water sample collected at the location. A sample was collected and sent back to the EPA laboratory for E. coli bacteria and PPCP.

At approximately 11:10 hours EPA sampled unnamed tributary to Shaker Glen Brook at 57 Russell Street (sample id “SGB2”). This outfall is approximately 1’x 2’ stone culvert with an

estimated flow of 20-30 gallons/minute. Using Hach brand test strips for ammonia and a Chemetrics K-9400 field kit for surfactants, EPA personnel processed a surface water sample collected at the location. A sample was collected and sent back to the EPA laboratory for E. coli bacteria and PPCP.

Once received from EPA laboratory, the analytical data for this sampling effort will be attached to this report.

The inspection occurred during wet conditions, as according to the National Oceanic and Atmospheric Administration the last measurable precipitation was 1.39 inches on 21 July 2009 (Bedford gauge).

Inspection ended at approximately 11:30. EPA has been and will continue to be in contact with the City of Woburn and its consultants as follow-up.

Photo 1: 7/22/09 8:33AM View facing west - sample “OF119” collected at this location.

Photo 2: 7/22/09 8:33 AM View facing north – sample "OF118" collected at this location. Note suds in receiving water.

Photo 3: 7/22/09 9:14 AM. View facing east - sample "OF119a" collected at this location.

Photo 4: 7/22/09 9:34 AM. View facing north - sample “OF118up” collected at this location. Note suds in receiving water and turbidity.

Photo 5: 7/22/09 9:55 AM. View facing east - sample “Cumming1” collected at this location.

Photo 5: 7/22/09 10:16 View facing north - sample “Cumming2” collected at this location. Note that no flow was observed from pipe on far left or semi-circle outfall on far right.

Photo 6: 7/22/09 10:17 View facing north - sample “LB1” collected at this location.

Photo 7: 7/22/09 10:35 View facing north - sample “LB2” collected at this location

Photo 8: 7/22/09 10:50 View facing south - sample “SGB1” collected at this location

Photo 9: 7/22/09 11:10 View facing north - sample “SGB2” collected at this location

5-4-06

EPA

United States Environmental Protection Agency
Washington, D.C. 20460

Water Compliance Inspection Report

Section A: National Data System Coding (i.e., PCS)

Transaction Code	NPDES	yr/mo/day	Inspection Type	Inspector	Fac Type
1 N 2 5	3 MAR041073 11	12 090804 17	18 <	19 R	20 1

Remarks

21 Stormwater MS4 Sampling 66

Inspection Work Days	Facility Self-Monitoring Evaluation Rating	BI	QA	Reserved	
67 0 69	70	71	72	73 74	75 80

Section B: Facility Data

Name and Location of Facility Inspected *(For industrial users discharging to POTW, also include POTW name and NPDES permit number)*	Entry Time/Date	Permit Effective Date
City of Woburn, Massachusetts 50 N Warren Street Woburn, MA 01801	0850 8/4/09	5/1/03
	Exit Time/Date	**Permit Expiration Date**
	1030 8/4/09	5/1/08

Name(s) of On-Site Representative(s)/Title(s)/Phone and Fax Number(s)	Other Facility Data *(e.g., SIC NAICS, and other descriptive information)*
John Corey, City Engineer Engineering Department Woburn, MA 01801 781-897-5881	

Name, Address of Responsible Official/Title/Phone and Fax Number	Contacted
Vincent Ferlisi, Commissioner of Public Works 781-897-5980	☐ Yes ☒ No

Section C: Areas Evaluated During Inspection *(Check only those areas evaluated)*

☐ Permit	☐ Self-Monitoring Program	☐ Pretreatment	☒ MS4
☐ Records/Reports	☐ Compliance Schedules	☐ Pollution Prevention	
☐ Facility Site Review	☐ Laboratory	☒ Storm Water	
☐ Effluent/Receiving Waters	☐ Operations & Maintenance	☐ Combined Sewer Overflow	
☐ Flow Measurement	☐ Sludge Handling/Disposal	☐ Sanitary Sewer Overflow	

Section D: Summary of Findings/Comments

(Attach additional sheets of narrative and checklists, including Single Event Violation codes, as necessary)

SEV Codes	SEV Description
☐☐☐☐☐	
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Name(s) and Signature(s) of Inspector(s)	Agency/Office/Phone and Fax Numbers	Date
Todd Bohn	US EPA R1 617-918-1358	8/6/09
Signature of Management Q A Reviewer	**Agency/Office/Phone and Fax Numbers**	**Date**

EPA Form 3560-3 (Rev 1-06) Previous editions are obsolete.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1
One Congress Street, Suite 1100
Boston, MA 02114-2023

Memorandum - Enforcement Confidential

Date: 10 December 2012

Subj: NPDES Compliance Inspection
Municipal Separate Storm Sewer System (MS4)
City of Woburn, MA

From: Todd Borci

To: File

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End of Inspection.

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5-4-06

United States Environmental Protection Agency
Washington, D.C. 20460

Water Compliance Inspection Report

Section A: National Data System Coding (i.e., PCS)

Transaction Code	NPDES	yr/mo/day	Inspection Type	Inspector	Fac Type
1 N 2 5	3 MAR041073 11	12 090715 17	18 C	19 R	20 1

Remarks

21 Stormwater MS4 Sampling 66

Inspection Work Days	Facility Self-Monitoring Evaluation Rating	BI	QA	Reserved
67 03 69	70	71	72	73 74 75 80

Section B: Facility Data

Name and Location of Facility Inspected (For industrial users discharging to POTW, also include POTW name and NPDES permit number)	Entry Time/Date	Permit Effective Date
City of Woburn, Massachusetts 50 N Warren Street Woburn, MA 01801	0835 7/15/09	May 2003
	Exit Time/Date	**Permit Expiration Date**
	1115 7/15/09	May 2008

Name(s) of On-Site Representative(s)/Title(s)/Phone and Fax Number(s)	Other Facility Data (e.g., SIC NAICS, and other descriptive information)
John Corey, City Engineer Engineering Department Woburn, MA 01801 781-897-5881	

Name, Address of Responsible Official/Title/Phone and Fax Number	Contacted
Vincent Ferlisi, Commissioner of Public Works 781-897-5980	☐ Yes ☑ No

Section C: Areas Evaluated During Inspection (Check only those areas evaluated)

☐ Permit	☐ Self-Monitoring Program	☐ Pretreatment	☐ MS4
☐ Records/Reports	☐ Compliance Schedules	☐ Pollution Prevention	
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Section D: Summary of Findings/Comments

(Attach additional sheets of narrative and checklists, including Single Event Violation codes, as necessary)

SEV Codes	SEV Description
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Name(s) and Signature(s) of Inspector(s)	Agency/Office/Phone and Fax Numbers	Date
Todd Boni	US EPA R1 617-918-1358	8/10/09

Signature of Management Q A Reviewer	Agency/Office/Phone and Fax Numbers	Date

EPA New England Stormwater Outfall Inspection & Sampling Summary - Worcester, MA 11/21/11

Location																	Coordinates		YSI Meter			Weather
						Surfactants	Chlorine	NH3 (mg/l)	PPCP ng/L										Salinity	Temp	Conductivity	
Date	Town	Site Name	Time	E.coli (MPN/100 ml)	Entero (MPN/100ml)			Test St.	Atenolol	Acetaminophen	Cotinine	1,7-Dimethylxanthine	Caffeine	Sulfamethazine	Carbamazepine	Metoprolol	GPS North(+)	GPS West (-)	ppt	C	uS	
7/14/11	Worcester, MA	OHB-1	8:30	21	ND	<0.25	0 06	0	NA	NA	NA	NA	NA	NA	NA	NA	42.23871105	-71.75069217	NA	NA	NA	0.05"
7/14/11	Worcester, MA	OHB-2	8:30	43	ND	<0.25	0 03	0.25	NA	NA	NA	NA	NA	NA	NA	NA	42.23874741	-71.75066084	NA	NA	NA	0.05"
7/14/11	Worcester, MA	BMB-1	9:00	1,741	1,515	0.75	0 05	<0.25	NA	NA	NA	NA	NA	NA	NA	NA	42.24266037	-71.7760692	NA	NA	NA	0.05"
7/14/11	Worcester, MA	OHB-3	9:15	1,302	201	<0.25	0 06	0	NA	NA	NA	NA	NA	NA	NA	NA	42.24129469	-71.7530352	0 2	18.0	374.5	0.05"
7/14/11	Worcester, MA	LQ-1	9:45	8	20	<0.25	0.13	0	NA	NA	NA	NA	NA	NA	NA	NA	42.24464032	-71.74730485	0.1	20.7	181.3	0.05"
7/14/11	Worcester, MA	FB-1	10:00	141,360	2,014	<0.25	0 08	0	NA	NA	NA	NA	NA	NA	NA	NA	42.26388815	-71.75935541	0 3	17.6	532	0.05"
7/14/11	Worcester, MA	LQ-2	10:20	39	ND	<0.25	0 05	<0.25	NA	NA	NA	NA	NA	NA	NA	NA	42.28006546	-71.76355851	0 5	20.8	1042	0.05"
7/26/11	Worcester, MA	LQ-19	9:00	219	85	<0.25	0 03	0	ND	14	22	17	420	ND	1.9	NA	42.28006546	-71.76355851	0 2	20.7	454.8	0.07"
7/26/11	Worcester, MA	LQ-13	9:40	>241920	1,782	<0.25	0 02	0	24	800	31	250	1,400	ND	1.9	NA	42.26388815	-71.75935541	0 2	18.5	506	0.07"
7/26/11	Worcester, MA	LQ-17	10:05	271	10	0.25	0 04	0-0.25	3.7	7.8	21	50	250	ND	ND	NA	42.24464032	-71.74730485	0.1	22.4	318.1	0.07"
7/26/11	Worcester, MA	OB-14	11:00	38	41	<0.25	0 00	0	ND	ND	2.2	4.4	10	ND	1.5	NA	42.23871105	-71.75069217	0 2	19.3	402.9	0.07"
7/26/11	Worcester, MA	OB-05	11:00	4	ND	0.25	0 00	0	ND	ND	1.5	7.1	27	ND	3.2	NA	42.23874741	-71.75066084	0 2	19.3	402.9	0.07"
7/26/11	Worcester, MA	OB-06	11:30	442	288	0	0	0	ND	2.2	7.0	3 0	53	ND	ND	NA	42.24129469	-71.7530352	0 2	19.8	399.7	0.07"
7/26/11	Worcester, MA	OB-06D	11:30	374	309	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	42.24129469	-71.7530352	NA	NA	NA	0.07"
7/26/11	Worcester MA	BMB-04	12:15	3683	2,224	0.25	0	0	5.1	240	68	98	880	0 51	15	NA	42.24266037	-71.7760692	0 3	18.7	584	0.07"
11/21/11	Worcester, MA	WOR-1	8:45	179	ND	<0 25	0.00	0	1 5	9.2	1.5	2.6	3.0	ND	ND	NA	42.279444	-71 805556	0 3	9.8	592	Dry
11/21/11	Worcester, MA	WOR-2	8:50	222	10	NA	NA	NA	2 0	20	2.5	8.0	19	ND	0 3	NA	42.279444	-71 805556	0.4	11.1	851	Dry
11/21/11	Worcester MA	WOR-3	9:45	198630	TNTC	NA	NA	NA	170	3100	40	630	3300	ND	1 2	NA	42.261667	-71 824167	0 2	10.6	398.9	Dry
11/21/11	Worcester, MA	WOR-4	10:05	362	52	NA	NA	NA	2.7	8.6	2.1	3.8	15	ND	0.64	NA	42.259722	-71 826944	1.7	13.1	3150	Dry
11/21/11	Worcester, MA	WOR-5	10:20	54750	3255	NA	NA	NA	34	3000	13	240	7300	ND	2 0	NA	42.259722	-71 826667	0.4	14.0	745	Dry
11/21/11	Worcester MA	WOR-6	11:00	6932	1043	NA	NA	NA	33	940	8.0	55	89	ND	0.79	NA	42.253889	-71 830278	0 2	13.4	458	Dry
11/21/11	Worcester, MA	WOR-7	11:05	6212	1725	NA	NA	NA	68	1300	20	130	280	ND	1 8	NA	42.253889	-71 830278	0 2	12.6	472	Dry
11/21/11	Worcester, MA	WOR-8	11:10	68670	9208	NA	NA	NA	290	3700	28	720	1900	ND	1 2	NA	42.253889	-71 830278	0 2	10.9	356	Dry
11/21/11	Worcester MA	WOR-9	11:35	43520	12997	0 25*	0 01*	0*	76	660	25	190	3300	ND	2 6	NA	42.240278	-71 841111	0 2	11.6	380	Dry
11/21/11	Worcester, MA	WOR-10	11:55	141360	169	NA	NA	NA	22	60	15	52	200	ND	ND	NA	42.236389	-71 841944	0 3	12.9	543	Dry
11/21/11	Worcester, MA	WOR-10D	11:55	43520	86	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	42.236389	-71 841944	NA	NA	NA	Dry
11/21/11	Worcester, MA	WOR-11	12:00	155310	373	NA	NA	NA	10	31	5.8	20	78	ND	ND	NA	42.236389	-71 841944	0.1	13.3	279	Dry
10/31/12	Worcester, MA	Kendrick	8:25	23590	1439	NA	NA	NA	41	300	22	140	290	NA	ND	27	42.30799674	-71 80050565	0 2	14.7	409.8	0.07"
10/31/12	Worcester, MA	Ararat	8:45	1458	759	1 0	0.00	0	4.1	320	44	50	390	NA	0.69	1.5	42.31279476	-71 80363942	0 6	15.3	950	0.07"
10/31/12	Worcester, MA	Pompano	9:30	16160	4611	<0 25	0.00	0	22	170	3.9	73	490	NA	1.7	12	42.30173411	-71.78067293	0 3	15.2	514	0.07"
10/31/12	Worcester, MA	PompanoD	9:30	9870	2359	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	42.30173411	-71.78067293	NA	NA	NA	0.07"
10/31/12	Worcester, MA	Clark	10:00	6130	4352	<0.25 (0.2)	0.02	0 25	44	1600	16	150	560	NA	6.4	15	42.31248958	-71.77503772	0 2	16.0	381.7	0.07"
10/31/12	Worcester, MA	Tacoma	10:40	510	644	NA	NA	NA	ND	32	2.7	8.5	42	NA	1 2	1.3	42.30697923	-71.76903927	0 2	13.4	375.6	0.07"
10/31/12	Worcester, MA	Mill	11:25	2747	1012	NA	NA	NA	3 9	130	6.7	28	84	NA	1.1	2.9	42.24624097	-71 83320549	0.1	13.5	235.3	0.07"
10/31/12	Worcester, MA	St. Johns	11:45	806	96	NA	NA	NA	ND	19	4.4	12	54	NA	3 6	1.1	42.23891791	-71 82113094	0.1	13.8	216.5	0.07"
10/31/12	Worcester, MA	McKeonA	12:10	716	216	NA	NA	NA	ND	22	5.1	14	57	NA	3 8	ND	42.24234758	-71 80888752	0.1	13.9	227	0.07"
10/31/12	Worcester, MA	McKeonB	12:15	806	395	NA	NA	NA	1 2	20	4.9	12	56	NA	3 5	ND	42.24234758	-71 80888752	0.1	13.9	219.0	0.07"
10/31/12	Worcester, MA	McKeonC	12:20	806	355	NA	NA	NA	0.96	22	4.5	13	57	NA	3 5	0 67	42.24234758	-71 80888752	0.1	13.9	220.6	0.07"

E. coli - color key: Red ≥ 10,000 col/100ml, Orange ≥ 1260 col/100ml, Yellow ≥ 235 col/100ml, Black < 235 col/100ml
Entero - color key: Red ≥ 1000 col/100ml, Orange ≥ 350 Yellow ≥ 61 col/100ml, Black < 61 col/100ml
NH3 - color key: Red ≥ 6 mg/L, Orange ≥ 0.5 mg/L, Yellow ≥ 0 0 mg/L
Surfactants - color key: Red ≥ 1.0 mg/L, Orange ≥ 0.5 mg/L, Yellow ≥ 0 25 mg/L, Black < 0.25 mg/L *** may give false positive at salinity greater than 1 ppt
PPCP color key: Pink = Concentrations greater than background
Cl2 - color key: Red ≥ 1.0 mg/L, Orange ≥ 0.3 mg/L, Yellow ≥ 0.02 mg/L, Black < 0.02 mg/L

REPORTING LIMITS
E. coli = 4 MPN/100mL
Enterococcus = 10 MPN/100mL
Surfactants Field = 0.1 mg/L
Ammonia Field = 0.1 mg/L

ND – not detected above the associated detection limit
NA – not applicable (analyte not tested for at that site at this time)
(~) – data reported as estimate

U.S. Environmental Protection Agency
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Boston, MA 02109-3912

SEWER SYSTEM COMPLIANCE INSPECTION

CITY OF WORCESTER, MASSACHUSETTS

INSPECTION REPORT

Inspection Dates:
January 22–23, 2013

Report Date:
February 27, 2013

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I. INTRODUCTION

On January 22–23, 2013 the U.S. Environmental Protection Agency (EPA), with assistance from PG Environmental, LLC (PG), a U.S. EPA contractor, (hereinafter, collectively, the EPA Inspection Team) inspected the City of Worcester's (City) wastewater collection system and certain components of the City's municipal separate storm sewer system (MS4). The primary focus of the inspection was an evaluation of the operation and maintenance of the collection system and sanitary sewer overflow (SSO) response and reporting procedures. The inspection also included a focus on the City's program for illicit discharge detection and elimination (IDDE) as a component of the City's MS4 program. This report summarizes the results of the inspection.

The inspection consisted of the following major activities:

- Discussions with representatives from the City regarding the operation and maintenance of the wastewater collection system, combined sewer overflow (CSO) treatment facility, SSO response and reporting procedures, collections system drawings and manuals, and MS4 IDDE program.
- Observations of the wastewater collection system field crew activities. Field operations were limited during the inspection due to snowfall and extremely cold temperatures.
- A physical inspection of the City's regulators, CSO treatment facility, pump stations, and storm sewer outfalls.
- Examination of the City's wastewater collection system operations, maintenance, and SSO response and reporting records.

The City's wastewater collection system, CSO treatment facility, and MS4 are regulated under multiple National Pollutant Discharge Elimination System (NPDES) permits and components of the Code of Massachusetts Regulations. The permits and state regulations are further described and referenced as applicable throughout the report.

The following were the primary representatives involved in the inspection:

City Representatives[1]:	Dino Eliadi, Director of Water and Sewer Operations Joseph Buckley, Assistant Director of Sewer Operations Philip Guerin, Director of Environmental Systems Dave Harris, Senior Engineer/Stormwater Coordinator Al Charbonneau, Chief Pump Station Operator
Massachusetts Department of Environmental Protection (MassDEP) Representative:	Ning Chen, Environmental Engineer
EPA Inspection Team:	Doug Koopman, EPA Region 1 Jack Melcher, EPA Region 1 Danny O'Connell, PG Environmental, LLC Bobby Jacobsen, PG Environmental, LLC

[1] The City's Assistant Commissioner for Operations, Department of Public Works & Parks, Mr. Matthew Labovites, was unable to participate in the inspection due to a family emergency. City staff present for the inspection indicated that Mr. Labovites was a significant source of information for City's operation and management of its sewer systems.

II. SUMMARY OF FIELD ACTIVITIES

Accompanied by City staff members, the EPA Inspection Team conducted site visits to multiple locations within the City's service area and viewed various City assets. Locations visited by the EPA Inspection Team include the following:

- Lake Avenue Pump Station.
- Quinsigamond Avenue Combined Sewer Overflow Storage and Treatment Facility.
- Multiple twin invert manholes.
- Multiple regulators.
- Various locations where sewer maintenance crews were conducting sewer flushing operations.

Appendix 1 provides a tabular summary of the field activities and references photographs taken during the inspection. Appendix 2, the Photograph Log, contains all referenced photographs.

III. BACKGROUND INFORMATION AND OBSERVATIONS

The City provides sewage collection for its jurisdiction through a system comprised of both combined and sanitary sewers. The system consists of approximately 360 miles of sanitary sewers, 65 miles of combined sewers, and 31 pump stations. Sewage is conveyed to the Upper Blackstone Water Pollution Abatement District's (UBWPAD) Upper Blackstone Wastewater Treatment Plant (WWTP) for treatment. Discharges from the WWTP are regulated under NPDES Permit No. MA0102369 (effective October 1, 2008) and Code of Massachusetts Regulations Title 314, Section 12.00.

According to the City Assistant Director of Sewer Operations, about 16–17 percent of the City's land area is served by the combined sewer system, primarily in the older downtown section of the City. The City has approximately 20 sewage flow regulators in the combined sewer system that can allow flow from the combined sewer to be conveyed through "CSO collector" sewers to the City's Quinsigamond Avenue Combined Sewer Overflow Storage and Treatment Facility (hereinafter, CSO Facility). The outfall from the CSO Facility comprises the City's only authorized CSO outfall location, and discharges from the CSO Facility are regulated under NPDES Permit No. MA0102997 (effective August 1, 2005).

The City's MS4 consists of approximately 290 miles of storm sewers, 2 pump stations, and more than 300 outfalls in five distinct watersheds. Discharges from the City's MS4 are regulated under NPDES Permit No. MAS010002 (effective October 30, 1998) and the City has developed a stormwater management plan (hereinafter, City SWMP) to guide implementation of its MS4 program.

The EPA Inspection Team conducted an array of office interviews and field activities to discuss current program implementation and observe operation and maintenance activities and the condition of assets. The following descriptions are based on information obtained and observations made during this inspection. The EPA Inspection Team did not meet with staff from the UBWPAD or visit the Upper Blackstone WWTP.

A. System Description

The City Assistant Director of Sewer Operations explained, in addition to the sewer lengths listed above, the City's system includes approximately 30 siphons, 27,000 manholes, and 18,000 catch basins. The City does not maintain ownership of any portion of the sewer laterals from private buildings and residences.

Within the separate sewer areas of the City, a significant portion of the system consists of sanitary sewer pipes and storm sewer pipes which were laid directly adjacent to one another with "common trench" construction in the early 1900s. With the common trench construction approach, the sanitary sewer and

storm sewer lines share manholes assets. The City Assistant Director of Sewer Operations explained that typically one sewer pipe is at a higher elevation than the other, but there is no standard throughout the City as to whether the sanitary or storm sewer pipe is at the higher elevation. The City refers to manholes where the sewer lines are adjacent to one another as "twin inverts." Appendix 3 provides a schematic of a twin invert structure included in the City's SWMP. There are approximately 2,500–3,000 twin invert structures in the City. A master list of the twin inverts did not exist at the time of the inspection. This is further discussed in Section V.D of the inspection report. The City provided a hardcopy map printed from the City's geographic information system (GIS) to show locations of known twin inverts (refer to Appendix 4).

City staff explained to the EPA Inspection Team that, in most locations, metal plates have been installed over top of the sanitary sewer line in the twin invert manholes (refer to Appendix 2, Photographs 25, 28, 33, and 38). The City Assistant Director of Sewer Operations stated that most of the metal plates were installed on top of the sanitary sewer lines in the twin inverts during the 1980s. Each metal plate was custom cut for the specific sanitary sewer line. Based on discussions during the inspection, it was unclear to the EPA Inspection Team whether gaskets were installed for the metal plates to create a more secure seal between the plate and the brickwork. The installation of spring-loaded retainer devices on top of the metal plates was conducted primarily over a five-year span in the 1990s, and by 2000 the vast majority of retainers had been installed (refer to Appendix 2, Photographs 28, 36, and 37). This activity was completed about one or two years prior to the inspection. The City did not have a program for inspecting manholes, including twin inverts, in the sewer system.

B. Regulators and CSO Facility

As stated above, the City has approximately 20 sewage flow regulators in the combined sewer system that can allow flow from the combined sewer to be conveyed to the City's CSO Facility when the sewer in the area of a regulator is surcharged. This typically happens during wet weather events when combined sewer flows exceed the capacity of the combined sewer. This can, however, happen during dry weather when a sewer is surcharged due to sedimentation, structural capacity limitations, or a blockage in the sewer line. Flow which is conveyed beyond the regulator structure enters one of three "CSO collector sewers" that transport the flow to the CSO Facility. The Southbridge Street Collector services the southwest area of the combined sewer system. The Quinsigamond Avenue Collector services the northern area of the combined sewer system, while the Harding Street Collector services the eastern and north eastern areas of the combined sewer system.

Once flow enters the CSO Facility, if the Upper Blackstone WWTP has treatment capacity available the wastewater is pumped directly to the WWTP. The City Chief Pump Station Operator explained that during wet weather events when the Upper Blackstone WWTP no longer has treatment capacity available (i.e., above an influent flow rate 62 million gallons per day (MGD)), UBWPAD staff will shut down the pumps at the CSO Facility which convey flow to the WWTP. Once flow is no longer being conveyed to the Upper Blackstone WWTP and the water level in the CSO Facility's wet well is greater than 439.00 feet in elevation, the City's CSO Facility initiates treatment mode and flow enters the contact tanks at the facility (2.5 million gallons of total storage). Wastewater entering the CSO Facility is provided with "flash treatment" (i.e., mechanical screening, flow through a grit chamber, disinfection, and dechlorination) and discharged to the Old Mill Brook Drainage Conduit, which flows to the Blackstone River.

City staff stated that the base flow at the CSO Facility is about 250,000 gallons per day (GPD), consisting primarily of groundwater. This base flow is pumped directly to the Upper Blackstone WWTP for treatment and discharge. The CSO Facility operates as a pump station during dry weather conditions. The City Assistant Director of Sewer Operations explained that the City has the ability to bypass flows around the City CSO Facility in the event of extreme wet weather; however, this had only been done once. In such an event, the facility would still operate at 100 percent of its flash treatment capacity and the

remainder of the flow would bypass the facility. This inspection did not include a comprehensive compliance evaluation of the CSO Facility or its past operations.

C. Pump Stations

According to City staff, the City has 33 total pump stations in the City—31 for sewage conveyance (including the CSO Facility) and 2 for stormwater. According to the City Chief Pump Station Operator, the City has seven of its own staff dedicated to working on pump stations. The City's pump station maintenance crews are assigned to either the "Lake Side" or "North End" of the City and each crew is composed of two pump station operators. The pump station maintenance crews conduct field inspections of pump stations on a daily basis and observations/activities are documented on paper "station report sheets."

According to City staff, all of the City's pump stations are equipped with alarms. Twenty-eight of the City's 33 pump stations are equipped with backup generators. Pump station maintenance crews run the generators with load about two times per week for about 30 minutes each time. The City Chief Pump Station Operator explained that the City's CSO Facility functions as a pump station the majority of the time, but it does not have full backup power.

The City started connecting pump stations to the City's supervisory control and data acquisition (SCADA) system sometime two years prior to the inspection. City staff stated that four of its pump stations were connected to the City's SCADA system at the time of the inspection: (1) Holden, (2) Lake Avenue, (3) Whitler Avenue, and (4) Dunkirk Drive.

City staff explained that about 20 percent of the City is located on the eastern side of a topographic ridge that extends generally north to south in the eastern portion of the City. Wastewater in this area is pumped via force main from the Lake Avenue Pump Station over the ridge. The Lake Avenue Pump Station can pump up to 20 MGD during wet weather events. The pump station is scheduled for a $7 million rehabilitation project starting in spring 2013.

D. System Mapping

The City Assistant Director of Sewer Operations and City Senior Engineer/Stormwater Coordinator explained that the City's service area was inventoried for the City's GIS in 1999–2000. The GIS includes the following: (1) catch basins, (2) sewer lines, (3) manholes, (4) twin inverts, (5) pump stations, (6) waterways, and (7) topography. The City has also done aerial flyovers to estimate the amount of impervious areas within the City as well as to identify locations where sewer lines are located in heavily forested areas and may be prone to root-related issues. However, based on the EPA Inspection Team's requests for lists of equipment and history of assets, the GIS did not appear to include specific information associated with the twin inverts, such as if and when the metal plate and retainer were installed and their statuses.

E. Flow Metering and Inflow/Infiltration

The City Assistant Director of Sewer Operations explained that there are three main areas in the City's sewer system with capacity issues related to inflow and infiltration (I/I). He explained that the City has consultants working on this issue and two I/I areas were involved in capital improvement program (CIP) projects at the time of the inspection. The City has one permanent flow meter in the Beaver Brook Trunk Sewer in the western portion of the City. According to City staff, the City and a consultant, Weston and Sampson, Inc., were assessing capacity-related issues due to I/I in the Beaver Brook area. The CIP projects for I/I were not discussed in detail during the inspection, as the most appropriate City contact to discuss CIP projects with was not present for the inspection due to a family emergency.

City staff also explained that another consultant to the City, CDM, was in the process of modeling the "core" of the City's sewer system, including the combined area, at the time of the inspection.

The City Assistant Director of Sewer Operations explained that in the areas of the sewer system with significant I/I, sanitary sewer overflows that result from capacity-related surcharged sewers typically release from manholes rather than into private residences or buildings. Nonetheless, in fall 2005 the City initiated a backwater valve reimbursement program to help prevent sanitary sewer overflows into private residences and buildings. Under the program the City will reimburse up to $2,000 for the installation of a backwater valve at a private residence or building. City staff stated that stipulations regarding the City's building code and the year the building was constructed affect eligibility for coverage under the program. City staff estimated that at least a couple hundred citizens have used the program and that there are more on the waiting list.

F. Fats, Oils, and Grease Program

The City Sewer Operations Division, in conjunction with the City Health Department, operates a fats, oils, and grease (FOG) program to help reduce impacts from FOG discharges to the sewer system. The City Director of Environmental Systems explained that the City initiated the program in 2006 and it was fully implemented in 2009. As a component of the program, the City conducted an initial evaluation of the food service establishments (FSEs) in the City. The City does not conduct regular FOG inspections of FSEs. If there is a blockage observed in the City's sewer system downstream of an FSE, then the City will conduct inspections of upstream FSEs to determine the source and require corrective action. At the time of the inspection, the City had not targeted high-density residential living areas.

G. Collection System Operation and Maintenance

The City has field crews that are dedicated to sewer line cleaning ("flusher crews") and other field crews that conduct catch basin cleaning. The City has two flusher trucks and one combination vacuum/flusher truck. There are 69 locations, or hotspots, in the sewer system that the City has identified for regular cleaning on at least a monthly basis. Aside from the regular cleaning activities in the hotspot locations, the City does not perform preventive cleaning in the sewer system. The City crews do not typically use the combination vacuum/flusher truck to remove debris from the collection system; instead they typically use a flusher truck to break up blockages and allow the grease and debris to flow downstream. The City Assistant Director of Sewer Operations explained that the City has about 30 siphons in the sewer system which are flushed "every couple of months." The City Senior Engineer/Stormwater Coordinator stated that there are about 18,000 catch basins in the City which are cleaned on an ongoing basis. It takes City staff approximately one and a half years to clean all of the catch basins.

City flusher crews and catch basin cleaning crews have access in the field to iPads which contain the City's GIS-based map of the system (refer to Appendix 2, Photographs 35 and 41). Sewer hotspot cleaning activities are documented on hardcopy field sheets. Catch basin cleaning activities are documented with a custom iPad application. Field crews input information into the iPad while in the field, and the information automatically uploads to the City's computer system when the iPad is brought back to the Sewer Operations Division. The City started using this application about one and a half years prior to the inspection, and was in the process of developing an application to document sewer cleaning operations.

According to the City Assistant Director of Sewer Operations, the City spends about $50,000 – $60,000 annually for root control in the sewer system with chemical foaming by a contractor, Duke's Root Control. When the City identifies a root problem in an area not treated by the root control contractor, the City conducts its own mechanical root cutting activities and then places that area on a list to be treated by the contractor in the future. City staff was unaware what percentage of the system has received root control treatment.

The City has a closed-circuit television (CCTV) inspection truck and also uses a contractor for CCTV inspection activities. The City has developed its own pipe rating system for assessing CCTV inspection images. The City did not have a program for systematically inspecting the sewer system with CCTV on a regular basis. CCTV inspection activities are normally performed in response to an identified issue such as a sewer line blockage. The City does not typically use CCTV to inspect sewer lines after flushing a section of sewer line. City staff was unaware what percentage of the system has been inspected with CCTV.

H. Work Order System and Complaints

The City has an electronic system called "Customer Service Request System" (hereinafter, CSRS) which was developed by City staff and implemented in October 2002. City staff referred to CSRS as its work order system. The system does not automatically generate and assign work orders to staff, but it is used to document and warehouse work performed in response to requests by City staff and the public. CSRS is designed to differentiate between calls initiated by the public and those initiated by City staff. CSRS is linked to the City's GIS to provide locations for documented requests. The City Assistant Director of Sewer Operations and the City Director of Environmental Systems explained that the City has been evaluating options for developing a computerized maintenance management system (CMMS) for the City Department of Public Works. The City was in the process of evaluating proposals for developing a CMMS at the time of the inspection. The current maintenance management system is driven by paper assignment sheets that are completed by field staff (e.g., regulator field inspection sheets).

CSRS serves as the City's system for documenting all public complaint calls except those to the fire department and the police department. The City's Customer Service Center, located at 20 East Worcester Avenue, receives public complaint calls from 7:30 a.m. to 5:00 p.m., Monday through Friday. After 5:00 p.m. on weekdays and at all times on the weekends, a water operations division clerk is responsible for receiving complaint calls and entering information into CSRS. From 3:30 p.m. to midnight, a water foreman and sewer equipment operator are on duty to respond to issues if needed. From midnight to 7:30 a.m. only the clerk is on duty and additional staff are on call to respond to emergencies. If call volume reaches a certain threshold, additional staff will be called in to assist with answering calls and entering information into CSRS.

CSRS has pre-loaded question scripts for each problem code in the system. Customer service representatives must ask these questions to the caller and manually type the answers in a field associated with each question. Each problem code is pre-assigned a priority ranking of either "emergency" or "standard." The priority can be changed manually. An "emergency" ranking would indicate that City staff should be dispatched within 30 minutes of receiving the call.

A City customer service assistant manager explained that there are three problem codes that customer service staff typically use for inputting public complaints related to the sewer system: (1) "DROPPED KEYS IN CATCH BASIN," (2) "SEWER BACKING UP IN HOUSE," and (3) "SEWER ODOR." Customer service representatives enter information directly into CSRS while taking a complaint call.

When a work order associated with the Sewer Operations Division is created by a customer service representative, a copy of the work order is automatically printed on a printer in the Sewer Operations Division, and the entry shows up on the computer screen of a sewer operations division clerk. The Sewer Operations Division must "accept" the work order, respond, and amend the work order status to "complete" once associated work tasks have been addressed.

Customer service representatives explained that the City has a basic manual that explains how to use the primary functions of CSRS and existing staff provide on-the-job training for new staff. City staff explained that they have not developed a detailed manual or standard operating procedure (SOP) for how

to handle different types of calls because explaining the numerous categories and situations in text would yield a manual or SOP that was not functional.

I. MS4 Outfall Screening and IDDE

The City Senior Engineer/Stormwater Coordinator explained the City conducts dry weather screening of its MS4 outfalls (approximately 339 outfalls total) from June to October each year. The City uses the following standard for determining when outfall screening can be conducted during the field screening season: after a period of four days with no more than 0.1 inch of rainfall during June and July; after a period of three days with no more than 0.1 inch of rainfall in August; and after a period of two days with no more than 0.1 inch of rainfall in September and October.

During field screening activities, City staff visually observes the outfalls and notes whether there is flow and the presence of odors or sheen on the surface of the water. If there is flow, City staff notes the time and depth, estimates the velocity, and uses a field test kit (i.e., HACH probe) to measure conductivity, dissolved oxygen, temperature, and pH at the time of outfall screening activity. City staff then revisits the outfall within 24 hours of the initial screening activity and documents conditions again. The City uses a Microsoft Access database for tracking illicit discharge detection and elimination activities.

The City Senior Engineer/Stormwater Coordinator stated that about two years prior to the inspection, the City started conducting additional sampling of dry weather flow for outfalls. The City does not necessarily collect samples for laboratory analysis during the initial or revisit screening activity, but rather comes back to the outfall at some point during the overall outfall screening season (i.e., June through October) to collect a sample for analysis. Regardless of whether the flow from an outfall in the past was determined to be groundwater, the City conducts sampling of the dry weather flow. The City samples for biochemical oxygen demand (BOD), total suspended solids (TSS), and fecal coliform. Samples for BOD and TSS are analyzed at the Upper Blackstone WWTP laboratory, while samples for fecal coliform are analyzed at the City's water treatment facility laboratory.

The City Senior Engineer/Stormwater Coordinator stated that in the past the City has analyzed samples for additional parameters, such as surfactants, through a third party laboratory. The City Senior Engineer/Stormwater Coordinator stated that if the fecal coliform levels measured in the dry weather flow are greater than 1,000–1,500 colony producing units (CPU) per 100 milliliters (mL) then the City will typically initiate source tracking activities. If the fecal coliform levels are less than 1,000 – 1,500 CPU/100 mL, then the City will not further investigate because experience has shown them that they will not detect an illicit connection. The City had not developed a written SOP to document this process.

If an illicit connection or illicit discharge (IC/ID) is detected through visual or sampling indicators, City staff prints a copy of the sewer system map of the area and goes upstream to observe the junction manholes. The City Senior Engineer/Stormwater Coordinator stated that sewersheds for each MS4 outfall have been mapped in the City's GIS-based map. City staff continues to visually inspect manholes for evidence of an IC/ID until a general source area is identified. If needed, the City uses CCTV inspection to identify the source and also conducts dye testing.

The City Senior Engineer/Stormwater Coordinator stated that the City has found approximately 200 illicit connections to the storm sewer system. The City maintains information about the illicit connections discovered from 1999–2013 in a Microsoft Access database. The database included entries for 171 "misconnections" and "illicit connections" for 1999–2013. The database includes a column for "dye test date" and "repair date."

City staff explained that the City has a "50/50" deal to assist homeowners for whom the connection was installed prior to 2000. Under the deal, the City pays for 50 percent of the cost to fix the illicit connection and the homeowner pays for the remaining 50 percent. If the connection was installed after 2000, the City

will cover the full cost of correction because in 2000 the City started requiring City inspectors to observe and approve initial sewer connections. The City Senior Engineer/Stormwater Coordinator stated that the City has taken homeowners to court in order to correct illicit connections because they constitute public health issues.

The City Senior Engineer/Stormwater Coordinator stated that the City has found numerous instances where there is leakage from a homeowner's sanitary sewer lateral to an adjacent storm drain line which may collect runoff from downspouts or yard drains.

The City Senior Engineer/Stormwater Coordinator explained that there are about 24 MS4 outfalls and specific locations along waterbodies in the City that are visually inspected by City staff on a weekly basis to identify evidence of sewer blockages and comingling of flows from the sanitary sewer to the storm sewer. A hardcopy form is filled out to document the activity. The EPA Inspection Team did not request or receive copies of the hardcopy forms completed by City field staff to document these activities.

IV. Assessment of Compliance with Permit Requirements

The EPA Inspection Team evaluated the City's compliance as it relates to the operation and maintenance of the City's collection system, certain components of its MS4 program, as well as recordkeeping and reporting procedures. The EPA Inspection Team identified several instances of potential noncompliance. These instances of potential noncompliance are summarized in Table 1 and reported as findings below.

Table 1. Findings of potential noncompliance

Potential Noncompliance	Permit/Regulatory References
Finding 1. Unauthorized discharges from the City's wastewater collection system	Section 301(a) of the Clean Water Act
Finding 2. Possible unreported SSOs occurred in the City's wastewater collection system	314 CMR 7.04(3)
Finding 3. Failure to properly operate and maintain the treatment works	314 CMR 12.04(8)–(9)
Finding 4. Failure to develop and implement a manhole inspection program	Table 10 of the City's *CMOM Program Implementation Plan Schedule*
Finding 5. Frequency of discharges from CSO Facility	Part I.A.1 of Permit No. MA0102997
Finding 6. Failure to fully implement the Nine Minimum Controls	Part I.A.2, Part I.B, Part I.C, and Attachment B of Permit No. MA0102997
Finding 7. Failure to properly implement a routine CSO regulator inspection program	Part I.C.1 of Permit No. MA0102997
Finding 8. Failure to submit annual reports for the CSO Facility by April 30	Part I.D of Permit No. MA0102997
Finding 9. Failure to conduct required MS4 water quality monitoring activities	Part I.C of Permit No. MAS010002

Finding 1. Unauthorized discharges from the City's wastewater collection system

Unauthorized discharges from the City's wastewater collection system occurred between January 1, 2010 and December 31, 2012.

Under Section 301(a) of the Clean Water Act (CWA), it is unlawful for any person to discharge any pollutant from a point source into "waters of the United States" except in compliance with an NPDES permit. The City does not have an NPDES permit that authorizes the discharge of wastewater from its separate sanitary sewer system. Therefore, any sewage spill from the City's collection system that enters "waters of the United States" constitutes a violation of the Clean Water Act.

Based on a review of monthly reports of SSOs and pump station bypass events submitted by the City to EPA, the EPA Inspection Team found that 119 unauthorized discharges of wastewater from unpermitted locations in the City's wastewater collection system occurred between January 1, 2010 and December 31, 2012[2]. Table 2 summarizes the number and type (i.e., SSO or pump station bypass) of occurrences per year. The monthly reports of SSOs and pump station bypass events submitted by the City to EPA indicate that all of the reported SSOs and at least 11 of the 14 pump station bypasses entered waterbodies. The final destinations of the other three bypass events were not recorded.

Table 2. Reported unauthorized discharges

Year	Number of SSOs	Number of Pump Station Bypass Events
2010	39	6
2011	31	8
2012	35	0
Total	**105**	**14**

In addition to the unauthorized discharges included in the monthly reports, through a review of work order entries in the City's CSRS, the EPA Inspection Team identified 164 possible unauthorized discharges of wastewater to buildings (i.e., SSOs) caused by issues with the City's sewer system (e.g., blockages and capacity issues) that occurred between January 1, 2010 and December 31, 2012. With the information provided, the EPA Inspection Team did not have the ability to determine whether the events occurred within the combined sewer area or the separate sewer area. Table 3 is a summary of the possible unauthorized discharges per year.

Table 3. Additional possible unauthorized discharges to buildings

Year	Possible Unauthorized Discharges
2010	79
2011	51
2012	34
Total	**164**

Further discussions of the EPA Inspection Team's review of the City's CSRS are included below in Findings 2 and 3. A summary of each possible unauthorized discharge identified during this review is included as Appendix 5.

[2] The monthly reports available to the EPA Inspection Team did not include a list of SSOs or pump station bypasses for September 2012 and November 2012.

Finding 2. Possible unreported SSOs occurred in the City's wastewater collection system

The City did not report multiple possible SSOs which occurred during the period of January 1, 2010 through December 31, 2012.

Section 314 Code of Massachusetts Regulations (CMR) 7.04(3) requires the following:

> *Persons owning or operating a sewer system shall report bypasses and/or overflows as follows:*
>
> *(a) In the event of an anticipated bypass or sanitary sewer overflow the owner shall provide notification to the Department, on a form approved by the Department, at least ten days prior to the event, if possible; or*
>
> *(b) In the event of an unanticipated bypass or sanitary sewer overflow, as soon as the owner has knowledge of the bypass or sanitary sewer overflow and no later than 24 hours after its first occurrence, the owner shall provide notification to the Department, on a form approved by the Department, of such an event.*
>
> *(c) Within five days of the event identified in either 314 CMR 7.04(3)(a) or (b) the owner shall provide the following information to the Department, on a form approved by the Department: All the activities that lead up to the event; steps taken to minimize the impact of the event on public health and the environment; and, steps taken to prevent such an event from happening in the future.*

The MassDEP SSO Reporting Form and instructions (updated January 2013) clearly state that unauthorized discharges, including backups of wastewater into public or private property due to the City's system, must be reported. Figure 1 below is an excerpt[3] from the instructions for the MassDEP SSO Reporting Form which further explains the reporting requirement.

> **Why do I need to report backups into buildings?**
> DEP wants to ensure that sewage backups into buildings as a result of problems in the sewer system are properly repaired and measures are put in place to reduce the likelihood of recurrence. Owner/operators of sewer systems that caused a backup may need to repair, rehabilitate, or upgrade the hydraulic capacity of their system, or change their operations and maintenance procedures.

Figure 1. Excerpt from MassDEP SSO Reporting Form.

In addition, page 2-1 of the City's *Sewer System Overflow (SSO) Emergency Response Plan (ERP)*, dated May 2005 (hereinafter, SSO ERP; refer to Appendix 6) explains that sewer overflows to "basements" are included in the City's definition of SSO. Specifically, the City's SSO ERP states the following:

> *The receiving water body is the point where a SSO enters a surface stream, river, or lake once it leaves the collection system. An understanding of this is necessary to ensure the proper execution of an overflow response. In addition to a receiving water body, sewer overflows can enter the environment at one or more of the following destinations: low lying areas, storm sewers (CBs),* ***basements*** *[emphasis added].*

As stated above, the EPA Inspection Team conducted a review of work orders contained in the City's CSRS. Specifically, the EPA Inspection Team obtained and reviewed work order entries from the City's CSRS with the problem code "SEWER BACKING UP INTO HOUSE" for the period of January 1, 2010 through December 31, 2012. The EPA Inspection Team reviewed the entries to determine whether the discharges were caused by issues in the City's system such as blockages or capacity limitations, or if the

[3] This language is included in the recently revised January 2013 version of the form and instructions, as well as the June 2008 version.

discharges were caused by issues in private laterals. Multiple entries did not include enough information to determine whether the blockage was in the City's system or a private lateral. Of the 684 total entries with the problem code "SEWER BACKING UP INTO HOUSE," 164 entries were related to issues with the City's sewer system (i.e., blockage or capacity issue). A summary of the entries and the EPA Inspection Team's review is included as Appendix 5. Further discussion of the causes of the discharges is included in Finding 3.

In its monthly reports to EPA, the City indicated that no SSOs occurred for eight separate months during 2010 to 2012. The EPA Inspection Team found work order entries for "SEWER BACKING UP INTO HOUSE" attributed to City sewer system issues in each of the months for which the City reported zero SSOs. Table 4 provides a summary of these months and the number of possible SSOs identified.

Table 4. Possible SSOs during months where zero SSOs were reported to EPA

Month	Number SSOs Reported to EPA	Possible SSOs Identified
April 2010	0	4
May 2010	0	3
June 2010	0	1
October 2010	0	4
May 2011	0	1
July 2011	0	3
October 2011	0	1
November 2011	0	3
Total	**0**	**20**

Finding 3. Failure to properly operate and maintain the treatment works

The City failed to properly operate and maintain the treatment works and had not developed and implemented an effective preventative maintenance program for its sewer collection system as required by 314 CMR 12.04(8)–(9).

Specifically, 314 CMR 12.04(8)–(9) requires the following:

> *(8) Any person operating treatment works shall maintain them in a manner that will ensure proper operation of the works, or any part thereof.*
>
> *(9) Any person operating treatment works shall establish and implement a preventive maintenance program to assure the efficient operation of all facilities and equipment.*

The City's *Sanitary Sewer Priority Cleaning Plan* (hereinafter, Cleaning Plan; refer to Appendix 7), submitted to EPA in February 2006, states the following:

> *It is impractical and unnecessary to clean the entire sanitary sewer system on a regular basis, as many sections of the system are not prone to flow restrictions. The need, then, is for a plan that will direct staff to focus on areas that would be most prone to restrictions and blockage and to suggest cleaning methods and frequencies that would best address the problem.*

Section 1 of the City's Cleaning Plan explains that the City developed a list of problem areas (i.e., hotspots) within the sewer system to be cleaned or flushed regularly ("typically twice per month"). City staff present for the inspection referred to this as the "flusher list." The flusher list was included as Attachment D to the City's Cleaning Plan and included 57 distinct locations for regular flushing (refer to Appendix 8). During the inspection, the EPA Inspection Team viewed a copy of the current flusher list

which included 69 locations (refer to Appendix 9). Since the flusher list was submitted to EPA in 2006, only one location has been removed from the list and 13 locations have been added. This may be indicative of either a failure to sufficiently address the root causes of sewer issues at the hotspot locations or a failure to review and update the flusher list to efficiently allocate the City's sewer cleaning resources. It was unclear to the EPA Inspection Team when the flusher list was last updated and whether the City had a structured approach for reviewing and updating the hotspot locations on the flusher list.

Aside from the regular flushing activities in the hotspot locations, the City does not perform preventative maintenance in the sewer system. Furthermore, the City does not typically use its combination vacuum/flusher truck to remove debris from the collection system; instead crews typically use a flusher truck to break up blockages and allow the material (e.g., grease and debris) to flow downstream. The City's practice of not removing grease and debris from the collection system during sewer flushing activities can cause the grease and debris to re-aggregate in downstream sewer lines and cause additional blockages. An effective preventative maintenance approach should include removing debris from the collection system during cleaning activities in sewer assets not immediately upstream of collection system trunk or interceptor sewer lines (i.e., large diameter, high flow sewer lines). During the inspection, the City Assistant Director of Sewer Operations explained that in summer 2012, the City started a pilot project to clean one entire sewershed on a preventative basis. It was not clear to the EPA Inspection Team whether the City intended to develop and implement a preventative cleaning schedule based on distinct sewersheds.

In addition, the City did not have a program for systematically inspecting the sewer system with CCTV on a regular basis. CCTV inspection activities are normally performed in response to an identified issue such as a sewer line blockage. As a result of the lack of an inspection program, the City is not able to properly assess the condition of its collection system and identify defects and areas of concern before they result in a collection system failure. Additionally, a CCTV inspection quality control program that follows the City's sewer cleaning activities would allow the City to evaluate the efficacy of its cleaning activities and modify the sewer cleaning procedures to minimize any damage caused to the aging collection system by the cleaning equipment.

The City representatives reported that the collection system has approximately 2,500–3,000 twin invert locations where the sanitary sewer line and storm sewer line are located adjacent to one another in a manhole structure. The twin inverts locations represent areas where there is a greater potential for comingling of sanitary and storm sewer flows. According to City staff, the City has not developed a program for regular inspection or maintenance of the twin invert structures, including the metal plates and retainer devices. City staff stated that they might become aware of comingling of flows at twin invert locations due to a blockage in the sanitary sewer line that creates service issues; however, the City did not have a program to actively identify unauthorized discharges between the sewer systems. This issue is further discussed below in Finding 4.

As explained above, during its review of the City's CSRS for the problem code "SEWER BACKING UP IN HOUSE," the EPA Inspection Team identified 164 possible unauthorized discharges of wastewater (i.e., SSOs) caused by issues with the City's sewer system that occurred between January 1, 2010 and December 31, 2012. During its review of the work orders, the EPA Inspection Team reviewed the notes entered into CSRS to determine the apparent root cause of each overflow (e.g., capacity, debris, grease). Table 5 summarizes the results of the root cause analysis.

Table 5. Causes for possible SSOs

Cause	Number of Occurrences
Capacity[a]	52
Debris[b]	15
Grease	46
Roots	5
Structural	4
Blockage – Material not identified[c]	41
Cause not identified[d]	1
Total	**164**

[a] Noted in the City's CSRS as "hi water" or "surcharged."
[b] Includes items such as paper, sheets, rags, gravel, and diapers.
[c] Multiple entries indicated that there was a blockage in the City's sewer line, but did not state what material caused the blockage.
[d] Not enough detail in the notes to determine a cause.

A more thorough summary of the work order entries and the EPA Inspection Team's review is included as Appendix 5. The EPA Inspection Team reviewed the work order entries to determine whether there were certain addresses that had experienced sewer backups due to issues with the City's sewer system more than once during the time from January 1, 2010 to December 31, 2012. There were 25 specific addresses that experienced more than one sewer backup due to issues with the City's sewer system during that time period. A summary of the addresses with recurring backups, including the dates and apparent causes of the backups, is presented in Table 6; additional detail is included as Appendix 10. Five of the 25 addresses were located at or near (within 0.1 mile of) hotspot locations identified on the City's 2006 flusher list. One of the addresses with recurring backups was added to the updated flusher list.

Table 6. Locations with recurring backups at or near hotspots

Address	Dates	Cause	Notes Regarding Inclusion on Hotspot Flusher List
71 CAMBRIDGE ST	2/6/2011	Blockage - Material not identified	The address with recurring backups is approximately 0.1 mile northwest of hotspot location No. 21 "Saugus Place @ Cambridge St. / interceptor" included on 2006 flusher list. This location is also included on the updated flusher list as No. 22.
	3/18/2011	Blockage - Material not identified	
1350 PLEASANT ST	3/14/2010	Blockage - Material not identified	This address was included as hotspot location No. 26 on the 2006 Flusher List. It is also included on the updated flusher list as No. 27 "Opposite side of 1350 Pleasant Street."
	3/29/2010	Grease	
16 SACHEM AVE	3/30/2010	Blockage - Material not identified	The 2006 flusher list includes "Achushnet Ave. sewer location to 22 Sachem Ave" as hotspot location No. 34. The address with recurring backups is within approximately 200 feet northwest

Address	Dates	Cause	Notes Regarding Inclusion on Hotspot Flusher List
	3/2/2011	Grease	of 22 Sachem Ave. The updated flusher list includes this same hotspot location as No. 38 and also includes 23 Sachem Avenue, which is approximately 250 feet southeast of the address with recurring backups.
31 SOUTHOLD RD	1/25/2010	Grease	Hotspot location No. 15 on the 2006 flusher list is "35 Southold Road." The address with recurring backups is within approximately 200 feet east of the listed hotspot location. The updated flusher list also includes this hotspot location as No. 16.
	3/30/2010	Capacity	
40 SOUTHOLD RD	2/25/2010	Capacity	The 2006 flusher list includes "35 Southold Road" as hotspot location No. 15. The address with recurring backups is within approximately 50 feet west of the listed hotspot location. The updated flusher list includes this hotspot location as No. 16.
	3/30/2010	Capacity	
	12/23/2010	Grease	
	5/27/2012	Debris	
	5/30/2012	Blockage - Material not identified	

Finding 4. Failure to develop and implement a manhole inspection program

The City had not developed and implemented a manhole inspection program as required in Table 10 of the City's *CMOM Program Implementation Plan Schedule* (hereinafter, CMOM Plan).

Specifically, Table 10 of the City's CMOM Plan (refer to Appendix 11) states:

> *Develop a formal manhole inspection plan that describes the procedures used to inspect manholes, developing a standard form that will be used to gather information on the manhole.*

On April 28, 2006, a consultant to the City, Camp Dresser & McKee, Inc., submitted the City's CMOM Plan to EPA in response to requirements of Administrative Docket No. 05-21. The section of the CMOM Plan titled "Physical Inspection and Testing Program" identified gaps in the City's program that needed to be addressed with implementation of specific plans. The CMOM Plan states "Even thought [sic] the City will inspect manholes through a contractor or by City personnel, the City needs to have a formalized program." Table 9 identifies that the City did not have a formal manhole inspection program in place and needed to implement a program, which includes a tracking system. Table 10, Implementation Plan & Schedule, of the City's CMOM Plan identifies that the City would develop and implement a program by June 2007. Figure 2 is an excerpt from the City's CMOM Plan which displays the schedule for developing and implementing the manhole inspection program.

Schedule
Inspection and Testing Program – Section 7(a)

- Develop Manhole Inspection Plan (June 2006 – December 2006)
- EPA Review
- Train employees (March 2007)
- Implementation (April 2007 – June 2007)

Figure 2. Excerpt from the City's CMOM Plan.

During the inspection, City staff stated that the City did not have a program for inspecting manholes in its sewer system. As noted above in Finding 3, the 2,500–3,000 twin invert locations in the City's sewer system are of particular concern due to the potential for comingling of flows between the sanitary and storm sewers. City staff explained that a metal plate and retainer device had been installed on most of the sanitary sewer lines in the twin invert manholes. However, the City did not employ a documented management mechanism listing the twin invert manholes and the status of internal assets (i.e. metal plate covers and retainer devices) to confirm the operational status and describe the possibility of cross-contamination between sanitary and storm sewer systems. Figure 3 is an excerpt from page 6-1 of the City's SWMP that explains some of the challenges of the twin inverts and the City's reasoning for installing the retainer devices on top of the metal plates.

Under certain flow conditions, surcharged conditions in one of the pipes may cause the water to rise above the dividing wall, allowing flow to enter the other system. For example, during heavy rainfall, the storm drain may surcharge, allowing excess inflow into the sanitary system. More problematic from a stormwater quality standpoint are sanitary sewer blockages, which cause back-ups into the twin-invert manholes, which overtop the dividing wall and discharge sanitary sewage to the storm drainage system. In an attempt to alleviate this problem, most of the twin-invert manholes in the City have been equipped with an aluminum plate set in mortar over the sanitary invert. These plates have not been effective, however, because they are often lifted by excessive surcharge pressure, or have not been replaced after being removed for access to the manhole. Once the plate is displaced, flow can pass between inverts.

There are approximately 2,579 twin-invert manholes in Worcester, representing 30 percent of the manholes in the City.

Figure 3. Excerpt from page 6-1 of the City's SWMP regarding twin inverts.

During the field activities conducted as a component of the inspection, the EPA Inspection Team observed several locations with at least one of the following conditions: (1) there was no metal plate on top of the sanitary sewer line, (2) the metal plate installed over the sanitary sewer line did not fully cover the opening, and (3) there was no retainer device on top of the metal plate. Refer to Appendix 1, Field Visit Nos. 11, 14, and 16 for a description of the assets and references to associated photographs.

Finding 5. Frequency of discharges from the City's CSO Facility

Part I.A.1, Footnote 2 of Permit No. MA0102997 states the following regarding frequency of discharges from the City CSO Facility:

> *Consistent with and upon completion of the portions of the compliance schedule set forth in Part I.E of the permit,* ***the average number of treated overflows from this facility will be limited to 4 per year or less beginning in 2007 and to 2 per year or less beginning in 2010****.*

Part I.E of Permit No. MA0102997 requires that the City complete six distinct improvements in accordance with the compliance dates included in the permit. The City's CSO Facility Annual Reports for 2008–2011 indicate that improvements 1 through 4 were completed, but numbers 5 and 6 had not been completed. City staff stated that improvement numbers 5 and 6 had not been completed at the time of the inspection. Improvements 5 and 6 were required to be completed by June 1, 2008 and June 1, 2010, respectively.

Based on review of the City's CSO Facility Annual Reports for 2008–2011, an average of 25.5 discharges per year from the CSO Facility have occurred during that time period. Table 7 is a summary of the number and volume of discharges from the CSO Facility.

Table 7. Discharges from the City's CSO Facility

Year	Number of CSO Discharges	Total Volume of CSO Discharges (million gallons)
2008	35	901
2009	22	333
2010	17	647
2011	28	702
TOTAL	**102**	**2,582**

Finding 6. Failure to fully implement the Nine Minimum Controls

A complete assessment of the Nine Minimum Controls (NMCs) program was not the primary focus of the inspection; however, there was some overlap with some of the controls and general collection system operation, and the EPA Inspection Team's observations are presented below.

Permit No. MA0102997 requires the City to implement the NMCs for its combined sewer system. Specific references to the NMCs are included in Part I.A.2, Part I.B, and Part I.C of the permit. The permit also references Attachment B for "Nine Minimum Technology Based Controls Documentation and Implementation Guidance" to achieve compliance with the NMCs. Attachment B of the permit identifies specific information that must be included in the documentation of each of the nine minimum technology based limitations. The following observations were made by the EPA Inspection Team regarding these specific controls and additional permit requirements related to NMC implementation.

NMC No. 1 Proper operation and regular maintenance programs for the sewer system and the combined sewer overflows

Aside from hotspot flushing, the City currently practices a reactive maintenance approach that does not include regularly scheduled inspection and maintenance of the wastewater collection system. As discussed above, the City performs sewer cleaning on a reactive basis, responding to customer complaints

and field crew observations rather than implementing a regularly scheduled preventive maintenance approach.

Attachment B of Permit No. MA0102997 requires that this technology based limitation must include a list of facilities and structures that are critical to the performance of the combined sewer system, including all regulators, tide gates, pumping stations, and sections of sewer lines which are prone to sedimentation or obstruction.

During the document review component of the inspection, the EPA Inspection Team observed two different regulator field inspection sheets used by City staff during 2011 and 2012 that identified different assets. Appendix 12 includes the regulator field inspection sheets provided by the City for 2011 and 2012. Specifically, the regulator field inspection sheet used during 2011 identifies 20 assets while another regulator field inspection sheet used eight times during 2012 identifies 26 assets. For example, the regulator field inspection sheet dated October 10, 2012 includes six locations that do not appear to have actual regulator assets but are listed as regulators. It is unclear to the EPA Inspection Team which of the regulator lists is accurate.

In addition, a review of the City's work order system (CSRS) identified multiple addresses which experienced recurring sewer backups that required flushing of the City's sewer line but were not included on the City's flushing list. As noted above, with the information provided, the EPA Inspection was unable to determine whether these locations are within the combined sewer or separate sewer area.

The permit also requires that inspection and maintenance personnel be trained and equipped for confined space entry. During the field component of this inspection, a City employee entered a confined space to retrieve a dropped piece of equipment without completing a confined space permit or using proper safety equipment. It is unclear if the City has properly trained and equipped inspection and maintenance personnel for confined space entry.

NMC No. 2 Maximum use of the wastewater collection system for storage

Attachment B of Permit No. MA0102997 includes multiple requirements for this NMC. This section is formatted to clearly display the requirements and associated observations made during the inspection.

The permit states that this technology based limitation must include the following:

> *Collection system inspection: This inspection should focus on the identification of maintenance or design deficiencies that restrict the use of otherwise available system capacity. This evaluation should document that inadequate regulators, piping bottlenecks, and pumping deficiencies have been identified and corrected, or scheduled for correction.*

Inspection Observation: Through a review of work orders and field sheets, the EPA Inspection Team has identified multiple locations in the sewer collection system that have had multiple events in which the collection system has been documented to have a restriction (surcharging) or blockage and the only apparent response to the issue was to flush the sewer line. As described above, the City has had a formal hotspot list since 2006 which included 57 locations. At the time of the inspection, the hotspot list contained 69 locations and only one of the 57 locations included on the 2006 list had been removed from the hotspot list. The City did not provide documentation to demonstrate that permanent corrective actions are being implemented by the City to address hotspot locations, especially those that have been on the list since 2006. The EPA Inspection Team did not review sewer rehabilitation projects with City staff since the appropriate City contact for the City's CIP was not present for the inspection due to a family emergency. This component of the inspection process typically identifies sewer assets receiving additional maintenance until planned structural modification to the asset can be completed.

The permit states that this technology based limitation must also include the following:

> *Tide gate maintenance and repair: Tide gates prevent significant volumes of water from entering the conveyance system, thereby freeing up system storage capacity during wet weather periods. Where appropriate, document that tide gate maintenance and repair procedures are adequate.*

Inspection Observation: Multiple regulator inspection field sheets obtained by the EPA Inspection Team noted problems with regulator gates such as "bad hinge," "hinge," and "broke" but did not identify specific issues or final resolution to the problem. In addition, the following information was not identified on the regulator inspection field sheets: (1) description of the necessary maintenance, (2) the date the necessary maintenance was performed, and (3) whether the observed problem was corrected.

The permit states that this technology based limitation must also include the following:

> *Adjustment of regulator settings: Adjustment of regulating devices can increase in-system storage of CSO flows and maximize transport to the POTW. Care should be taken to ensure that the regulator adjustment will not result in unacceptable surcharging of the system. Document that regulators have been adjusted to optimum settings. The method by which the community determined the optimum regulator setting (e.g. modeling, trial and error) shall be included in the documentation.*

Inspection Observation: Regulator No. 6, Millbury at Richland was observed to be at approximately 50 percent of its design capacity at approximately 9:00 am January 23, 2013 (refer to Appendix 1, Field Visit No. 5).

The permit states that this technology based limitation must also include the following

> *Removal of obstructions to flow: Document that accumulations of debris which may cause flow restrictions are identified, and debris is removed routinely. Documentation shall include a summary of the locations where sediment is removed, the number of times each year the sediment is removed and the total quantity of material removed each year.*

Inspection Observation: Due to the City's lack of preventive cleaning, there is the potential for a buildup of debris and grease in the sewer lines. In addition, the City's policy of flushing verses cleaning (i.e., flushing debris downstream rather than removing it) allows potentially obstructive materials to remain in the sewer system. The resulting buildup of debris and grease prevents the City from maximizing storage in the collection system. No records were available to the EPA Inspection Team that documented the quantity of material removed from sewer lines and the number of times lines were flushed each year. In addition, the City indicated that the collection system is subject to I/I during wet weather events, which reduces capacity for storage of wastewater in the collection system.

NMC No. 3 Review and modification of the pretreatment program to assure CSO impacts are minimized

Part 1.C.2 of Permit No. MA0102997 states, "Discharges to the combined system of septage, holding tank wastes or other material which may cause a visible oil sheen or containing floatable materials are prohibited during wet weather when CSO discharges may be active." The City did not report having a program that limited septage, holding tank wastes, or other materials that may cause a visible oil sheen or contain floatable materials. City staff stated that the City had developed and implemented a FOG program for the community.

Activities associated with controlling and/or regulating septage, holding tank wastes, material that may cause visible oil sheens, or containing floatable materials are typically managed by a WWTP's industrial

pretreatment program (IPP). The IPP for the City is managed by the UBWPAD. This inspection did not include discussions with the UBWPAD.

As stated previously in this report, a review of the City's CSRS documented that grease is a recurring cause of blockages in the City's wastewater collection system and had been the cause of SSOs, basement backups, and surcharged sewers.

NMC No. 4 Maximization of flow to the POTW for treatment

Attachment B of Permit No. MA0102997 recognizes that most of the actions recommended for maximization of the collection system for storage (NMC No. 2) will also serve to maximize flow to the POTW. Therefore, the observations included above for NMC No. 2 are not repeated in this section. In addition to optimizing those controls to maximize flow to the POTW, the following specific controls should be evaluated and implemented where possible:

a. *Use of off-line or unused POTW capacity for storage of wet weather flows.*
b. *Use of excess primary treatment for treatment of wet weather flows. If the use of excess primary capacity will result in violations of the community's NPDES permit limits, the community shall get approval of the proposed bypass from the permitting authority prior to implementation.*

The City has installed a leaf gate mechanism for the sewer line along Route 122 to maximize storage in the sewer line. The City also stores wastewater in the CSO Facility contact tanks as a component of its wet weather operations. The City has submitted and operates under a CSO Facility SOP which describes open communications between the City operators and the UBWPAD to maximize flows to the Upper Blackstone WWTP.

NMC No. 5 Prohibition of dry weather overflows from CSOs

The City has three combined sewer overflow collector sewers (described in Section III of this report) that transport dry weather overflows (DWOs) to the CSO Facility for pumping to the Upper Blackstone WWTP for treatment.

NMC No. 6 Control of solid and floatable materials in CSOs

The City CSO Facility has two mechanical bar screens for the removal and capture of solids and floatables (refer to Appendix 1, Field Visit No. 1). The Inspection Team noted that several stormwater catch basins in the combined sewer area were full of solids and debris (refer to Appendix 1, Field Visit No. 8).

NMC No. 7 Pollution prevention programs that focus on contaminant reduction activities

Pollution prevention programs were not reviewed as a component of this inspection.

NMC No. 8 Public notification to ensure that the public receives adequate notification of CSO occurrences and impacts

Public notification program and activities were not reviewed as a component of this inspection.

NMC No. 9 Monitoring to effectively characterize CSO impacts and the efficacy of CSO controls

The City's CSO Facility was visited as a component of the inspection process. A general tour and procedural discussions concerning the facility operations were conducted. The facility had an operational SCADA system and the City operations team maintained a hardcopy of operation logs. This inspection did not include an evaluation of the CSO impacts or the efficacy of CSO control.

Finding 7. Failure to properly implement a routine CSO regulator inspection program

Part I.C.1 of Permit No. MA0102997 requires the following:

> *Each CSO structure/regulator, pumping station and/or tidegate shall be routinely inspected, at a minimum of once per month, to insure* [sic] *that it is in good working condition and adjusted to minimize combined sewer discharges and tidal surcharging.*

The permit also requires, through the inspection process, that the City document the following information: (1) date and time of the inspection, (2) general condition of the facility, and (3) whether the facility is operating satisfactorily. If maintenance is necessary, the following additional information must be recorded: (1) description of the necessary maintenance, (2) the date the necessary maintenance was performed, and (3) whether the observed problem was corrected. The City must maintain all records of inspections for at least three years.

As a component of the inspection, the EPA Inspection Team requested the City to provide copies of its regulator inspections and related findings for 2011 and 2012 (refer to Appendix 12). The information provided by the City for 2011 only contained five regulator field sheets. The field sheets documented individual regulator inspection activities performed during the months of January, March, and April 2011, and two separate inspections for December 2011. The field sheets did not include the times at which the inspections were conducted and the entries for "flow" and "structural concerns & comments" were not completed in a consistent manner. Furthermore, a number of the field sheets' comments noted problems with regulator gates (bad hinge, hinge, and broke) and blocked sewer conditions but did not specify the following: (1) description of the necessary maintenance, (2) the date the necessary maintenance was performed, and (3) whether the observed problem was corrected. The City did not provide documentation for the months of February, May, June, July, August, September, October, or November 2011.

The 2012 file folder contained 12 regulator field sheets representing activities from three January inspections, two inspections each for the months of May and October 2012, and single inspections for the months of February, August, September, November, and December 2012. The field sheets did not include the times at which the inspections were conducted and the entries for "flow" and "structural concerns & comments" were not completed in a consistent manner. The field sheet dated October 11, 2012 contains inspection information for regulator locations not identified on any of the 2011 field sheets and only inspected once for the year 2012. Furthermore, it is unclear if these locations have regulators, as the field sheet has "?" in the column provide for gate and weir condition. The City did not provide documentation for the months of March, April, June, and July 2012.

Finding 8. Failure to submit annual reports for the CSO Facility by April 30

Part I.D of Permit No. MA0102997 requires the City to submit a report to EPA and MassDEP by April 30 of each year that includes the specific information listed at Part I.D.1–5 of the permit. During its review of documents during the inspection process, the EPA Inspection Team noted that the City submitted multiple annual reports after the April 30 deadline. Table 8 summarizes the timing of the report submittals.

Table 8. Summary of timing for CSO Facility annual reports

Reporting Year	Due Date	Submittal Date	Days Beyond Due Date
2008	April 30, 2009	November 5, 2009	189
2009	April 30, 2010	December 16, 2010	230
2010	April 30, 2011	December 20, 2011	234
2011	April 30, 2012	October 4, 2012	157

Finding 9. Failure to conduct required MS4 water quality monitoring activities

Since fall 2003, the City has not conducted wet weather monitoring as required by Part I.C, *Wet Weather Monitoring and Reporting Requirements*, of the City's MS4 permit (Permit No. MAS010002).

Specifically, Part I.C.1.a of the permit requires the City to sample locations identified in its March 25, 1998 letter to EPA "at least three times per year (spring, summer and fall) for all the parameters suggested, including cadmium and replacing oil & grease with Total Petroleum Hydrocarbons (TPH)."

Part I.C.1.a(1) of the permit requires the City to conduct instream sampling at the mouth of the Mill Brook Conduit for fecal coliform during the spring and summer.

Part I.C.1.a(3) of the permit requires spring and summer sampling of "sampling station 00 from the BRI study" and "a station downstream of where Beaver Brook and Tatnuck Brook completely mix, but above the Kettle Brook confluence."

The City Assistant Director of Sewer Operations and City Senior Engineer/Stormwater Coordinator explained that the City conducted these monitoring activities during the first five years of its permit coverage, but has not conducted these monitoring activities since that time.

V. ADDITIONAL CONCERNS

In addition to findings of potential noncompliance, the EPA Inspection Team noted several additional areas of concern, as discussed below.

A. Old Mill Brook Conduit Interconnection

City staff explained that there is an interconnection between the "Old Mill Brook Drainage Conduit" (which conveys the Old Mill Brook and stormwater) and the "Old Mill Brook CSO Collector Conduit" (which conveys CSO flows to the City's CSO Facility). It was unclear to the EPA Inspection Team exactly where in the system this interconnection is located and what the engineered flow dynamics are at the interconnection. A basic schematic of the interconnection was viewed at the City's CSO Facility and is included as Appendix 13. The schematic shows that there is a static weir between the conduits; flows from the Old Mill Brook Drainage Conduit could overtop the weir and enter the Old Mill Brook CSO Collector Conduit upstream of the City's CSO Facility. Based on this diagram, it appears that surface water from Old Mill Brook and Salisbury Pond would be directed to the Old Mill Brook CSO Collector Conduit and the City's CSO Facility which would limit available treatment and pumping capacities of raw combined wastewaters at the CSO Facility. It was unclear to the EPA Inspection Team whether the City conducts inspections of the overflow weir or when the last overflow between the conduits occurred.

B. Fecal Coliform Sampling at MS4 Outfalls

As described above in Section III.I, the City conducts sampling for fecal coliform of dry weather flows from MS4 outfalls observed during outfall screening activities. The City MS4 Coordinator explained that the City did not have written SOPs for following up on the sampling activities, such as a threshold for fecal coliform levels that would initiate action by the City. The City Senior Engineer/Stormwater Coordinator explained that generally a value greater than 1,000–1,500 CPU/100 mL would typically initiate action for source identification and potential illicit connection elimination. The EPA Inspection Team did not obtain fecal coliform sampling data from the City's MS4 outfall screening activities.

For the sake of comparison to the City's informal fecal coliform sampling threshold, the EPA Inspection Team reviewed the current Massachusetts Surface Water Quality Standards (314 CMR 4.00) to determine what bacteria levels had been established for inland waters designated as "Class B," such as the Blackstone River. The current water quality standards for this classification are expressed as *E. coli* and are therefore not directly comparable to fecal coliform sampling used by the City. However, for reference, it should be noted that the 1996 Massachusetts Surface Water Quality Standards for bacteria in Class B waters were expressed as fecal coliform. The 1996 water quality standard was such that the geometric mean must be less than 200 CPU/100mL in any representative set of samples, and less than 10 percent of the samples can be greater than 400 CPU/100mL.

During field activities conducted as a component of the inspection, the EPA Inspection Team, along with City staff, viewed a section of Beaver Brook (which flows underground through much of the City) that was daylighted about 4–5 years prior to the inspection. The City Senior Engineer/Stormwater Coordinator stated that the City started conducting monthly sampling for fecal coliform at this location in Beaver Brook after it was daylighted. The City Senior Engineer/Stormwater Coordinator stated that the typical fecal coliform level measured in this section of Beaver Brook is about 6,000 CPU/100 mL. He attributed this primarily to the age of the sewer system in the area. Page 6-3 of the City's SWMP notes that the Beaver Brook "subbasin" includes the most twin invert manholes of any other subbasin in the City (639 of the identified 2,579 twin invert manholes are in this subbasin). The City Senior Engineer/Stormwater Coordinator explained that the City has found about 20 illicit connections upstream of this location. He estimated there are probably about 20–25 outfalls from the MS4 to Beaver Brook, upstream of this sampling location in the underground section of Beaver Brook. These suspected outfalls are not able to be visually observed during dry weather field screening activities due to their underground location. The EPA Inspection Team did not obtain sampling data for the fecal coliform sampling conducted in Beaver Brook.

C. Linear Footage Recorded for Sewer Flushing

A sewer cleaning field crew member interviewed during the inspection explained that he reports the entire length of sewer line that was flushed no matter how many times a particular section of line was flushed during one activity. Therefore, the reported linear footage recorded as being flushed would not represent a unique length of sewer that was maintained, but rather the length of total sewer line that the flusher hose entered. It was not clear to the EPA Inspection Team whether all sewer maintenance field crew members record the linear footage for sewer flushing with the same method.

D. Number of Twin Invert Structures in the City's System

The City was unable to tell the EPA Inspection Team the actual number of twin invert manhole structures in the City's sewer system. During the opening discussions of the inspection, the City Assistant Director of Sewer Operations estimated that there were about 1,700 twin invert manholes in the City's system. The EPA Inspection Team requested the City to provide a list or inventory of all of the twin invert manholes. In response, the City Assistant Director of Sewer Operations explained that the City's GIS contains the most complete inventory of twin inverts in the City, and additional twin inverts are added to the GIS as they are discovered in the City. After querying the GIS during the inspection, the City Assistant Director of Sewer Operations stated that there are 2,500 to 3,000 twin invert manholes in the system; however, he did not provide an actual figure for the number of the structures in the system. Page 6-1 of the City's SWMP (created for the City's MS4 permit issued in 1998) states there are 2,579 twin invert manholes in the City's system. As noted above, the City does not have a program for inspecting the twin invert manholes.

E. Number and Purpose of CSO Regulator Structures in the City's System

During the initial interview process, City representatives stated that there were 17 regulators in the combined sewer system. The EPA inspection Team was informed that the regulators were inspected at least monthly; however, in some cases regulator manholes maybe inaccessible due the parking of resident's vehicles. A review of the regulator inspection records for 2011 and 2012 identified two different list formats of regulators; one list contained 26 regulator locations while the other had 20 regulator locations. During inspection field activities, a sewer maintenance field crew member stated that there are 24 regulators in the system. The EPA Inspection Team did not have time to inspect all the regulator locations. The actual number of regulators is not clear to the EPA Inspection Team.

In addition, while inspecting regulator structures along Millbury Street, the EPA Inspection Team was informed by one of the City employees that the gate structure was used for solids removal. In addition, at one of the regulators along Millbury Street, City staff present for the inspection stated that they were not certain if there was a tidegate associated with the regulator, and if there is, it is not viewed as a component of typical regulator field inspections. The EPA Inspection Team was informed that City staff had been provided with training for performing regulator inspections; however, based on these discussions in the field, there is some concern with the extent and thoroughness of the training.

Region 1, New England

United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Water Microbiology Laboratory Report

November 29, 2012

Erin Trainor - EIA / OEME
US EPA New England R1

Project Number: 12100053
Project: MS4 Worcester, MA
Analysis: E. Coli Defined Substrate
Analyst: Nathan Raines

Date Samples Received by the Laboratory: 10/31/2012

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I method: Total Coliform/E. coli by Defined Substrate, Revision #2

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8609.

Sincerely,

David F. McDonald
Biology Laboratory Manager

Water Microbiology Laboratory
Data Qualifier Codes

J = Estimate
H = Exceeds holding time
I = Exceeds incubation time
At = Atypical overgrowth
S = Lost sample
V = Insufficient sample volume
TNTC = Too numerous to count
MB = Media blank
+++ = Positive control
- - - = Negative control
SP = Spiked Sample
L = Estimated, result below reporting limit (RL)
ND = Not Detected, result less than RL
D = Lab Duplicate
P = Plate counts outside preferred range

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

MS4 Worcester, MA

E. Coli Defined Substrate

Matrix: Water

Sample Number	Lab ID	Date of Collection		Date of Analysis		Compound	Concentration MPN/100 mL	RL MPN/100 mL	Qualifier
ARARAT	AB35611	10/31/12	8:45 am	10/31/12	2:35 pm	E. Coli Defined Substrate	**1,458**	4	
CLARK	AB35614	10/31/12	10:00 am	10/31/12	2:35 pm	E. Coli Defined Substrate	**6,130**	100	
KENDRICK	AB35610	10/31/12	8:25 am	10/31/12	2:35 pm	E. Coli Defined Substrate	**23,590**	100	H
McKEON A	AB35618	10/31/12	12:10 pm	10/31/12	2:35 pm	E. Coli Defined Substrate	**716**	4	
McKEON B	AB35619	10/31/12	12:15 pm	10/31/12	2:35 pm	E. Coli Defined Substrate	**806**	4	
McKEON C	AB35620	10/31/12	12:20 pm	10/31/12	2:35 pm	E. Coli Defined Substrate	**806**	4	
MILL	AB35616	10/31/12	11:25 am	10/31/12	2:35 pm	E. Coli Defined Substrate	**2,747**	4	
POMPANO	AB35612	10/31/12	9:30 am	10/31/12	2:35 pm	E. Coli Defined Substrate	**16,160**	100	
POMPANO D	AB35613	10/31/12	9:30 am	10/31/12	2:35 pm	E. Coli Defined Substrate	**9,870**	100	
ST JOHNS	AB35617	10/31/12	11:45 am	10/31/12	2:35 pm	E. Coli Defined Substrate	**806**	4	
TACOMA	AB35615	10/31/12	10:40 am	10/31/12	2:35 pm	E. Coli Defined Substrate	**510**	4	

Number of Samples: 11

Region 1, New England

United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Water Microbiology Laboratory Report

November 29, 2012

Erin Trainor - EIA / OEME
US EPA New England R1

Project Number: 12100053
Project: MS4 Worcester, MA
Analysis: Enterococcus in Water
Analyst: Nathan Raines

Date Samples Received by the Laboratory: 10/31/2012

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I method: Enterococcus by Defined Substrate, Revision #2

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8609.

Sincerely,

David F. McDonald
Biology Laboratory Manager

Water Microbiology Laboratory
Data Qualifier Codes

J = Estimate
H = Exceeds holding time
I = Exceeds incubation time
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S = Lost sample
V = Insufficient sample volume
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P = Plate counts outside preferred range

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

MS4 Worcester, MA

Enterococcus in Water

Matrix: Water

Sample Number	Lab ID	Date of Collection:	Date of Analysis	Compound	Concentration MPN/100mL	RL MPN/100mL	Qualifier
ARARAT	AB35611	10/31/12 8:45 am	10/31/12 2:35 pm	Enterococcus in Water	**759**	10	
CLARK	AB35614	10/31/12 10:00 am	10/31/12 2:35 pm	Enterococcus in Water	**4,352**	10	
KENDRICK	AB35610	10/31/12 8:25 am	10/31/12 2:35 pm	Enterococcus in Water	**1,439**	10	H
McKEON A	AB35618	10/31/12 12:10 pm	10/31/12 2:35 pm	Enterococcus in Water	**216**	10	
McKEON B	AB35619	10/31/12 12:15 pm	10/31/12 2:35 pm	Enterococcus in Water	**395**	10	
McKEON C	AB35620	10/31/12 12:20 pm	10/31/12 2:35 pm	Enterococcus in Water	**355**	10	
MILL	AB35616	10/31/12 11:25 am	10/31/12 2:35 pm	Enterococcus in Water	**1,012**	10	
POMPANO	AB35612	10/31/12 9:30 am	10/31/12 2:35 pm	Enterococcus in Water	**4,611**	10	
POMPANO D	AB35613	10/31/12 9:30 am	10/31/12 2:35 pm	Enterococcus in Water	**2,359**	10	
ST JOHNS	AB35617	10/31/12 11:45 am	10/31/12 2:35 pm	Enterococcus in Water	**96**	10	
TACOMA	AB35615	10/31/12 10:40 am	10/31/12 2:35 pm	Enterococcus in Water	**644**	10	

Number of Samples: 11

ENVIRONMENTAL PROTECTION AGENCY

REGION 1

CHAIN OF CUSTODY RECORD

PROJ. NO.: 12100053

PROJECT NAME: Worcester, MA MS4

SAMPLERS: (Signature) [signature]

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	E. Coli	Enterococcus					REMARKS
Kendrick	10/31/12	0825		X	Worcester, MA	1	X	X					
Ararat		0845											
Pompano		0930											
Clark		1000											
Tacoma		1040											
Mill		1125											
St Johns		1145											
McKean A		1210											
McKean B		1215											
McKean C		1220											
Pompano D		0930											

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	10/31/12 1429				
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature) [signature]	Date / Time 10/31/12 14:29	Remarks CC. Doug Koopman on results	

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

1- 19110

Appendix 1
Summary of Field Activities

Field Visit No.	Asset/Location	Date and Time of Inspection	Photolog Reference	Observations
1	Quinsigamond CSO Treatment Facility (60 Quinsigamond Avenue)	January 22, 2013 12:50 p.m.	1-4	- The EPA Inspection Team met with the City Chief Pump Station Operator and Head Pump Station Operator. City staff stated the previous discharge event from the facility was during the second week of December 2012. - The average dry weather flow to the CSO Facility is about 250,000 gallons per day. The dry weather flow is pumped by two 600 gallon per minute (gpm) pumps through an 8" force main that discharges to a 48" brick interceptor sewer which conveys flow to the Upper Blackstone WWTP for treatment. City staff stated that the pumps had been refurbished about one or two months prior to the inspection. - During wet weather treatment events where the Upper Blackstone WWTP still has capacity, wastewater entering the CSO Facility wet well is pumped by two 6,000 gpm submersible pumps through a 24" ductile iron force main that discharges to a 96" interceptor which conveys flow to the Upper Blackstone WWTP. City staff stated that both pumps were operational at the time of the inspection. - There are two bar screens that are supported by a screenings conveyer belt to trash dumpster. - There are two "contact" tanks at the facility configured in series that have a total storage capacity of 2.5 million gallons. - The CSO Facility provides "flash treatment" for disinfection with sodium hypochlorite and dechlorination with sodium bisulfite prior to discharge to the Mill Brook Conduit and Upper Blackstone River. Sodium hypochlorite is added to the influent wastewater after flowing through mechanical bar screens prior to entering the contact tanks. The "flash treated" wastewater is discharged to the Old Mill Brook through Outfall No. 001. - After treatment events, the contact tanks are cleaned with water sprayed from bridge pumps suspended above the contact tanks. The cleaning water is then conveyed to the Upper Blackstone WWTP. - A copy of standard operating procedures for the CSO Facility, dated September 2007, was kept near the SCADA computer station at the facility. - The facility had a paper operations log kept near the SCADA computer station at the facility.

Field Visit No.	Asset/Location	Date and Time of Inspection	Photolog Reference	Observations
2	Leaf Gate Structure (Along Route 122, about 100 yards southwest of intersection with Harrison Street)	January 22, 2013 2:31 p.m.	5	- The facility has a hydraulic pump for gate operation. - A pressure transducer series in the sewer system activates the leaf gate at pre-set levels. - The EPA Inspection Team viewed the control building for the leaf gate, but did not view the leaf gate itself.
3	Lake Avenue Pump Station	January 22, 2013 3:00 p.m.	6-8	- The facility has a 17–18 MGD pumping capacity. - The facility is scheduled for a major rehabilitation project that will include the installation of horizontal variable force drive pumps and increase the pumping capacity to approximately 22 MGD. - The base flow at the facility is approximately 5 MGD. - Wastewater entering the pump station flows through Muffin Monster® grinders and grit chambers before being pumped from the facility. The facility is equipped with two standby mechanical bar screens which could be used in the event that the grinders were not functioning. City staff stated that the grinders were installed about eight years prior to the inspection. - Grit collected at the pump station is taken to the Upper Blackstone Landfill for disposal. - According to City staff, two of the four pumps at the pump station are currently rebuilt every nine or ten months. - A new generator will be installed as a component of the pump station rehabilitation project. - Flow from the facility is conveyed through 20” and 24” force mains over a ridge to the west. - A storm sewer system outfall to Lake Quinsigamond at the pump station is visually inspected by City staff daily to detect potential illicit discharges to the storm sewer system in the upstream areas.
4	Garden Street Regulator No. 2	January 23, 2013 8:30 – 8:50	9	- EPA Inspection Team divided into two separate sub-field teams on January 23, 2013. - The City team opened a number of manholes. Due to temperature extremes, high vapor/mist/fog was observed in manholes making observations difficult.

Field Visit No.	Asset/Location	Date and Time of Inspection	Photolog Reference	Observations
	(Field Team 1)	a.m.		- The regulator manhole was located in the dirt at the end of Garden Street within approximately 70 feet of the interstate 290 south bound. - No overflow or bypassing of the regulator was observed. Due to position of underground assets, depth of the assets, and environmental conditions (extreme cold/misting) observations were limited.
5	Millbury at Richland Regulator No. 6 (Field Team 1)	January 23, 2013 9:00 a.m.	10-13	- At 9:00 a.m. wastewater was at approximately 50 percent of the height of the pipe to the sewer (appeared to be approximately an 8" pipe) (Photo 10). - Wastewater was pooling on the upstream side of the regulator (Photo 11). - A gate structure was observed in the manhole downstream of the regulator asset (Photo 12). - The manhole downstream of the gate manhole had debris which appeared to be a broken manhole cover (Photo 13).
6	MS4 Outfall No. "il05" (Field Team 2) (Near intersection of Huntington Avenue and Lulea Street)	January 23, 2013 9:08 a.m.	14	- The outfall discharges to Indian Lake, which is used for recreation. - Flow was observed discharging from the outfall. - It had snowed in the City within 48 hours of the site visit.
7	Millbury at Taylor Regulator No. 7 (Field Team 1)	January 23, 2013 9:10 a.m.	15-17	- Very low flow observed into and out of the regulator. - A gate structure was observed in the manhole downstream of the regulator asset.
8	Millbury at Lafayette Street Regulator No. 14	January 23, 2013 9:15 a.m.	18-21	- Storm water catch basin at the corner of Millbury Street and Lafayette Street was observed to be full of debris (Photo 18). - Sewer system was found to be surcharged.

Field Visit No.	Asset/Location	Date and Time of Inspection	Photolog Reference	Observations
	(Field Team 1)			- City Inspection Team called for a flusher truck to service the line. - The flusher hose was damaged. Protective covering had been cut through. Hose safety and life appeared to have been significantly compromised (Photo 20). - Flusher truck had a variety of nozzles for different servicing requirements (Photo 21). - EPA Inspection Team observed flusher truck activities until 9:55 a.m. - Line was not cleared while the EPA Inspection Team was onsite.
9	MS4 Outfall No. "il01" (Field Team 2) (At eastern end of Shoreham Street)	January 23, 2013 9:21 a.m.	22	- The outfall discharges to Indian Lake, which is used for recreation. - Flow was observed discharging from the outfall. - It had snowed in the City within 48 hours of the site visit. - The headwall at the outfall location was identified as No. 20550.
10	Beaver Brook (Field Team 2) (About 500 feet east of intersection of Mann Street and Chandler Street)	January 23, 2013 9:49 a.m.	23	- This section of Beaver Brook, which flows underground through much of the City, was "daylighted" about 4–5 years prior to the inspection. - The City Senior Engineer/Stormwater Coordinator stated that the City started conducting monthly sampling for fecal coliform at this location in Beaver Brook after it was daylighted. - The City Senior Engineer/Stormwater Coordinator stated that the typical fecal coliform level measured in this section of Beaver Brook is about 6,000 CPU/100 mL. He attributed this primarily to the age of the sewer system in the area. - The City has found about 20 illicit connections upstream of this location. - The City Senior Engineer/Stormwater Coordinator explained that there are probably about 20–25 outfalls from the MS4 to Beaver Brook in the underground culverted section of Beaver Brook.
11	Twin Invert (Field Team 2) (About 250 feet east of intersection	January 23, 2013 9:58 a.m.	24-25	- Flow was observed in storm sewer line. - The metal plate installed on top of the sanitary sewer line did not completely cover the opening. - There was not retainer on top of the metal plate.

Field Visit No.	Asset/Location	Date and Time of Inspection	Photolog Reference	Observations
	of Chandler Street and Coolidge Road)			- The City Senior Engineer/Stormwater Coordinator stated that the sanitary sewer line was at a lower elevation than the storm sewer line in this location.
12	Pond at Water Regulator No. 9 (Field Team 1)	January 23, 2013 10:00 a.m.	26-27	- Very low flow observed into and out of the regulator. - A gate structure was observed in the manhole downstream of the regulator asset.
13	Twin Inverts (Field Team 2) (Near intersection of Brownell Street and Calmia Street)	January 23, 2013 10:06 a.m.	28-29	- Two sets of twin inverts were observed at this location. - Both twin inverts had metal plates and retainers installed on the sanitary sewer line. - It was unclear whether the sanitary sewer or storm sewer lines were at a higher elevation than the other.
14	Twin Invert (Field Team 2) (Intersection of Rob Roy Road and Morningside Road)	January 23, 2013 10:14 a.m.	30	- Flow was observed in the storm sewer line. - Metal plate was installed on sanitary sewer line. - Retainer for metal plate appeared to be out of correct position.
15	Twin Invert (Field Team 2) (Near intersection of Howland Terrace and Wetherell Street)	January 23, 2013 10:24 a.m.	31	- Upstream end sanitary sewer line observed at this twin invert. - No flow or metal plate observed for sanitary sewer line.
16	Twin Invert	January 23, 2013	32-33	- Connection from nearby catch basin dropped into storm sewer line from above the sanitary sewer line and metal plate covering.

Field Visit No.	Asset/Location	Date and Time of Inspection	Photolog Reference	Observations
	(Field Team 2) (Near intersection of Howland Terrace and Wetherell Street)	10:32 a.m.		- There was no retainer installed for the metal plate on the sanitary sewer line. - The City Senior Engineer/Stormwater Coordinator stated that the metal plate may have been concreted in place.
17	Twin Invert 8 Garland Avenue (Field Team 1)	January 23, 2013 10:35 a.m.	34-35	- There was a metal plate and retainer installed for the sanitary sewer line. - This location was downstream of a number of public housing units. - The City representatives stated that this area has problems associated with diapers being disposed of through the sanitary sewer. - City representative used an iPad to show position of asset.
18	Twin Invert 2 Thayer Street (Field Team 1)	January 23, 2013 10:50 a.m.	36-38	- There was a metal plate and retainer installed for the sanitary sewer line. - The City representatives demonstrated how the metal plate and retainer are removed and repositioned. - Metal plate did not appear to have gasket. - No gasket or gasket-like materials was observed on the brick and concrete area that seated the metal plate to provide a water tight seal between the metal plate and the mason work. - During this demonstration a component of the metal plate and retainer devise fell into the sewer. City team member entered sewer to retrieve equipment without following typical confined space entry protocols.
19	Regulator – "Thomas at Summer" (Field Team 2)	January 23, 2013 10:58 a.m.	39	- Flow was present in the main sewer line along Summer Street. This sewer line discharges to the East Interceptor. - Flow beyond the regulator is conveyed to the Old Mill Brook Conduit CSO Collector. - No flow was observed discharging beyond the regulator at the time of the site visit. - There was a wooden gate installed downstream of the regulator.
20	Twin Invert	January 23, 2013	40-41	- There was a metal plate and retainer installed for the sanitary sewer line. - Requested that City representative use iPad to show position of asset.

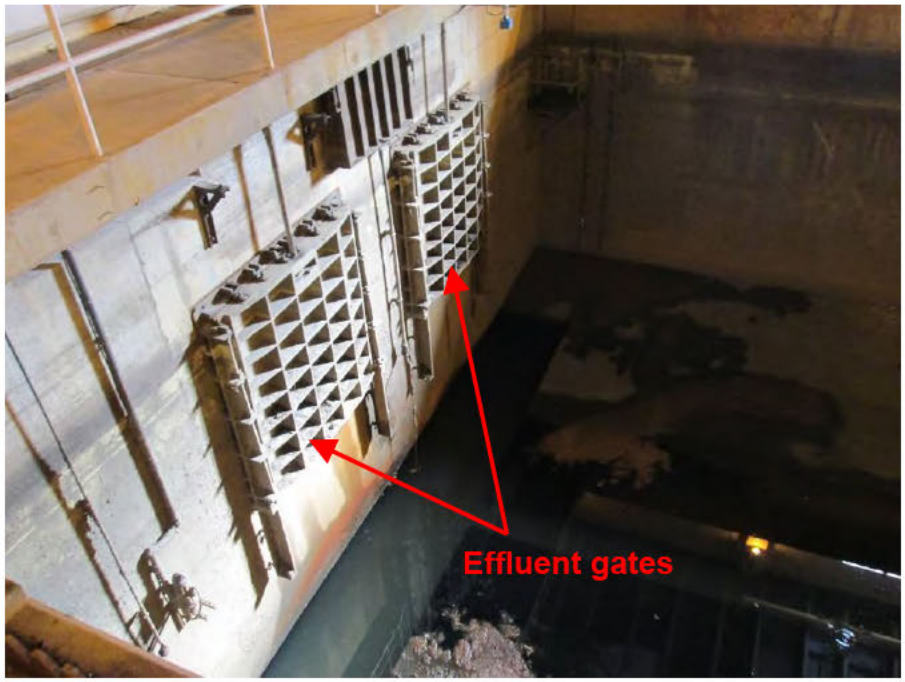
Field Visit No.	Asset/Location	Date and Time of Inspection	Photolog Reference	Observations
	10 Thayer Street (Field Team 1)	11:00 a.m.		
21	Twin Invert 2 Friedel Street (Field Team 1)	January 23, 2013 11:10 a.m.	42	- There was a metal plate and retainer installed for the sanitary sewer line.
22	Regulators – "Millbury at Sigel" and "Taylor at Millbury" (Field Team 2)	January 23, 2013 1:23 p.m.	43-46	- Millbury at "Sigel" o City staff stated that this was the "Millbury at Sigel" regulator, but this name was not on the City's list of regulators. o Flow was observed in the sewer, but not beyond the regulator or gate. - Taylor at Millbury o Minimal flow was observed in the sanitary sewer line at this location. o Flow beyond the regulator is conveyed to the Old Mill Brook Conduit CSO Collector. o No flow was observed discharging beyond the regulator at the time of the site visit. o There was a wooden gate installed downstream of the regulator.
23	Regulator – "Millbury at Lafayette" (Field Team 2)	January 23, 2013 1:31 p.m.	47	- This was the location of a sewer line blockage observed in the morning of January 23, 2013. - City staff stated that the blockage had been cleared. - Accumulated wastewater was observed in the bottom of the manhole barrel. City staff stated that this is how it typically looks due to the elevation in the manhole. - Wetted area was observed beyond the wooden gate installed downstream of the regulator at the time of the site visit.
24	Regulator – "Millbury at Ashmont" (Field Team 2)	January 23, 2013 1:55 p.m.	48-49	- Flow was observed in the sanitary sewer line at this location. - The City Craftsman/Working Foreman was unaware of whether there was a gate installed downstream of this regulator. He explained that if there is a gate for this regulator, it is not viewed during inspection activities for this regulator.

Field Visit No.	Asset/Location	Date and Time of Inspection	Photolog Reference	Observations
25	Twin Invert (Field Team 2) (Near intersection of Lake Avenue and Anna Street)	January 23, 2013 2:19 p.m.	50	- There was a metal plate and retainer installed for the sanitary sewer line at this location.
26	Sewer Line Flushing (Field Team 2) (No. 5 Locust Avenue at No. 37 Alvarado	January 23, 2013 2:40 p.m.	51-52	- This was a “hotspot” location which had issues with blockages due to grease and rags. - The City flusher truck operator explained that typically he cleans about 100–200 feet of sewer line for the hotspot cleaning locations. - The City flusher truck operator explained that he records his activity on a hardcopy field sheet that is turned into office staff once the activity is completed. - The City flusher truck operator stated that if he were to flush the same section of sewer line multiple times in one cleaning event, he would record the linear footage cleaned as the sum of the linear footage from each flushing. Therefore, the linear footage does not represent the length of unique sewer line cleaned during cleaning activities.

Appendix 2
Photograph Log

Photograph 1. CSO Facility – Field Visit No. 1 – View of mechanical bar screens.

Photograph 2. CSO Facility – Field Visit No. 2 – View of one of the two contact tanks at the facility.

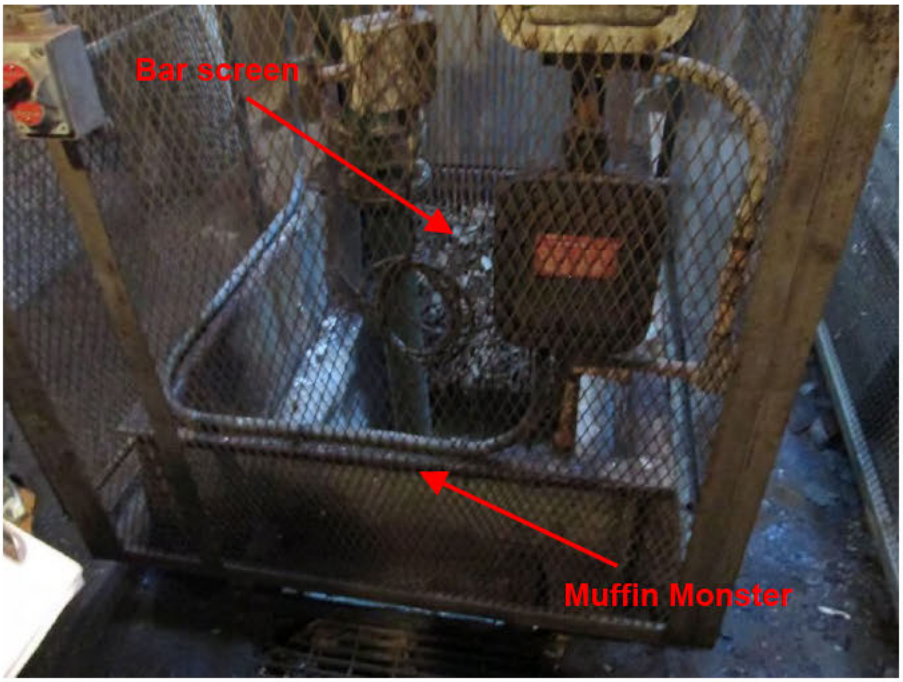


Photograph 3. **CSO Facility – Field Visit No. 1 – View of effluent gates from contact basin.**

Photograph 4. **CSO Facility – Field Visit No. 1 – View of bridge pumps spraying water to wash out a contact tank.**

Photograph 5. Leaf Gate Structure – Field Visit No. 2 – View of control building.

Photograph 6. Lake Avenue Pump Station – Field Visit No. 3 – View inside pump station.



Photograph 7. **Lake Avenue Pump Station – Field Visit No. 3 – View of Muffin Monster® grinder and bar screen in the influent channel.**

Photograph 8. **Lake Avenue Pump Station – Field Visit No. 3 – View of Muffin Monster® grinder noted in Photo 7.**

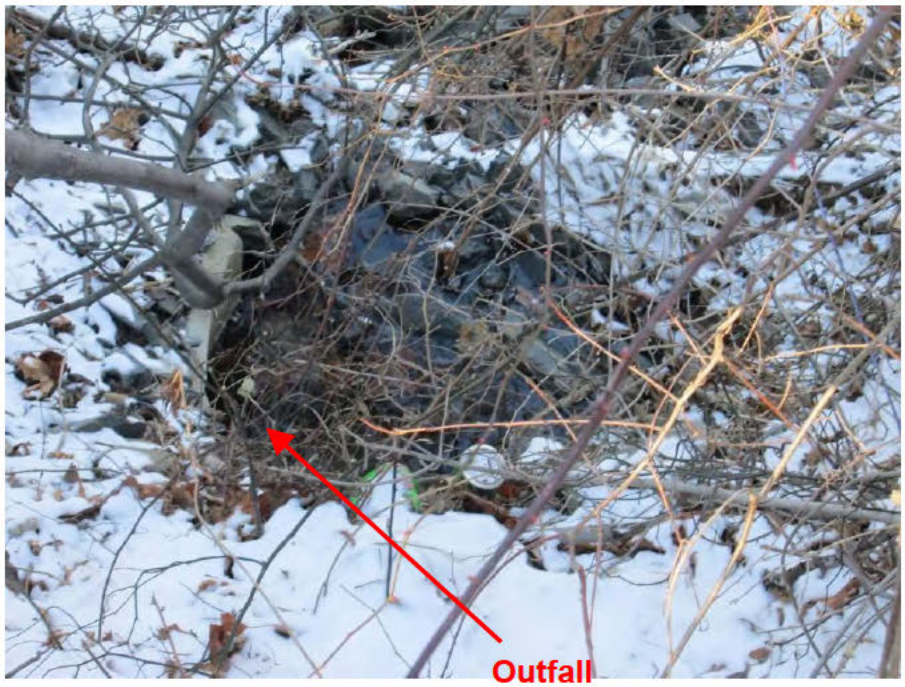
Photograph 9. **Garden Street Regulator No. 2 – Field Visit No. 4 – View into regulator structure.**

Photograph 10. **Millbury at Richland Regulator No. 6 – Field Visit No. 5 – View into regulator structure. At 9:00 a.m. wastewater was at approximately 50 percent of the height of the pipe to the sewer.**

Photograph 11. Millbury at Richland Regulator No. 6 – Field Visit No. 5 – View of unobstructed flow on downstream side of regulator in sewer main line.

Photograph 12. Millbury at Richland Regulator No. 6 – Field Visit No. 5 – View of regulator gate structure.

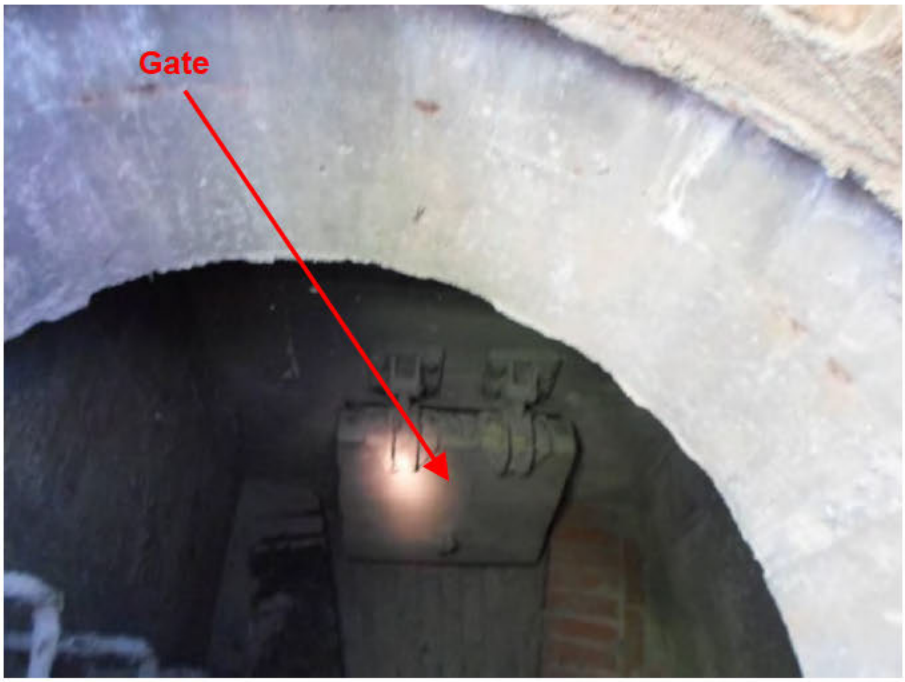
Photograph 13. Millbury at Richland Regulator No. 6 – Field Visit No. 5 – View of broken manhole cover in sewer downstream of regulator gate manhole.



Photograph 14. MS4 Outfall No. "il05" – Field Visit No. 6 – View of outfall which was discharging at the time of the site visit.

Photograph 15. Millbury at Taylor Regulator No. 7 – Field Visit No. 7 – View of low flow into the regulator structure at approximately 9:10 a.m.

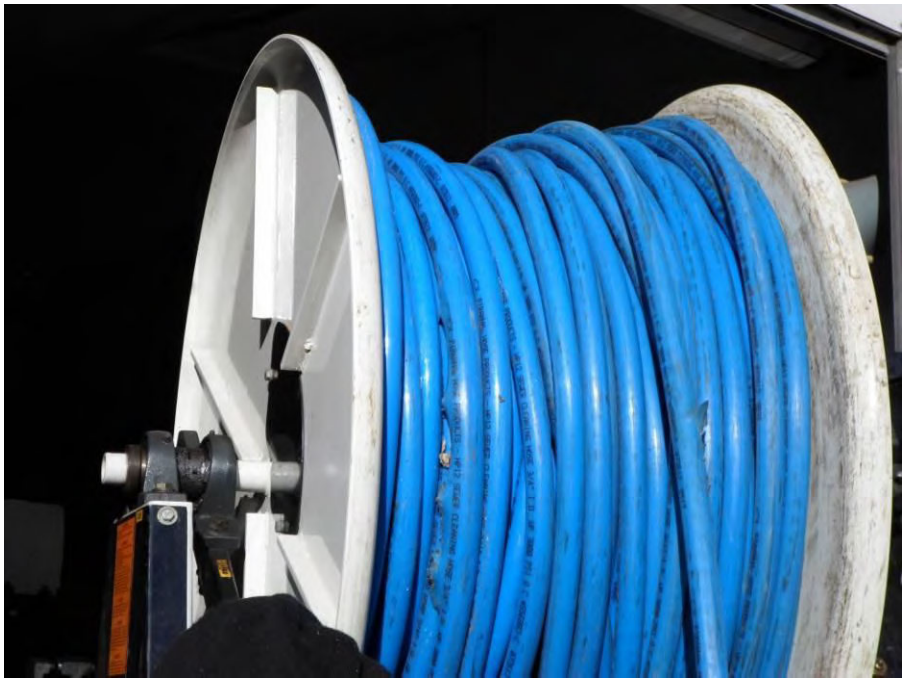
Photograph 16. Millbury at Taylor Regulator No. 7 – Field Visit No. 7 – View of low flow in sewer from regulator structure at approximately 9:10 a.m.



Photograph 17. Millbury at Taylor Regulator No. 7 – Field Visit No. 7 – View of regulator gate structure.

Photograph 18. Millbury at Lafayette Street Regulator No. 14 – Field Visit No. 8 – View of stormwater catch basin on Millbury Street immediately north of Lafayette Street with solids and general debris in the basin.

Photograph 19. Millbury at Lafayette Street Regulator No. 14 – Field Visit No. 8 – View of flusher truck servicing a sewer line in the immediate area of the regulator structure.

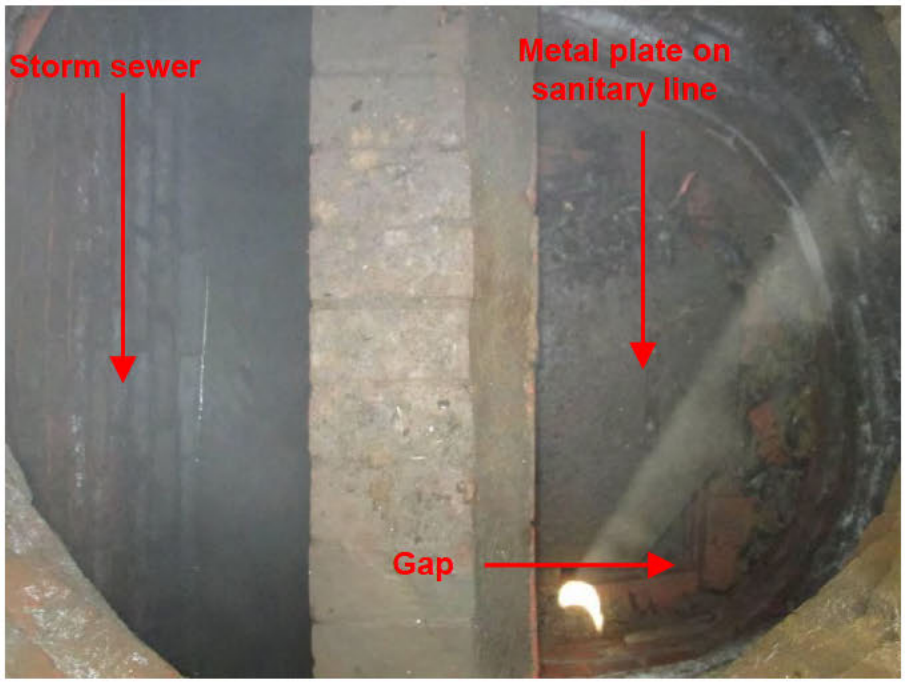


Photograph 20. Millbury at Lafayette Street Regulator No. 14 – Field Visit No. 8 – View of flusher hose damaged in multiple locations with the protective covering cut completely through.

Photograph 21. Millbury at Lafayette Street Regulator No. 14 – Field Visit No. 8 – View of nozzles available to the flusher truck team.

Photograph 22. MS4 Outfall No. "il01" – Field Visit No. 9 – View of outfall which was discharging at the time of the site visit.

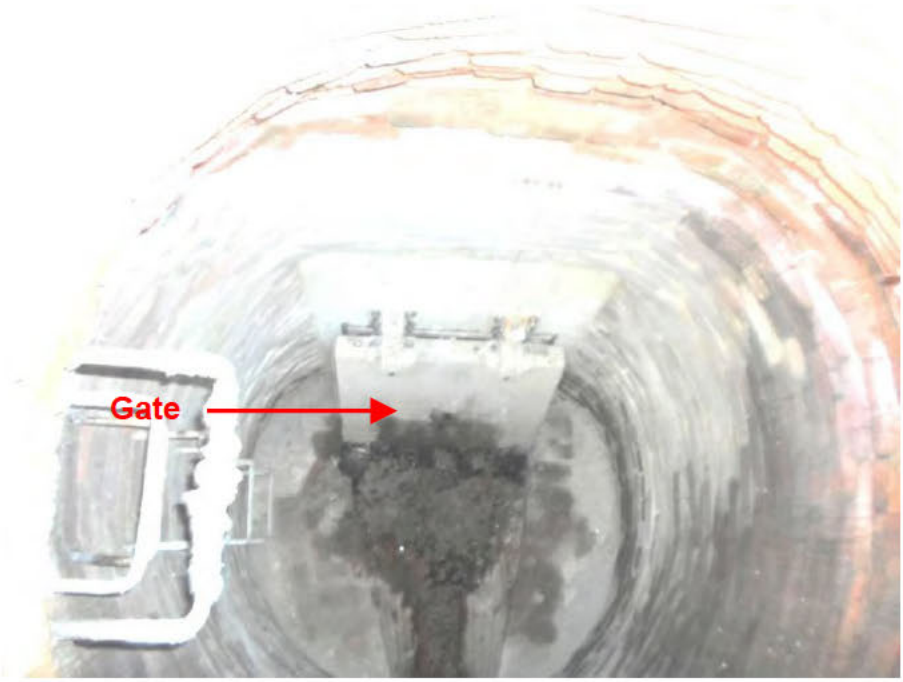
Photograph 23. Beaver Brook – Field Visit No. 10 – View of daylighted section of the brook.



Photograph 24. Twin Invert – Field Visit No. 11 – View into twin invert manhole. Note lack of retainer device and gap along edge of metal plate.

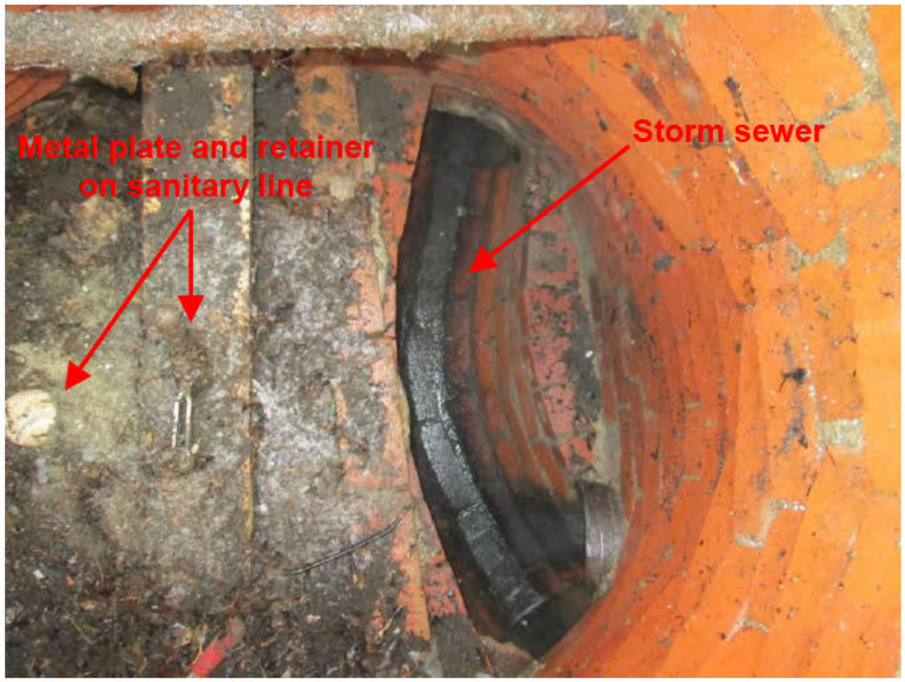
Photograph 25. Twin Invert – Field Visit No. 11 – Additional view into twin invert manhole shown in Photograph 24.

Photograph 26. Pond at Water Regulator No. 9 – Field Visit No. 12 – View of pooling water below what appeared to be a high water mark in the regulator structure.



Photograph 27. **Pond at Water Regulator No. 9 – Field Visit No. 12 – View of regulator gate structure. No flow observed discharging. What appeared to be water marks and debris were present on discharge side of the gate.**

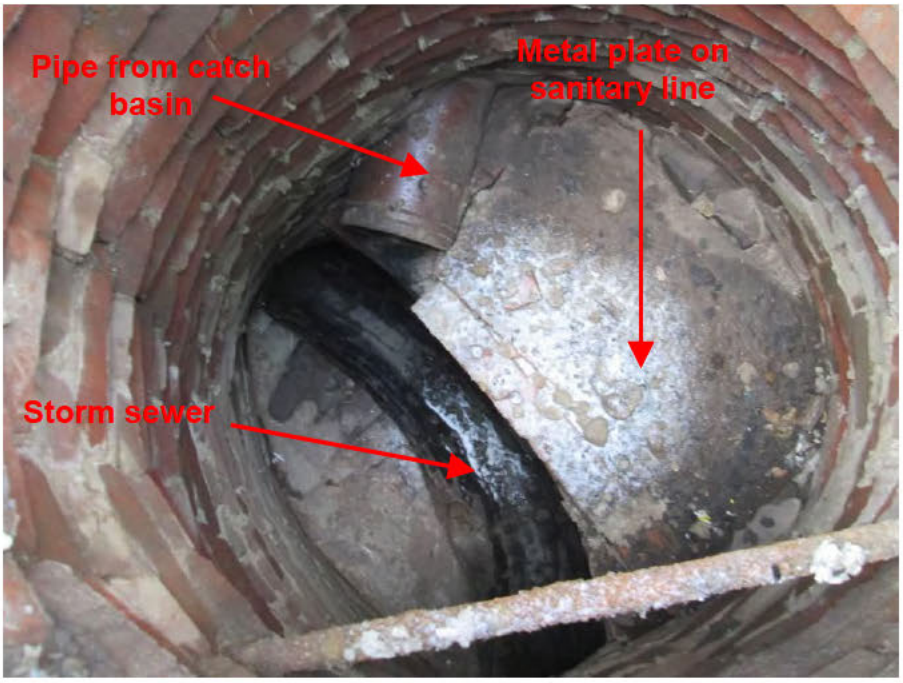
Photograph 28. **Twin Invert – Field Visit No. 13 – View into twin invert manhole. Note metal plate and retainer device on sanitary sewer line.**



Photograph 29. Twin Invert – Field Visit No. 13 – View of another twin invert manhole at the location. Note metal plate and retainer device on sanitary sewer line.

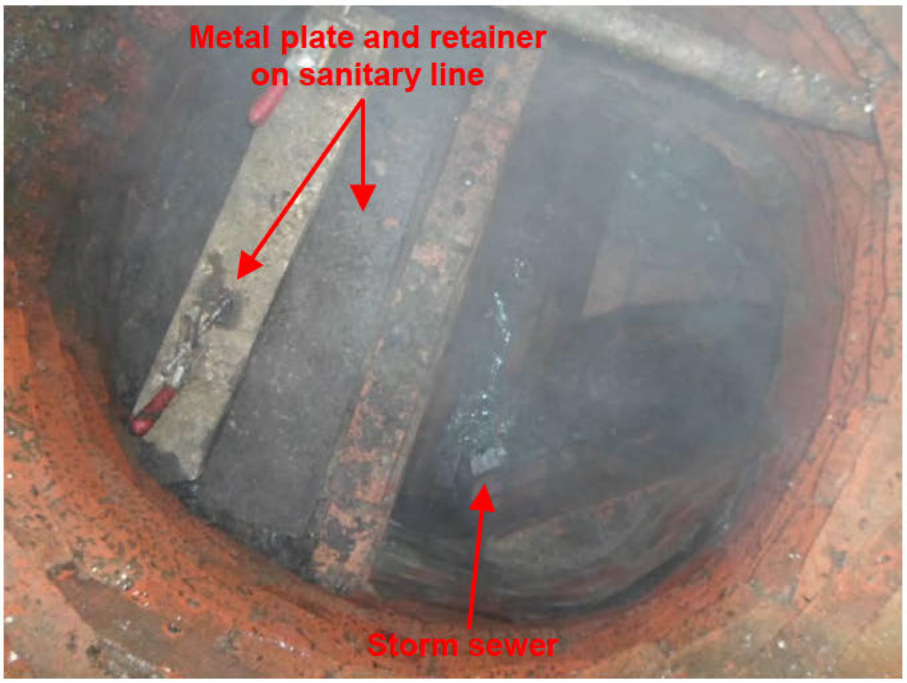
Photograph 30. Twin Invert – Field Visit No. 14 – View into twin invert manhole. Note retainer device appeared to be out of correct position.

Photograph 31. Twin Invert – Field Visit No. 15 – View into twin invert manhole. No flow observed. Note lack of metal plate.



Photograph 32. Twin Invert – Field Visit No. 16 – View into twin invert manhole. Note pipe from nearby catch basin and lack of retainer device.

Photograph 33. Twin Invert – Field Visit No. 16 – Close-up view of pipe and metal plate shown in Photograph 32.



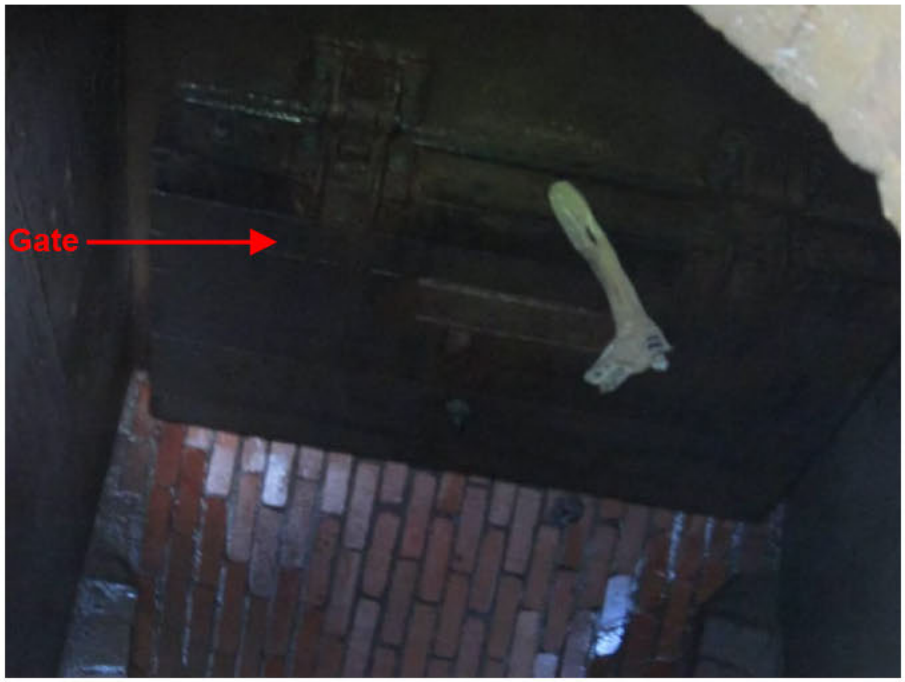
Photograph 34. Twin Invert – 8 Garland Avenue – Field Visit No. 17 – View into twin invert manhole. Note metal plate and retainer device.

Photograph 35. Twin Invert – 8 Garland Avenue – Field Visit No. 17 – View of iPad screen used by City staff with GIS-based map at this location.

Photograph 36. Twin Invert – 2 Thayer Street – Field Visit No. 18 – View into twin invert manhole. Note metal plate and retainer device.

Photograph 37. Twin Invert – 2 Thayer Street – Field Visit No. 18 – View of retainer device.

Photograph 38. Twin Invert – 2 Thayer Street – Field Visit No. 18 – View of City staff removing metal plate. Metal plate did not appear to have a gasket on the underside.



Photograph 39. Thomas at Summer Regulator – Field Visit No. 19 – View of regulator gate structure.

Photograph 40. Twin Invert – 10 Thayer Street – Field Visit No. 20 – View into twin invert manhole. Note metal plate and retainer device.

Photograph 41. Twin Invert – 10 Thayer Street – Field Visit No. 20 – View of iPad screen used by City staff with GIS-based map at this location.

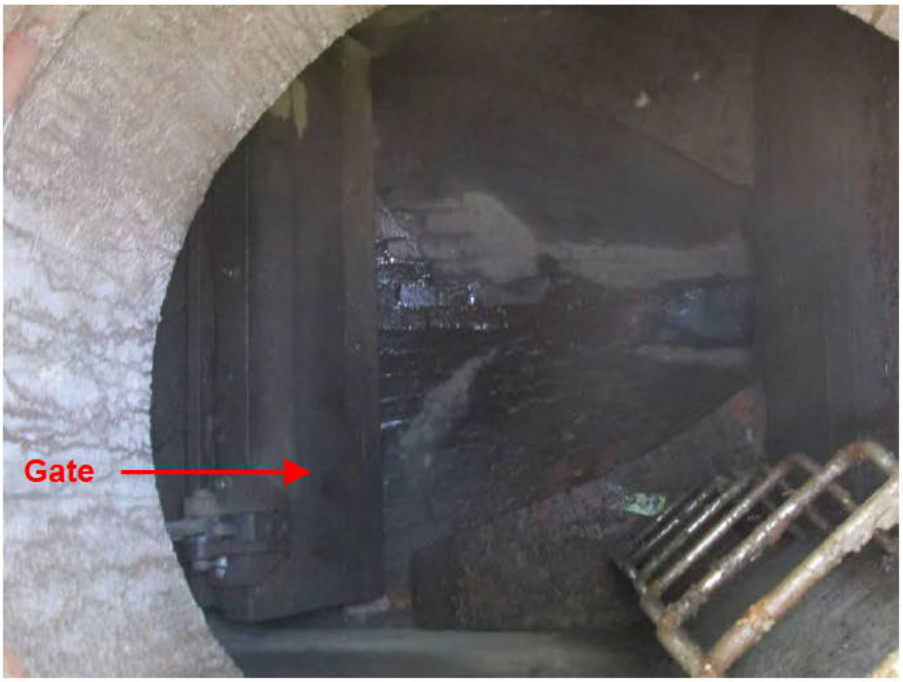
Photograph 42. Twin Invert – 2 Friedel Street – Field Visit No. 21 – View into twin invert manhole. Note metal plate and retainer device.

Photograph 43. Millbury at "Sigel" Regulator – Field Visit No. 22 – View into regulator structure.

Photograph 44. Millbury at "Sigel" Regulator – Field Visit No. 22 – View of regulator gate structure.

Photograph 45. Taylor at Millbury Regulator – Field Visit No. 22 – View into regulator structure. Low flow was observed in the sewer.

Photograph 46. Taylor at Millbury Regulator – Field Visit No. 22 – View of regulator gate structure.



Photograph 47. Millbury at Lafayette Regulator – Field Visit No. 23 – View of regulator gate structure. Note wetted area beyond the gate.

Photograph 48. Millbury at Ashmont Regulator – Field Visit No. 24 – View into regulator structure.

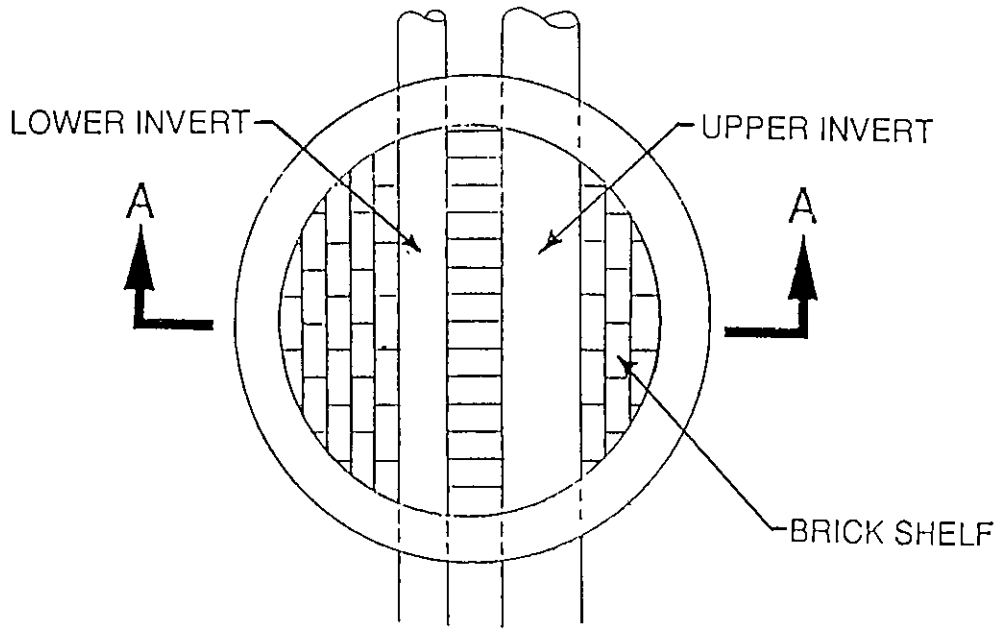
Photograph 49. Millbury at Ashmont Regulator – Field Visit No. 24 – View of flow in sewer line downstream of regulator.

Photograph 50. Twin Invert – Field Visit No. 25 – View into twin invert manhole. Note metal plate and retainer.

Photograph 51. Sewer Line Flushing – Field Visit No. 26 – View of sewer line which had been flushed.

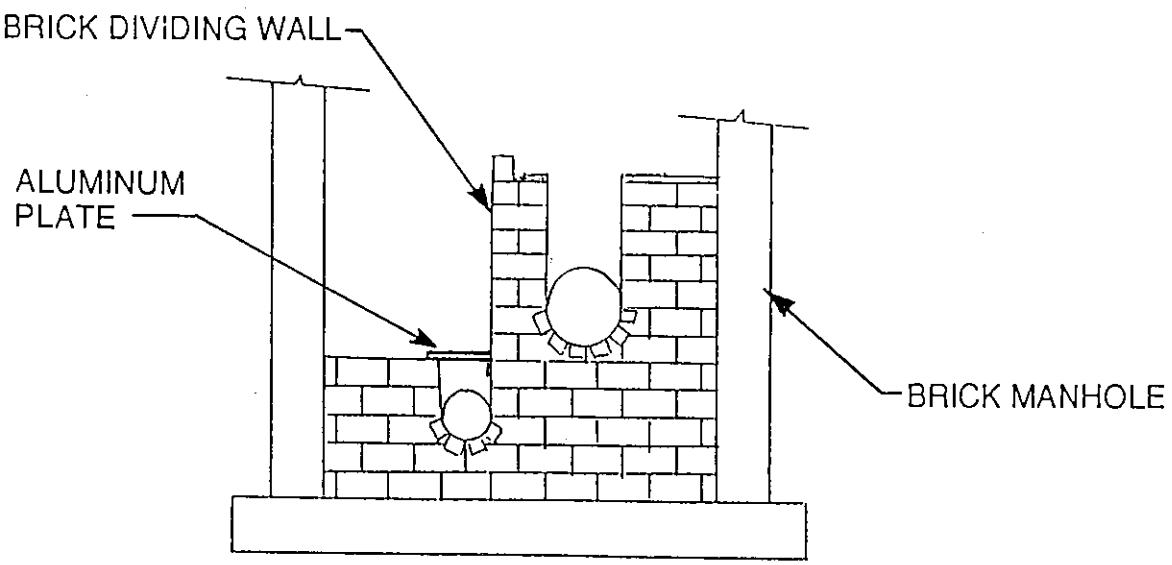
Photograph 52. Sewer Line Flushing – Field Visit No. 26 – View of hose and equipment in back of flusher truck.

Appendix 3
Schematic of Twin Invert Structure



PLAN

NOTE: THE SIZE AND CONTENTS OF THE UPPER AND LOWER INVERTS VARIES

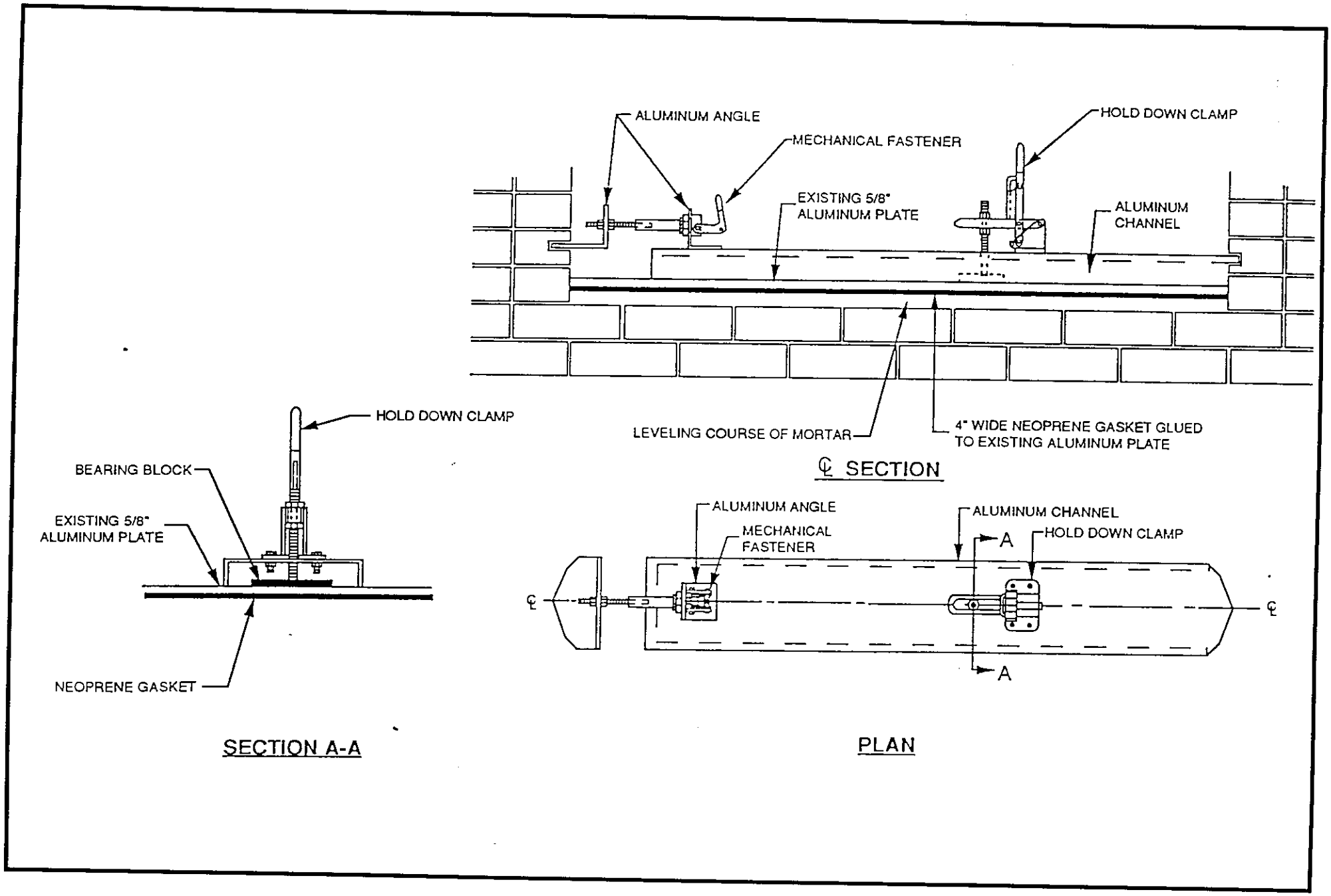


SECTION A-A

NOT TO SCALE

City of Worcester, Massachusetts
Department of Public Works

Figure 6-1
Twin Invert Manhole



City of Worcester, Massachusetts
Department of Public Works

Figure 6-2
Hold Down Device

Appendix 4
Twin Invert Map

CITY OF WORCESTER
TWIN INVERTS

Appendix 5
Summary of Possible Unauthorized Discharges

Year	Work Order No.	Problem Code	Location	Date Generated	Description	Work Order Notes	EPA Inspection Team Notes	Cause Based on City Work Order Notes
2010	1257662	SEWER BACKING UP IN HOUSE	99 DOWNING ST	1/24/2010	"SEWER BACKING UP IN BASEMENT"	1/24/2010: "called in crew for blocked sewer" 1/25/2010: "2-49 flushed and freed blocked sewer. Cause: Grease NO SSO"	Blockage in City sewer line due to grease. Cleared by City. Unclear why it states "NO SSO."	Grease
2010	1257872	SEWER BACKING UP IN HOUSE	15 CAMERON ST	1/25/2010	"OWNER OF SINGLE FAMILY HOME IS REPORTING THAT THE SEWER IS BACKING UP IN TO THE BASEMENT THROUGHT THE BASEMENTS BATHROOM. OWNER IS HOME NOW PLEASE ASSESS."	1/25/2010: "HI WATER 2-16 CHECKED SEWER WENT DOWN"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1257869	SEWER BACKING UP IN HOUSE	109 LAKE AVE	1/25/2010	"THERE IS SEWAGE BACKING UP IN THE RESIDENT BASEMENT"	1/25/2010: "High water, 2-32 spoke with owner's HAM"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1257750	SEWER BACKING UP IN HOUSE	87 OSCEOLA AVE	1/25/2010	"SEWER BACKING UP IN TO HOUSE, OWNER IS ON SITE NOW AND HAS GARABEDIAN PLUMBERS THERE. THEY HAVE CHEKCED OWNERS LINES AND THINK IT IS DUE TO THE CITYS SEWER LINES"	1/25/2010: "2-37 freed blocked sewer. Cause: gravel + others NO SSO"	Blockage in City sewer line due to grease. Cleared by City. Unclear why it states "NO SSO."	Grease
2010	1257893	SEWER BACKING UP IN HOUSE	31 SOUTHOLD RD	1/25/2010	"SAYS HE IS GETTING SOME SEWAGE BACKING UP INTO HIS CELLAR"	1/25/2010: "Blocked sewer freed by 2-37. Cause: grease NO SSO"	Blockage in City sewer line due to grease. Cleared by City. Unclear why it states "NO SSO."	Grease
2010	1257901	SEWER BACKING UP IN HOUSE	30 WHIPPLE ST	1/25/2010	"HAS WATER BACKING UP INTO A DRAIN IN THE CELLAR,,,ROTO-ROUTER IS THERE"	1/25/2010: "THIS WAS A BLOCKED SEWER" 1/26/2010: "2-49 freed blocked sewer Cause: Grease SSO"	Blockage in City sewer line due to grease. Cleared by City. Clearly identifies this as an SSO.	Grease
2010	1259873	SEWER BACKING UP IN HOUSE	28 CARO ST	2/10/2010	"MAINTENANCE PERSON FOR THIS MULTIFAMILY UNIT REPOERTING SEWER BACKING UP IN THE BASEMENT APARTMENT HE IS ON SITE NOW PLEASE ASSESS"	2/10/2010: "checked again by 4-5...found blocked sewer...refer to Joe B" 2/11/2010: "2-49 Freed blocked sewer. Not a SSO 30 galons of sewage spilled inside 28 Caro St. Cause:Grease & Rags"	Blockage in City sewer line due to grease and rags. Cleared by City. Unclear why it states "Not a SSO."	Grease
2010	1260027	SEWER BACKING UP IN HOUSE	1050 MAIN ST	2/12/2010	"HE IS ON THE SECOND FLOOR - CALLED SEWERS & SPOKE W/ VIOLET"	2/12/2010: "2-37 Freed blocked sewer. Cause: Grease NO SSO 2-14 put 2 pails of sanfax in sanitary line in front of 1050 Main st."	Blockage in City sewer line due to grease. Cleared by City. Unclear why it states "NO SSO."	Grease
2010	1260741	SEWER BACKING UP IN HOUSE	946 PLEASANT ST	2/22/2010	"SEWER IS BACKING UP IN THE BASEMENT OF THIS SINGLE FAMILY HOME, OWNER IS ON SITE CURRENTLY PLEASE ASSESS."	2/22/2010: "2-37 freed blockage due to paper and grease homeowner had approximately 100 to 125 gallons of sewerage in his home"	Blockage in City sewer line due to paper and grease. Cleared by City.	Grease

Year	Work Order No.	Problem Code	Location	Date Generated	Description	Work Order Notes	EPA Inspection Team Notes	Cause Based on City Work Order Notes
2010	1261106	SEWER BACKING UP IN HOUSE	109 LAKE AVE	2/24/2010	"CALLED SEWERS & SPOKE WITH VIOLET"	2/24/2010: "Hi water, sewer going to the lake"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1261298	SEWER BACKING UP IN HOUSE	91 LAKE AVE	2/25/2010	"SEAWAGE BACKING UP INTO BASEMENT"	2/26/2010: "high water ok to close"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1261303	SEWER BACKING UP IN HOUSE	40 SOUTHOLD RD	2/25/2010	"SEWER BACKINGUP IN HOUSE"	2/26/2010: "2-49 checked sewer line entire street high water lines were surcharging sewer pending Harvey Muir 2-49 checked this morning 8:30 AM line is down and running 2-26-2010 ok to close per Harvey Muir"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1261394	SEWER BACKING UP IN HOUSE	19 ELMWOOD ST	2/26/2010	"SEWER IS BACKING UP IN HOUSE"	2/26/2010: "Keith Gilchrist checked it out it was high water ok to close 2-26-2010 Backwater valve program"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1261306	SEWER BACKING UP IN HOUSE	299 LOVELL ST	2/26/2010	"SEWER BACKING UP IN HOUSE REFERRED TO SEWERS 2-26-2010"	2/26/2010: "Hight Water" 2/26/2010: "Michelle Montanez 4508-410-9404 called in because sewage is still backing up in her basement. She is stating that the problem is getting worse. Called over to sewer and spoke with Sue." 2/26/2010: "still high water per Wayne Savage 2:10 Andre is speaking to owner about backwater valve"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1261324	SEWER BACKING UP IN HOUSE	6 OLEAN ST	2/26/2010	"THE PHONE NUMBER ABOVE IS FOR HER FATHER (FRANCIS) - CALLED SEWERS & SPOKE WITH VIOLET"	2/26/2010: "high water per 2-14 Wayne Savage ok to close per Harvey Muir"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1261526	SEWER BACKING UP IN HOUSE	77 ORIENT ST	2/27/2010	"SEWER BACKING UP INTO HOME"	2/27/2010: "BLOCKED SEWER" 3/1/2010: "Cataldo, Carota in truck 2-49 with Ballotte freed blocked sewer. Lots of grease no. SSO."	Blockage in City sewer line due to grease. Cleared by City. Unclear why it states "no. SSO."	Grease
2010	1263118	SEWER BACKING UP IN HOUSE	32 AMHERST ST	3/14/2010	"SEWER IN THE CELLAR"	3/14/2010: "2-37 K.Gilchrist responded, the homeowner's tell" since they are working in Beaver Brook he have this problem"??He have sewer in His house. There are HI water condition in this area." 3/15/2010: "John called in that sewage is still backing up in his hosue. Called over to sewers spoke with Sharon" 3/15/2010: "Per Sewer radio communication: Sewer lines are running fine, due to heavy rain they are at capacity."	Appears to be backup due to capacity issues in City sewer line.	Capacity

Year	Work Order No.	Problem Code	Location	Date Generated	Description	Work Order Notes	EPA Inspection Team Notes	Cause Based on City Work Order Notes
2010	1263119	SEWER BACKING UP IN HOUSE	28 CARO ST	3/14/2010	"SEWER BACKING UP IN THE HOUSE"	3/14/2010: "Trench collapsing, Riccardi Construction in charge are in site in this moments 2-39 responded vac'ed MH until Riccardi get the neccessary people" 3/14/2010: "2-39 VAC'ED THE MH NEAR 28 CARO ST. MR. P.DUPRE VAC'ED 4 TRUCK FULL OF SEWER FOR RICCARDI CONSTRACTION."	Appears to be structural issue with City sewer line.	Structural
2010	1263120	SEWER BACKING UP IN HOUSE	91 LAKE AVE	3/14/2010	"OWNERS SAYS SEWAGE COMING INTO BASEMENT"	3/14/2010: "2-37 gilchrist responded this is a blocked sewer Cause HI water surcharging in all the Mh's in the Lake"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1263105	SEWER BACKING UP IN HOUSE	1350 PLEASANT ST	3/14/2010	"SEWER BACKING UP IN THE HOUSE"	3/14/2010: "2-49 freed blocked sewer. Cause: regular blocked One house was afected Mr.Smarra talked to hime owner's"	Blockage in City sewer line. Cleared by the City. Does "regular blocked" mean "regulator blocked"?	Blockage - Material not identified
2010	1263255	SEWER BACKING UP IN HOUSE	12 CRESWELL RD	3/15/2010	"THERE IS SEWAGE BACKING UP INTO THE RESIDENT BASEMENT"	3/15/2010: "high water in sewer systen due to rain. Will discuss BWV with owner."	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1263247	SEWER BACKING UP IN HOUSE	36 INTERVALE RD	3/15/2010	"PLUMBER IS AT THE SITE, SEWER BACKING UP IN HOUSE."	3/15/2010: "high water in sewer system due to rain. Will continue to monitor area.. Will discuss BWV program with owner"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1263269	SEWER BACKING UP IN HOUSE	109 LAKE AVE	3/15/2010	"SEWER BACKINGUP IN HOUSE THROUGH SINKS"	3/15/2010: "High water in area due to rain. Will discuss BWV program with owner."	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1263222	SEWER BACKING UP IN HOUSE	1 MABELLE ST	3/15/2010	"OWNER OF SINGLE FAMILY HOME EXPERIENCING SEWER BACK UP IN THE BASEMENT. HAS PLUMBERS ON SITE NOW WHO SAY IT IS COMING FROM CITY SIDE."	3/16/2010: "2-14 Hi water running fine"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1263217	SEWER BACKING UP IN HOUSE	59 MIDLAND ST	3/15/2010	"CALLED THIS OVER TO SEWERS SPOKE WITH SHARON"	3/15/2010: "2-28 need to pump and flush" 3/16/2010: "Hi water running fine 2-14 W.Savage"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1264202	SEWER BACKING UP IN HOUSE	27 CHANDLER ST	3/23/2010	"SEWER BACKING UP IN CELLAR."	3/24/2010: "This was a blocked sewer, freed at Irving @ Chandler. Possible broken pipe. Also will be TV'd. MUIR"	Blockage in City sewer line. Cleared by the City. Possibly broken pipe. CCTV inspection requested.	Structural
2010	1264759	SEWER BACKING UP IN HOUSE	18 LOWELL ST	3/27/2010	"OWNER SAYS SEWER BACKING UP IN HOUSE. HE HAD PLUMBER CHECK HIS LINE AND SAYS ITS BLOCKED"	3/27/2010: "called in crew for Blocked Sewer line Harvey Muir, John Carota, and Keith Alen. 3-27-2010." 3/29/2010: "Freed blocked"	Blockage in City sewer line. Cleared by the City.	Blockage - Material not identified

Year	Work Order No.	Problem Code	Location	Date Generated	Description	Work Order Notes	EPA Inspection Team Notes	Cause Based on City Work Order Notes
2010	1264919	SEWER BACKING UP IN HOUSE	49 LITCHFIELD ST	3/29/2010	"OWNER OF THIS 3 FAMILY HOME REPORTING SEWER BACKING UP IN TO THE CELLAR OF THE BUILDING AT THE MOMENT, THEY ARE ON SITE NOW."	3/29/2010: "2-49 flush restriction ASsphalt and concrete in invert nned to be taken out. W.Savage" 3/30/2010: "9:30 am 2-49 flushed the line just in case No a Blocked..Talked to homeowner's. RAMM"	Blockage in City sewer line. Cleared by the City. Appears to be due to debris in the sewer line.	Debris
2010	1264927	SEWER BACKING UP IN HOUSE	1350 PLEASANT ST	3/29/2010	"CALLER STATES THIS IS AN ONGOING PROBLEM AND HE HAS SPOKEN TO JOE BUCKLEY ABOUT THIS PROBLEM IN THE PAST. CALLER STATES THERE IS AN AREA ACROSS THE STREET THAT GETS BLOCKED AND THE CITY LINE NEEDS TO BE FLUSHED."	3/29/2010: "sewer was blocked. 2-39 truck found a lot of grease. Sewer was freed and is running. Dupre/Carota"	Blockage in City sewer line due to grease. Cleared by City.	Grease
2010	1265088	SEWER BACKING UP IN HOUSE	44 BELLEVUE ST	3/30/2010	"SEWAGE IS BACKING UP INTO THE BASEMENT"	3/30/2010: "Hi Water OK to CLOSE"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1265143	SEWER BACKING UP IN HOUSE	67 DEERFIELD ST	3/30/2010	"WATER 1' DEEP IN CELLAR"	4/2/2010: "Hi water No problem w/house"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1265124	SEWER BACKING UP IN HOUSE	47 GREENFIELD ST	3/30/2010	"WATER AND SAWERAGE IS GOING INTO BASEMENT - HAS SUMP PUMP IS RUNNING BUT HAVING A HARD TIME KEEPING UP WITH IT."	3/30/2010: "2-42 Checked mh's in area. HI water. OK to close"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1265065	SEWER BACKING UP IN HOUSE	15 HAROLD ST	3/30/2010	"STARTED ABOUT AN HOUR AGO. ROBERT PUZO HOME OWNER IS ON SITE"	3/30/2010: "Hi Water water going down slowly"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1265129	SEWER BACKING UP IN HOUSE	12 JUNE ST	3/30/2010	"ENTRANCE IS AROUND THE BACK OF THE PROPERTY. LANDLORD CALLED AND STATED THAT TO THEIR KNOWLEDGE ITS ONLY THE BASEMENT APT THAT IS HAVING ISSUE WITH SEWER BACKING UP AND OVERFLOWING FROM TOILET."	3/30/2010: "High water OK to close"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1265099	SEWER BACKING UP IN HOUSE	18 KINNICUT RD SO	3/30/2010	"SEWAGE IS BACKING UP INTO THE HOUSE"	4/2/2010: "Hi water, line still up 4/1/10 Hi water"	Appears to be backup due to capacity issues in City sewer line.	Capacity

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2010	1265131	SEWER BACKING UP IN HOUSE	199 LAKE AVE	3/30/2010	"SEWERAGE BACKIN GUP INTO TUB (1ST FLOOR) AND HAS VERY FOUL ODOR AND ALSO FILLING TOILET BUT NOT OVERFLOWING YET"	3/30/2010: "A.Louzado responded talked to the Lady Hi water. - needs back water valve. ok to close"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1265119	SEWER BACKING UP IN HOUSE	6 MABELLE ST	3/30/2010	"OWNER OF SINGLE FAMILY HAVING SEWER BACKING UP IN TO HOUSE. OWNER IS ON SITE NOW AND USING TWO SUB-PUMPS BUT MORE SEWER IS COMING IN"	3/31/2010: "Paulino called in for an update, I spoke with Violet in Sewers she stated the sewers are running high and crews are checking the lines twice a day (morning & afternoon)."	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1265137	SEWER BACKING UP IN HOUSE	85 MOWER ST	3/30/2010	"WATER COMING OUT OF TOILET"	4/3/2010: "At 10:20 am sewer still surcharging" 4/5/2010: "At 10:55 am Sewer back to normal level"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1264968	SEWER BACKING UP IN HOUSE	6 OLEAN ST	3/30/2010	None noted	3/30/2010: "2-14 responded checked line they running high. HI Water - W.Savage"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1265046	SEWER BACKING UP IN HOUSE	16 SACHEM AVE	3/30/2010	"WATER AND SEWAGE IS BACKING UP INTO THE BASEMENT"	3/30/2010: "High water MH surcharging. 2-39 freed Blocked Sewer"	Appears to be backup due to capacity issues and a blockage in City sewer line.	Blockage - Material not identified
2010	1264944	SEWER BACKING UP IN HOUSE	101 SOUTH FLAGG ST	3/30/2010	None noted	3/30/2010: "2-14 and 2-49 responded this is a Hi Water condition all's MH's in the area are high so much rain."	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1265135	SEWER BACKING UP IN HOUSE	31 SOUTHOLD RD	3/30/2010	"STATES THAT THERE IS SEWERAGE BACKING UP INTO THE PROPERTY"	3/30/2010: "2-39 flushed from Greenwood to Southhold Hi water going down slowly OK to closed"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1265132	SEWER BACKING UP IN HOUSE	40 SOUTHOLD RD	3/30/2010	"SEWERAGE BACKING UP INTO PROPERTY. SAID THIS IS A RECURRENT ISSUE"	3/30/2010: "2-39 Flushed from Greenwood to Southold. High Water water going down slowly OK to close"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1265121	SEWER BACKING UP IN HOUSE	28 SPRING VALLEY RD	3/30/2010	"SEWER BACKING UP IN TO BASEMENT, PUMP IS NOT KEEPING UP.OWNER ON SITE NOW"	3/30/2010: "High water OK to close"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1265134	SEWER BACKING UP IN HOUSE	8 TIFFANY AVE	3/30/2010	"SAID THAT CHECK VALVE IS HOLDING THE BULK, BUT IS STILL LEAKING INTO BASEMENT."	3/30/2010: "Hi water ok to close"	Appears to be backup due to capacity issues in City sewer line.	Capacity

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2010	1265141	SEWER BACKING UP IN HOUSE	15 TIFFANY AVE	3/30/2010	"HAS BAD-SMELLING WATER BACKING UP...SPME DEBRIS"	3/30/2010: "2-42 spoke to owner's whole area has high water. OK to close"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1265094	SEWER BACKING UP IN HOUSE	61 VALLEY HILL DR	3/30/2010	"SEWER BACKING UP IN CELLAR, BATHROOM."	3/31/2010: "Hight water. Talked to home owner about Back Water Valve Program"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1265337	SEWER BACKING UP IN HOUSE	14 GAMBIER ST	3/31/2010	"SEWER BACKING INTO HOME"	4/2/2010: "Hight water. Talked with the owner"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1265336	SEWER BACKING UP IN HOUSE	5 GENEVA ST	3/31/2010	"SEWER BACKING UP INTO HOUSE"	4/2/2010: "Ground water coming in main line CHAD"	Appears to be backup due to capacity issues in City sewer line. No note for follow-up inspection.	Capacity
2010	1265323	SEWER BACKING UP IN HOUSE	128 INSTITUTE RD	3/31/2010	"SEWER BACKING UP IN CELLAR"	4/1/2010: :"J.Buckley checked this complaint and said is HI WATER OK to close"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1265300	SEWER BACKING UP IN HOUSE	17 KINNICUT RD SO	3/31/2010	"CALLER STATES THERE IS 4 1/2 FEET OF RAW SEWAGE IN HER BASEMENT AND THAT SHE HAS 2 PUMPS AND 2 WET VACS RUNNING"	3/31/2010: "2-14 W Savage responded he said is a HI WATER problem Pending" 4/2/2010: "Hi water"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1265215	SEWER BACKING UP IN HOUSE	97 NEWTON AVE NORTH	3/31/2010	None noted	3/31/2010: "Hi water"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1265489	SEWER BACKING UP IN HOUSE	44 BELLEVUE ST	4/1/2010	"REFER TO WORK ORDER 1265088 - CALLER STATES THERE IS STILL SEWER BACKING UP IN THE HOUSE - HE IS THE ROPERTY OWNER"	4/1/2010: "2-39 freed Blocked Sewer. Cause: Grease NO SSO"	Blockage in City sewer line due to grease. Cleared by City. Unclear why it states "NO SSO."	Grease
2010	1265541	SEWER BACKING UP IN HOUSE	26 ELMWOOD ST	4/1/2010	"SAYS THAT THEY HAVE WATER COMING UP IN HER YARD & INTO HER HOUSE."	4/2/2010: "Sewer actively coming back up through basement. Spoke with Violet and Dave Luft, says it was high water, house is built down lower than the rest of the neighborhood manhole is high, whole neighborhood is surcharging. Nothing they are able to do at this point."	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1265598	SEWER BACKING UP IN HOUSE	8 CRESWELL RD	4/2/2010	None noted	4/2/2010: "2-14 checked this is a Hi Water"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1265657	SEWER BACKING UP IN HOUSE	50 MAYWOOD ST	4/2/2010	"SEWER BACKING UP IN CELLAR"	4/2/2010: "R.Maher and Randy Parent found blocked sewer lines." 4/5/2010: "2- 49 freed the blockage due to grease and rags gary mooskian checked the location on 4-5-2010 and it is running fine"	Blockage in City sewer line due to grease and rags. Cleared by City.	Grease

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2010	1269801	SEWER BACKING UP IN HOUSE	101 SOUTH FLAGG ST	5/8/2010	"CALLER SAYS THERE IS RAW SEWAGE COMING UP THROUGH HIS SHOWER DRAIN"	5/8/2010: "R.MAHER/R.PARENT RESPONDED AND IT WAS FOUND TO BE A BLOCKED SEWER" 5/10/2010: "Cause/ Grease: Vehicle #2-49 Freed the obstruction and reported that the cause was grease"	Blockage in City sewer line due to grease. Cleared by City.	Grease
2010	1270056	SEWER BACKING UP IN HOUSE	39 OBERLIN ST	5/11/2010	"3-4 INCHES OF SEWERAGE BACKED UP IN THIS SINGLE FAMILY'S BASEMENT. HOME OWNER ON SITE NOW"	5/12/2010: "Owner claim to have a foot of raw sewage in her cellar due to Blocked Sewer 5/10/10. Owners is responsable to clean up. She will contact Law Office. Cause:Grease, Gravel NO SSO"	Blockage in City sewer line due to grease and gravel. Cleared by City. Unclear why it states "NO SSO."	Grease
2010	1270902	SEWER BACKING UP IN HOUSE	8 NUTMEG DR	5/18/2010	"SEWAGE IS BACKING UP INTO THE RESIDENTS BASMENT"	5/18/2010: "2-14 responded to this blocked sewer . 2-37 flushed the line and freed the blockage Cause" Grease" NO SSO"	Blockage in City sewer line due to grease. Cleared by City. Unclear why it states "NO SSO."	Grease
2010	1274752	SEWER BACKING UP IN HOUSE	92 BIRCH ST	6/18/2010	"SEWER BACKING UP IN THE HOUSE"	6/18/2010: "complaint and w/2-49 flusher freed blocked sewer. Cause: Grease + NO SSO"	Blockage in City sewer line due to grease. Cleared by City. Unclear why it states "NO SSO."	Grease
2010	1277917	SEWER BACKING UP IN HOUSE	64 CHINO AVE	7/17/2010	"SEWER BACKING UP IN HOUSE"	7/17/2010: "AFTER ARRIVING THE CREW FOUND IT TO BE A BLOCKED SEWER LINE. CALLED IN A SEWER CREW (R. CALTADO, J.CAROTA, AND K. CHAREST) WHO FLUSHED THE LINE AND IT IS O.K. NOW." 7/22/2010: "Freed blockage no SSO"	Blockage in City sewer line. Cleared by City. Unclear why it states "no SSO."	Blockage - Material not identified
2010	1278516	SEWER BACKING UP IN HOUSE	77 MASSASOIT RD	7/22/2010	"SEWER BACKING UP"	7/22/2010: "2-49 freed blocked sewer ok to close"	Blockage in City sewer line. Cleared by City.	Blockage - Material not identified
2010	1281486	SEWER BACKING UP IN HOUSE	100 BARBER AVE	8/19/2010	"Sewerage is leaking into transformer outside the building in side parking lot. Next to Higgin's Armory."	8/19/2010: "2-49 freed the blockage 8-19-2010"	Blockage in City sewer line. Cleared by City.	Blockage - Material not identified
2010	1286024	SEWER BACKING UP IN HOUSE	1050 MAIN ST	9/25/2010	"CALLER HAVING TOILET BACKING UP IN APARTMENT. HE SAID THAT NORMALLY WHEN THIS HAPPENS, THE SEWER IS BLOCKED MAIN @ CAMBRIDGE STREET"	9/25/2010: "BLOCKED SEWER" 9/25/2010: "SEWER UNBLOCKED BY CATALDO AND CREW - W/O CLOSED" 9/27/2010: "Parent was operating flusher because clerk went through list and nobody was available. alot of grease and cigaretts some cardboard reason for blockage. This was not an SSO."	Blockage in City sewer line due to grease and debris. Cleared by City. Unclear why it states "This was not an SSO."	Grease

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2010	1287548	SEWER BACKING UP IN HOUSE	132 JUNE ST	10/7/2010	"the landlord is calling. a tenant of his reported to him that the sewer is backing up. he lives in the cellar apt. backing up in tubs, toilets."	10/7/2010: "2-49 freed blockage ok to close per John Dalbeck it was filled with grease it was not an SSO"	Blockage in City sewer line due to grease. Cleared by City. Unclear why it states "it was not an SSO."	Grease
2010	1288288	SEWER BACKING UP IN HOUSE	50 MAYWOOD ST	10/13/2010	"Sewage is backing up into the sink in the basement"	10/13/2010: "2-49 freed blockage full of sheets and rags ok to close"	Blockage in City sewer line due to sheets and rags. Cleared by City.	Debris
2010	1289095	SEWER BACKING UP IN HOUSE	11 EVERS ST	10/20/2010	"sewage backing up in house. 11 Evers Street. GNO Plumbing called this in, they are on site right now."	10/20/2010: "This was a blocked sewer was freed by 2-49 Cause :Grease and debris No SSO"	Blockage in City sewer line due to grease and debris. Cleared by City. Unclear why it states "No SSO."	Grease
2010	1289993	SEWER BACKING UP IN HOUSE	61 SEVER ST	10/27/2010	"Snaked the line but sewage is still backing up. Caller states the sewer line comes out on Roxbury St,"	10/27/2010: "2-37 freed blocked sewer Cause: mix debris NO SSO"	Blockage in City sewer line due to debris. Cleared by City. Unclear why it states "NO SSO."	Debris
2010	1290481	SEWER BACKING UP IN HOUSE	32 LAKESIDE AVE	11/1/2010	"Sewer backing up"	11/1/2010: "2-37 freed blockage full of grease and rags this was an SSO"	Blockage in City sewer line due to grease. Cleared by City. Clearly identifies this is an SSO.	Grease
2010	1291963	SEWER BACKING UP IN HOUSE	295 PLEASANT ST	11/15/2010	"Sewer backing up in cellar"	11/15/2010: "BLOCKED SEWER" 11/15/2010: "SEWER FREED"	Blockage in City sewer line. Cleared by City.	Blockage - Material not identified
2010	1292345	SEWER BACKING UP IN HOUSE	32 CAMBRIDGE ST	11/18/2010	None noted	11/18/2010: "full of grease 2-39 freed blockage ok to close per Wayne Savage"	Blockage in City sewer line due to grease. Cleared by City.	Grease
2010	1292561	SEWER BACKING UP IN HOUSE	105 SOUTH FLAGG ST	11/19/2010	"SEWERAGE BACKING UP IN CELLAR"	11/20/2010: "BLOCKED SEWER" 11/20/2010: "FREED UP SEWER, WAS FULL OF GREASE & RAGS" 11/20/2010: "Flushed line and found the cause to be GREASE/RAGS. Re-flushed line. Going to try and put sanfax in line later today. Crew Cataldo-Gilchrist-Hernandez with truck 2-37."	Blockage in City sewer line due to grease. Cleared by City.	Grease
2010	1292885	SEWER BACKING UP IN HOUSE	3 HOLT AVE	11/23/2010	"sewage backing up in cellar of 3 Holt Ave"	11/23/2010: "sewer filled with roots ok to close"	Does not specify whether blockage was in City sewer line or private lateral. Simply states "sewer filled with roots." Because the City checks its own lines, it appears that the accumulated roots were in the City sewer line.	Roots

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2010	1293602	SEWER BACKING UP IN HOUSE	105 SOUTH FLAGG ST	12/2/2010	"SEWER BACKING UP IN CELLAR. ALSO SHE HAS A PUMP IN HER CELLAR PUPMPING IT OUT"	12/2/2010: "ok to close 2-39 freed blocked sewer line it was a SSO roots"	Blockage in City sewer line due to roots. Cleared by City. Clearly identifies this as an SSO.	Roots
2010	1293787	SEWER BACKING UP IN HOUSE	1 CLAPP ST	12/3/2010	"Caller reporting sewer backing up in House"	12/3/2010: "homeowners problem blocked sewer 2-49 flushed not a SSO was full of grease and rags ok to close" 12/6/2010: "Spoke with John he states the rags & grease is coming from the resident at 5 Clapp St."	Work order states both that it was a "homeowner problem" and also indicates there was a blockage in the City sewer line due to rags and grease. Unclear why it states "not a SSO."	Grease
2010	1294414	SEWER BACKING UP IN HOUSE	11 CARLETON ST	12/11/2010	"GUFSTASON PLUMBING SAYS OWNERS HOUSE IS BACKING SEWAGE UP"	12/11/2010: "OVER A FOOT OF SEWAGE ENTERED BASEMENT OF #12 CARLETON STREET. BLOCKAGE WAS ON CITY LINE. SEWER WAS FREED UP BY R. CATALDO AND CREW" 12/13/2010: "Blockage freed by 2-37 crew Cataldo/Parent/Allen. Found rags and grease that caused blockage."	Blockage in City sewer line due to grease and rags. Cleared by City.	Grease
2010	1294407	SEWER BACKING UP IN HOUSE	17 LYMAN ST	12/11/2010	"OWNER STATES SEWAGE BACKING UP IN HOUSE"	12/11/2010: "REFERRED TO CREW FOR BLOCKED SEWER" 12/11/2010: "rocky and crew freed" 12/13/2010: "Lots of grease and debris found. Flushed line again. Cataldo/Berenson/Allen crew. To be TV'D ASAP"	Blockage in City sewer line. Cleared by City. Appears to have been caused by grease and debris. CCTV inspection requested.	Grease
2010	1294426	SEWER BACKING UP IN HOUSE	17 LYMAN ST	12/12/2010	"SEWER IS BACKING UP INTO HOUSE"	12/12/2010: "CREW FREED BLOCK SEWER" 12/12/2010: "MAHER AND CREW FOUND GRAVEL, SEWER LINE SHOULD BE CAMARA'ED"	Blockage in City sewer line. Cleared by City. Appears to have been caused by gravel. CCTV inspection requested.	Debris
2010	1295538	SEWER BACKING UP IN HOUSE	40 SOUTHOLD RD	12/23/2010	"sewage backing up in cellar. single family home. 40 southold rd."	12/23/2010: "BLOCKED SEWER" 12/23/2010: "BLOCKED SEWER IS CLEARED UP BY GILCHRIST & ARCOUETTE" 12/23/2010: "SEVERAL MANHOLES ON SOUTHHOLD RD NEEDS TO BE VACCUM" 12/27/2010: "ok to close blockage cleared / blockage due to shop rags and grease blockage cleared by c arcoute and k. gilchrist. open a new complaint for vac out manholes on southhold"	Blockage in City sewer line due to grease and rags. Cleared by City.	Grease
2011	1297036	SEWER BACKING UP IN HOUSE	299 LOVELL ST	1/8/2011	"HAS SEWER BACKING UP INTO HER BASEMENT"	1/8/2011: "IT'S A BLOCKED SEWER" 1/9/2011: "Freed blocked sewer, Cataldo, Macjewski, Allen. To be sanfaxed Monday morning"	Blockage in City sewer line. Cleared by City.	Blockage - Material not identified
2011	1297373	SEWER BACKING UP IN HOUSE	210 PARK AVE	1/11/2011	"Emergency - Commercial UPS - Store - she states sewer backing up in cellar"	1/11/2011: "per John Dalbeck ok to close was an SSO 2-49 freed blockage"	Blockage in City sewer line. Cleared by City. Clearly identifies this as an SSO.	Blockage - Material not identified

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2011	1298122	SEWER BACKING UP IN HOUSE	8 LYON ST	1/13/2011	"Sewage is backing up into the basement"	1/13/2011: "ok to close sewer blockage -2-37 freed blockage , not an sso blockage unknown ok to close out wayne savage is stating that shrewsbury st is running high"	Blockage in City sewer line. Cleared by City. Unclear why it states "not an sso." Appears that that may also be related to a capacity issue.	Blockage - Material not identified
2011	1300624	SEWER BACKING UP IN HOUSE	65 CROWNINGSHIELD RD	1/24/2011	"sewer backing up in cellar"	1/24/2011: "FOUND TO BE A BLOCKED SEWER, CALLED IN CREW TO FREE." 1/24/2011: "R.CATALDO AND CREW FREED UP"	Blockage in City sewer line. Cleared by City.	Blockage - Material not identified
2011	1301608	SEWER BACKING UP IN HOUSE	10 STEVENS RD	1/27/2011	"CALLER HAS SEWER BACKING UP INTO HOME - ROTO ROOTER HAS BEEN AT HOME AND SAID HE WENT OUT 100 FEET"	1/28/2011: "2-11 called in car plate over MH. Was able to get address and have owner move car. Sewer is blocked." 1/28/2011: "Sewer Freed By 2-37. Needs to be CCTV inspected. Flusher was having trouble aprox 50' from MH."	Blockage in City sewer line. Cleared by City. CCTV inspection requested.	Blockage - Material not identified
2011	1303860	SEWER BACKING UP IN HOUSE	210 WEST ST	2/4/2011	None noted	2/4/2011: "2-37 freed sewer"	Blockage in City sewer line. Cleared by City.	Blockage - Material not identified
2011	1304331	SEWER BACKING UP IN HOUSE	71 CAMBRIDGE ST	2/6/2011	"SEWER BACKING UP IN HOUSE"	2/6/2011: "water checked MH's. Sewer up in Cambridge Street. KB to call in crew to free sewer" 2/6/2011: "2-37 having trouble. pulling back gravel and brick. 2-39 to respond" 2/6/2011: "2-39 freed sewer. need to cctv sewer. flusher kept getting stuck"	Blockage in City sewer line. Cleared by City. CCTV inspection requested.	Blockage - Material not identified
2011	1304462	SEWER BACKING UP IN HOUSE	10 STEVENS RD	2/6/2011	"HAS SEWER BACKING UP INTO HER HOME"	2/6/2011: "K.GILCHRIST & K. CHAREST FREE UPA BLOCKED SEWER. REFER TO SEWER DEPT" 2/7/2011: "sewer freed. will cctv line"	Blockage in City sewer line. Cleared by City. CCTV inspection requested.	Blockage - Material not identified
2011	1306694	SEWER BACKING UP IN HOUSE	34 TORONITA AVE	2/24/2011	"this building is vacant because resident is in a nursing home - this was called in by his cousin Kenneth Carlson 203-885-5970"	2/24/2011: "2-37 freed blocked sewer 2-24-2011"	Blockage in City sewer line. Cleared by City.	Blockage - Material not identified
2011	1306912	SEWER BACKING UP IN HOUSE	121 HIGHLAND ST	2/25/2011	"STEVE FROM HIGHLAND LIQUORES AND BOYNTON RESTAURANT SAYS SEWER IS BACKING UP IN BUILDING"	2/25/2011: "Keith Gilchrest and Keith Allen for Meo3 and Meo 1 for blocked sewer at Boynton Rest /Liquor Store" 2/25/2011: "1 manhole in front of #15 Ormond Street and 2 manholes in front of Church on Ormond Street needs to be vaccumed asap or Monday 2-28-11 per R.Poske/Randy Parent and crew that freed blockage 2-25-11" 2/27/2011: "Sewer line loaded with grease. Blockage freed by 2-49 truck. Cataldo/Gichrist/Allen. Poske and Parent assisted. May have to be vaced Monday. No SSO."	Blockage in City sewer line due to grease. Cleared by City. Unclear why it states "No SSO."	Grease

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2011	1307582	SEWER BACKING UP IN HOUSE	16 SACHEM AVE	3/2/2011	"2-37 WILL RESPOND TO SEWER BACKING UP"	3/2/2011: "2-37 freed the blockage cause was grease and roots"	Blockage in City sewer line due to grease and roots. Cleared by City.	Grease
2011	1307687	SEWER BACKING UP IN HOUSE	41 UPLAND ST	3/3/2011	"HAS SEWER BACKING UP INTO HIS HOUSE, NEAR HIS BASEMENT FLOOR"	3/3/2011: "Sanitary sewer overflow at this location" 3/3/2011: "2-49 freed block sewer which was coming out of manhole in backyard (cause is paper products)"	Blockage in City sewer line due to paper products. Cleared by City. Clearly identifies this as an SSO.	Debris
2011	1307952	SEWER BACKING UP IN HOUSE	299 LOVELL ST	3/5/2011	None noted	3/5/2011: "SEWER FREED" 3/6/2011: "Blockage by grease"	Blockage in City sewer line due to grease. Cleared by City.	Grease
2011	1308122	SEWER BACKING UP IN HOUSE	60 BEAVER BROOK PKWY	3/7/2011	None noted	3/7/2011: "will be monitored until high water recedes" 3/7/2011: "Kelly called in stating that the water is still backing up in her house. Called over to sewers spoke to Rocky. Per Rocky the pipe in that area is full and they are running a 6 inch pump to alleviate the pressure. This should make the water stop backing up at the property. Informed resident of this."	Appears to be backup due to capacity issues in City sewer line.	Capacity
2011	1308013	SEWER BACKING UP IN HOUSE	30 MANN ST	3/7/2011	"caller states sewer backing in her washing machine, toilet."	3/7/2011: "crew has been dispatched per Radio communication" 3/7/2011: "monitor ground water" 3/9/2011: "Resident called in that the sewage is still backing up in her house and has been for the last 3 days. Called over to sewers spoke to Sue and she said that they will have someone check this location. Informed resident of this. Joe Buckley called and asked that I send him a copy of the work order" 3/9/2011: "The resident should consider Back Water Valve - Sewer Division has been on site twice. will return later today" 3/23/2011: "was high water due to rains/snow melt. mann st level has gone down"	Appears to be backup due to capacity issues in City sewer line. Recurring issue.	Capacity
2011	1307988	SEWER BACKING UP IN HOUSE	103 MOWER ST	3/7/2011	"sewage back up in cellar, there is also water flooding into the cellar as well. resident states that it IS a flooding condition. wife will be home today."	3/7/2011: "monitor high water" 3/28/2011: "Derek called because he is wondering if he can seek reimbursement for the sewage clean up in his house. i called sue in sewer division, she stated that derek should contact the law department. he is also wondering if the sewer division will eventually come up and fix the city sewer lines because this happens at least once a year."	Appears to be backup due to capacity issues in City sewer line. Recurring issue.	Capacity

Year	Work Order No.	Problem Code	Location	Date Generated	Description	Work Order Notes	EPA Inspection Team Notes	Cause Based on City Work Order Notes
2011	1308137	SEWER BACKING UP IN HOUSE	210 PARK AVE	3/7/2011	"Sewerage is backing up through toilets"	3/7/2011: "Sanitary sewer overflow at this location" 3/7/2011: "2-39 crew freed the block sewer ok to close"	Blockage in City sewer line. Cleared by City.	Blockage - Material not identified
2011	1307969	SEWER BACKING UP IN HOUSE	101 SOUTH FLAGG ST	3/7/2011	None noted	3/8/2011: "Sanitary sewer overflow at this location"	Clearly identifies this is an SSO. No details given regarding cause.	Not identified
2011	1307964	SEWER BACKING UP IN HOUSE	8 TIFFANY AVE	3/7/2011	"HAS SEWER BACKING UP. NEED SOMEONE TO CHECK IT OUT BEFORE IT GETS WORSE"	3/7/2011: "ok to close high water per j. dalbeck"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2011	1308430	SEWER BACKING UP IN HOUSE	3 FARNUM TER	3/9/2011	"sewer backing up in house, plumber is at the sites."	3/9/2011: "sewer crew 2-49 flushed sewer believed to be broken - met water staff at 12:30 water excavation is source of broken line. Crew is on site." 3/11/2011: "see 1368756. water dept broke sewer main. main was repaired. sewer is now ok"	Backup appears to have been caused by break in City sewer line.	Structural
2011	1309511	SEWER BACKING UP IN HOUSE	28 CARO ST	3/17/2011	"Tom is the maintenance person for this property. A few days ago, there was sewage backing up in the toilet in basement apartment. Now, the drain pipe in the bathroom is leaking sewage. He is on site now"	3/17/2011: "2-39 freed blocked sewer full of gravel John Dalbeck spoke with maintenance man"	Blockage in City sewer line due to gravel. Cleared by City.	Debris
2011	1309453	SEWER BACKING UP IN HOUSE	35 FRUIT ST	3/17/2011	"SEWAGE BACKING UP IN BASEMENT. ACCORDING TO POLICE A PIPE IS CRACKED IN BASEMENT"	3/17/2011: "sewer from Cedar St. @ Seaver St. the diagonal connection had an unknown restriction holding back the line mr dupre is going to sign out the 2-39 and clean the remnants from the restriction. ok to close" 3/17/2011: "2-39 found lines loaded with Grease per Sal radio communication with field crew"	Blockage in City sewer line due to grease. Cleared by City.	Grease
2011	1309768	SEWER BACKING UP IN HOUSE	71 CAMBRIDGE ST	3/18/2011	"Sewerage backing up through the "pipe near the toilet" and in the toilet"	3/18/2011: "RICH & KEITH CHECKED IT OUT, IT'S A BLOCKED SEWER CALLED IN BOB GUSTAFSON, PAUL DUPRE, & TIM ROBIDOUX" 3/22/2011: "Donna from CM had homeowner calling back several times, asking for the city to clean up his basement. After a conversation with Mr. Buckley confirmed that the DPW would be unable to facilitate that request." 8/15/2011: "Per Joe Buckley sewer freed that evening contractor repair work on going"	Blockage in City sewer line. Cleared by City. Unclear why entry stating that the sewer was "freed" is dated about 5 months after the event occurred.	Blockage - Material not identified

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2011	1312204	SEWER BACKING UP IN HOUSE	117 HIGHLAND ST	4/8/2011	"sewer back up in cellar"	4/8/2011: "blocked through location between ormond street and west street" 4/8/2011: "249 freed blocked sewer"	Blockage in City sewer line. Cleared by City.	Blockage - Material not identified
2011	1312325	SEWER BACKING UP IN HOUSE	256 PARK AVE	4/9/2011	"sewage backing up from house/building"	4/9/2011: "called in Bob Gustafson/Foreman and Operator Robert Dupre Meo #3 and Meo #1 Keith Charest 4-9-11 for blocked sewage." 4/9/2011: "Crew freed blockage and all set"	Blockage in City sewer line. Cleared by City.	Blockage - Material not identified
2011	1312729	SEWER BACKING UP IN HOUSE	36 KING ST	4/13/2011	"sewage is backing up into the basement"	4/13/2011: "we flushed past their connection - freed blocked sewer and found grease and gravel"	Blockage in City sewer line due to grease and gravel. Cleared by City.	Grease
2011	1312790	SEWER BACKING UP IN HOUSE	20 SPRING VALLEY RD	4/13/2011	"raw sewer backing up in house - Worcester Fire Dept. is at the site now"	4/13/2011: "Sanitary sewer overflow at this location" 5/12/2011: "5-12-11 add note per J. Buckley sewer blockage was caused by grease"	Blockage in City sewer line due to grease. Cleared by City. Clearly identifies this as an SSO.	Grease
2011	1313164	SEWER BACKING UP IN HOUSE	18 STONELAND RD	4/18/2011	"W.P.D. CALLED OVER TO REPORT THAT SOMEONE AT 18 STONELAND RD. IS SAYING THAT THEY HAVE A PLUMMER AT THE HOUSE AND HE TOLD THEM TO CALL THE CITY TO REPORT RAW SEWAGE BACKING UP IN THE CELLAR"	4/18/2011: "BLOCKED SEWER" 4/18/2011: "BOB GUSTUFSON CALLED TO TELL US THEY FREED THE BLOCKED SEWER"	Blockage in City sewer line. Cleared by City.	Blockage - Material not identified
2011	1317624	SEWER BACKING UP IN HOUSE	119 HIGHLAND ST	5/30/2011	"THIS IS THE BOYTON RESTERAUNT AND THE SEWAGE IS BACKING UP IN THE SINKS"	5/30/2011: "called in a sewer crew to unblock this blockage" 5/30/2011: "Freed Sewer on Ormond Street. Manholes need to be vaccumed Also freed thru location to West Street as a result of Ormond Street Rich Maher & Keith Charest called in crew for blockage. 5-31-11"	Blockage in City sewer line. Cleared by City.	Blockage - Material not identified
2011	1319985	SEWER BACKING UP IN HOUSE	3 KNOWLTON AVE	6/17/2011	"sewage backing up in cellar. he is on site"	6/17/2011: "2-39 took care of blocked sewer at this location"	Blockage in City sewer line. Cleared by City.	Blockage - Material not identified
2011	1320186	SEWER BACKING UP IN HOUSE	3 KNOWLTON AVE	6/20/2011	"sewer backing up in cellar, owner is on site now."	6/20/2011: "2-39 flushed and vaced sanitary sewer"	Appears to be blockage in City sewer line. Cleared by the City. Recurring issue. Entry on 6/17/2011 as well.	Blockage - Material not identified
2011	1321513	SEWER BACKING UP IN HOUSE	6 PILGRIM AVE	7/4/2011	"HAS SEWER BACKING UP INTO HIS HOUSE. HIS HOUSE IS @ THE SPLIT OF PILGRIM @ DELL"	7/4/2011: "POSSIBLE BROKEN SEWER MAIN ON PILGRIM AVE TRIED FLUSHING WENT 50' FEET NO MORE. WAS PULLING ROCKS & GRAVEL BACK POLITO IS WORKING ON THE STREET AND HAS A TRENCH THAT GOES ACROSS WHERE FLUSHER IS GETTING STUCK. 6 PILGRIM AVE HAS SEWAGE ENTERING HOME PLEASE KEEP HIM INFORM"	Backup appears to have been caused by break in City sewer line.	Structural

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2011	1321594	SEWER BACKING UP IN HOUSE	57 GREAT BROOK VALLEY AVE	7/5/2011	"sewage backing up in cellar"	7/5/2011: "per 2-14 the problem was grease was blocking the sewer. ok to close"	Blockage in City sewer line due to grease. Cleared by City.	Grease
2011	1321595	SEWER BACKING UP IN HOUSE	63 GREAT BROOK VALLEY AVE	7/5/2011	"sewage backing up in cellar"	7/5/2011: "per 2-14 grease was the problem. Freed by 2-39. ok to close"	Blockage in City sewer line due to grease. Cleared by City.	Grease
2011	1325111	SEWER BACKING UP IN HOUSE	159 MILL ST	8/4/2011	"Sewer Backing up in house, she sates the manhole cover is in front of 155 Mill St. near the grassy area."	8/4/2011: "BLOCKED SEWER" 8/8/2011: "per J. Dalbeck blockage here freed by 2-49. ok to close"	Blockage in City sewer line. Cleared by City. Unclear if sewer line was finally cleared four days after the complaint, or that is when the resolution was entered into the work order system.	Blockage - Material not identified
2011	1325941	SEWER BACKING UP IN HOUSE	85 PRESCOTT ST	8/11/2011	"Sewer backing up in House"	8/11/2011: "BLOCKED SEWER" 8/12/2011: "per R. Cataldo -Cataldo /Hopkins-49 and Arcouette -Labor Dupre-39 responded crew worked manholes. had to call in Dupre to vac six manholes and flush. A lot of grase/oil/rags /debris was in manholes. 39 crew to return in morning to inspect manholes. ok to close."	Blockage in City sewer line. Cleared by City. Significant grease, oil, rags, and debris.	Grease
2011	1327788	SEWER BACKING UP IN HOUSE	7 HAROLD ST	8/28/2011	None noted	8/28/2011: "high water receded ok to close cause of restriction high water" 8/28/2011: "ok to close high water has receeded"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2011	1327749	SEWER BACKING UP IN HOUSE	14 HILTON AVE	8/28/2011	None noted	8/28/2011: "monitor high water" 8/28/2011: "per B. Gustafson 2-26 water level down. ok to close"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2011	1327791	SEWER BACKING UP IN HOUSE	23 HILTON AVE	8/28/2011	None noted	8/28/2011: "monitor high water" 8/28/2011: "per 2-26 B. Gustafson water is lower-ok to close"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2011	1327871	SEWER BACKING UP IN HOUSE	28 HILTON AVE	8/28/2011	None noted	8/28/2011: "pending high water sewers is to monitor" 8/28/2011: "per 2-26 B. Gustafson B. Ceffalo checked and the high water is down. ok to close."	Appears to be backup due to capacity issues in City sewer line.	Capacity
2011	1327857	SEWER BACKING UP IN HOUSE	45 HILTON AVE	8/28/2011	None noted	8/28/2011: "in sewers being monitored until high water receeds" 8/28/2011: "per 2-26 B. Gustafson water level is lower. ok to close."	Appears to be backup due to capacity issues in City sewer line.	Capacity
2011	1327810	SEWER BACKING UP IN HOUSE	101 SOUTH FLAGG ST	8/28/2011	None noted	8/28/2011: "monitor high water until it receeds" 8/28/2011: "per 2-49 K Gilchrist water subsided. ok to close"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2011	1329393	SEWER BACKING UP IN HOUSE	4 DORRANCE ST	9/8/2011	"sewage backing up in toilet in basement of this home"	9/8/2011: "per 2-49 all set high water. ok to close"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2011	1329255	SEWER BACKING UP IN HOUSE	15 HAROLD ST	9/8/2011	None noted	9/8/2011: "Resident called back stating all of the manhole covers are starting to flow up." 9/8/2011: "per 2-49 high water -put covers back on . ok to close."	Appears to be backup due to capacity issues in City sewer line.	Capacity

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2011	1329288	SEWER BACKING UP IN HOUSE	22 ORAN ST	9/8/2011	"WPD states that sewer is coming up through the cellar of the house"	9/8/2011: "per 2-39 lines running slow-high water ok to close."	Appears to be backup due to capacity issues in City sewer line.	Capacity
2011	1334808	SEWER BACKING UP IN HOUSE	67 DEERFIELD ST	10/19/2011	"Sewage is backing up into the residents basement."	10/19/2011: "per 2-14 W. Savage the block is freed. Ok to close"	Blockage in City sewer line. Cleared by City.	Blockage - Material not identified
2011	1338454	SEWER BACKING UP IN HOUSE	33 CANTERBURY ST	11/9/2011	None noted	11/10/2011: "per J. Dalbeck 2-11 2-39 and 2-49 flushed and vac'd this blocked sewer. I t was blocked with gravel and grease. ok to close."	Blockage in City sewer line due to grease. Cleared by City.	Grease
2011	1339352	SEWER BACKING UP IN HOUSE	159 MILL ST	11/15/2011	"sewer back up in cellar"	11/15/2011: "per 2-39 P. Dupre he flushed the line and rags and grease were blocking the line. ok to close."	Blockage in City sewer line due to grease and rags. Cleared by City.	Grease
2011	1340627	SEWER BACKING UP IN HOUSE	24 BAXTER ST	11/28/2011	"Happened before, thought it was an internal pump problem, there was a blockage in the street. Several years ago."	11/28/2011: "GAVE IT TO RICH & KEITH TO CHECK IT OUT. IT WAS BLOCKED SEWER" 11/28/2011: "FREE BLOCKED SEWER. BLOCKED SEWER WAS CAUSED BY ROOTS. REFER TO SEWER DEPT FOR CAMERA." 11/30/2011: "sewer freed not an sso"	Blockage in City sewer line due to roots. Cleared by City. CCTV inspection requested. Unclear why it states "not an sso."	Roots
2011	1341221	SEWER BACKING UP IN HOUSE	700 SOUTHBRIDGE ST	12/3/2011	"called to a resurant ... he has a line going 200' out but hasn't hit any blockage ... says he has alot of water coming back, which isn't normal"	12/3/2011: "Crew flushed and vacc'd line and took a lot of gravel from it" 12/5/2011: "per 2-26 B. Gustafson not an SSO. ok to close."	Blockage in City sewer line. Cleared by City. Significant gravel removed.	Debris
2011	1343292	SEWER BACKING UP IN HOUSE	9 IRENE ST	12/28/2011	"per Gustafson Plumbing the sewer was backing up and nobody at the location was using water"	12/29/2011: "per 2-11 J. Dalbeck this sewer blockage was freed by 2-37 -NO SSO-Blocked by paper . ok to close."	Blockage in City sewer line due to paper. Cleared by City. Unclear why it states "NO SSO."	Debris
2012	1343762	SEWER BACKING UP IN HOUSE	25 CONVERSE ST	1/4/2012	"Sewer Backing up in cellar - plumber is at the sites"	1/4/2012: "BLOCKED SEWER CHECKED BY RICH & KEITH"	Blockage in City sewer line.	Blockage - Material not identified
2012	1344034	SEWER BACKING UP IN HOUSE	12 LAKESIDE AVE	1/6/2012	"Sewer Backing Up in House at 12 LAKESIDE AVE, plumber is at the site"	1/6/2012: "BLOCKED SEWER, CALLED IN BOB GUSTAFSON, K.GILCHRIST, & T.MACJEWSKI" 1/6/2012: "SEWER SANITATION OVERFLOW ON LAKESIDE AVE" 1/10/2012: "per 2-26 B. Gustafson blocked sanitary sewer freed by 2-37 Gilchrist and Macjewski-caused by grease-had night man treat it with Sanfax. It is SSO. Will give to Andre."	Blockage in City sewer line due to grease. Cleared by City. Clearly identifies this is an SSO.	Grease
2012	1344391	SEWER BACKING UP IN HOUSE	38 DIX ST	1/11/2012	"caller will be on site in about 15 minutes"	1/11/2012: "per 2-39 P. Dupre flushed line -got a little gravel. After lunch will vac line ."	Appears to be problem with City sewer line which was addressed by flushing.	Debris
2012	1344694	SEWER BACKING UP IN HOUSE	100 GROVE ST	1/12/2012	"Backup at Commonwealth Mgmt"	1/13/2012: "ok to close not an S.S.O. blockage has been removed"	Does not specify whether blockage was in City sewer line or private lateral. Unclear why it states "not an S S.O."	Blockage - Material not identified

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2012	1347253	SEWER BACKING UP IN HOUSE	1 SAMSOSET RD	2/3/2012	"Plumber is a the sites, his name is Scott, Cell number is 508-873-1103, sewer backing up in cellar."	2/3/2012: "2-39 freed the blocked sewer. It was full of grease OK to close per Wayne Savage 2-14 (complaint truck)"	Blockage in City sewer line due to grease. Cleared by City.	Grease
2012	1347981	SEWER BACKING UP IN HOUSE	13 ASHMONT AVE	2/12/2012	"CALLER REPORTS THAT THERE IS SEWAGE "BUBBLING" FROM THE DRAIN IN THE FLOOR IN THE CELLAR"	2/12/2013: "PER R. GUSTAFSON - BLOCKED SEWER HAS BEEN FREED - IT WILL NEED MORE ATTENTION ON MONDAY MORNING 2/13/12" 2/14/2012: "per 2-40 K. Bicknell 2-39 pumped and flushed and freed the sewer here. It was due to grease and gravel. NO SSO. ok to close."	Blockage in City sewer line due to grease and gravel. Cleared by City. Unclear why it states "NO SSO."	Grease
2012	1350484	SEWER BACKING UP IN HOUSE	4 ASHMONT AVE	3/6/2012	"Sewer backing up in cellar in three family home. Plumber was working at home today. This is not the first time that this has happened."	3/6/2012: "per 2-14 John Dalbeck --2-49 freed the blockage at this location (Ashmont at Quinsigamond Ave) It was full of mud, debris, etc it is now surcharging 2-14 crew will check again this afternoon."	Blockage in City sewer line due to "mud, debris, etc." Cleared by City.	Debris
2012	1350721	SEWER BACKING UP IN HOUSE	2A IDALLA AVE	3/7/2012	"HAS SEWER BACKING UP & HAS A PLUMBER ON SITE. PLUMBER WOULD LIKE SOMEONE TO CALL BACK."	3/7/2012: "2-37 FREED UP A PARTIAL BLOCKED. IT WAS DUE TO GREASE." 3/7/2012: "RANDY SPOKE WITH JOE BUCKLEY ABOUT 2A IDALLA AVE. PER ORDER OF MR. BUCKLEY RANDY WAS ADVISED TO CALL A SEWER CREW IN. ALSO MR. BUCKLEY WILL HAVE MAIN LINE CAMERA FOR TOMORROW MORNING 3/8/12 FOR IDALLA AVE."	Blockage in City sewer line due to grease. Cleared by City. Follow-up CCTV inspection requested.	Grease
2012	1352772	SEWER BACKING UP IN HOUSE	611 MAIN ST	3/21/2012	"SEWAGE BACKING UP INTO REGISTRY OF MOTOR VEHICLES"	3/21/2012: "BLOCKED SEWER - TOLD TO CALL IN CREW" 3/21/2012: "PER T. ROBIDOUX - BLOCKED SEWER FREED - ALOT OF GREASE"	Blockage in City sewer line due to grease. Cleared by City.	Grease
2012	1357247	SEWER BACKING UP IN HOUSE	58 VALLEY HILL DR	4/14/2012	"SEWAGE BACKING UP IN BASEMENT"	4/14/2012: "BLOCKED SEWER FREED UP" 4/17/2012: "Result was paper no sso and no grease"	Blockage in City sewer line due to paper. Cleared by City. Unclear why it states "no sso."	Debris
2012	1357986	SEWER BACKING UP IN HOUSE	67 HIGHLAND ST	4/19/2012	"sewer back up in cellar"	4/19/2012: "per 2-39 P. Dupre freed blocked sewer. ok to close."	Blockage in City sewer line. Cleared by the City.	Blockage - Material not identified
2012	1357907	SEWER BACKING UP IN HOUSE	3 KNOWLTON AVE	4/19/2012	None noted	4/19/2012: "per 2-39 P. Dupre vac and flushed the line and owner is not having a problem now. ok to close"	Appears to be problem with City sewer line which was addressed by flushing.	Blockage - Material not identified
2012	1358219	SEWER BACKING UP IN HOUSE	67 HIGHLAND ST	4/20/2012	None noted	4/20/2012: "BLOCKED SEWER CALLED IN CHAD ARCOUETTE, JOHN CAROTA, KEITH CHAREST." 4/20/2012: "FREED UP THE BLOCKED SEWER"	Blockage in City sewer line. Cleared by the City. There is an entry for the same address on the previous day (4/19/2012).	Blockage - Material not identified
2012	1358155	SEWER BACKING UP IN HOUSE	3 KNOWLTON AVE	4/20/2012	"Sewer backing up in cellar. This is the third time that this has happened."	4/26/2012: "per John Dalbeck - this was freed by 2-39 OK to close this WO 4-20-2012"	Appears to be problem with City sewer line which was then cleared by the City. There is an entry for the same address on the previous day (4/19/2012).	Blockage - Material not identified

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2012	1359137	SEWER BACKING UP IN HOUSE	3 KNOWLTON AVE	4/30/2012	"per Dave Harris Health Dept called- there is still a problem at this location, Sewer dept has been there 4 times in the past two weeks."	4/30/2012: "2-26 Bob Gustafson was called --- 2-39 responded sewer dept flushed and vac'd the sewer line it is running fine at this time"	Appears to be problem with City sewer line which was then cleared by the City. This is a recurring issue. There are entries for the same address on 4/19/2012 and 4/20/2012.	Blockage - Material not identified
2012	1359751	SEWER BACKING UP IN HOUSE	51 UPLAND GARDENS DR	5/3/2012	"SEWER BACKING UP INTO BULDING 51 AAND ALSO COMNING OUT OF STREET"	5/4/2012: "per Chad Arcouette 2-49 Teddy Macjewski freed the blocked sewer. It was full of GREASE OK to CLOSE 5-4-2012"	Blockage in City sewer line due to grease. Cleared by City.	Grease
2012	1359974	SEWER BACKING UP IN HOUSE	3 KNOWLTON AVE	5/7/2012	None noted	5/7/2012: "at 9 00 Wayne Savage called the sewer office -2-37 flushed the sewer line TWICE They will go back to this location (3 Knowlton Ave) this afternoon to check the situation." 5/7/2012: "This WO can be closed for now This is an ongoing problem Andre Louzado will check this location for the backwater valve program"	Appears to be problem with City sewer line which was then cleared by the City. This is a recurring issue. There are entries for the same address on 4/19/2012, 4/20/2012, and 4/30/2012.	Blockage - Material not identified
2012	1360684	SEWER BACKING UP IN HOUSE	18 DARBY ST	5/10/2012	"Sewer backing up in cellar, plumber is at the site he open the manhole cover he states the distribution plug is off is sitting at the bottom of the manhole"	5/10/2012: "per 2-14 J. Dalbeck there was a sewer block at this location. NOT AN SSO. Blocked with diapers, handiwipes etc. ok to close and open new work order for pump and flush at a later date."	Blockage in City sewer line due to "diapers, handwipes, etc."	Debris
2012	1361083	SEWER BACKING UP IN HOUSE	54 LYMAN ST	5/14/2012	"Caller is the property owner and states this is the 3rd time this has happened over a 3 year span"	5/14/2012: "per Tim Robidoux 2-14 ---2-39 Paul Dupre flushed and freed the blockage- it was FULL of GREASE They could not get in touch with the owner Everything is all set."	Blockage in City sewer line due to grease. Cleared by City.	Grease

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2012	1362861	SEWER BACKING UP IN HOUSE	40 SOUTHOLD RD	5/27/2012	"CALLER STATES THAT THE SEWAGE IS BACKING UP IN HIS CELLAR DRAIN"	5/27/2012: "THERE ARE SEVERAL HOUSES THAT ARE EFFECTED BY THIS SEWER BLOCK. #"s 40 AND 42 SOUTHOLD RD. HAD CALLED HERE ABOUT THE BLOCK AND #"s 45-47 SOUTHOLD RD. CAME OUT TO SPEAK WITH MR. PARENT WHEN HE WAS UP IN THE AREA. THESE TWO ARE A DUPLEX AND THEIR FOUNDATION IS LOWER THAN THE OTHER HOUSES AROUND THEM." 5/27/2012: "MR. PARENT AND MR. DUPRE PULLED THE PIECE OF P.V.C. PIPE OUT FROM THE FRONT OF THE INVERT PIPE WHICH RELEASED THE BLOCK AND ALLOWED THE SEWER TO FLOW BACK DOWN WHERE IT'S SUPPOSED TO BE. NOW IT IS DOWN AND RUNNING FINE." 5/29/2012: "ok to close and open a sewer line to be tv'd at this same section of sewer"	Blockage in City sewer line due to piece of PVC pipe. Cleared by City. Follow-up CCTV inspection requested.	Debris
2012	1363168	SEWER BACKING UP IN HOUSE	40 SOUTHOLD RD	5/30/2012	"Caller states he had a blockage in the system on Sunday which was relived from the crew and since then he has had sewage backup"	5/30/2012: "John Dalbeck and crew were there-2-39 flushed the line- DID NOT VAC OK to CLOSE"	Appears to be problem with City sewer line which was then cleared by the City. This is a recurring issue. There is an entry for the same address on 5/27/2012.	Blockage - Material not identified
2012	1368541	SEWER BACKING UP IN HOUSE	419 BELMONT ST	7/5/2012	"SEWER BACKING UP INTO BUILDING"	7/5/2012: "PARENT RESPONDS/ DAVE HARRIS RESPONDS - SEWER IS BLOCKED" 7/6/2012: "Chad Arcouette, Dave Harris responded and Paul Dupre 2-39 vac"d the blockage Lines are running fine"	Blockage in City sewer line. Cleared by the City.	Blockage - Material not identified
2012	1377031	SEWER BACKING UP IN HOUSE	34 RICHMOND AVE	9/1/2012	"sewage backing up into cellar and flooding it"	9/1/2012: "blocked sewer was freed by 4-26 (Gustafson) & crew (Caron, Sands) at 1130" 9/4/2012: "per 2-26 B. Gustafson blocked sanitary sewer-freed by J. Carota and W. Sands. Not an SSO-roots. ok to close."	Blockage in City sewer line due to roots. Cleared by City. Unclear why it states "Not an SSO."	Roots
2012	1377103	SEWER BACKING UP IN HOUSE	20 LORING ST	9/4/2012	"Resident stating that there is sewage backing up into his house. Says that he has been having problems since a tree was removed due to the asian beetle."	9/4/2012: "per Tim Robidoux the sewer line was flushed by 2-49 Bob Berenson It was full of sticks, rags, debris could Not get in touch with the homeowner. OK TO CLOSE 9-4-2012"	Blockage in City sewer line due to sticks, rags, and debris. Cleared by City.	Debris
2012	1378757	SEWER BACKING UP IN HOUSE	14 MARCH ST	9/15/2012	"sewage backing up in house"	9/15/2012: "Sewer blocked called in crew" 9/15/2012: "Bob Gustafson and crew clear blocked sewer lines." 9/17/2012: "per 2-37 Carota/Sanda freed blockage. Not an SSO -caused by paper towels/debris. ok to close"	Blockage in City sewer line due to paper towels/debris. Cleared by City. Unclear why it states "Not an SSO."	Debris

Year	Work Order No.	Problem Code	Location	Date Generated	Description	Work Order Notes	EPA Inspection Team Notes	Cause Based on City Work Order Notes
2012	1379248	SEWER BACKING UP IN HOUSE	14 MARCH ST	9/19/2012	"Sewer backing up in cellar, happened last weekend as well."	9/19/2012: "per 2-14 T. Robidoux states that 2=39 P. Dupre freed the blockage at this location. Not known what is was blocked with. ok to close."	Appears to be problem with City sewer line which was then cleared by the City. This is a recurring problem. There is an entry for the same address on 9/15/2012.	Blockage - Material not identified
2012	1384585	SEWER BACKING UP IN HOUSE	26 WASHBURN ST	11/2/2012	"Caller reporting Sewer Backing up in house"	11/2/2012: "per 2-26 B. Gustafson states this sewer was blocked. It was blocked with grease. Block was Colton at Washburn. Not SSO. Freed by 2-37 B. Berenson. ok to close."	Blockage in City sewer line due to grease. Cleared by City. Unclear why it states "Not SSO."	Grease
2012	1384692	SEWER BACKING UP IN HOUSE	1160 WEST BOYLON ST	11/4/2012	"Restaurant backing up"	11/4/2012: "Sewer line is blocked. Called in Bob Gustafson, Wayne Neff, and Juan Reyes. 11-4-12 For blockie." 11/4/2012: "FREED BLOCKED SEWER" 11/5/2012: "per 2-37 W. Neff/Reyes freed the blocked sewer. Caused by grease /Not an SSO. ok to close. This was reported per 2-26 B. Gustafson."	Blockage in City sewer line due to grease. Cleared by City. Unclear why it states "Not SSO."	Grease
2012	1387516	SEWER BACKING UP IN HOUSE	189 HOPE AVE	11/28/2012	"Resident calling to report sewage backing up into the bathroom through the toilet."	11/28/2012: "per 2-14 T. Robidoux states that 2-49 B. Hopkins freed blocked sewer. ok to close."	Blockage in City sewer line. Cleared by the City.	Blockage - Material not identified
2012	1388127	SEWER BACKING UP IN HOUSE	5 SAUGUS PL	12/3/2012	"Sewer backing up in House"	12/5/2012: "per 2-26 B. Gustafson states 2-49 freed this on 12-3-12. 2-39 vac'd Saugus Place and Cambrisge Street at Saugus Place (vac'd and flushed) on 12-5-12. ok to close."	Blockage in City sewer line. Cleared by the City.	Blockage - Material not identified
2012	1390642	SEWER BACKING UP IN HOUSE	10 LUNELLE ST	12/24/2012	"When running the washing machine and flushing the toilet it drain water is backing up. resident unsure if it is sewage. believes it is coming from the sewage pipe."	12/26/2012: "per 2-26 B. Gustafson sanitary invert on Lunelle at Lafayette is full of roots. 2-39 flushed and 2-45 will clean invert. ok to close." 12/26/2012: "per 2-17 S. Smarra 2-28 J. Toussaint removed scoops from the manhole. ok to close."	Blockage in City sewer line due to roots. Cleared by City.	Roots
2012	1391385	SEWER BACKING UP IN HOUSE	194 BURNCOAT ST	12/28/2012	"sewage backing up in the house back check failed need assistance"	12/28/2012: "per 2-8 T. Robidoux states the sewer was blocked at this location. 2-37 B. Hopkins freed the blockage. It was full of grease. ok to close."	Blockage in City sewer line due to grease. Cleared by City.	Grease
2012	1391515	SEWER BACKING UP IN HOUSE	109 LAKE AVE	12/28/2012	"resident has sewage coming out of her shut off. sink is filled with water"	12/28/2012: "THE PROBLEM IS WITH THE PUMP STATION. METHUEN CONSTRUCTION WAS CALLED IN. UNSURE OF RESULTS." 12/29/2012: "WE WERE CALLED BACK TO THIS ADDRESS BECAUSE THE SEWER HAD RE-BLOCKED." 12/29/2012: "SEWER LINE IS FREED UP AND RUNNING FINE"	Appears to be issue with pump station or blockage in City sewer line which caused back up.	Blockage - Material not identified

Year	Work Order No.	Problem Code	Location	Date Generated	Description	Work Order Notes	EPA Inspection Team Notes	Cause Based on City Work Order Notes
2012	1391523	SEWER BACKING UP IN HOUSE	18 ORMOND ST	12/29/2012	"CALLER REPORTS SEWAGE BACKING UP INTO HOUSE"	12/31/2012: "per 2-26 B. Gustafson states this was freed by 2-39 on 12-29-13 Dupre/Reyes. This was also re-checked on 12-31-12 and 2-14 C. Arcouette put half of a 5lb. bucket of sanfax down it near the church. ok to close."	Appears to be blockage in City sewer line. Cleared by the City.	Blockage - Material not identified

Appendix 6
SSO ERP Cover Page and Excerpt

Report

City of Worcester, MA

Sewer System Overflow (SSO)
Emergency Response Plan (ERP)

May 2005

Weston&Sampson

Weston & Sampson Engineers, Inc.
Five Centennial Drive
Peabody, MA 01960-7985

www.westonandsampson.com
Tel: 978-532-1900 Fax: 978-977-0100

2.0 FACTORS THAT INFLUENCE OVERFLOW RESPONSE

2.1 Existing Sewer System

The City of Worcester covers approximately 37 square miles and serves a residential population in excess of 170,000. The DPW operates and maintains approximately 426 miles of sanitary and combined sewers. The existing system consists of approximately 360 miles of sanitary sewers and approximately 65 miles of combined sanitary sewer. Additionally, there are 29 sanitary sewer-pumping stations and approximately 290 miles of storm sewers. Figure 1, located in Appendix B, depicts the city's service area. The City of Worcester service area is served by both sanitary and combined sewers. In general, sanitary sewers serve the newer and more outlying portions of the service area. Combined sewers exist primarily in the older and downtown areas.

2.2 Sanitary Sewer Overflow Locations

SSOs that have been identified in the past are listed in Table 1, located in Appendix C. This table will be updated regularly to assist in managing SSOs.

2.3 Overflow Destination

The receiving water body is the point where a SSO enters a surface stream, river, or lake once it leaves the collection system. An understanding of this is necessary to ensure the proper execution of an overflow response.

In addition to a receiving water body, sewer overflows can enter the environment at one or more of the following destinations:

- Low lying areas
- Storm sewers (CBs)
- Basements

Appendix 7
Cleaning Plan Excerpt

City of Worcester
Department of Public Works & Parks

Sanitary Sewer System Priority Cleaning Plan
February 3, 2006

The Worcester Department of Public Works & Parks (DPWP) Sanitary Sewer System Priority Cleaning Plan is designed to guide staff decision-making relative to which portions of the collection system need regular cleaning and maintenance to restore and maintain flow capacity. It is impractical and unnecessary to clean the entire sanitary sewer system on a regular basis, as many sections of the system are not prone to flow restrictions. The need, then, is for a plan that will direct staff to focus on areas that would be most prone to restrictions and blockage and to suggest cleaning methods and frequencies that would best address the problem.

The Priority Cleaning Plan uses four general assessment methods to locate actual and potential problem areas in the collection system. Data garnered from these four major areas is used to make informed decisions that help maintain quality sewer service while considering current and future systemic needs, balanced with environmental responsibility. All sewer cleaning requires system plan review and system inspection. Sewer system capacity is maintained and increased by the removal of inflow and infiltration and the removal of flow limiting restrictions. Causes of restrictions include but are not limited to; fats, oils, and grease (FOG), root intrusion, solids build-up, structural degradation and structural failure.

<u>Collection System Assessment</u>

1. Service-Based

Many years of institutional knowledge, along with complaint response and CCTV inspections, has produced a list of problem areas and procedures for maintenance. Please see Attachment D- Flusher List. DPWP cleans or flushes these sections regularly, typically twice per month, dependent on a variety of factors. DPWP also uses enzyme treatments and chemical treatments for system segments with excessive grease build-up. Full implementation of the FOG Program will slow or limit the need for grease treatment programs. The current Flusher List changes over time as new problem areas are located and permanent solutions are implemented for historically difficult areas. Sewer segments below minimum grade, which are unable to maintain a self-cleaning velocity, or having hydraulic restrictions due to a structural connection to an interceptor are the most common problem areas. These segments require regular cleaning to maintain service. Other locations requiring regular cleaning are identified by recurring complaints of sewer trouble from homeowners and businesses, documented sanitary sewer overflows and routine inspections.

Appendix 8
2006 Flusher List

Attachment D

Flushing List

#	Location
1	Lyon Street @ Demarco Terrace
2	Fletcher Street (Notify#12 before flushing)
3	Plantation Street @ Franklin Street
4	Plantation St.@ Tampa St. first M.H. on Tampa St.
5	Locust Ave. @ #37 Alvarado Avenue
6	Dallas St. @ End in location
7	Cohasset St. @ Hilton Ave. & Elmire Ave. sewer location
8	Lake Avenue @ Bay Edge Drive
9	Nathaniel St. Notify # 29 first
10	Greenfield #25
11	Heywood St. @ Massasoit Road M/H near island
12	Providence St. @ Upsala St. on Providence
13	Ester St @ Henrietta
14	Thenius Street @ Stebbins Street
15	#35 Southold Road
16	Fifth Avenue @ Millbury Street
17	Perry Ave. @ Millbury Street on side walk
18	#14 Ashmont Ave. @ Quinsigamond / Western interceptor
19	#55 Ellsworth Street 'High leval sewer '
20	Lafayette Street @ Millbury Street
21	Saugus Place @ Cambridge St. / interceptor
22	Stafford Street @ Blockbusters :Parking lot
23	Heard St @ Hadwen Park sewer location
24	#17 Henderson Avenue
25	#45 Wildwood Avenue
26	Oppisite #1350 Pleasant Street
27	Guild Road @ Pleasant Street
28	921 Pleasant Street
29	#68 Dick Drive on Sidewalk @ Donna Road
30	#4 Grove St Heights
31	#5 Dogwood Road
32	Woodridge Road Check end of Street
33	208 Saint Nicholas Ave. Sewer Location to Uncatena Ave.

#	Location
34	Achushnet Ave. sewer location to 22 Sachem Ave.
35	Country Club Blvd. on Island
36	134 Barnard Road on sidewalk
37	#100 Grove Street
38	# 3 Wachusette Street @ Home Street
39	Ormond Street, several spots
40	#14 Winslow Street @ Pleasant Street
41	#1 Mabelle Street
42	#46 June Street
43	#21 Reed Street
44	Longfellow Road second M.H. in
45	Knowles Road at end
46	66 Glendale Street
47	2 Fourth Street
48	Bergin Lane
49	Beaver Street
50	Birch Street sewer location to Park Avenue
51	Lakeside Avenue @ Lovell Street
52	Genoa Street @ dead end
53	Mapletree Lane n@ Enfield Street
54	Parker Street @ Mayfield Street
55	Massasoit Rd., Between Kenberma Rd. & Crowingshield Rd.
56	Cumberland Street sewer location to W.Boylston Street
57	Park Avenue @ Coes Street Near Funeral home

Most locations are flushed bi-monthly.

Appendix 9
Updated Flusher List

FLUSHER HOT LIST

#		Checked by	Flushed by
1	Lyon @ Shrewsbury St.		
2	Fletcher St. (notify #12 before flushing)		
3	Plantation St. @ Franklin St.		
4	Plantation St. @ first M.H. on Tampa (diversion)		
* 5	Locust Ave. @ # 37 Alvarado		
6	Dallas St. @ Enid in location		
7	Cohasset St. @ Hilton and Elmire Location		
8	Lake Ave @ Bay Edge + Whitla Dr		
9	Lake Ave @ Sherbrook Ave		
10	Nathaniel St. (notify # 29 first)		
11	# 25 Greenfeild St.		
12	Heywood St. @ Massasoit Rd (M.H. near island)		
13	Providence St. @ Upsala (on Providence St.)		
14	Esther St. @ Henrieta St.		
15	Thenius St. @ Stebbins St.		
16	# 35 Southold Rd.		
17	Fifth Ave @ Millbury St.		
18	Perry Ave @Milbury St. (sidewalk)		
19	# 14 Ashmont (runs High into Quinsigamond Ave)		
20	# 55 Ellsworth St. (High level Sewer)		
21	Lafaytte St. @ Millbury St.		
22	Saugus Place @ Cambridge St. (Both local lines)		
23	Stafforfd St. @ Block Buster Parking Lot		
24	Heard St. At Park		
25	# 17 Henderson Ave		
26	# 45 Wildwood Ave		
27	Opposite side of 1350 Pleasant St.		
28	Guild Rd. @ Pleasant St.		
29	# 63 Moreland St.		
30	Moreland St. @ Orrison St.		
31	# 333 Mower St.		
32	# 921 Pleasant st		
33	# 68 Dick Dr. (on sidewalk) @ donna Rd. (thru location)		
34	# 4 Grove St. Heights		
35	# 5 Dogwood Rd.		

36	Woodridge Rd. Check @ end		
37	# 208 Saint Nicholas St. To Uncantena Ave.		
38	Acushnet Ave. Location #22 Sachem Ave.		
39	Country Club Blvd. (Various Locations)		
40	# 134 Barnard Rd. on sidewalk		
41	West Boylston St. (The Eagle)		
42	# 100 Grove St.		
43	# 3 Wachusett St. @ Holme St.		
44	Ormond St. (several spots)		
45	# 14 Winslow @ Pleasant St.		
46	Abbott St. @ #40 Chandler St. (After winslow)		
47	# 1 Mabelle St.		
48	# 46 June St.		
49	# 21 Reed St.		
50	June @ Chandler (Post Office to #132)		
51	Longfellow rd. (2nd M.H. in		
52	Knowles Rd.		
53	# 59 Greendale St.		
54	# 2 Fourth St.		
55	Bergin Lane		
56	Beaver St.		
57	Birch St. to Park Ave.		
58	Lakeside Ave. @ lovell St.		
59	Veterans @ Garland		
60	# 2 Genoa St. (dead end)		
61	Maple Tree Lane @ Enfeild St.		
62	Parker St. @ Mayfeild St.		
63	Massasoit Rd. (between Kenberma And Crowningsheild)		
64	Park Ave @ Coes St.		
65	# 23 Sachem Ave (off Clark St.)		
66	# 1050 Main St. @ Cambridge St.		
67	#11 Saratoga Dr.		
68	#64 Chino Ave		
69	Clarendon St @ Fairmont (Flush both ways)		

Appendix 10
Summary of Recurring Backups

Address	Dates	Cause*	Location Included on Hotspot Flusher List?	Notes
44 BELLEVUE ST	3/30/2010	Capacity	No	Not applicable
	4/1/2010	Grease		
71 CAMBRIDGE ST	2/6/2011	Blockage - Material not identified	Yes	The address with recurring backups is approximately 0.1 mile northwest of hotspot location No. 21 "Saugus Place @ Cambridge St. / interceptor" included on 2006 Flusher List. This location is also included on the updated flusher list as No. 22.
	3/18/2011	Blockage - Material not identified		
28 CARO ST	2/10/2010	Grease	No	Not applicable
	3/14/2010	Structural		
	3/17/2011	Debris		
67 DEERFIELD ST	3/30/2010	Capacity	No	Not applicable
	10/19/2011	Blockage - Material not identified		
15 HAROLD ST	3/30/2010	Capacity	No	Not applicable
	9/8/2011	Capacity		
67 HIGHLAND ST	4/19/2012	Blockage - Material not identified	No	Not applicable
	4/20/2012	Blockage - Material not identified		
3 KNOWLTON AVE	6/17/2011	Blockage - Material not identified	No	Not applicable
	6/20/2011	Blockage - Material not identified		
	4/19/2012	Blockage - Material not identified		
	4/20/2012	Blockage - Material not identified		
	4/30/2012	Blockage - Material not identified		
	5/7/2012	Blockage - Material not identified		
109 LAKE AVE	1/25/2010	Capacity	No	Not applicable
	2/24/2010	Capacity		
	3/15/2010	Capacity		
	12/28/2012	Blockage - Material not identified		
91 LAKE AVE	2/25/2010	Capacity	No	Not applicable
	3/14/2010	Capacity		
299 LOVELL ST	2/26/2010	Capacity	No	Not applicable
	1/8/2011	Blockage - Material not identified		
	3/5/2011	Grease		
17 LYMAN ST	12/11/2010	Grease	No	Not applicable
	12/12/2010	Debris		
1050 MAIN ST	2/12/2010	Grease	Yes	Not identified as a hotspot location on the 2006 Flusher List, but this address is included as No. 66 on the updated flusher list.
	9/25/2010	Grease		
14 MARCH ST	9/15/2012	Debris	No	Not applicable
	9/19/2012	Blockage - Material not identified		

50 MAYWOOD ST	4/2/2010	Grease	No	Not applicable
	10/13/2010	Debris		
6 OLEAN ST	2/26/2010	Capacity	No	Not applicable
	3/30/2010	Capacity		
210 PARK AVE	1/11/2011	Blockage - Material not identified	No	Not applicable
	3/7/2011	Blockage - Material not identified		
1350 PLEASANT ST	3/14/2010	Blockage - Material not identified	Yes	This address was included as hotspot location No. 26 on the 2006 Flusher List. It is also included on the updated flusher list as No. 27 "Opposite side of 1350 Pleasant Street."
	3/29/2010	Grease		
16 SACHEM AVE	3/30/2010	Blockage - Material not identified	Yes	The 2006 Flusher List includes "Achushnet Ave. sewer location to 22 Sachem Ave" as hotspot location No. 34 on the list. The address with recurring backups is within approximately 200 feet to the northwest of 22 Sachem Ave. The updated flusher list includes this same hotspot location as No. 38 and also includes 23 Sachem Avenue, which is approximately 250 feet southeast of the address with recurring backups.
	3/2/2011	Grease		
101 SOUTH FLAGG ST	3/30/2010	Capacity	No	Not applicable
	5/8/2010	Grease		
	3/7/2011	Not identified		
	8/28/2011	Capacity		
105 SOUTH FLAGG ST	11/19/2010	Grease	No	Not applicable
	12/2/2010	Roots		
31 SOUTHOLD RD	1/25/2010	Grease	Yes	The 2006 Flusher List includes "35 Southold Road" as hotspot location No. 15 on the list. The address with recurring backups is within approximately 200 feet to the east of the listed hotspot location. The updated flusher list also includes this hotspot location as No. 16.
	3/30/2010	Capacity		
40 SOUTHOLD RD	2/25/2010	Capacity	Yes	The 2006 Flusher List includes "35 Southold Road" as hotspot location No. 15 on the list. The address with recurring backups is within approximately 50 feet to the west of the listed hotspot location. The updated flusher list also includes this hotspot location as No. 16.
	3/30/2010	Capacity		
	12/23/2010	Grease		
	5/27/2012	Debris		
	5/30/2012	Blockage - Material not identified		
20 SPRING VALLEY RD	4/13/2011	Grease	No	Not applicable
	3/30/2010	Capacity		
10 STEVENS RD	1/27/2011	Blockage - Material not identified	No	Not applicable
	2/6/2011	Blockage - Material not identified		
8 TIFFANY AVE	3/30/2010	Capacity	No	Not applicable
	3/7/2011	Capacity		

* Based on the EPA Inspection Team's review of the notes included in the City's CSRS work order entries.

Appendix 11
CMOM Plan Excerpt

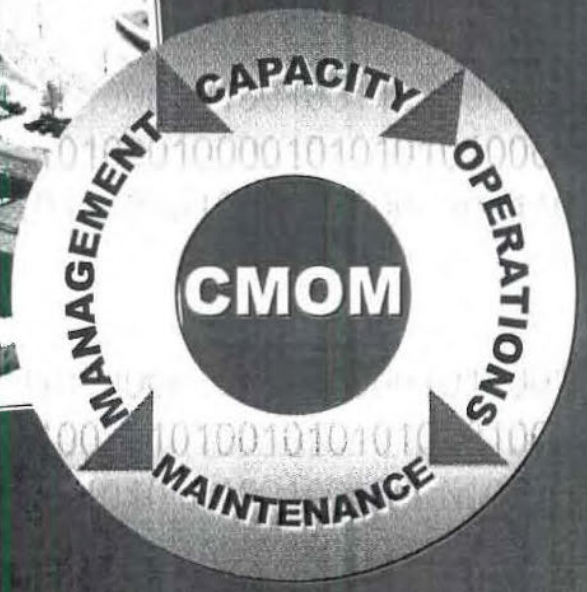
CDM

City of Worcester

Administrative Order Docket No. 05-21

Capacity, Management, Operations and Maintenance (CMOM) Program Implementation Plan Schedule

April 28, 2006



Implementation Schedule

Physical Inspection and Testing Program

The City of Worcester Long Term Preventive Maintenance Plan dated February 28, 2006, describes the Physical Inspection and Testing Procedures at the City. These procedures present the City's approach in meeting the requirements of the Administrative Order (AO).

The following is a schedule to improve on both the City's Televising (CCTV) and Manhole inspection program.

CCTV Program: CMOM requires an internal TV inspection program that provides visual inspection and facilitates condition evaluation and enables deterioration and changes to be tracked over time. The TV Inspection program requires written operation procedures and guidelines, and a method to rate the defects found during the inspection process.

Worcester has one televising crew, which include camera vehicles using the Pearpoint Self-contained CCTV, which will be replaced in year 2007. The Sewer Operations Division has a system to rate the condition of pipe using a rating system that ranks the condition of a segment of pipe from good to bad. The program has been developed over the years by field personnel and is understood by both Engineering and Sewer Operations Division, but no formal program is in place that includes written Standard Operating Procedures (SOPs). When personnel televise a sewer line, information is manually recorded and includes pipe size, type, length, structural rating, cleanliness of line and location.

Table 7

Current Gap
Gap The Sewer Operations Division has developed a program to rate the condition of a wastewater main. The program records information manually and is difficult to retrieve making prioritization and trend analysis difficult. There is no link to any work management or mapping system further limiting the usefulness of the data. Written procedures have not been developed increasing the possibility that the standards are inconsistently applied. Under current AO, the City is required to develop physical inspection and testing procedures to be used in the inspection and maintenance of the system. Under Section 7. Long Term Preventive Maintenance Plan - subsection a. Specifically, the Sewer Operations Division needs to identify the problem areas and prioritize the inspection of these areas.

Table 8

Implementation Plan & Schedule
Plan ▪ Develop an inspection plan that describes the procedures used to inspect sewer mains using the Sewer Operations Division televising system. Inspection should continue to focus on problem areas and establishing a program to correct these problem areas. Schedule Inspection and Testing Program – Section 7(a) ▪ Develop inspection plan (June 2006 – December 2007) ▪ Submit to EPA for Review 2008 ▪ Train employees (March 2008) ▪ Implementation (March 2008 – March 2009)

Manhole Inspection Program: The City of Worcester has approximately 10,600 manholes made of concrete and brick. Even thought the City will inspect manholes either through a contract or by City personnel, the City needs to have a formalized program.

Table 9

Current Gap
Gap The Sewer Operations Division does not have a formal manhole inspection program in place. The Sewer Operations Division needs to implement a program, which would include a tracking system. Under current AO, the City is required to develop physical inspection and testing procedures to be used in the inspection and maintenance of the system. Under Section 7. Long Term Preventive Maintenance Plan - subsection a.

Table 10

Implementation Plan & Schedule
Plan ▪ Develop a formal manhole inspection plan that describes the procedures used to inspect manholes, developing a standard form that will be used to gather information on the manhole. Schedule Inspection and Testing Program – Section 7(a) ▪ Develop Manhole Inspection Plan (June 2006 – December 2006) ▪ EPA Review ▪ Train employees (March 2007) ▪ Implementation (April 2007 – June 2007)

Appendix 12
Regulator Field Inspection Sheets for 2011 and 2012

2011 Regulator Field Inspection Sheets

2011 File Folder (in order received)

DJC 1/23/13

City of Worcester DPW & Parks
Sewer Operations Division

Date: 12-23-11

Inspector: 2-49 K. Allen / R. Hopkins

Weather: Cloudy

Name	Blocked ?	Surcharged ?	Gate / Weir condition	Flow	Structural concerns & Comments
Lincoln Street					
Garden Street ✓					
Washington Square					
Millbury at Ashmont ✓					
Millbury at Canton					
Millbury at Richland ✓					
Taylor at Millbury ✓					
Kelly Square/ Vernon Street ✓					
Pond at Water ✓					
Posner Square					
Grafton at Franklin ✓					
Southgate Place ✓					
Harrison Street At Water Street ✓					
Millbury at Lafayette Street ✓					
Millbury at Endicott ✓					
Southbridge at Sargent ✓					
Green at Madison Street					
Summer at Laurel ✓					
Thomas at Summer ✓					
Kelly Square Control Structure					

Date: 12-6-11

Inspector: T. Robidoux - K. Gilchrist

Weather: Light Rain

City of Worcester DPW & Parks
Sewer Operations Division

Name	Blocked ?	Surcharged ?	Gate / Weir condition	Flow	Structural concerns & Comments
Lincoln Street	—	—	—	—	
Garden Street	NO	Yes	—	Yes	
Washington Square	NO	Yes	—	Yes	
Millbury at Ashmont	NO	Yes	—	Yes	
Millbury at Canton	—	—	~~OK~~	—	
Millbury at Richland	Little	Yes	OK	Yes	Needs To Be Flushed and VAC 2-39 Freed
Taylor at Millbury	—	—	OK	NO	Always dry No Flow
Kelly Square/ Vernon Street	Little	Yes	—	Yes	Need Flushing
Pond at Water	NO	Yes	Good	Yes	
Posner Square	NO	Yes	OK	Yes	
Grafton at Franklin	NO	Yes	OK	Yes	
Southgate Place	NO	Yes	OK	Yes	
Harrison Street At Water Street	Little	Yes	Broke	Yes	Need To Be Flushed
Millbury at Lafayette Street	NO	✓	OK	Yes	~~[illegible]~~
Millbury at Endicott	NO	✓	OK	Yes	
Southbridge at Sargent	NO	Yes	OK	Yes	
Green at Madison Street	NO	Yes	OK	Yes	
Summer at Laurel	NO	Yes	OK	Yes	
Thomas at Summer	NO	Yes	OK	Yes	
Kelly Square Control Structure	NO	Yes	~~OK~~	Yes	

Date: 4/25/11

Inspector: Chad

Weather : Rain

City of Worcester DPW & Parks
Sewer Operations Division

Name	Blocked ?	Surcharged ?	Gate / Weir condition	Flow	Structural concerns & Comments
Lincoln Street					
Garden Street					
Washington Square					
Millbury at Ashmont				OK	
Millbury at Canton				ok	spill over
Millbury at Richland				ok	
Taylor at Millbury				ok	
Kelly Square/ Vernon Street				ok	
Pond at Water				ok	spill over
Posner Square					
Grafton at Franklin				ok	
Southgate Place				ok	
Harrison Street At Water Street			Hindge	ok	
Millbury at Lafayette Street				ok	
Millbury at Endicott				ok	Leak
Southbridge at Sargent				ok	
Green at Madison Street					
Summer at Laurel				ok	
Thomas at Summer				ok	
Kelly Square Control Structure				ok	spill over

Date: 3/3/2011

Inspector: 2-37

Weather : Sunny and Dry

City of Worcester DPW & Parks
Sewer Operations Division

Name	Blocked ?	Surcharged ?	Gate / Weir condition	Flow	Structural concerns & Comments
Lincoln Street					
Garden Street					
Washington Square					
Millbury at Ashmont	NO				
Millbury at Canton	NO				
Millbury at Richland	yes				FREED BY 2-37
Taylor at Millbury	NO				
Kelly Square/ Vernon Street	NO				
Pond at Water					
Posner Square					
Grafton at Franklin					
Southgate Place					
Harrison Street At Water Street					
Millbury at Lafayette Street					
Millbury at Endicott					
Southbridge at Sargent					
Green at Madison Street					
Summer at Laurel					
Thomas at Summer					
Kelly Square Control Structure			✓		TIP GATE OVERFLOWING

Date: 1/31/11

Inspector: Chad

Weather : Clear

City of Worcester DPW & Parks
Sewer Operations Division

Name	Blocked ?	Surcharged ?	Gate / Weir condition	Flow	Structural concerns & Comments
Lincoln Street				—	
Garden Street				—	
Washington Square				—	
Millbury at Ashmont				ok	
Millbury at Canton				ok	Restricted
Millbury at Richland				ok	
Taylor at Millbury				—	
Kelly Square/ Vernon Street				—	
Pond at Water				ok	
Posner Square				—	
Grafton at Franklin				—	
Southgate Place				—	
Harrison Street At Water Street			Bad Hinge	ok	
Millbury at Lafayette Street				ok	
Millbury at Endicott				ok	
Southbridge at Sargent				—	
Green at Madison Street				—	
Summer at Laurel				—	
Thomas at Summer				ok	
Kelly Square Control Structure				—	

2012 Regulator Field Inspection Sheets

Date: 12/19/12

Inspector: Robidoux – Lechaire

Weather: Cold / Dry

2012 File Folder (in order received)

DJC 11/8/13

City of Worcester DPW & Parks
Sewer Operations Division

#	Location	Blocked ?	Surcharged ?	Gate/Weir condicion	Flow	Structural concerns & comments
1	Lincoln St.					
2	Garden St.				✓	
3	Washington Square				✓	
4	Millbury at Ashmont				✓	
5	Millbury at Canton					
6	Millbury at Richland				✓	
7	Taylor at Millbury				✓	
8	Kelly Square / Vernon St.				✓	
9	Pond at Water					
10	Posner Square				✓	
11	Grafton at Franklin				✓	
12	Southgate Place					
13	Harrison St. at Water St.				✓	
14	Millbury St. at Lafayette St.				✓	
15	Millbury St. at Endicott				✓	
16	Southbridge at Sargent					
17	Green at Madison St.				✓	
18	Summer at Laurel				✓	
19	Thomas at Summer				✓	
20	Kelly Square Control Structure				✓	
21	Shamrock at Shrewsbury					
22	Risso Court at Shrewsbury					
23	Oleum Court at Shrewsbury					
24	Waitte at Shrewsbury					
25	Sewaro at Shrewsbury					
26	Laria at Shrewsbury					

Date: 11-8-12

Inspector: Juan R. Reyes

Weather: Snow with rain

City of Worcester DPW & Parks
Sewer Operations Division

#	Location	Blocked ?	Surcharged ?	Gate/Weir condicion	Flow	Structural concerns & comments
1	Lincoln St.	OK			OK	
2	Garden St.	OK			OK	
3	Washington Square	✓			✓	
4	Millbury at Ashmont	OK			OK	
5	Millbury at Canton	OK			OK	
6	Millbury at Richland	OK			OK	
7	Taylor at Millbury	OK			OK	
8	Kelly Square / Vernon St.	OK			OK	
9	Pond at Water	OK			OK	
10	Posner Square	OK			OK	
11	Grafton at Franklin	OK			OK	
12	Southgate Place	OK			OK	
13	Harrison St. at Water St.	OK			OK	
14	Millbury St. at Lafayette St.	OK			OK	
15	Millbury St. at Endicott	OK			OK	
16	Southbridge at Sargent	OK			OK	
17	Green at Madison St.	OK			OK	
18	Summer at Laurel	OK			OK	
19	Thomas at Summer	OK			OK	
20	Kelly Square Control Structure					
21	Shamrock at Shrewsbury					
22	Risso Court at Shrewsbury					
23	Oleum Court at Shrewsbury					
24	Waitte at Shrewsbury					
25	Sewaro at Shrewsbury					
26	Laria at Shrewsbury					

Regulators

Date: 10-11-12

Inspector: Robidoux Driver: Neff

Weather:

City of Worcester DPW & Parks
Sewer Operations Division

#	Location	Blocked ?	Surcharged ?	Gate/Weir condicion	Flow	Structural concerns & comments
1	Lincoln St.					
2	Garden St.					
3	Washington Square		✓			
4	Millbury at Ashmont		✓			
5	Millbury at Canton		✓			
6	Millbury at Richland		✓			
7	Taylor at Millbury		✓			
8	Kelly Square / Vernon St.		✓			
9	Pond at Water		✓			
10	Posner Square		✓			
11	Grafton at Franklin		✓			
12	Southgate Place		✓	✓		
13	Harrison St. at Water St.		✓	✓		Broken Gate
14	Millbury St. at Lafayette St.		✓			
15	Millbury St. at Endicott		✓			
16	Southbridge at Sargent		✓			
17	Green at Madison St.		✓			
18	Summer at Laurel		✓			
19	Thomas at Summer		✓			
20	Kelly Square Control Structure					
21	Shamrock at Shrewsbury					
22	Risso Court at Shrewsbury					
23	Oleum Court at Shrewsbury					
24	Waitte at Shrewsbury					
25	Sewaro at Shrewsbury					
26	Laria at Shrewsbury					

Date: 10-11-12

Inspector: Robidoux – Mooskian – Leclaire

Weather:

City of Worcester DPW & Parks
Sewer Operations Division

#	Location	Blocked ?	Surcharged ?	Gate/Weir condicion	Flow	Structural concerns & comments
1	Lincoln St.					
2	Garden St.					
3	Washington Square					
4	Millbury at Ashmont					
5	Millbury at Canton					
6	Millbury at Richland					
7	Taylor at Millbury					
8	Kelly Square / Vernon St.					
9	Pond at Water					
10	Posner Square					
11	Grafton at Franklin					
12	Southgate Place					
13	Harrison St. at Water St.					
14	Millbury St. at Lafayette St.					
15	Millbury St. at Endicott					
16	Southbridge at Sargent					
17	Green at Madison St.					
18	Summer at Laurel					
19	Thomas at Summer					
20	Kelly Square Control Structure					
21	Shamrock at Shrewsbury	no	no	?	low	good
22	Risso Court at Shrewsbury	no	no	?	low	good
23	Oleum Court at Shrewsbury	no	no	?	low	good
24	Waitte at Shrewsbury	no	no	?	low	no
25	Sewaro at Shrewsbury	no	no	?	low	no
26	Laria at Shrewsbury	no	no	Could use	low	none

Date: 9/28/12

Inspector: Robidoux Bedworth

Weather: Rain

City of Worcester DPW & Parks
Sewer Operations Division

#	Location	Blocked ?	Surcharged ?	Gate/Weir condicion	Flow	Structural concerns & comments
1	Lincoln St.	—	—	—		
2	Garden St.	—	—	—		
3	Washington Square		✓	✓		
4	Millbury at Ashmont		✓	✓		
5	Millbury at Canton		✓	✓		
6	Millbury at Richland		✓	✓		
7	Taylor at Millbury		✓	✓		
8	Kelly Square / Vernon St.		✓	✓		
9	Pond at Water		✓	✓		
10	Posner Square		✓	✓		
11	Grafton at Franklin		✓	✓		
12	Southgate Place	—	—	—		
13	Harrison St. at Water St.		✓	✓		
14	Millbury St. at Lafayette St.		✓	✓		
15	Millbury St. at Endicott		✓	✓		
16	Southbridge at Sargent	—	—	—		
17	Green at Madison St.		✓	✓		
18	Summer at Laurel		✓	✓		
19	Thomas at Summer		✓	✓		
20	Kelly Square Control Structure		✓	✓		
21	Shamrock at Shrewsbury	—	—			
22	Risso Court at Shrewsbury	—	—			
23	Oleum Court at Shrewsbury	—	—			
24	Waitte at Shrewsbury	—	—			
25	Sewaro at Shrewsbury	—	—			
26	Laria at Shrewsbury	—	—			

Date: 8/1/12

Inspector: Chad

Weather: Rain

Regulators

City of Worcester DPW & Parks
Sewer Operations Division

#	Location	Blocked ?	Surcharged ?	Gate/Weir condicion	Flow	Structural concerns & comments
1	Lincoln St.					
2	Garden St.					
3	Washington Square					
4	Millbury at Ashmont				ok	
5	Millbury at Canton	✓			ok	
6	Millbury at Richland	✓			ok	
7	Taylor at Millbury				ok	
8	Kelly Square / Vernon St.				ok	
9	Pond at Water				ok	
10	Posner Square					
11	Grafton at Franklin				ok	
12	Southgate Place					
13	Harrison St. at Water St.			Broke	ok	
14	Millbury St. at Lafayette St.				ok	
15	Millbury St. at Endicott				ok	
16	Southbridge at Sargent					
17	Green at Madison St.					
18	Summer at Laurel				ok	
19	Thomas at Summer				ok	
20	Kelly Square Control Structure				ok	
21	Shamrock at Shrewsbury					
22	Risso Court at Shrewsbury					
23	Oleum Court at Shrewsbury					
24	Waitte at Shrewsbury					
25	Sewaro at Shrewsbury					
26	Laria at Shrewsbury					

Date: 5/25/12

Inspector: Chad

Weather : clear

City of Worcester DPW & Parks
Sewer Operations Division

Name	Blocked ?	Surcharged ?	Gate / Weir condition	Flow	Structural concerns & Comments
Lincoln Street					
Garden Street				ok	
Washington Square				ok	
Millbury at Ashmont	✓			ok	2-39 Fraud Blockage ok
Millbury at Canton				ok	
Millbury at Richland				ok	
Taylor at Millbury				ok	
Kelly Square/ Vernon Street				ok	
Pond at Water				ok	
Posner Square					
Grafton at Franklin				ok	
Southgate Place					
Harrison Street At Water Street				ok	
Millbury at Lafayette Street				ok	
Millbury at Endicott				ok	
Southbridge at Sargent				ok	
Green at Madison Street				ok	
Summer at Laurel				ok	
Thomas at Summer				ok	
Kelly Square Control Structure				ok	

Date: 5/3/12

Inspector: Robidoux

Weather: Drizzle

Regulators

City of Worcester DPW & Parks
Sewer Operations Division

#	Location	Blocked ?	Surcharged ?	Gate/Weir condicion	Flow	Structural concerns & comments
1	Lincoln St.	NO			Good	
2	Garden St.	NO			Good	
3	Washington Square	NO			Good	
4	Millbury at Ashmont	NO			Good	
5	Millbury at Canton					
6	Millbury at Richland	NO			✓	
7	Taylor at Millbury	NO			✓	
8	Kelly Square / Vernon St.	NO			✓	
9	Pond at Water	NO			✓	
10	Posner Square	NO			✓	
11	Grafton at Franklin	NO			✓	
12	Southgate Place	NO			✓	
13	Harrison St. at Water St.	NO			✓	
14	Millbury St. at Lafayette St.	NO			✓	
15	Millbury St. at Endicott	NO			✓	
16	Southbridge at Sargent	NO			✓	
17	Green at Madison St.	NO			✓	
18	Summer at Laurel	NO			✓	
19	Thomas at Summer	NO			✓	
20	Kelly Square Control Structure	NO				
21	Shamrock at Shrewsbury					
22	Risso Court at Shrewsbury					
23	Oleum Court at Shrewsbury					
24	Waitte at Shrewsbury					
25	Sewaro at Shrewsbury					
26	Laria at Shrewsbury					

Regulators -

City of Worcester DPW & Parks
Sewer Operations Division

Date: 2-9-12

Inspector: Robidoux - Beckwith

Weather : Sunny

Name	Blocked ?	Surcharged ?	Gate / Weir condition	Flow	Structural concerns & Comments
Lincoln Street	NO	yes		Good	
Garden Street	No	yes		Good	
Washington Square	NO	yes		Good	
Millbury at Ashmont	NO	yes		Good	
Millbury at Canton	NO	yes		Good	
Millbury at Richland	NO	yes		Good	
Taylor at Millbury	NO	yes		Good	
Kelly Square/ Vernon Street	NO	yes		Good	
Pond at Water	NO	yes		Good	
Posner Square	No	yes		Good	
Grafton at Franklin	NO	yes		Good	
Southgate Place	NO	yes		Good	
Harrison Street At Water Street	NO	yes		Good	
Millbury at Lafayette Street	NO	yes		Good	
Millbury at Endicott	NO	yes		Good	
Southbridge at Sargent	NO	yes		Good	
Green at Madison Street	NO	yes		Good	
Summer at Laurel	NO	yes		Good	
Thomas at Summer	NO	yes		Good	
Kelly Square Control Structure	No	yes		Good	

Date: 1-9-12

Inspector: Robidoux/Allen/Quijada

Weather: Cold - Sunny

City of Worcester DPW & Parks
Sewer Operations Division

Name	Blocked ?	Surcharged ?	Gate / Weir condition	Flow	Structural concerns & Comments
Lincoln Street					
Garden Street				✓	
Washington Square				✓	
Millbury at Ashmont				✓	
Millbury at Canton					
Millbury at Richland				✓	
Taylor at Millbury				✓	
Kelly Square/ Vernon Street				✓	
Pond at Water				✓	
Posner Square				✓	
Grafton at Franklin				✓	
Southgate Place				✓	
Harrison Street At Water Street				✓	
Millbury at Lafayette Street				✓	
Millbury at Endicott				✓	
Southbridge at Sargent				✓	
Green at Madison Street				✓	
Summer at Laurel				✓	
Thomas at Summer				✓	
Kelly Square Control Structure				✓	

Date: 1-3-12

Inspector: T. Robidoux

Weather : Cold

City of Worcester DPW & Parks
Sewer Operations Division

Name	Blocked ?	Surcharged ?	Gate / Weir condition	Flow	Structural concerns & Comments
Lincoln Street			✓	✓	
Garden Street			✓	✓	
Washington Square			✓	✓	
Millbury at Ashmont			✓	✓	
Millbury at Canton			✓	✓	
Millbury at Richland			✓	✓	
Taylor at Millbury			✓	✓	
Kelly Square/ Vernon Street			✓	✓	
Pond at Water			✓	✓	
Posner Square			✓	✓	
Grafton at Franklin			✓	✓	
Southgate Place			CRUZE	✓	
Harrison Street At Water Street			—BG	✓	
Millbury at Lafayette Street			✓	✓	
Millbury at Endicott			✓	✓	
Southbridge at Sargent			✓	✓	
Green at Madison Street			✓	✓	
Summer at Laurel			✓	✓	
Thomas at Summer			✓	✓	
Kelly Square Control Structure			✓	✓	

Date: 1-4-12

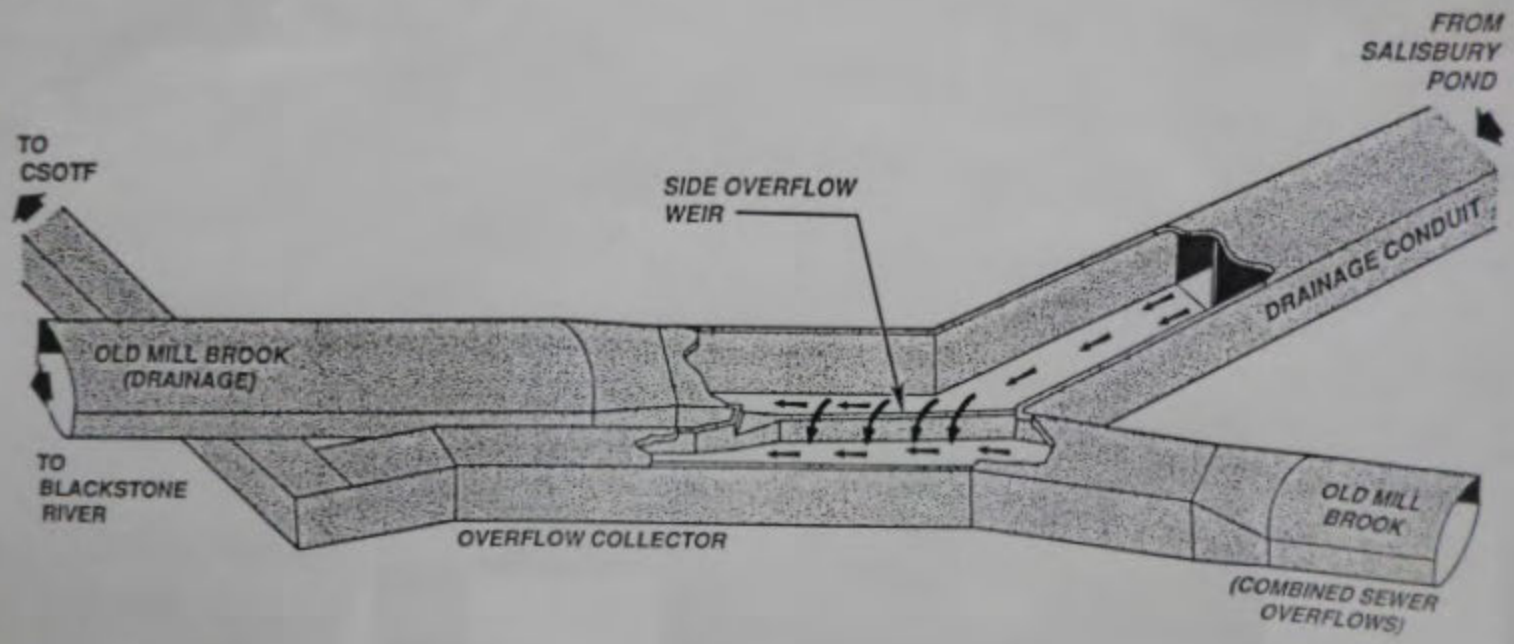
Inspector: Juan R. Rojas

Weather: rain

City of Worcester DPW & Parks
Sewer Operations Division

#	Location	Blocked ?	Surcharged ?	Gate/Weir condicion	Flow	Structural concerns & comments
1	Lincoln St.				ok	
2	Garden St.				ok	
3	Washington Square				ok	
4	Millbury at Ashmont				ok	
5	Millbury at Canton				ok	
6	Millbury at Richland				ok	
7	Taylor at Millbury				ok	
8	Kelly Square / Vernon St.				ok	
9	Pond at Water				ok	
10	Posner Square					
11	Grafton at Franklin				ok	
12	Southgate Place					
13	Harrison St. at Water St.				ok	
14	Millbury St. at Lafayette St.				ok	
15	Millbury St. at Endicott				ok	
16	Southbridge at Sargent					
17	Green at Madison St.				ok	
18	Summer at Laurel				ok	
19	Thomas at Summer				ok	
20	Kelly Square Control Structure				ok	
21	Shamrock at Shrewsbury					
22	Risso Court at Shrewsbury					
23	Oleum Court at Shrewsbury					
24	Waitte at Shrewsbury					
25	Sewaro at Shrewsbury					
26	Laria at Shrewsbury					

Appendix 13
Schematic for Old Mill Brook Conduit Interconnection



SYSTEM INTERCONNECTION

NOT TO SCALE

Fay, Spofford & Thorndike, Inc.

SOUTHBRIDGE ST.
OVERFLOW COLLECTOR
QUINSIGAMOND AVE.
OVERFLOW COLLECTOR
COMBINED SEWER
OVERFLOW TREATMENT
FACILITY
PUMPED
(DRY WEATHER FLOW)
EFFLUENT
CONDUIT
INFLUENT CONDUIT
BY-PASS
TO UPPER
BLACKSTONE
REGIONAL
WASTEWATER
TREATMENT
FACILITY
MAIN INTERCEPTOR
MILL BROOK
HARDING ST.
OVERFLOW
COLLECTOR
DRAINAGE CONDUIT
FROM SALISBURY
POND
MILL BROOK
TO BLACKSTONE
RIVER
SYSTEMS OPERATIONS
NOT TO SCALE
FST
Fay, Spofford & Thorndike, Inc.

Inspection Conclusion Data Sheet (ICDS)

FY2010

Inspector: _Erin Trainor_____

Inspection Date: _October 31, 2012_____

Facility Name/Address: _City of Worcester, Massachusetts MS4 – Various Locations_____

Facility Manager/Title and Address (if different from facility address): Michael V. O'Brien, City Manager, 455 Main Street, Worcester, MA 01608.

Facility Contact/Title and Address (if different from facility address): Michael V. O'Brien, City Manager, 455 Main Street, Worcester, MA 01608.

1. Media Type: (Check one)

☐ CAA-Stationary ☐ CAA-Mobile Source ☐ CAA-112r
☐ CAA-NESHAP
☐ CWA-NPDES ☐ CWA-Pretreatment POTW ☐ CWA-Pretreatment IU
☐ CWA 311 ☐ CWA 404 **X** CWA-Stormwater
☐ EPCRA 313 ☐ EPCRA N313
☐ RCRA-C ☐ RCRA-I
☐ SDWA-UIC ☐ SDWA-PWSS
☐ TSCA-Lead Paint ☐ TSCA-PCBs ☐ TSCA-Core ☐ TSCA-AHERA

2. Did you observe deficiencies (potential violations) during the inspection?

☐ Yes **X** No

3. If you observed deficiencies, did you communicate them to the facility during the inspection?

☐ Yes **X** No

4. Deficiencies observed?

_____ Potential violation of a compliance schedule in an enforceable order.

_____ Potential failure to maintain a record or failure to disclose a document.

_____ Potential failure to maintain, inspect or repair equipment including meters, sensors, and recording equipment.

_____ Potential failure to complete or submit a notification, report, certification, or manifest.

_____ Potential failure to obtain a permit, product approval, or certification.

_____ Potential failure to follow a required sampling or monitoring procedure or laboratory procedure.

_____ Potential failure to follow or develop a required management practice or procedure.

_____ Potential failure to identify and manage a regulated waste or pollutant in any media.

_____ Potential failure to report regulated events such as spills, accidents, etc.

_____ Potential incorrect use of a material (e.g., pesticide, waste, product, etc.) or use of improper or unapproved material.

_____ Potential failure to follow a permit condition(s).

5 Did you observe or see the facility take any actions during the inspection to address the deficiencies communicated to the facility?

☐ Yes ☐ No **X** N/A only if #3 was NO.

If YES, check only the action(s) actually observed/seen or write in a short description of the action in the "optional" section. (Check all that apply)

Action(s) taken

_____ Complete(d) a Notification or Report

_____ Correct(ed) Monitoring Deficiencies

_____ Correct(ed) Record Keeping Deficiencies

_____ Implemented New or Improved Management Practices or Procedures

_____ Improved Pollutant Identification (e.g., Labeling, Manifesting, Storage, etc.)

_____ Reduced Pollution (e.g., Use Reduction, Industrial Process Change, Emissions or Discharge Change, etc.)

_____ Request(ed) a Permit Application or Applied for a Permit

_____ Verified Compliance with Previously Issued Enforcement Action - Part or All Conditions

The following common air or water pollutant(s) **should only be checked** if the "Reduced Pollution" line was checked.

Water: ☐ Ammonia ☐ BOD ☐COD ☐TSS ☐O/G ☐Total Coliform ☐D.O.
☐ Metals ☐Cyanide ☐ Other_____

Air: ☐ NOx ☐ SO2 ☐ PM ☐ VOC ☐ Metals ☐ HAPs ☐ CO
☐ Other_____

6. Did you provide general compliance assistance in accordance with the policy on the Role of the EPA Inspector in Providing Compliance Assistance During Inspections?

☐ Yes **X** No

7. Did you provide site-specific compliance assistance in accordance with the policy on the Role of the EPA Inspector in Providing Compliance Assistance During Inspections?

☐ Yes **X** No

Optional Additional Information: EPA inspectors may wish to provide a narrative description of actions taken by the facility or assistance to help the facility come into compliance. (Narratives may be used in national or regional reports to provide examples of EPA inspection outcomes).

Refer to inspection report.

United States Environmental Protection Agency
Washington, D.C. 20460

Water Compliance Inspection Report

Section A: National Data System Coding (i.e., PCS)

Transaction Code	NDPES	yy/mm/dd	Inspec ion Type	Inspector	Fac Type
1 N	2 3 M A S 0 1 0 0 0 2	11 12 1 2 / 1 0 / 3 1	17 18 <	19 R	20

Inspection Type Description

Stormwater-MS4-sampling

Remarks

21 66

Inspec ion Work Days	Facility Self-Monitoring Evaluation Rating	B1	QA	Reserved
67 1 . 0 69	70	71	72	73 74 75 80

Section B: Facility Data

Name and Location of Facility Inspected (For industrial users discharging to POTW, also include POTW name and NPDES permit number)	Entry Time/Date	Permit Effective Date
In-stream sample collected along Weasel Brook at Kendrick Field, identified as Kendrick. Outfall located along Ararat Street, identified as Ararat. Outfall located at the end of Pompano Road, identified as Pompano. Outfall located on Clark Road, identified as Clark. In-stream sample collected along Poor Farm Brook at Tacoma Road, idenitfied as Tacoma. In-stream sample collected along Beaver Brook at the Mill Street bridge crossing, identfied as Mill. In-stream sample collected along Middle River at St. Johns cemetery, identfied as St. Johns. In-stream sample collected along Middle River from the south culvert of the McKeon Road bridge crossing, identified as McKeonA. In-stream sample collected along Middle River from the center culvert of the McKeon Road bridge crossing, identified as	8:00AM 10/31/2012	
	Exit Time/Date 12:30PM 10/31/2012	Permit Expiration Date

Name(s) of On-Site Representative(s)/Title(s)/Phone and Fax Number(s)

Other Facility Data:
Receiving Water: Poor Farm Brook
Beaver Brook
Weasel Brook
Middle River

Name, Address of responsible Official/Title/Phone and Fax Number.
Michael V. O'Brien, City Manager
455 Main Street, Worcester, MA 01608
Phone: (508) 799-1175, Fax: (508) 799-1208

Contacted
[ ] Yes [X] No

Section C: Areas Evaluated During Inspection (Check only those areas evaluated)

[ ] Permit	[ ] Self-Monitoring Program	[ ] Pretreatment	[X] MS4
[ ] Records/Reports	[ ] Compliance Schedules	[ ] Pollution Prevention	
[ ] Facility Site Review	[ ] Laboratory	[X] Storm Water	
[X] Effluent/Receiving Waters	[ ] Operations & Maintenance	[ ] Combined Sewer Overflow	
[ ] Flow Measurement	[ ] Sludge Handling/Disposal	[ ] Sanitary Sewer Overflow	

Section D: Summary of Findings/Comments (Attach additional sheets of narrative and checklists as necessary)

SEV Codes	SEV Description

Name(s) and Signature(s) of Inspector(s)	Agency/Office/Phone and Fax Numbers	Date
Erin F. Trainor	US EPA / EIA / p. (617) 918-8382 / f. (617) 918-8282	11/2/2012
Signature of Management QA Reviewer	Agency/Office/Phone and Fax Numbers	Date

U.S. Environmental Protection Agency
Office of Compliance and Enforcement
1200 Pennsylvania Avenue, NW
Washington, DC 20460

U.S. Environmental Protection Agency, Region 1
5 Post Office Square - Suite 100
Boston, MA 02109-3912

SEWER SYSTEM COMPLIANCE INSPECTION

CITY OF WORCESTER, MASSACHUSETTS

INSPECTION REPORT

Inspection Dates:
January 22–23, 2013

Report Date:
February 27, 2013

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Appendix 13: Schematic for Old Mill Brook Conduit Interconnection

I. INTRODUCTION

On January 22–23, 2013 the U.S. Environmental Protection Agency (EPA), with assistance from PG Environmental, LLC (PG), a U.S. EPA contractor, (hereinafter, collectively, the EPA Inspection Team) inspected the City of Worcester's (City) wastewater collection system and certain components of the City's municipal separate storm sewer system (MS4). The primary focus of the inspection was an evaluation of the operation and maintenance of the collection system and sanitary sewer overflow (SSO) response and reporting procedures. The inspection also included a focus on the City's program for illicit discharge detection and elimination (IDDE) as a component of the City's MS4 program. This report summarizes the results of the inspection.

The inspection consisted of the following major activities:

- Discussions with representatives from the City regarding the operation and maintenance of the wastewater collection system, combined sewer overflow (CSO) treatment facility, SSO response and reporting procedures, collections system drawings and manuals, and MS4 IDDE program.
- Observations of the wastewater collection system field crew activities. Field operations were limited during the inspection due to snowfall and extremely cold temperatures.
- A physical inspection of the City's regulators, CSO treatment facility, pump stations, and storm sewer outfalls.
- Examination of the City's wastewater collection system operations, maintenance, and SSO response and reporting records.

The City's wastewater collection system, CSO treatment facility, and MS4 are regulated under multiple National Pollutant Discharge Elimination System (NPDES) permits and components of the Code of Massachusetts Regulations. The permits and state regulations are further described and referenced as applicable throughout the report.

The following were the primary representatives involved in the inspection:

City Representatives[1]:	Dino Eliadi, Director of Water and Sewer Operations Joseph Buckley, Assistant Director of Sewer Operations Philip Guerin, Director of Environmental Systems Dave Harris, Senior Engineer/Stormwater Coordinator Al Charbonneau, Chief Pump Station Operator
Massachusetts Department of Environmental Protection (MassDEP) Representative:	Ning Chen, Environmental Engineer
EPA Inspection Team:	Doug Koopman, EPA Region 1 Jack Melcher, EPA Region 1 Danny O'Connell, PG Environmental, LLC Bobby Jacobsen, PG Environmental, LLC

[1] The City's Assistant Commissioner for Operations, Department of Public Works & Parks, Mr. Matthew Labovites, was unable to participate in the inspection due to a family emergency. City staff present for the inspection indicated that Mr. Labovites was a significant source of information for City's operation and management of its sewer systems.

II. SUMMARY OF FIELD ACTIVITIES

Accompanied by City staff members, the EPA Inspection Team conducted site visits to multiple locations within the City's service area and viewed various City assets. Locations visited by the EPA Inspection Team include the following:

- Lake Avenue Pump Station.
- Quinsigamond Avenue Combined Sewer Overflow Storage and Treatment Facility.
- Multiple twin invert manholes.
- Multiple regulators.
- Various locations where sewer maintenance crews were conducting sewer flushing operations.

Appendix 1 provides a tabular summary of the field activities and references photographs taken during the inspection. Appendix 2, the Photograph Log, contains all referenced photographs.

III. BACKGROUND INFORMATION AND OBSERVATIONS

The City provides sewage collection for its jurisdiction through a system comprised of both combined and sanitary sewers. The system consists of approximately 360 miles of sanitary sewers, 65 miles of combined sewers, and 31 pump stations. Sewage is conveyed to the Upper Blackstone Water Pollution Abatement District's (UBWPAD) Upper Blackstone Wastewater Treatment Plant (WWTP) for treatment. Discharges from the WWTP are regulated under NPDES Permit No. MA0102369 (effective October 1, 2008) and Code of Massachusetts Regulations Title 314, Section 12.00.

According to the City Assistant Director of Sewer Operations, about 16–17 percent of the City's land area is served by the combined sewer system, primarily in the older downtown section of the City. The City has approximately 20 sewage flow regulators in the combined sewer system that can allow flow from the combined sewer to be conveyed through "CSO collector" sewers to the City's Quinsigamond Avenue Combined Sewer Overflow Storage and Treatment Facility (hereinafter, CSO Facility). The outfall from the CSO Facility comprises the City's only authorized CSO outfall location, and discharges from the CSO Facility are regulated under NPDES Permit No. MA0102997 (effective August 1, 2005).

The City's MS4 consists of approximately 290 miles of storm sewers, 2 pump stations, and more than 300 outfalls in five distinct watersheds. Discharges from the City's MS4 are regulated under NPDES Permit No. MAS010002 (effective October 30, 1998) and the City has developed a stormwater management plan (hereinafter, City SWMP) to guide implementation of its MS4 program.

The EPA Inspection Team conducted an array of office interviews and field activities to discuss current program implementation and observe operation and maintenance activities and the condition of assets. The following descriptions are based on information obtained and observations made during this inspection. The EPA Inspection Team did not meet with staff from the UBWPAD or visit the Upper Blackstone WWTP.

A. System Description

The City Assistant Director of Sewer Operations explained, in addition to the sewer lengths listed above, the City's system includes approximately 30 siphons, 27,000 manholes, and 18,000 catch basins. The City does not maintain ownership of any portion of the sewer laterals from private buildings and residences.

Within the separate sewer areas of the City, a significant portion of the system consists of sanitary sewer pipes and storm sewer pipes which were laid directly adjacent to one another with "common trench" construction in the early 1900s. With the common trench construction approach, the sanitary sewer and

storm sewer lines share manholes assets. The City Assistant Director of Sewer Operations explained that typically one sewer pipe is at a higher elevation than the other, but there is no standard throughout the City as to whether the sanitary or storm sewer pipe is at the higher elevation. The City refers to manholes where the sewer lines are adjacent to one another as "twin inverts." Appendix 3 provides a schematic of a twin invert structure included in the City's SWMP. There are approximately 2,500–3,000 twin invert structures in the City. A master list of the twin inverts did not exist at the time of the inspection. This is further discussed in Section V.D of the inspection report. The City provided a hardcopy map printed from the City's geographic information system (GIS) to show locations of known twin inverts (refer to Appendix 4).

City staff explained to the EPA Inspection Team that, in most locations, metal plates have been installed over top of the sanitary sewer line in the twin invert manholes (refer to Appendix 2, Photographs 25, 28, 33, and 38). The City Assistant Director of Sewer Operations stated that most of the metal plates were installed on top of the sanitary sewer lines in the twin inverts during the 1980s. Each metal plate was custom cut for the specific sanitary sewer line. Based on discussions during the inspection, it was unclear to the EPA Inspection Team whether gaskets were installed for the metal plates to create a more secure seal between the plate and the brickwork. The installation of spring-loaded retainer devices on top of the metal plates was conducted primarily over a five-year span in the 1990s, and by 2000 the vast majority of retainers had been installed (refer to Appendix 2, Photographs 28, 36, and 37). This activity was completed about one or two years prior to the inspection. The City did not have a program for inspecting manholes, including twin inverts, in the sewer system.

B. Regulators and CSO Facility

As stated above, the City has approximately 20 sewage flow regulators in the combined sewer system that can allow flow from the combined sewer to be conveyed to the City's CSO Facility when the sewer in the area of a regulator is surcharged. This typically happens during wet weather events when combined sewer flows exceed the capacity of the combined sewer. This can, however, happen during dry weather when a sewer is surcharged due to sedimentation, structural capacity limitations, or a blockage in the sewer line. Flow which is conveyed beyond the regulator structure enters one of three "CSO collector sewers" that transport the flow to the CSO Facility. The Southbridge Street Collector services the southwest area of the combined sewer system. The Quinsigamond Avenue Collector services the northern area of the combined sewer system, while the Harding Street Collector services the eastern and north eastern areas of the combined sewer system.

Once flow enters the CSO Facility, if the Upper Blackstone WWTP has treatment capacity available the wastewater is pumped directly to the WWTP. The City Chief Pump Station Operator explained that during wet weather events when the Upper Blackstone WWTP no longer has treatment capacity available (i.e., above an influent flow rate 62 million gallons per day (MGD)), UBWPAD staff will shut down the pumps at the CSO Facility which convey flow to the WWTP. Once flow is no longer being conveyed to the Upper Blackstone WWTP and the water level in the CSO Facility's wet well is greater than 439.00 feet in elevation, the City's CSO Facility initiates treatment mode and flow enters the contact tanks at the facility (2.5 million gallons of total storage). Wastewater entering the CSO Facility is provided with "flash treatment" (i.e., mechanical screening, flow through a grit chamber, disinfection, and dechlorination) and discharged to the Old Mill Brook Drainage Conduit, which flows to the Blackstone River.

City staff stated that the base flow at the CSO Facility is about 250,000 gallons per day (GPD), consisting primarily of groundwater. This base flow is pumped directly to the Upper Blackstone WWTP for treatment and discharge. The CSO Facility operates as a pump station during dry weather conditions. The City Assistant Director of Sewer Operations explained that the City has the ability to bypass flows around the City CSO Facility in the event of extreme wet weather; however, this had only been done once. In such an event, the facility would still operate at 100 percent of its flash treatment capacity and the

remainder of the flow would bypass the facility. This inspection did not include a comprehensive compliance evaluation of the CSO Facility or its past operations.

C. Pump Stations

According to City staff, the City has 33 total pump stations in the City—31 for sewage conveyance (including the CSO Facility) and 2 for stormwater. According to the City Chief Pump Station Operator, the City has seven of its own staff dedicated to working on pump stations. The City's pump station maintenance crews are assigned to either the "Lake Side" or "North End" of the City and each crew is composed of two pump station operators. The pump station maintenance crews conduct field inspections of pump stations on a daily basis and observations/activities are documented on paper "station report sheets."

According to City staff, all of the City's pump stations are equipped with alarms. Twenty-eight of the City's 33 pump stations are equipped with backup generators. Pump station maintenance crews run the generators with load about two times per week for about 30 minutes each time. The City Chief Pump Station Operator explained that the City's CSO Facility functions as a pump station the majority of the time, but it does not have full backup power.

The City started connecting pump stations to the City's supervisory control and data acquisition (SCADA) system sometime two years prior to the inspection. City staff stated that four of its pump stations were connected to the City's SCADA system at the time of the inspection: (1) Holden, (2) Lake Avenue, (3) Whitler Avenue, and (4) Dunkirk Drive.

City staff explained that about 20 percent of the City is located on the eastern side of a topographic ridge that extends generally north to south in the eastern portion of the City. Wastewater in this area is pumped via force main from the Lake Avenue Pump Station over the ridge. The Lake Avenue Pump Station can pump up to 20 MGD during wet weather events. The pump station is scheduled for a $7 million rehabilitation project starting in spring 2013.

D. System Mapping

The City Assistant Director of Sewer Operations and City Senior Engineer/Stormwater Coordinator explained that the City's service area was inventoried for the City's GIS in 1999–2000. The GIS includes the following: (1) catch basins, (2) sewer lines, (3) manholes, (4) twin inverts, (5) pump stations, (6) waterways, and (7) topography. The City has also done aerial flyovers to estimate the amount of impervious areas within the City as well as to identify locations where sewer lines are located in heavily forested areas and may be prone to root-related issues. However, based on the EPA Inspection Team's requests for lists of equipment and history of assets, the GIS did not appear to include specific information associated with the twin inverts, such as if and when the metal plate and retainer were installed and their statuses.

E. Flow Metering and Inflow/Infiltration

The City Assistant Director of Sewer Operations explained that there are three main areas in the City's sewer system with capacity issues related to inflow and infiltration (I/I). He explained that the City has consultants working on this issue and two I/I areas were involved in capital improvement program (CIP) projects at the time of the inspection. The City has one permanent flow meter in the Beaver Brook Trunk Sewer in the western portion of the City. According to City staff, the City and a consultant, Weston and Sampson, Inc., were assessing capacity-related issues due to I/I in the Beaver Brook area. The CIP projects for I/I were not discussed in detail during the inspection, as the most appropriate City contact to discuss CIP projects with was not present for the inspection due to a family emergency.

City staff also explained that another consultant to the City, CDM, was in the process of modeling the "core" of the City's sewer system, including the combined area, at the time of the inspection.

The City Assistant Director of Sewer Operations explained that in the areas of the sewer system with significant I/I, sanitary sewer overflows that result from capacity-related surcharged sewers typically release from manholes rather than into private residences or buildings. Nonetheless, in fall 2005 the City initiated a backwater valve reimbursement program to help prevent sanitary sewer overflows into private residences and buildings. Under the program the City will reimburse up to $2,000 for the installation of a backwater valve at a private residence or building. City staff stated that stipulations regarding the City's building code and the year the building was constructed affect eligibility for coverage under the program. City staff estimated that at least a couple hundred citizens have used the program and that there are more on the waiting list.

F. Fats, Oils, and Grease Program

The City Sewer Operations Division, in conjunction with the City Health Department, operates a fats, oils, and grease (FOG) program to help reduce impacts from FOG discharges to the sewer system. The City Director of Environmental Systems explained that the City initiated the program in 2006 and it was fully implemented in 2009. As a component of the program, the City conducted an initial evaluation of the food service establishments (FSEs) in the City. The City does not conduct regular FOG inspections of FSEs. If there is a blockage observed in the City's sewer system downstream of an FSE, then the City will conduct inspections of upstream FSEs to determine the source and require corrective action. At the time of the inspection, the City had not targeted high-density residential living areas.

G. Collection System Operation and Maintenance

The City has field crews that are dedicated to sewer line cleaning ("flusher crews") and other field crews that conduct catch basin cleaning. The City has two flusher trucks and one combination vacuum/flusher truck. There are 69 locations, or hotspots, in the sewer system that the City has identified for regular cleaning on at least a monthly basis. Aside from the regular cleaning activities in the hotspot locations, the City does not perform preventive cleaning in the sewer system. The City crews do not typically use the combination vacuum/flusher truck to remove debris from the collection system; instead they typically use a flusher truck to break up blockages and allow the grease and debris to flow downstream. The City Assistant Director of Sewer Operations explained that the City has about 30 siphons in the sewer system which are flushed "every couple of months." The City Senior Engineer/Stormwater Coordinator stated that there are about 18,000 catch basins in the City which are cleaned on an ongoing basis. It takes City staff approximately one and a half years to clean all of the catch basins.

City flusher crews and catch basin cleaning crews have access in the field to iPads which contain the City's GIS-based map of the system (refer to Appendix 2, Photographs 35 and 41). Sewer hotspot cleaning activities are documented on hardcopy field sheets. Catch basin cleaning activities are documented with a custom iPad application. Field crews input information into the iPad while in the field, and the information automatically uploads to the City's computer system when the iPad is brought back to the Sewer Operations Division. The City started using this application about one and a half years prior to the inspection, and was in the process of developing an application to document sewer cleaning operations.

According to the City Assistant Director of Sewer Operations, the City spends about $50,000 – $60,000 annually for root control in the sewer system with chemical foaming by a contractor, Duke's Root Control. When the City identifies a root problem in an area not treated by the root control contractor, the City conducts its own mechanical root cutting activities and then places that area on a list to be treated by the contractor in the future. City staff was unaware what percentage of the system has received root control treatment.

The City has a closed-circuit television (CCTV) inspection truck and also uses a contractor for CCTV inspection activities. The City has developed its own pipe rating system for assessing CCTV inspection images. The City did not have a program for systematically inspecting the sewer system with CCTV on a regular basis. CCTV inspection activities are normally performed in response to an identified issue such as a sewer line blockage. The City does not typically use CCTV to inspect sewer lines after flushing a section of sewer line. City staff was unaware what percentage of the system has been inspected with CCTV.

H. Work Order System and Complaints

The City has an electronic system called "Customer Service Request System" (hereinafter, CSRS) which was developed by City staff and implemented in October 2002. City staff referred to CSRS as its work order system. The system does not automatically generate and assign work orders to staff, but it is used to document and warehouse work performed in response to requests by City staff and the public. CSRS is designed to differentiate between calls initiated by the public and those initiated by City staff. CSRS is linked to the City's GIS to provide locations for documented requests. The City Assistant Director of Sewer Operations and the City Director of Environmental Systems explained that the City has been evaluating options for developing a computerized maintenance management system (CMMS) for the City Department of Public Works. The City was in the process of evaluating proposals for developing a CMMS at the time of the inspection. The current maintenance management system is driven by paper assignment sheets that are completed by field staff (e.g., regulator field inspection sheets).

CSRS serves as the City's system for documenting all public complaint calls except those to the fire department and the police department. The City's Customer Service Center, located at 20 East Worcester Avenue, receives public complaint calls from 7:30 a.m. to 5:00 p.m., Monday through Friday. After 5:00 p.m. on weekdays and at all times on the weekends, a water operations division clerk is responsible for receiving complaint calls and entering information into CSRS. From 3:30 p.m. to midnight, a water foreman and sewer equipment operator are on duty to respond to issues if needed. From midnight to 7:30 a.m. only the clerk is on duty and additional staff are on call to respond to emergencies. If call volume reaches a certain threshold, additional staff will be called in to assist with answering calls and entering information into CSRS.

CSRS has pre-loaded question scripts for each problem code in the system. Customer service representatives must ask these questions to the caller and manually type the answers in a field associated with each question. Each problem code is pre-assigned a priority ranking of either "emergency" or "standard." The priority can be changed manually. An "emergency" ranking would indicate that City staff should be dispatched within 30 minutes of receiving the call.

A City customer service assistant manager explained that there are three problem codes that customer service staff typically use for inputting public complaints related to the sewer system: (1) "DROPPED KEYS IN CATCH BASIN," (2) "SEWER BACKING UP IN HOUSE," and (3) "SEWER ODOR." Customer service representatives enter information directly into CSRS while taking a complaint call.

When a work order associated with the Sewer Operations Division is created by a customer service representative, a copy of the work order is automatically printed on a printer in the Sewer Operations Division, and the entry shows up on the computer screen of a sewer operations division clerk. The Sewer Operations Division must "accept" the work order, respond, and amend the work order status to "complete" once associated work tasks have been addressed.

Customer service representatives explained that the City has a basic manual that explains how to use the primary functions of CSRS and existing staff provide on-the-job training for new staff. City staff explained that they have not developed a detailed manual or standard operating procedure (SOP) for how

to handle different types of calls because explaining the numerous categories and situations in text would yield a manual or SOP that was not functional.

I. MS4 Outfall Screening and IDDE

The City Senior Engineer/Stormwater Coordinator explained the City conducts dry weather screening of its MS4 outfalls (approximately 339 outfalls total) from June to October each year. The City uses the following standard for determining when outfall screening can be conducted during the field screening season: after a period of four days with no more than 0.1 inch of rainfall during June and July; after a period of three days with no more than 0.1 inch of rainfall in August; and after a period of two days with no more than 0.1 inch of rainfall in September and October.

During field screening activities, City staff visually observes the outfalls and notes whether there is flow and the presence of odors or sheen on the surface of the water. If there is flow, City staff notes the time and depth, estimates the velocity, and uses a field test kit (i.e., HACH probe) to measure conductivity, dissolved oxygen, temperature, and pH at the time of outfall screening activity. City staff then revisits the outfall within 24 hours of the initial screening activity and documents conditions again. The City uses a Microsoft Access database for tracking illicit discharge detection and elimination activities.

The City Senior Engineer/Stormwater Coordinator stated that about two years prior to the inspection, the City started conducting additional sampling of dry weather flow for outfalls. The City does not necessarily collect samples for laboratory analysis during the initial or revisit screening activity, but rather comes back to the outfall at some point during the overall outfall screening season (i.e., June through October) to collect a sample for analysis. Regardless of whether the flow from an outfall in the past was determined to be groundwater, the City conducts sampling of the dry weather flow. The City samples for biochemical oxygen demand (BOD), total suspended solids (TSS), and fecal coliform. Samples for BOD and TSS are analyzed at the Upper Blackstone WWTP laboratory, while samples for fecal coliform are analyzed at the City's water treatment facility laboratory.

The City Senior Engineer/Stormwater Coordinator stated that in the past the City has analyzed samples for additional parameters, such as surfactants, through a third party laboratory. The City Senior Engineer/Stormwater Coordinator stated that if the fecal coliform levels measured in the dry weather flow are greater than 1,000–1,500 colony producing units (CPU) per 100 milliliters (mL) then the City will typically initiate source tracking activities. If the fecal coliform levels are less than 1,000 – 1,500 CPU/100 mL, then the City will not further investigate because experience has shown them that they will not detect an illicit connection. The City had not developed a written SOP to document this process.

If an illicit connection or illicit discharge (IC/ID) is detected through visual or sampling indicators, City staff prints a copy of the sewer system map of the area and goes upstream to observe the junction manholes. The City Senior Engineer/Stormwater Coordinator stated that sewersheds for each MS4 outfall have been mapped in the City's GIS-based map. City staff continues to visually inspect manholes for evidence of an IC/ID until a general source area is identified. If needed, the City uses CCTV inspection to identify the source and also conducts dye testing.

The City Senior Engineer/Stormwater Coordinator stated that the City has found approximately 200 illicit connections to the storm sewer system. The City maintains information about the illicit connections discovered from 1999–2013 in a Microsoft Access database. The database included entries for 171 "misconnections" and "illicit connections" for 1999–2013. The database includes a column for "dye test date" and "repair date."

City staff explained that the City has a "50/50" deal to assist homeowners for whom the connection was installed prior to 2000. Under the deal, the City pays for 50 percent of the cost to fix the illicit connection and the homeowner pays for the remaining 50 percent. If the connection was installed after 2000, the City

will cover the full cost of correction because in 2000 the City started requiring City inspectors to observe and approve initial sewer connections. The City Senior Engineer/Stormwater Coordinator stated that the City has taken homeowners to court in order to correct illicit connections because they constitute public health issues.

The City Senior Engineer/Stormwater Coordinator stated that the City has found numerous instances where there is leakage from a homeowner's sanitary sewer lateral to an adjacent storm drain line which may collect runoff from downspouts or yard drains.

The City Senior Engineer/Stormwater Coordinator explained that there are about 24 MS4 outfalls and specific locations along waterbodies in the City that are visually inspected by City staff on a weekly basis to identify evidence of sewer blockages and comingling of flows from the sanitary sewer to the storm sewer. A hardcopy form is filled out to document the activity. The EPA Inspection Team did not request or receive copies of the hardcopy forms completed by City field staff to document these activities.

IV. Assessment of Compliance with Permit Requirements

The EPA Inspection Team evaluated the City's compliance as it relates to the operation and maintenance of the City's collection system, certain components of its MS4 program, as well as recordkeeping and reporting procedures. The EPA Inspection Team identified several instances of potential noncompliance. These instances of potential noncompliance are summarized in Table 1 and reported as findings below.

Table 1. Findings of potential noncompliance

Potential Noncompliance	Permit/Regulatory References
Finding 1. Unauthorized discharges from the City's wastewater collection system	Section 301(a) of the Clean Water Act
Finding 2. Possible unreported SSOs occurred in the City's wastewater collection system	314 CMR 7.04(3)
Finding 3. Failure to properly operate and maintain the treatment works	314 CMR 12.04(8)–(9)
Finding 4. Failure to develop and implement a manhole inspection program	Table 10 of the City's *CMOM Program Implementation Plan Schedule*
Finding 5. Frequency of discharges from CSO Facility	Part I.A.1 of Permit No. MA0102997
Finding 6. Failure to fully implement the Nine Minimum Controls	Part I.A.2, Part I.B, Part I.C, and Attachment B of Permit No. MA0102997
Finding 7. Failure to properly implement a routine CSO regulator inspection program	Part I.C.1 of Permit No. MA0102997
Finding 8. Failure to submit annual reports for the CSO Facility by April 30	Part I.D of Permit No. MA0102997
Finding 9. Failure to conduct required MS4 water quality monitoring activities	Part I.C of Permit No. MAS010002

Finding 1. Unauthorized discharges from the City's wastewater collection system

Unauthorized discharges from the City's wastewater collection system occurred between January 1, 2010 and December 31, 2012.

Under Section 301(a) of the Clean Water Act (CWA), it is unlawful for any person to discharge any pollutant from a point source into "waters of the United States" except in compliance with an NPDES permit. The City does not have an NPDES permit that authorizes the discharge of wastewater from its separate sanitary sewer system. Therefore, any sewage spill from the City's collection system that enters "waters of the United States" constitutes a violation of the Clean Water Act.

Based on a review of monthly reports of SSOs and pump station bypass events submitted by the City to EPA, the EPA Inspection Team found that 119 unauthorized discharges of wastewater from unpermitted locations in the City's wastewater collection system occurred between January 1, 2010 and December 31, 2012[2]. Table 2 summarizes the number and type (i.e., SSO or pump station bypass) of occurrences per year. The monthly reports of SSOs and pump station bypass events submitted by the City to EPA indicate that all of the reported SSOs and at least 11 of the 14 pump station bypasses entered waterbodies. The final destinations of the other three bypass events were not recorded.

Table 2. Reported unauthorized discharges

Year	Number of SSOs	Number of Pump Station Bypass Events
2010	39	6
2011	31	8
2012	35	0
Total	**105**	**14**

In addition to the unauthorized discharges included in the monthly reports, through a review of work order entries in the City's CSRS, the EPA Inspection Team identified 164 possible unauthorized discharges of wastewater to buildings (i.e., SSOs) caused by issues with the City's sewer system (e.g., blockages and capacity issues) that occurred between January 1, 2010 and December 31, 2012. With the information provided, the EPA Inspection Team did not have the ability to determine whether the events occurred within the combined sewer area or the separate sewer area. Table 3 is a summary of the possible unauthorized discharges per year.

Table 3. Additional possible unauthorized discharges to buildings

Year	Possible Unauthorized Discharges
2010	79
2011	51
2012	34
Total	**164**

Further discussions of the EPA Inspection Team's review of the City's CSRS are included below in Findings 2 and 3. A summary of each possible unauthorized discharge identified during this review is included as Appendix 5.

[2] The monthly reports available to the EPA Inspection Team did not include a list of SSOs or pump station bypasses for September 2012 and November 2012.

Finding 2. Possible unreported SSOs occurred in the City's wastewater collection system

The City did not report multiple possible SSOs which occurred during the period of January 1, 2010 through December 31, 2012.

Section 314 Code of Massachusetts Regulations (CMR) 7.04(3) requires the following:

> *Persons owning or operating a sewer system shall report bypasses and/or overflows as follows:*
>
> *(a) In the event of an anticipated bypass or sanitary sewer overflow the owner shall provide notification to the Department, on a form approved by the Department, at least ten days prior to the event, if possible; or*
>
> *(b) In the event of an unanticipated bypass or sanitary sewer overflow, as soon as the owner has knowledge of the bypass or sanitary sewer overflow and no later than 24 hours after its first occurrence, the owner shall provide notification to the Department, on a form approved by the Department, of such an event.*
>
> *(c) Within five days of the event identified in either 314 CMR 7.04(3)(a) or (b) the owner shall provide the following information to the Department, on a form approved by the Department: All the activities that lead up to the event; steps taken to minimize the impact of the event on public health and the environment; and, steps taken to prevent such an event from happening in the future.*

The MassDEP SSO Reporting Form and instructions (updated January 2013) clearly state that unauthorized discharges, including backups of wastewater into public or private property due to the City's system, must be reported. Figure 1 below is an excerpt[3] from the instructions for the MassDEP SSO Reporting Form which further explains the reporting requirement.

> **Why do I need to report backups into buildings?**
> DEP wants to ensure that sewage backups into buildings as a result of problems in the sewer system are properly repaired and measures are put in place to reduce the likelihood of recurrence. Owner/operators of sewer systems that caused a backup may need to repair, rehabilitate, or upgrade the hydraulic capacity of their system, or change their operations and maintenance procedures.

Figure 1. Excerpt from MassDEP SSO Reporting Form.

In addition, page 2-1 of the City's *Sewer System Overflow (SSO) Emergency Response Plan (ERP)*, dated May 2005 (hereinafter, SSO ERP; refer to Appendix 6) explains that sewer overflows to "basements" are included in the City's definition of SSO. Specifically, the City's SSO ERP states the following:

> *The receiving water body is the point where a SSO enters a surface stream, river, or lake once it leaves the collection system. An understanding of this is necessary to ensure the proper execution of an overflow response. In addition to a receiving water body, sewer overflows can enter the environment at one or more of the following destinations: low lying areas, storm sewers (CBs),* ***basements*** *[emphasis added].*

As stated above, the EPA Inspection Team conducted a review of work orders contained in the City's CSRS. Specifically, the EPA Inspection Team obtained and reviewed work order entries from the City's CSRS with the problem code "SEWER BACKING UP INTO HOUSE" for the period of January 1, 2010 through December 31, 2012. The EPA Inspection Team reviewed the entries to determine whether the discharges were caused by issues in the City's system such as blockages or capacity limitations, or if the

[3] This language is included in the recently revised January 2013 version of the form and instructions, as well as the June 2008 version.

discharges were caused by issues in private laterals. Multiple entries did not include enough information to determine whether the blockage was in the City's system or a private lateral. Of the 684 total entries with the problem code "SEWER BACKING UP INTO HOUSE," 164 entries were related to issues with the City's sewer system (i.e., blockage or capacity issue). A summary of the entries and the EPA Inspection Team's review is included as Appendix 5. Further discussion of the causes of the discharges is included in Finding 3.

In its monthly reports to EPA, the City indicated that no SSOs occurred for eight separate months during 2010 to 2012. The EPA Inspection Team found work order entries for "SEWER BACKING UP INTO HOUSE" attributed to City sewer system issues in each of the months for which the City reported zero SSOs. Table 4 provides a summary of these months and the number of possible SSOs identified.

Table 4. Possible SSOs during months where zero SSOs were reported to EPA

Month	Number SSOs Reported to EPA	Possible SSOs Identified
April 2010	0	4
May 2010	0	3
June 2010	0	1
October 2010	0	4
May 2011	0	1
July 2011	0	3
October 2011	0	1
November 2011	0	3
Total	**0**	**20**

Finding 3. Failure to properly operate and maintain the treatment works

The City failed to properly operate and maintain the treatment works and had not developed and implemented an effective preventative maintenance program for its sewer collection system as required by 314 CMR 12.04(8)–(9).

Specifically, 314 CMR 12.04(8)–(9) requires the following:

> *(8) Any person operating treatment works shall maintain them in a manner that will ensure proper operation of the works, or any part thereof.*
>
> *(9) Any person operating treatment works shall establish and implement a preventive maintenance program to assure the efficient operation of all facilities and equipment.*

The City's *Sanitary Sewer Priority Cleaning Plan* (hereinafter, Cleaning Plan; refer to Appendix 7), submitted to EPA in February 2006, states the following:

> *It is impractical and unnecessary to clean the entire sanitary sewer system on a regular basis, as many sections of the system are not prone to flow restrictions. The need, then, is for a plan that will direct staff to focus on areas that would be most prone to restrictions and blockage and to suggest cleaning methods and frequencies that would best address the problem.*

Section 1 of the City's Cleaning Plan explains that the City developed a list of problem areas (i.e., hotspots) within the sewer system to be cleaned or flushed regularly ("typically twice per month"). City staff present for the inspection referred to this as the "flusher list." The flusher list was included as Attachment D to the City's Cleaning Plan and included 57 distinct locations for regular flushing (refer to Appendix 8). During the inspection, the EPA Inspection Team viewed a copy of the current flusher list

which included 69 locations (refer to Appendix 9). Since the flusher list was submitted to EPA in 2006, only one location has been removed from the list and 13 locations have been added. This may be indicative of either a failure to sufficiently address the root causes of sewer issues at the hotspot locations or a failure to review and update the flusher list to efficiently allocate the City's sewer cleaning resources. It was unclear to the EPA Inspection Team when the flusher list was last updated and whether the City had a structured approach for reviewing and updating the hotspot locations on the flusher list.

Aside from the regular flushing activities in the hotspot locations, the City does not perform preventative maintenance in the sewer system. Furthermore, the City does not typically use its combination vacuum/flusher truck to remove debris from the collection system; instead crews typically use a flusher truck to break up blockages and allow the material (e.g., grease and debris) to flow downstream. The City's practice of not removing grease and debris from the collection system during sewer flushing activities can cause the grease and debris to re-aggregate in downstream sewer lines and cause additional blockages. An effective preventative maintenance approach should include removing debris from the collection system during cleaning activities in sewer assets not immediately upstream of collection system trunk or interceptor sewer lines (i.e., large diameter, high flow sewer lines). During the inspection, the City Assistant Director of Sewer Operations explained that in summer 2012, the City started a pilot project to clean one entire sewershed on a preventative basis. It was not clear to the EPA Inspection Team whether the City intended to develop and implement a preventative cleaning schedule based on distinct sewersheds.

In addition, the City did not have a program for systematically inspecting the sewer system with CCTV on a regular basis. CCTV inspection activities are normally performed in response to an identified issue such as a sewer line blockage. As a result of the lack of an inspection program, the City is not able to properly assess the condition of its collection system and identify defects and areas of concern before they result in a collection system failure. Additionally, a CCTV inspection quality control program that follows the City's sewer cleaning activities would allow the City to evaluate the efficacy of its cleaning activities and modify the sewer cleaning procedures to minimize any damage caused to the aging collection system by the cleaning equipment.

The City representatives reported that the collection system has approximately 2,500–3,000 twin invert locations where the sanitary sewer line and storm sewer line are located adjacent to one another in a manhole structure. The twin inverts locations represent areas where there is a greater potential for comingling of sanitary and storm sewer flows. According to City staff, the City has not developed a program for regular inspection or maintenance of the twin invert structures, including the metal plates and retainer devices. City staff stated that they might become aware of comingling of flows at twin invert locations due to a blockage in the sanitary sewer line that creates service issues; however, the City did not have a program to actively identify unauthorized discharges between the sewer systems. This issue is further discussed below in Finding 4.

As explained above, during its review of the City's CSRS for the problem code "SEWER BACKING UP IN HOUSE," the EPA Inspection Team identified 164 possible unauthorized discharges of wastewater (i.e., SSOs) caused by issues with the City's sewer system that occurred between January 1, 2010 and December 31, 2012. During its review of the work orders, the EPA Inspection Team reviewed the notes entered into CSRS to determine the apparent root cause of each overflow (e.g., capacity, debris, grease). Table 5 summarizes the results of the root cause analysis.

Table 5. Causes for possible SSOs

Cause	Number of Occurrences
Capacity[a]	52
Debris[b]	15
Grease	46
Roots	5
Structural	4
Blockage – Material not identified[c]	41
Cause not identified[d]	1
Total	**164**

[a] Noted in the City's CSRS as "hi water" or "surcharged."
[b] Includes items such as paper, sheets, rags, gravel, and diapers.
[c] Multiple entries indicated that there was a blockage in the City's sewer line, but did not state what material caused the blockage.
[d] Not enough detail in the notes to determine a cause.

A more thorough summary of the work order entries and the EPA Inspection Team's review is included as Appendix 5. The EPA Inspection Team reviewed the work order entries to determine whether there were certain addresses that had experienced sewer backups due to issues with the City's sewer system more than once during the time from January 1, 2010 to December 31, 2012. There were 25 specific addresses that experienced more than one sewer backup due to issues with the City's sewer system during that time period. A summary of the addresses with recurring backups, including the dates and apparent causes of the backups, is presented in Table 6; additional detail is included as Appendix 10. Five of the 25 addresses were located at or near (within 0.1 mile of) hotspot locations identified on the City's 2006 flusher list. One of the addresses with recurring backups was added to the updated flusher list.

Table 6. Locations with recurring backups at or near hotspots

Address	Dates	Cause	Notes Regarding Inclusion on Hotspot Flusher List
71 CAMBRIDGE ST	2/6/2011	Blockage - Material not identified	The address with recurring backups is approximately 0.1 mile northwest of hotspot location No. 21 "Saugus Place @ Cambridge St. / interceptor" included on 2006 flusher list. This location is also included on the updated flusher list as No. 22.
	3/18/2011	Blockage - Material not identified	
1350 PLEASANT ST	3/14/2010	Blockage - Material not identified	This address was included as hotspot location No. 26 on the 2006 Flusher List. It is also included on the updated flusher list as No. 27 "Opposite side of 1350 Pleasant Street."
	3/29/2010	Grease	
16 SACHEM AVE	3/30/2010	Blockage - Material not identified	The 2006 flusher list includes "Achushnet Ave. sewer location to 22 Sachem Ave" as hotspot location No. 34. The address with recurring backups is within approximately 200 feet northwest

Address	Dates	Cause	Notes Regarding Inclusion on Hotspot Flusher List
	3/2/2011	Grease	of 22 Sachem Ave. The updated flusher list includes this same hotspot location as No. 38 and also includes 23 Sachem Avenue, which is approximately 250 feet southeast of the address with recurring backups.
31 SOUTHOLD RD	1/25/2010	Grease	Hotspot location No. 15 on the 2006 flusher list is "35 Southold Road." The address with recurring backups is within approximately 200 feet east of the listed hotspot location. The updated flusher list also includes this hotspot location as No. 16.
	3/30/2010	Capacity	
40 SOUTHOLD RD	2/25/2010	Capacity	The 2006 flusher list includes "35 Southold Road" as hotspot location No. 15. The address with recurring backups is within approximately 50 feet west of the listed hotspot location. The updated flusher list includes this hotspot location as No. 16.
	3/30/2010	Capacity	
	12/23/2010	Grease	
	5/27/2012	Debris	
	5/30/2012	Blockage - Material not identified	

Finding 4. Failure to develop and implement a manhole inspection program

The City had not developed and implemented a manhole inspection program as required in Table 10 of the City's *CMOM Program Implementation Plan Schedule* (hereinafter, CMOM Plan).

Specifically, Table 10 of the City's CMOM Plan (refer to Appendix 11) states:

> *Develop a formal manhole inspection plan that describes the procedures used to inspect manholes, developing a standard form that will be used to gather information on the manhole.*

On April 28, 2006, a consultant to the City, Camp Dresser & McKee, Inc., submitted the City's CMOM Plan to EPA in response to requirements of Administrative Docket No. 05-21. The section of the CMOM Plan titled "Physical Inspection and Testing Program" identified gaps in the City's program that needed to be addressed with implementation of specific plans. The CMOM Plan states "Even thought [sic] the City will inspect manholes through a contractor or by City personnel, the City needs to have a formalized program." Table 9 identifies that the City did not have a formal manhole inspection program in place and needed to implement a program, which includes a tracking system. Table 10, Implementation Plan & Schedule, of the City's CMOM Plan identifies that the City would develop and implement a program by June 2007. Figure 2 is an excerpt from the City's CMOM Plan which displays the schedule for developing and implementing the manhole inspection program.

Schedule
Inspection and Testing Program – Section 7(a)

- Develop Manhole Inspection Plan (June 2006 – December 2006)
- EPA Review
- Train employees (March 2007)
- Implementation (April 2007 – June 2007)

Figure 2. Excerpt from the City's CMOM Plan.

During the inspection, City staff stated that the City did not have a program for inspecting manholes in its sewer system. As noted above in Finding 3, the 2,500–3,000 twin invert locations in the City's sewer system are of particular concern due to the potential for comingling of flows between the sanitary and storm sewers. City staff explained that a metal plate and retainer device had been installed on most of the sanitary sewer lines in the twin invert manholes. However, the City did not employ a documented management mechanism listing the twin invert manholes and the status of internal assets (i.e. metal plate covers and retainer devices) to confirm the operational status and describe the possibility of cross-contamination between sanitary and storm sewer systems. Figure 3 is an excerpt from page 6-1 of the City's SWMP that explains some of the challenges of the twin inverts and the City's reasoning for installing the retainer devices on top of the metal plates.

Under certain flow conditions, surcharged conditions in one of the pipes may cause the water to rise above the dividing wall, allowing flow to enter the other system. For example, during heavy rainfall, the storm drain may surcharge, allowing excess inflow into the sanitary system. More problematic from a stormwater quality standpoint are sanitary sewer blockages, which cause back-ups into the twin-invert manholes, which overtop the dividing wall and discharge sanitary sewage to the storm drainage system. In an attempt to alleviate this problem, most of the twin-invert manholes in the City have been equipped with an aluminum plate set in mortar over the sanitary invert. These plates have not been effective, however, because they are often lifted by excessive surcharge pressure, or have not been replaced after being removed for access to the manhole. Once the plate is displaced, flow can pass between inverts.

There are approximately 2,579 twin-invert manholes in Worcester, representing 30 percent of the manholes in the City.

Figure 3. Excerpt from page 6-1 of the City's SWMP regarding twin inverts.

During the field activities conducted as a component of the inspection, the EPA Inspection Team observed several locations with at least one of the following conditions: (1) there was no metal plate on top of the sanitary sewer line, (2) the metal plate installed over the sanitary sewer line did not fully cover the opening, and (3) there was no retainer device on top of the metal plate. Refer to Appendix 1, Field Visit Nos. 11, 14, and 16 for a description of the assets and references to associated photographs.

Finding 5. Frequency of discharges from the City's CSO Facility

Part I.A.1, Footnote 2 of Permit No. MA0102997 states the following regarding frequency of discharges from the City CSO Facility:

> *Consistent with and upon completion of the portions of the compliance schedule set forth in Part I.E of the permit,* ***the average number of treated overflows from this facility will be limited to 4 per year or less beginning in 2007 and to 2 per year or less beginning in 2010****.*

Part I.E of Permit No. MA0102997 requires that the City complete six distinct improvements in accordance with the compliance dates included in the permit. The City's CSO Facility Annual Reports for 2008–2011 indicate that improvements 1 through 4 were completed, but numbers 5 and 6 had not been completed. City staff stated that improvement numbers 5 and 6 had not been completed at the time of the inspection. Improvements 5 and 6 were required to be completed by June 1, 2008 and June 1, 2010, respectively.

Based on review of the City's CSO Facility Annual Reports for 2008–2011, an average of 25.5 discharges per year from the CSO Facility have occurred during that time period. Table 7 is a summary of the number and volume of discharges from the CSO Facility.

Table 7. Discharges from the City's CSO Facility

Year	Number of CSO Discharges	Total Volume of CSO Discharges (million gallons)
2008	35	901
2009	22	333
2010	17	647
2011	28	702
TOTAL	**102**	**2,582**

Finding 6. Failure to fully implement the Nine Minimum Controls

A complete assessment of the Nine Minimum Controls (NMCs) program was not the primary focus of the inspection; however, there was some overlap with some of the controls and general collection system operation, and the EPA Inspection Team's observations are presented below.

Permit No. MA0102997 requires the City to implement the NMCs for its combined sewer system. Specific references to the NMCs are included in Part I.A.2, Part I.B, and Part I.C of the permit. The permit also references Attachment B for "Nine Minimum Technology Based Controls Documentation and Implementation Guidance" to achieve compliance with the NMCs. Attachment B of the permit identifies specific information that must be included in the documentation of each of the nine minimum technology based limitations. The following observations were made by the EPA Inspection Team regarding these specific controls and additional permit requirements related to NMC implementation.

NMC No. 1 Proper operation and regular maintenance programs for the sewer system and the combined sewer overflows

Aside from hotspot flushing, the City currently practices a reactive maintenance approach that does not include regularly scheduled inspection and maintenance of the wastewater collection system. As discussed above, the City performs sewer cleaning on a reactive basis, responding to customer complaints

and field crew observations rather than implementing a regularly scheduled preventive maintenance approach.

Attachment B of Permit No. MA0102997 requires that this technology based limitation must include a list of facilities and structures that are critical to the performance of the combined sewer system, including all regulators, tide gates, pumping stations, and sections of sewer lines which are prone to sedimentation or obstruction.

During the document review component of the inspection, the EPA Inspection Team observed two different regulator field inspection sheets used by City staff during 2011 and 2012 that identified different assets. Appendix 12 includes the regulator field inspection sheets provided by the City for 2011 and 2012. Specifically, the regulator field inspection sheet used during 2011 identifies 20 assets while another regulator field inspection sheet used eight times during 2012 identifies 26 assets. For example, the regulator field inspection sheet dated October 10, 2012 includes six locations that do not appear to have actual regulator assets but are listed as regulators. It is unclear to the EPA Inspection Team which of the regulator lists is accurate.

In addition, a review of the City's work order system (CSRS) identified multiple addresses which experienced recurring sewer backups that required flushing of the City's sewer line but were not included on the City's flushing list. As noted above, with the information provided, the EPA Inspection was unable to determine whether these locations are within the combined sewer or separate sewer area.

The permit also requires that inspection and maintenance personnel be trained and equipped for confined space entry. During the field component of this inspection, a City employee entered a confined space to retrieve a dropped piece of equipment without completing a confined space permit or using proper safety equipment. It is unclear if the City has properly trained and equipped inspection and maintenance personnel for confined space entry.

NMC No. 2 Maximum use of the wastewater collection system for storage

Attachment B of Permit No. MA0102997 includes multiple requirements for this NMC. This section is formatted to clearly display the requirements and associated observations made during the inspection.

The permit states that this technology based limitation must include the following:

> *Collection system inspection: This inspection should focus on the identification of maintenance or design deficiencies that restrict the use of otherwise available system capacity. This evaluation should document that inadequate regulators, piping bottlenecks, and pumping deficiencies have been identified and corrected, or scheduled for correction.*

Inspection Observation: Through a review of work orders and field sheets, the EPA Inspection Team has identified multiple locations in the sewer collection system that have had multiple events in which the collection system has been documented to have a restriction (surcharging) or blockage and the only apparent response to the issue was to flush the sewer line. As described above, the City has had a formal hotspot list since 2006 which included 57 locations. At the time of the inspection, the hotspot list contained 69 locations and only one of the 57 locations included on the 2006 list had been removed from the hotspot list. The City did not provide documentation to demonstrate that permanent corrective actions are being implemented by the City to address hotspot locations, especially those that have been on the list since 2006. The EPA Inspection Team did not review sewer rehabilitation projects with City staff since the appropriate City contact for the City's CIP was not present for the inspection due to a family emergency. This component of the inspection process typically identifies sewer assets receiving additional maintenance until planned structural modification to the asset can be completed.

The permit states that this technology based limitation must also include the following:

> *Tide gate maintenance and repair: Tide gates prevent significant volumes of water from entering the conveyance system, thereby freeing up system storage capacity during wet weather periods. Where appropriate, document that tide gate maintenance and repair procedures are adequate.*

Inspection Observation: Multiple regulator inspection field sheets obtained by the EPA Inspection Team noted problems with regulator gates such as "bad hinge," "hinge," and "broke" but did not identify specific issues or final resolution to the problem. In addition, the following information was not identified on the regulator inspection field sheets: (1) description of the necessary maintenance, (2) the date the necessary maintenance was performed, and (3) whether the observed problem was corrected.

The permit states that this technology based limitation must also include the following:

> *Adjustment of regulator settings: Adjustment of regulating devices can increase in-system storage of CSO flows and maximize transport to the POTW. Care should be taken to ensure that the regulator adjustment will not result in unacceptable surcharging of the system. Document that regulators have been adjusted to optimum settings. The method by which the community determined the optimum regulator setting (e.g. modeling, trial and error) shall be included in the documentation.*

Inspection Observation: Regulator No. 6, Millbury at Richland was observed to be at approximately 50 percent of its design capacity at approximately 9:00 am January 23, 2013 (refer to Appendix 1, Field Visit No. 5).

The permit states that this technology based limitation must also include the following

> *Removal of obstructions to flow: Document that accumulations of debris which may cause flow restrictions are identified, and debris is removed routinely. Documentation shall include a summary of the locations where sediment is removed, the number of times each year the sediment is removed and the total quantity of material removed each year.*

Inspection Observation: Due to the City's lack of preventive cleaning, there is the potential for a buildup of debris and grease in the sewer lines. In addition, the City's policy of flushing verses cleaning (i.e., flushing debris downstream rather than removing it) allows potentially obstructive materials to remain in the sewer system. The resulting buildup of debris and grease prevents the City from maximizing storage in the collection system. No records were available to the EPA Inspection Team that documented the quantity of material removed from sewer lines and the number of times lines were flushed each year. In addition, the City indicated that the collection system is subject to I/I during wet weather events, which reduces capacity for storage of wastewater in the collection system.

NMC No. 3 Review and modification of the pretreatment program to assure CSO impacts are minimized

Part 1.C.2 of Permit No. MA0102997 states, "Discharges to the combined system of septage, holding tank wastes or other material which may cause a visible oil sheen or containing floatable materials are prohibited during wet weather when CSO discharges may be active." The City did not report having a program that limited septage, holding tank wastes, or other materials that may cause a visible oil sheen or contain floatable materials. City staff stated that the City had developed and implemented a FOG program for the community.

Activities associated with controlling and/or regulating septage, holding tank wastes, material that may cause visible oil sheens, or containing floatable materials are typically managed by a WWTP's industrial

pretreatment program (IPP). The IPP for the City is managed by the UBWPAD. This inspection did not include discussions with the UBWPAD.

As stated previously in this report, a review of the City's CSRS documented that grease is a recurring cause of blockages in the City's wastewater collection system and had been the cause of SSOs, basement backups, and surcharged sewers.

NMC No. 4 Maximization of flow to the POTW for treatment

Attachment B of Permit No. MA0102997 recognizes that most of the actions recommended for maximization of the collection system for storage (NMC No. 2) will also serve to maximize flow to the POTW. Therefore, the observations included above for NMC No. 2 are not repeated in this section. In addition to optimizing those controls to maximize flow to the POTW, the following specific controls should be evaluated and implemented where possible:

a. *Use of off-line or unused POTW capacity for storage of wet weather flows.*
b. *Use of excess primary treatment for treatment of wet weather flows. If the use of excess primary capacity will result in violations of the community's NPDES permit limits, the community shall get approval of the proposed bypass from the permitting authority prior to implementation.*

The City has installed a leaf gate mechanism for the sewer line along Route 122 to maximize storage in the sewer line. The City also stores wastewater in the CSO Facility contact tanks as a component of its wet weather operations. The City has submitted and operates under a CSO Facility SOP which describes open communications between the City operators and the UBWPAD to maximize flows to the Upper Blackstone WWTP.

NMC No. 5 Prohibition of dry weather overflows from CSOs

The City has three combined sewer overflow collector sewers (described in Section III of this report) that transport dry weather overflows (DWOs) to the CSO Facility for pumping to the Upper Blackstone WWTP for treatment.

NMC No. 6 Control of solid and floatable materials in CSOs

The City CSO Facility has two mechanical bar screens for the removal and capture of solids and floatables (refer to Appendix 1, Field Visit No. 1). The Inspection Team noted that several stormwater catch basins in the combined sewer area were full of solids and debris (refer to Appendix 1, Field Visit No. 8).

NMC No. 7 Pollution prevention programs that focus on contaminant reduction activities

Pollution prevention programs were not reviewed as a component of this inspection.

NMC No. 8 Public notification to ensure that the public receives adequate notification of CSO occurrences and impacts

Public notification program and activities were not reviewed as a component of this inspection.

NMC No. 9 Monitoring to effectively characterize CSO impacts and the efficacy of CSO controls

The City's CSO Facility was visited as a component of the inspection process. A general tour and procedural discussions concerning the facility operations were conducted. The facility had an operational SCADA system and the City operations team maintained a hardcopy of operation logs. This inspection did not include an evaluation of the CSO impacts or the efficacy of CSO control.

Finding 7. Failure to properly implement a routine CSO regulator inspection program

Part I.C.1 of Permit No. MA0102997 requires the following:

> *Each CSO structure/regulator, pumping station and/or tidegate shall be routinely inspected, at a minimum of once per month, to insure* [sic] *that it is in good working condition and adjusted to minimize combined sewer discharges and tidal surcharging.*

The permit also requires, through the inspection process, that the City document the following information: (1) date and time of the inspection, (2) general condition of the facility, and (3) whether the facility is operating satisfactorily. If maintenance is necessary, the following additional information must be recorded: (1) description of the necessary maintenance, (2) the date the necessary maintenance was performed, and (3) whether the observed problem was corrected. The City must maintain all records of inspections for at least three years.

As a component of the inspection, the EPA Inspection Team requested the City to provide copies of its regulator inspections and related findings for 2011 and 2012 (refer to Appendix 12). The information provided by the City for 2011 only contained five regulator field sheets. The field sheets documented individual regulator inspection activities performed during the months of January, March, and April 2011, and two separate inspections for December 2011. The field sheets did not include the times at which the inspections were conducted and the entries for "flow" and "structural concerns & comments" were not completed in a consistent manner. Furthermore, a number of the field sheets' comments noted problems with regulator gates (bad hinge, hinge, and broke) and blocked sewer conditions but did not specify the following: (1) description of the necessary maintenance, (2) the date the necessary maintenance was performed, and (3) whether the observed problem was corrected. The City did not provide documentation for the months of February, May, June, July, August, September, October, or November 2011.

The 2012 file folder contained 12 regulator field sheets representing activities from three January inspections, two inspections each for the months of May and October 2012, and single inspections for the months of February, August, September, November, and December 2012. The field sheets did not include the times at which the inspections were conducted and the entries for "flow" and "structural concerns & comments" were not completed in a consistent manner. The field sheet dated October 11, 2012 contains inspection information for regulator locations not identified on any of the 2011 field sheets and only inspected once for the year 2012. Furthermore, it is unclear if these locations have regulators, as the field sheet has "?" in the column provide for gate and weir condition. The City did not provide documentation for the months of March, April, June, and July 2012.

Finding 8. Failure to submit annual reports for the CSO Facility by April 30

Part I.D of Permit No. MA0102997 requires the City to submit a report to EPA and MassDEP by April 30 of each year that includes the specific information listed at Part I.D.1–5 of the permit. During its review of documents during the inspection process, the EPA Inspection Team noted that the City submitted multiple annual reports after the April 30 deadline. Table 8 summarizes the timing of the report submittals.

Table 8. Summary of timing for CSO Facility annual reports

Reporting Year	Due Date	Submittal Date	Days Beyond Due Date
2008	April 30, 2009	November 5, 2009	189
2009	April 30, 2010	December 16, 2010	230
2010	April 30, 2011	December 20, 2011	234
2011	April 30, 2012	October 4, 2012	157

Finding 9. Failure to conduct required MS4 water quality monitoring activities

Since fall 2003, the City has not conducted wet weather monitoring as required by Part I.C, *Wet Weather Monitoring and Reporting Requirements*, of the City's MS4 permit (Permit No. MAS010002).

Specifically, Part I.C.1.a of the permit requires the City to sample locations identified in its March 25, 1998 letter to EPA "at least three times per year (spring, summer and fall) for all the parameters suggested, including cadmium and replacing oil & grease with Total Petroleum Hydrocarbons (TPH)."

Part I.C.1.a(1) of the permit requires the City to conduct instream sampling at the mouth of the Mill Brook Conduit for fecal coliform during the spring and summer.

Part I.C.1.a(3) of the permit requires spring and summer sampling of "sampling station 00 from the BRI study" and "a station downstream of where Beaver Brook and Tatnuck Brook completely mix, but above the Kettle Brook confluence."

The City Assistant Director of Sewer Operations and City Senior Engineer/Stormwater Coordinator explained that the City conducted these monitoring activities during the first five years of its permit coverage, but has not conducted these monitoring activities since that time.

V. ADDITIONAL CONCERNS

In addition to findings of potential noncompliance, the EPA Inspection Team noted several additional areas of concern, as discussed below.

A. Old Mill Brook Conduit Interconnection

City staff explained that there is an interconnection between the "Old Mill Brook Drainage Conduit" (which conveys the Old Mill Brook and stormwater) and the "Old Mill Brook CSO Collector Conduit" (which conveys CSO flows to the City's CSO Facility). It was unclear to the EPA Inspection Team exactly where in the system this interconnection is located and what the engineered flow dynamics are at the interconnection. A basic schematic of the interconnection was viewed at the City's CSO Facility and is included as Appendix 13. The schematic shows that there is a static weir between the conduits; flows from the Old Mill Brook Drainage Conduit could overtop the weir and enter the Old Mill Brook CSO Collector Conduit upstream of the City's CSO Facility. Based on this diagram, it appears that surface water from Old Mill Brook and Salisbury Pond would be directed to the Old Mill Brook CSO Collector Conduit and the City's CSO Facility which would limit available treatment and pumping capacities of raw combined wastewaters at the CSO Facility. It was unclear to the EPA Inspection Team whether the City conducts inspections of the overflow weir or when the last overflow between the conduits occurred.

B. Fecal Coliform Sampling at MS4 Outfalls

As described above in Section III.I, the City conducts sampling for fecal coliform of dry weather flows from MS4 outfalls observed during outfall screening activities. The City MS4 Coordinator explained that the City did not have written SOPs for following up on the sampling activities, such as a threshold for fecal coliform levels that would initiate action by the City. The City Senior Engineer/Stormwater Coordinator explained that generally a value greater than 1,000–1,500 CPU/100 mL would typically initiate action for source identification and potential illicit connection elimination. The EPA Inspection Team did not obtain fecal coliform sampling data from the City's MS4 outfall screening activities.

For the sake of comparison to the City's informal fecal coliform sampling threshold, the EPA Inspection Team reviewed the current Massachusetts Surface Water Quality Standards (314 CMR 4.00) to determine what bacteria levels had been established for inland waters designated as "Class B," such as the Blackstone River. The current water quality standards for this classification are expressed as *E. coli* and are therefore not directly comparable to fecal coliform sampling used by the City. However, for reference, it should be noted that the 1996 Massachusetts Surface Water Quality Standards for bacteria in Class B waters were expressed as fecal coliform. The 1996 water quality standard was such that the geometric mean must be less than 200 CPU/100mL in any representative set of samples, and less than 10 percent of the samples can be greater than 400 CPU/100mL.

During field activities conducted as a component of the inspection, the EPA Inspection Team, along with City staff, viewed a section of Beaver Brook (which flows underground through much of the City) that was daylighted about 4–5 years prior to the inspection. The City Senior Engineer/Stormwater Coordinator stated that the City started conducting monthly sampling for fecal coliform at this location in Beaver Brook after it was daylighted. The City Senior Engineer/Stormwater Coordinator stated that the typical fecal coliform level measured in this section of Beaver Brook is about 6,000 CPU/100 mL. He attributed this primarily to the age of the sewer system in the area. Page 6-3 of the City's SWMP notes that the Beaver Brook "subbasin" includes the most twin invert manholes of any other subbasin in the City (639 of the identified 2,579 twin invert manholes are in this subbasin). The City Senior Engineer/Stormwater Coordinator explained that the City has found about 20 illicit connections upstream of this location. He estimated there are probably about 20–25 outfalls from the MS4 to Beaver Brook, upstream of this sampling location in the underground section of Beaver Brook. These suspected outfalls are not able to be visually observed during dry weather field screening activities due to their underground location. The EPA Inspection Team did not obtain sampling data for the fecal coliform sampling conducted in Beaver Brook.

C. Linear Footage Recorded for Sewer Flushing

A sewer cleaning field crew member interviewed during the inspection explained that he reports the entire length of sewer line that was flushed no matter how many times a particular section of line was flushed during one activity. Therefore, the reported linear footage recorded as being flushed would not represent a unique length of sewer that was maintained, but rather the length of total sewer line that the flusher hose entered. It was not clear to the EPA Inspection Team whether all sewer maintenance field crew members record the linear footage for sewer flushing with the same method.

D. Number of Twin Invert Structures in the City's System

The City was unable to tell the EPA Inspection Team the actual number of twin invert manhole structures in the City's sewer system. During the opening discussions of the inspection, the City Assistant Director of Sewer Operations estimated that there were about 1,700 twin invert manholes in the City's system. The EPA Inspection Team requested the City to provide a list or inventory of all of the twin invert manholes. In response, the City Assistant Director of Sewer Operations explained that the City's GIS contains the most complete inventory of twin inverts in the City, and additional twin inverts are added to the GIS as they are discovered in the City. After querying the GIS during the inspection, the City Assistant Director of Sewer Operations stated that there are 2,500 to 3,000 twin invert manholes in the system; however, he did not provide an actual figure for the number of the structures in the system. Page 6-1 of the City's SWMP (created for the City's MS4 permit issued in 1998) states there are 2,579 twin invert manholes in the City's system. As noted above, the City does not have a program for inspecting the twin invert manholes.

E. Number and Purpose of CSO Regulator Structures in the City's System

During the initial interview process, City representatives stated that there were 17 regulators in the combined sewer system. The EPA inspection Team was informed that the regulators were inspected at least monthly; however, in some cases regulator manholes maybe inaccessible due the parking of resident's vehicles. A review of the regulator inspection records for 2011 and 2012 identified two different list formats of regulators; one list contained 26 regulator locations while the other had 20 regulator locations. During inspection field activities, a sewer maintenance field crew member stated that there are 24 regulators in the system. The EPA Inspection Team did not have time to inspect all the regulator locations. The actual number of regulators is not clear to the EPA Inspection Team.

In addition, while inspecting regulator structures along Millbury Street, the EPA Inspection Team was informed by one of the City employees that the gate structure was used for solids removal. In addition, at one of the regulators along Millbury Street, City staff present for the inspection stated that they were not certain if there was a tidegate associated with the regulator, and if there is, it is not viewed as a component of typical regulator field inspections. The EPA Inspection Team was informed that City staff had been provided with training for performing regulator inspections; however, based on these discussions in the field, there is some concern with the extent and thoroughness of the training.

Appendix 1
Summary of Field Activities

Field Visit No.	Asset/Location	Date and Time of Inspection	Photolog Reference	Observations
1	Quinsigamond CSO Treatment Facility (60 Quinsigamond Avenue)	January 22, 2013 12:50 p.m.	1-4	- The EPA Inspection Team met with the City Chief Pump Station Operator and Head Pump Station Operator. City staff stated the previous discharge event from the facility was during the second week of December 2012. - The average dry weather flow to the CSO Facility is about 250,000 gallons per day. The dry weather flow is pumped by two 600 gallon per minute (gpm) pumps through an 8" force main that discharges to a 48" brick interceptor sewer which conveys flow to the Upper Blackstone WWTP for treatment. City staff stated that the pumps had been refurbished about one or two months prior to the inspection. - During wet weather treatment events where the Upper Blackstone WWTP still has capacity, wastewater entering the CSO Facility wet well is pumped by two 6,000 gpm submersible pumps through a 24" ductile iron force main that discharges to a 96" interceptor which conveys flow to the Upper Blackstone WWTP. City staff stated that both pumps were operational at the time of the inspection. - There are two bar screens that are supported by a screenings conveyer belt to trash dumpster. - There are two "contact" tanks at the facility configured in series that have a total storage capacity of 2.5 million gallons. - The CSO Facility provides "flash treatment" for disinfection with sodium hypochlorite and dechlorination with sodium bisulfite prior to discharge to the Mill Brook Conduit and Upper Blackstone River. Sodium hypochlorite is added to the influent wastewater after flowing through mechanical bar screens prior to entering the contact tanks. The "flash treated" wastewater is discharged to the Old Mill Brook through Outfall No. 001. - After treatment events, the contact tanks are cleaned with water sprayed from bridge pumps suspended above the contact tanks. The cleaning water is then conveyed to the Upper Blackstone WWTP. - A copy of standard operating procedures for the CSO Facility, dated September 2007, was kept near the SCADA computer station at the facility. - The facility had a paper operations log kept near the SCADA computer station at the facility.

Field Visit No.	Asset/Location	Date and Time of Inspection	Photolog Reference	Observations
2	Leaf Gate Structure (Along Route 122, about 100 yards southwest of intersection with Harrison Street)	January 22, 2013 2:31 p.m.	5	- The facility has a hydraulic pump for gate operation. - A pressure transducer series in the sewer system activates the leaf gate at pre-set levels. - The EPA Inspection Team viewed the control building for the leaf gate, but did not view the leaf gate itself.
3	Lake Avenue Pump Station	January 22, 2013 3:00 p.m.	6-8	- The facility has a 17–18 MGD pumping capacity. - The facility is scheduled for a major rehabilitation project that will include the installation of horizontal variable force drive pumps and increase the pumping capacity to approximately 22 MGD. - The base flow at the facility is approximately 5 MGD. - Wastewater entering the pump station flows through Muffin Monster® grinders and grit chambers before being pumped from the facility. The facility is equipped with two standby mechanical bar screens which could be used in the event that the grinders were not functioning. City staff stated that the grinders were installed about eight years prior to the inspection. - Grit collected at the pump station is taken to the Upper Blackstone Landfill for disposal. - According to City staff, two of the four pumps at the pump station are currently rebuilt every nine or ten months. - A new generator will be installed as a component of the pump station rehabilitation project. - Flow from the facility is conveyed through 20” and 24” force mains over a ridge to the west. - A storm sewer system outfall to Lake Quinsigamond at the pump station is visually inspected by City staff daily to detect potential illicit discharges to the storm sewer system in the upstream areas.
4	Garden Street Regulator No. 2	January 23, 2013 8:30 – 8:50	9	- EPA Inspection Team divided into two separate sub-field teams on January 23, 2013. - The City team opened a number of manholes. Due to temperature extremes, high vapor/mist/fog was observed in manholes making observations difficult.

Field Visit No.	Asset/Location	Date and Time of Inspection	Photolog Reference	Observations
	(Field Team 1)	a.m.		- The regulator manhole was located in the dirt at the end of Garden Street within approximately 70 feet of the interstate 290 south bound. - No overflow or bypassing of the regulator was observed. Due to position of underground assets, depth of the assets, and environmental conditions (extreme cold/misting) observations were limited.
5	Millbury at Richland Regulator No. 6 (Field Team 1)	January 23, 2013 9:00 a.m.	10-13	- At 9:00 a.m. wastewater was at approximately 50 percent of the height of the pipe to the sewer (appeared to be approximately an 8" pipe) (Photo 10). - Wastewater was pooling on the upstream side of the regulator (Photo 11). - A gate structure was observed in the manhole downstream of the regulator asset (Photo 12). - The manhole downstream of the gate manhole had debris which appeared to be a broken manhole cover (Photo 13).
6	MS4 Outfall No. "il05" (Field Team 2) (Near intersection of Huntington Avenue and Lulea Street)	January 23, 2013 9:08 a.m.	14	- The outfall discharges to Indian Lake, which is used for recreation. - Flow was observed discharging from the outfall. - It had snowed in the City within 48 hours of the site visit.
7	Millbury at Taylor Regulator No. 7 (Field Team 1)	January 23, 2013 9:10 a.m.	15-17	- Very low flow observed into and out of the regulator. - A gate structure was observed in the manhole downstream of the regulator asset.
8	Millbury at Lafayette Street Regulator No. 14	January 23, 2013 9:15 a.m.	18-21	- Storm water catch basin at the corner of Millbury Street and Lafayette Street was observed to be full of debris (Photo 18). - Sewer system was found to be surcharged.

Field Visit No.	Asset/Location	Date and Time of Inspection	Photolog Reference	Observations
	(Field Team 1)			- City Inspection Team called for a flusher truck to service the line. - The flusher hose was damaged. Protective covering had been cut through. Hose safety and life appeared to have been significantly compromised (Photo 20). - Flusher truck had a variety of nozzles for different servicing requirements (Photo 21). - EPA Inspection Team observed flusher truck activities until 9:55 a.m. - Line was not cleared while the EPA Inspection Team was onsite.
9	MS4 Outfall No. "il01" (Field Team 2) (At eastern end of Shoreham Street)	January 23, 2013 9:21 a.m.	22	- The outfall discharges to Indian Lake, which is used for recreation. - Flow was observed discharging from the outfall. - It had snowed in the City within 48 hours of the site visit. - The headwall at the outfall location was identified as No. 20550.
10	Beaver Brook (Field Team 2) (About 500 feet east of intersection of Mann Street and Chandler Street)	January 23, 2013 9:49 a.m.	23	- This section of Beaver Brook, which flows underground through much of the City, was "daylighted" about 4–5 years prior to the inspection. - The City Senior Engineer/Stormwater Coordinator stated that the City started conducting monthly sampling for fecal coliform at this location in Beaver Brook after it was daylighted. - The City Senior Engineer/Stormwater Coordinator stated that the typical fecal coliform level measured in this section of Beaver Brook is about 6,000 CPU/100 mL. He attributed this primarily to the age of the sewer system in the area. - The City has found about 20 illicit connections upstream of this location. - The City Senior Engineer/Stormwater Coordinator explained that there are probably about 20–25 outfalls from the MS4 to Beaver Brook in the underground culverted section of Beaver Brook.
11	Twin Invert (Field Team 2) (About 250 feet east of intersection	January 23, 2013 9:58 a.m.	24-25	- Flow was observed in storm sewer line. - The metal plate installed on top of the sanitary sewer line did not completely cover the opening. - There was not retainer on top of the metal plate.

Field Visit No.	Asset/Location	Date and Time of Inspection	Photolog Reference	Observations
	of Chandler Street and Coolidge Road)			- The City Senior Engineer/Stormwater Coordinator stated that the sanitary sewer line was at a lower elevation than the storm sewer line in this location.
12	Pond at Water Regulator No. 9 (Field Team 1)	January 23, 2013 10:00 a.m.	26-27	- Very low flow observed into and out of the regulator. - A gate structure was observed in the manhole downstream of the regulator asset.
13	Twin Inverts (Field Team 2) (Near intersection of Brownell Street and Calmia Street)	January 23, 2013 10:06 a.m.	28-29	- Two sets of twin inverts were observed at this location. - Both twin inverts had metal plates and retainers installed on the sanitary sewer line. - It was unclear whether the sanitary sewer or storm sewer lines were at a higher elevation than the other.
14	Twin Invert (Field Team 2) (Intersection of Rob Roy Road and Morningside Road)	January 23, 2013 10:14 a.m.	30	- Flow was observed in the storm sewer line. - Metal plate was installed on sanitary sewer line. - Retainer for metal plate appeared to be out of correct position.
15	Twin Invert (Field Team 2) (Near intersection of Howland Terrace and Wetherell Street)	January 23, 2013 10:24 a.m.	31	- Upstream end sanitary sewer line observed at this twin invert. - No flow or metal plate observed for sanitary sewer line.
16	Twin Invert	January 23, 2013	32-33	- Connection from nearby catch basin dropped into storm sewer line from above the sanitary sewer line and metal plate covering.

Field Visit No.	Asset/Location	Date and Time of Inspection	Photolog Reference	Observations
	(Field Team 2) (Near intersection of Howland Terrace and Wetherell Street)	10:32 a.m.		- There was no retainer installed for the metal plate on the sanitary sewer line. - The City Senior Engineer/Stormwater Coordinator stated that the metal plate may have been concreted in place.
17	Twin Invert 8 Garland Avenue (Field Team 1)	January 23, 2013 10:35 a.m.	34-35	- There was a metal plate and retainer installed for the sanitary sewer line. - This location was downstream of a number of public housing units. - The City representatives stated that this area has problems associated with diapers being disposed of through the sanitary sewer. - City representative used an iPad to show position of asset.
18	Twin Invert 2 Thayer Street (Field Team 1)	January 23, 2013 10:50 a.m.	36-38	- There was a metal plate and retainer installed for the sanitary sewer line. - The City representatives demonstrated how the metal plate and retainer are removed and repositioned. - Metal plate did not appear to have gasket. - No gasket or gasket-like materials was observed on the brick and concrete area that seated the metal plate to provide a water tight seal between the metal plate and the mason work. - During this demonstration a component of the metal plate and retainer devise fell into the sewer. City team member entered sewer to retrieve equipment without following typical confined space entry protocols.
19	Regulator – "Thomas at Summer" (Field Team 2)	January 23, 2013 10:58 a.m.	39	- Flow was present in the main sewer line along Summer Street. This sewer line discharges to the East Interceptor. - Flow beyond the regulator is conveyed to the Old Mill Brook Conduit CSO Collector. - No flow was observed discharging beyond the regulator at the time of the site visit. - There was a wooden gate installed downstream of the regulator.
20	Twin Invert	January 23, 2013	40-41	- There was a metal plate and retainer installed for the sanitary sewer line. - Requested that City representative use iPad to show position of asset.

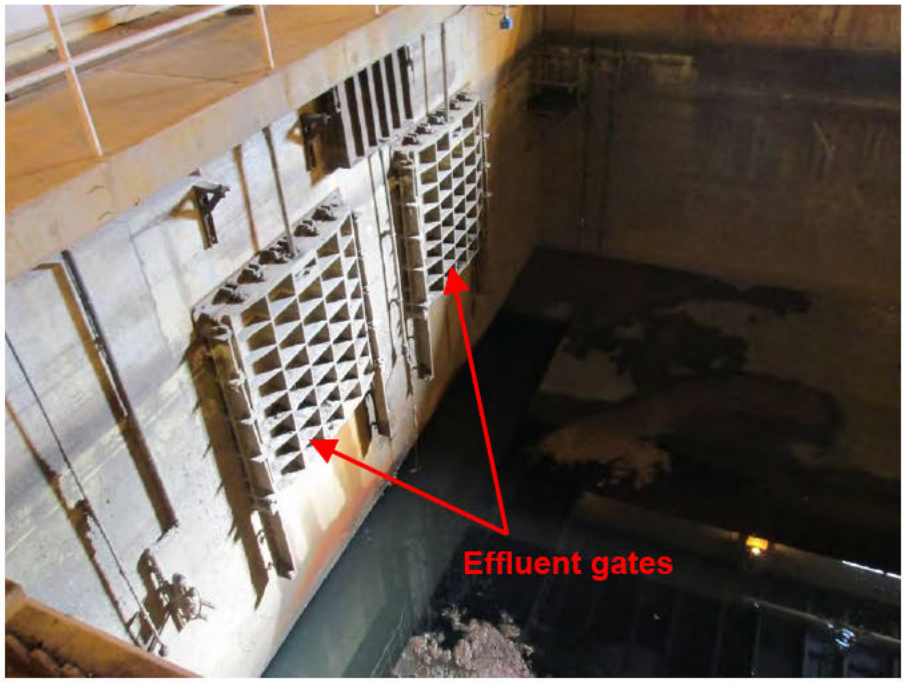
Field Visit No.	Asset/Location	Date and Time of Inspection	Photolog Reference	Observations
	10 Thayer Street (Field Team 1)	11:00 a.m.		
21	Twin Invert 2 Friedel Street (Field Team 1)	January 23, 2013 11:10 a.m.	42	- There was a metal plate and retainer installed for the sanitary sewer line.
22	Regulators – "Millbury at Sigel" and "Taylor at Millbury" (Field Team 2)	January 23, 2013 1:23 p.m.	43-46	- Millbury at "Sigel" o City staff stated that this was the "Millbury at Sigel" regulator, but this name was not on the City's list of regulators. o Flow was observed in the sewer, but not beyond the regulator or gate. - Taylor at Millbury o Minimal flow was observed in the sanitary sewer line at this location. o Flow beyond the regulator is conveyed to the Old Mill Brook Conduit CSO Collector. o No flow was observed discharging beyond the regulator at the time of the site visit. o There was a wooden gate installed downstream of the regulator.
23	Regulator – "Millbury at Lafayette" (Field Team 2)	January 23, 2013 1:31 p.m.	47	- This was the location of a sewer line blockage observed in the morning of January 23, 2013. - City staff stated that the blockage had been cleared. - Accumulated wastewater was observed in the bottom of the manhole barrel. City staff stated that this is how it typically looks due to the elevation in the manhole. - Wetted area was observed beyond the wooden gate installed downstream of the regulator at the time of the site visit.
24	Regulator – "Millbury at Ashmont" (Field Team 2)	January 23, 2013 1:55 p.m.	48-49	- Flow was observed in the sanitary sewer line at this location. - The City Craftsman/Working Foreman was unaware of whether there was a gate installed downstream of this regulator. He explained that if there is a gate for this regulator, it is not viewed during inspection activities for this regulator.

Field Visit No.	Asset/Location	Date and Time of Inspection	Photolog Reference	Observations
25	Twin Invert (Field Team 2) (Near intersection of Lake Avenue and Anna Street)	January 23, 2013 2:19 p.m.	50	- There was a metal plate and retainer installed for the sanitary sewer line at this location.
26	Sewer Line Flushing (Field Team 2) (No. 5 Locust Avenue at No. 37 Alvarado	January 23, 2013 2:40 p.m.	51-52	- This was a “hotspot” location which had issues with blockages due to grease and rags. - The City flusher truck operator explained that typically he cleans about 100–200 feet of sewer line for the hotspot cleaning locations. - The City flusher truck operator explained that he records his activity on a hardcopy field sheet that is turned into office staff once the activity is completed. - The City flusher truck operator stated that if he were to flush the same section of sewer line multiple times in one cleaning event, he would record the linear footage cleaned as the sum of the linear footage from each flushing. Therefore, the linear footage does not represent the length of unique sewer line cleaned during cleaning activities.

Appendix 2
Photograph Log

Photograph 1. CSO Facility – Field Visit No. 1 – View of mechanical bar screens.

Photograph 2. CSO Facility – Field Visit No. 2 – View of one of the two contact tanks at the facility.

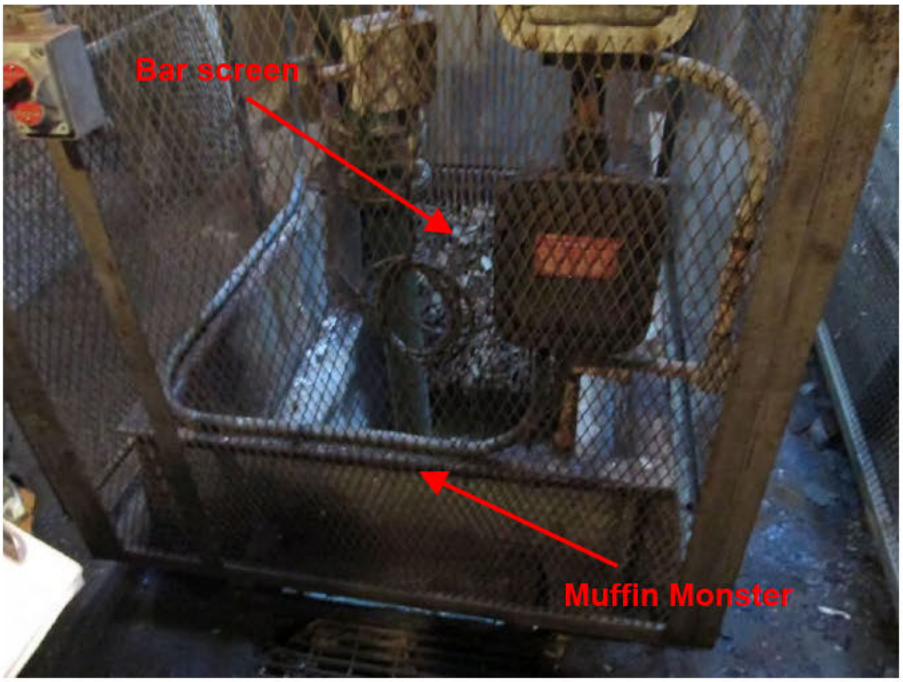


Photograph 3. **CSO Facility – Field Visit No. 1 – View of effluent gates from contact basin.**

Photograph 4. **CSO Facility – Field Visit No. 1 – View of bridge pumps spraying water to wash out a contact tank.**

Photograph 5. Leaf Gate Structure – Field Visit No. 2 – View of control building.

Photograph 6. Lake Avenue Pump Station – Field Visit No. 3 – View inside pump station.



Photograph 7. **Lake Avenue Pump Station – Field Visit No. 3 – View of Muffin Monster® grinder and bar screen in the influent channel.**

Photograph 8. **Lake Avenue Pump Station – Field Visit No. 3 – View of Muffin Monster® grinder noted in Photo 7.**

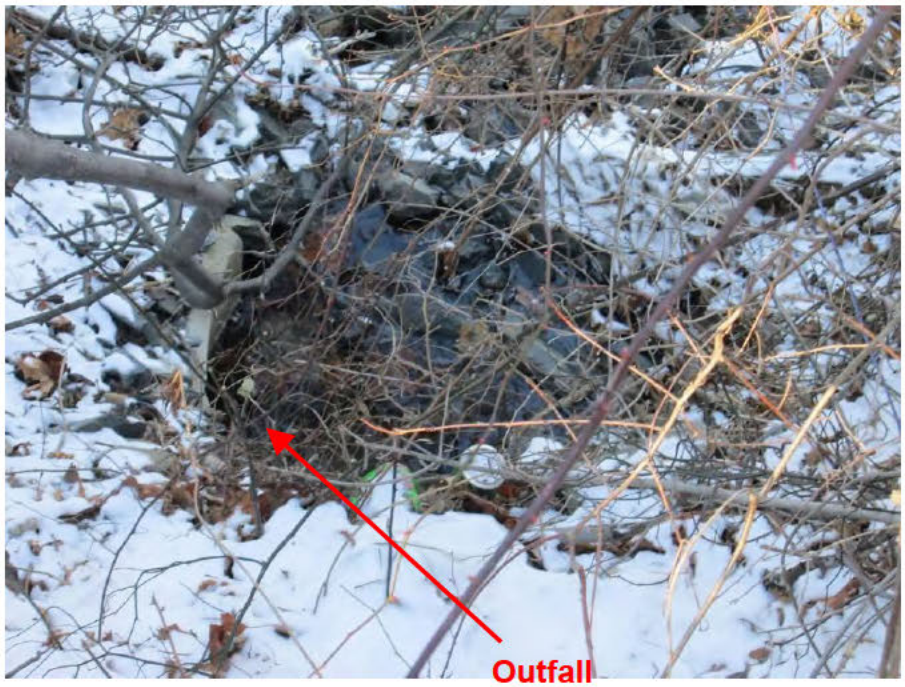
Photograph 9. **Garden Street Regulator No. 2 – Field Visit No. 4 – View into regulator structure.**

Photograph 10. **Millbury at Richland Regulator No. 6 – Field Visit No. 5 – View into regulator structure. At 9:00 a.m. wastewater was at approximately 50 percent of the height of the pipe to the sewer.**

Photograph 11. Millbury at Richland Regulator No. 6 – Field Visit No. 5 – View of unobstructed flow on downstream side of regulator in sewer main line.

Photograph 12. Millbury at Richland Regulator No. 6 – Field Visit No. 5 – View of regulator gate structure.

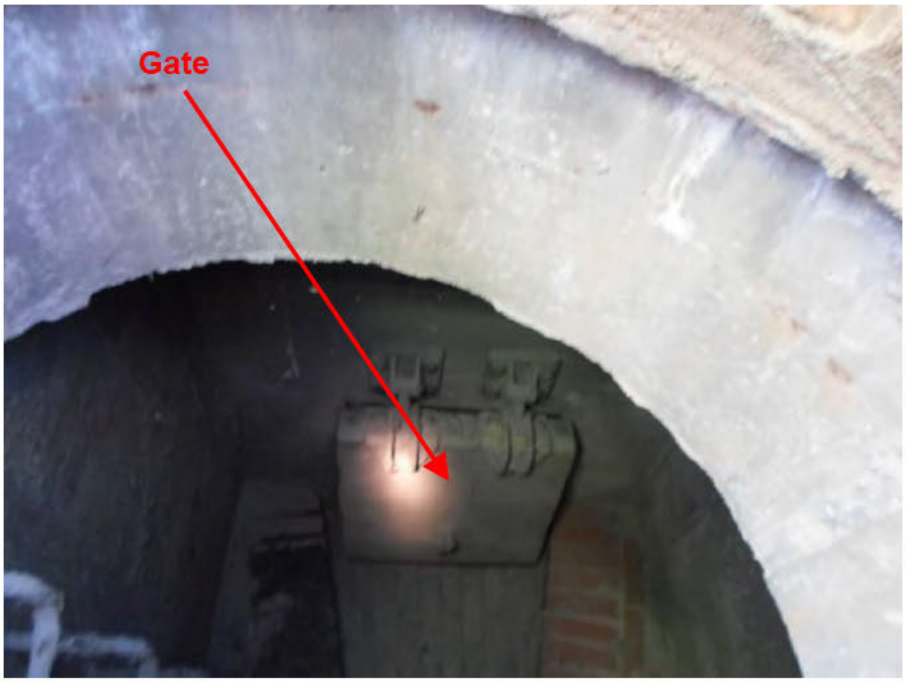
Photograph 13. Millbury at Richland Regulator No. 6 – Field Visit No. 5 – View of broken manhole cover in sewer downstream of regulator gate manhole.



Photograph 14. MS4 Outfall No. "il05" – Field Visit No. 6 – View of outfall which was discharging at the time of the site visit.

Photograph 15. Millbury at Taylor Regulator No. 7 – Field Visit No. 7 – View of low flow into the regulator structure at approximately 9:10 a.m.

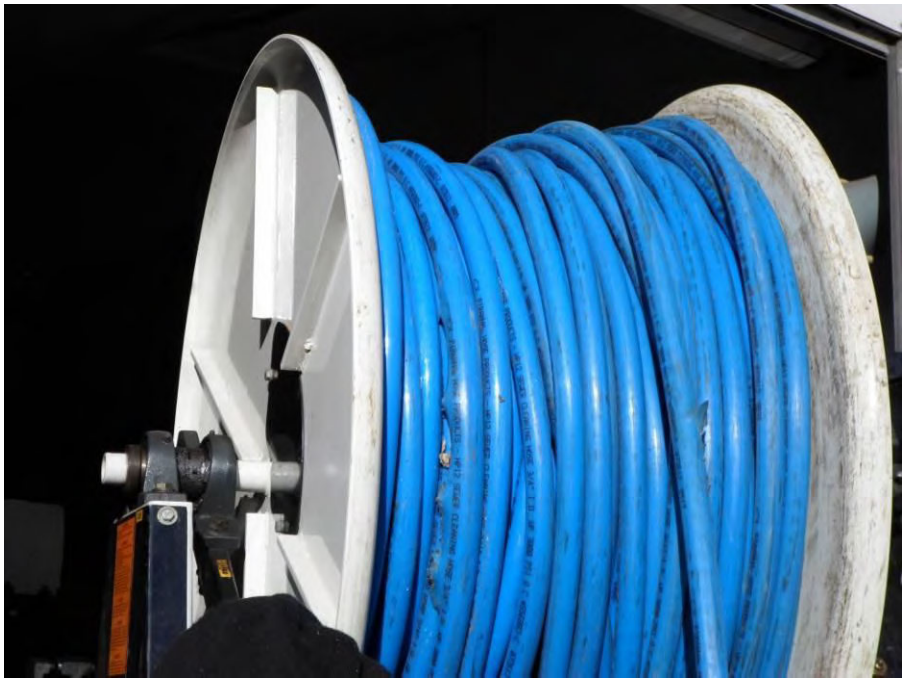
Photograph 16. Millbury at Taylor Regulator No. 7 – Field Visit No. 7 – View of low flow in sewer from regulator structure at approximately 9:10 a.m.



Photograph 17. Millbury at Taylor Regulator No. 7 – Field Visit No. 7 – View of regulator gate structure.

Photograph 18. Millbury at Lafayette Street Regulator No. 14 – Field Visit No. 8 – View of stormwater catch basin on Millbury Street immediately north of Lafayette Street with solids and general debris in the basin.

Photograph 19. Millbury at Lafayette Street Regulator No. 14 – Field Visit No. 8 – View of flusher truck servicing a sewer line in the immediate area of the regulator structure.

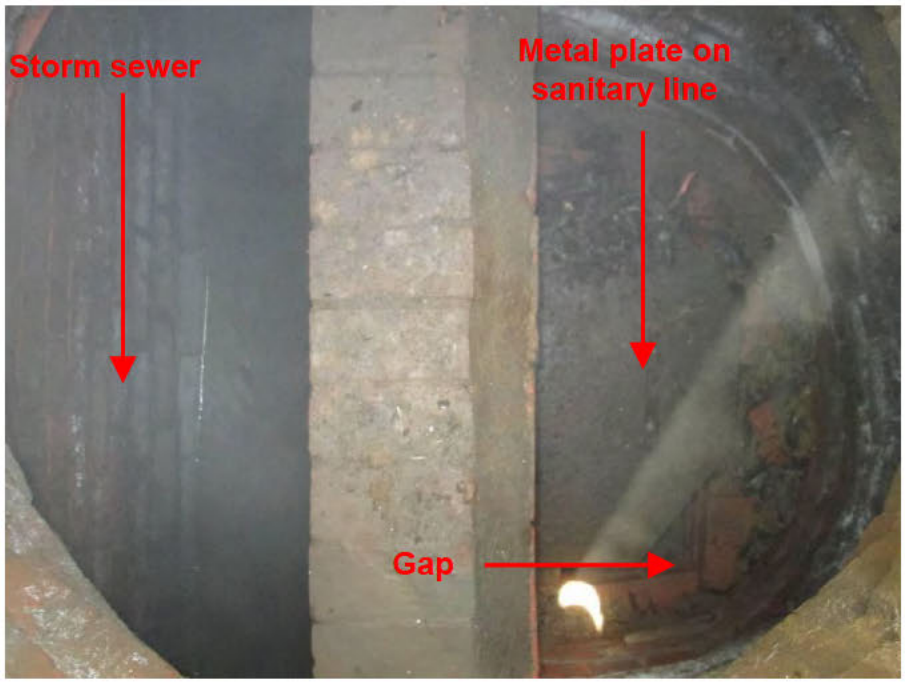


Photograph 20. Millbury at Lafayette Street Regulator No. 14 – Field Visit No. 8 – View of flusher hose damaged in multiple locations with the protective covering cut completely through.

Photograph 21. Millbury at Lafayette Street Regulator No. 14 – Field Visit No. 8 – View of nozzles available to the flusher truck team.

Photograph 22. MS4 Outfall No. "il01" – Field Visit No. 9 – View of outfall which was discharging at the time of the site visit.

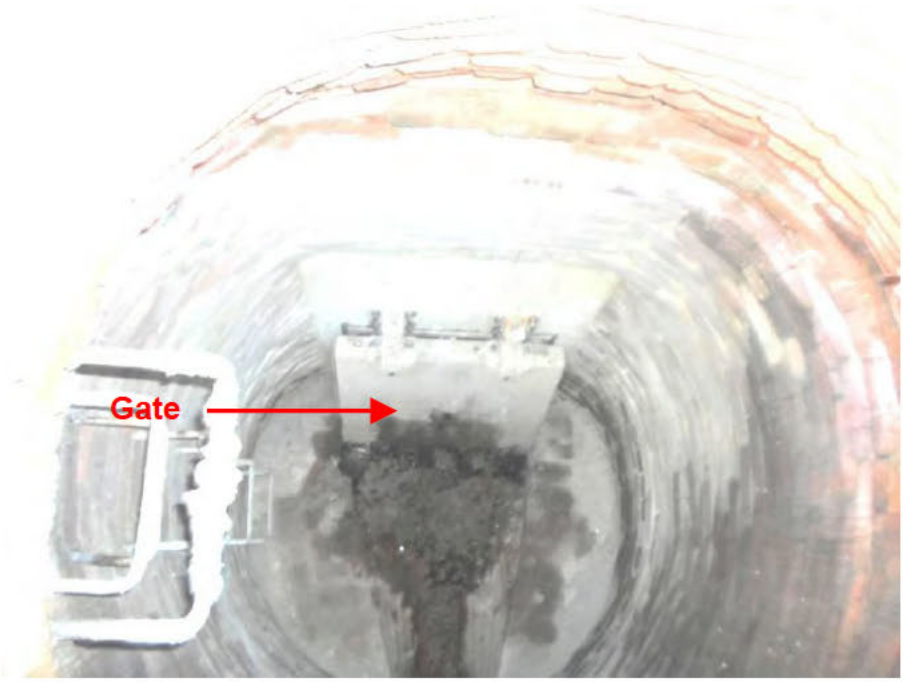
Photograph 23. Beaver Brook – Field Visit No. 10 – View of daylighted section of the brook.



Photograph 24. Twin Invert – Field Visit No. 11 – View into twin invert manhole. Note lack of retainer device and gap along edge of metal plate.

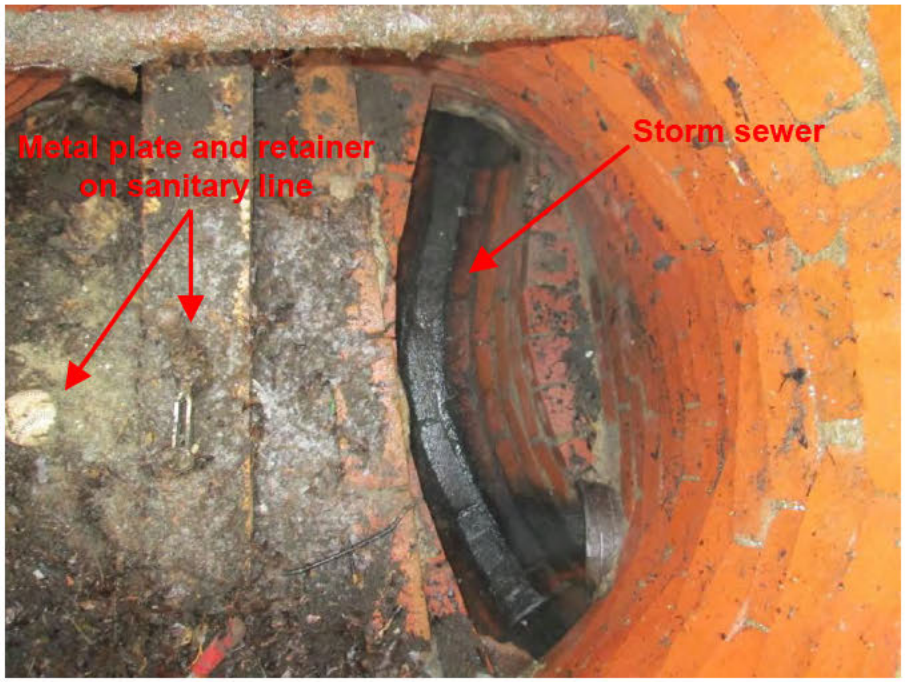
Photograph 25. Twin Invert – Field Visit No. 11 – Additional view into twin invert manhole shown in Photograph 24.

Photograph 26. Pond at Water Regulator No. 9 – Field Visit No. 12 – View of pooling water below what appeared to be a high water mark in the regulator structure.



Photograph 27. **Pond at Water Regulator No. 9 – Field Visit No. 12 – View of regulator gate structure. No flow observed discharging. What appeared to be water marks and debris were present on discharge side of the gate.**

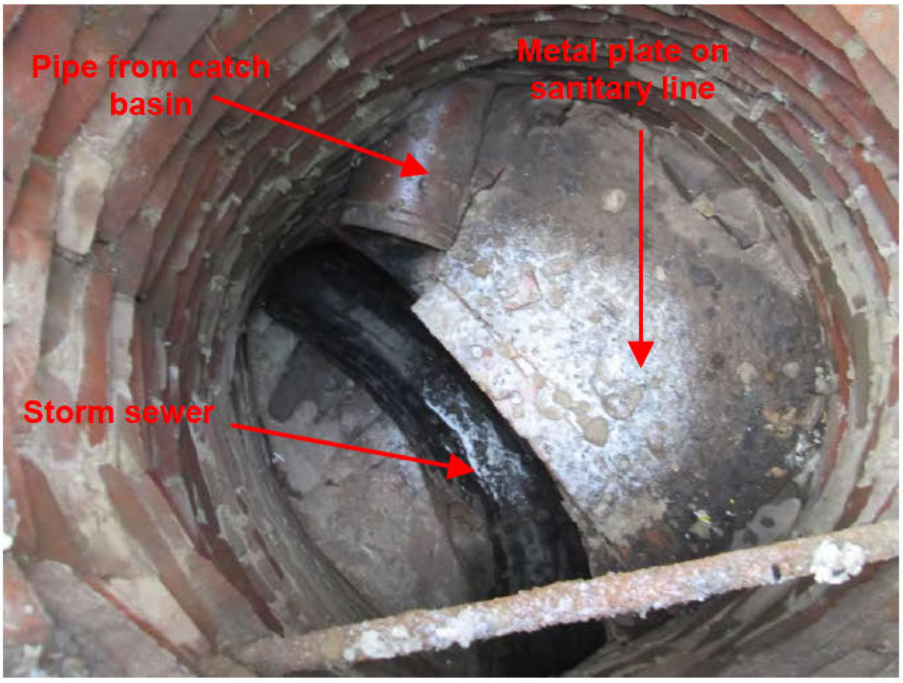
Photograph 28. **Twin Invert – Field Visit No. 13 – View into twin invert manhole. Note metal plate and retainer device on sanitary sewer line.**



Photograph 29. Twin Invert – Field Visit No. 13 – View of another twin invert manhole at the location. Note metal plate and retainer device on sanitary sewer line.

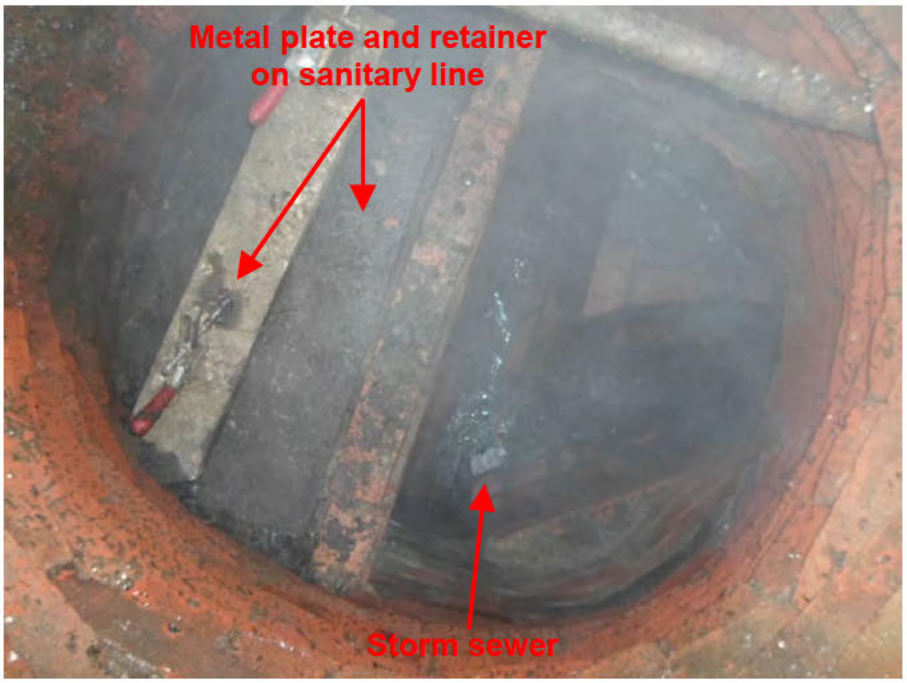
Photograph 30. Twin Invert – Field Visit No. 14 – View into twin invert manhole. Note retainer device appeared to be out of correct position.

Photograph 31. Twin Invert – Field Visit No. 15 – View into twin invert manhole. No flow observed. Note lack of metal plate.



Photograph 32. Twin Invert – Field Visit No. 16 – View into twin invert manhole. Note pipe from nearby catch basin and lack of retainer device.

Photograph 33. Twin Invert – Field Visit No. 16 – Close-up view of pipe and metal plate shown in Photograph 32.



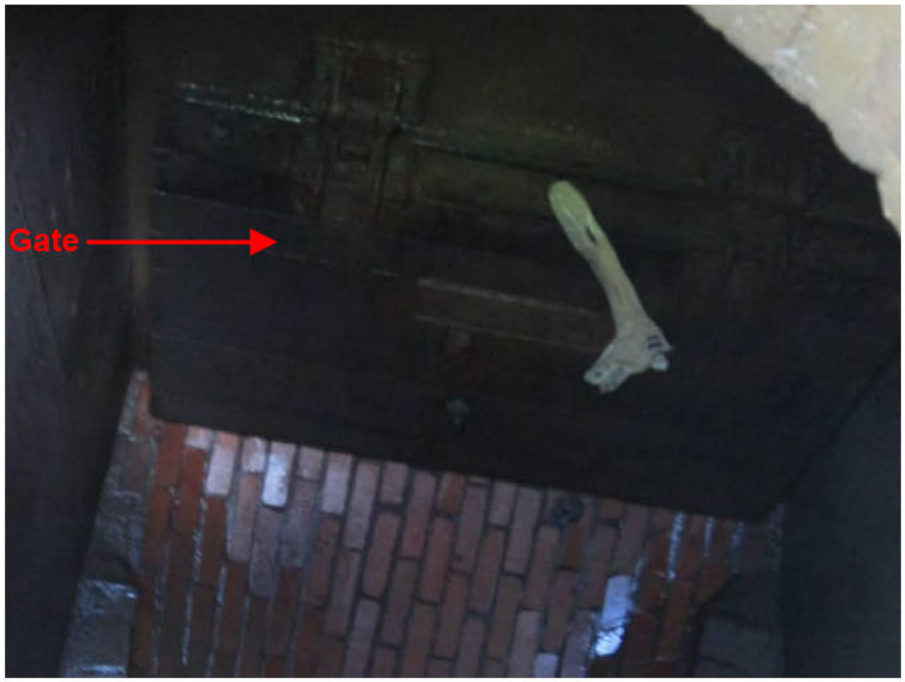
Photograph 34. Twin Invert – 8 Garland Avenue – Field Visit No. 17 – View into twin invert manhole. Note metal plate and retainer device.

Photograph 35. Twin Invert – 8 Garland Avenue – Field Visit No. 17 – View of iPad screen used by City staff with GIS-based map at this location.

Photograph 36. Twin Invert – 2 Thayer Street – Field Visit No. 18 – View into twin invert manhole. Note metal plate and retainer device.

Photograph 37. Twin Invert – 2 Thayer Street – Field Visit No. 18 – View of retainer device.

Photograph 38. Twin Invert – 2 Thayer Street – Field Visit No. 18 – View of City staff removing metal plate. Metal plate did not appear to have a gasket on the underside.



Photograph 39. Thomas at Summer Regulator – Field Visit No. 19 – View of regulator gate structure.

Photograph 40. Twin Invert – 10 Thayer Street – Field Visit No. 20 – View into twin invert manhole. Note metal plate and retainer device.

Photograph 41. Twin Invert – 10 Thayer Street – Field Visit No. 20 – View of iPad screen used by City staff with GIS-based map at this location.

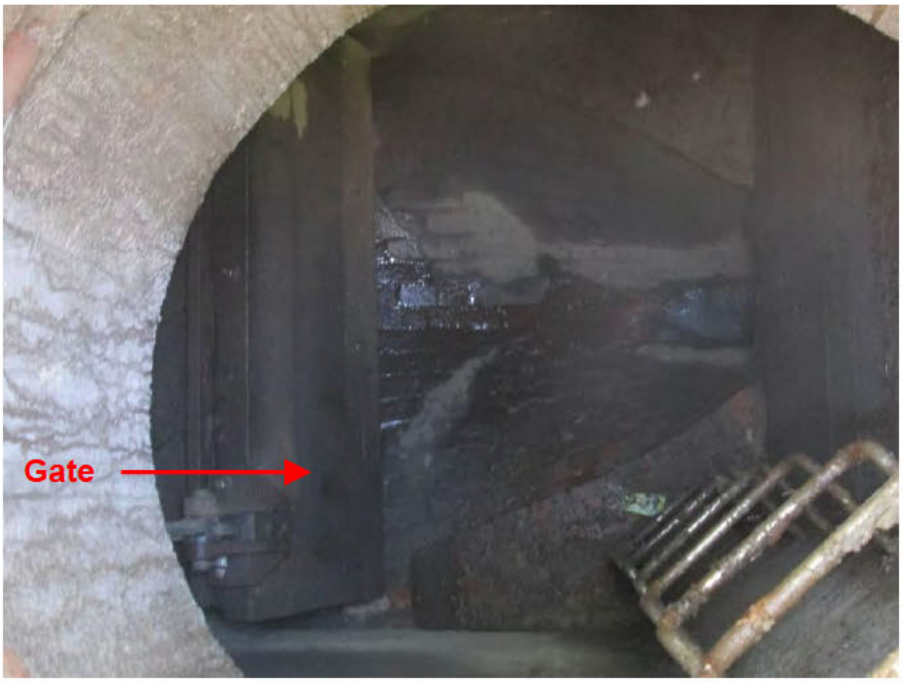
Photograph 42. Twin Invert – 2 Friedel Street – Field Visit No. 21 – View into twin invert manhole. Note metal plate and retainer device.

Photograph 43. Millbury at "Sigel" Regulator – Field Visit No. 22 – View into regulator structure.

Photograph 44. Millbury at "Sigel" Regulator – Field Visit No. 22 – View of regulator gate structure.

Photograph 45. Taylor at Millbury Regulator – Field Visit No. 22 – View into regulator structure. Low flow was observed in the sewer.

Photograph 46. Taylor at Millbury Regulator – Field Visit No. 22 – View of regulator gate structure.



Photograph 47. Millbury at Lafayette Regulator – Field Visit No. 23 – View of regulator gate structure. Note wetted area beyond the gate.

Photograph 48. Millbury at Ashmont Regulator – Field Visit No. 24 – View into regulator structure.

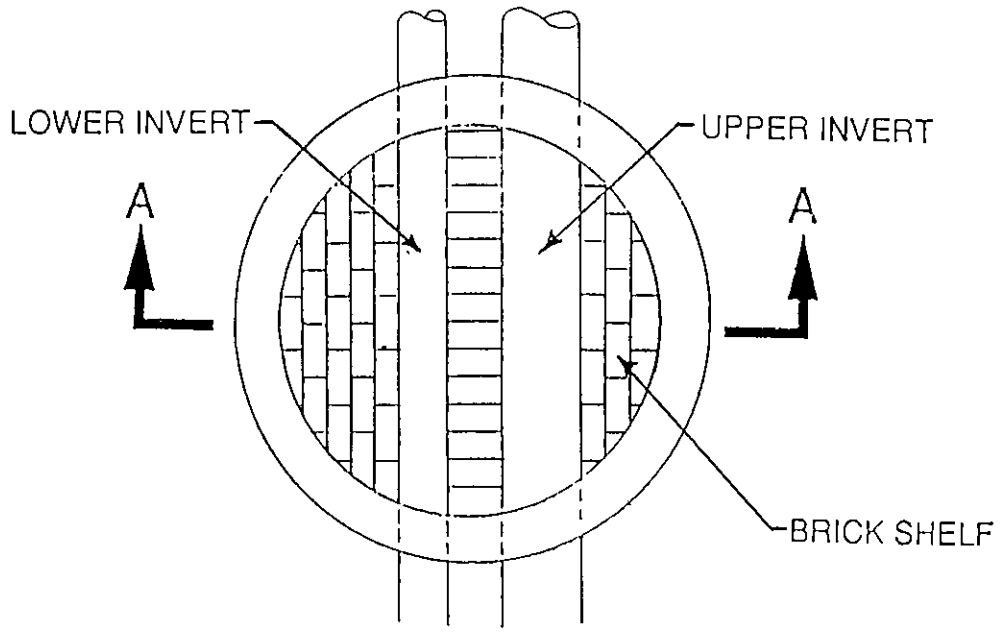
Photograph 49. Millbury at Ashmont Regulator – Field Visit No. 24 – View of flow in sewer line downstream of regulator.

Photograph 50. Twin Invert – Field Visit No. 25 – View into twin invert manhole. Note metal plate and retainer.

Photograph 51. Sewer Line Flushing – Field Visit No. 26 – View of sewer line which had been flushed.

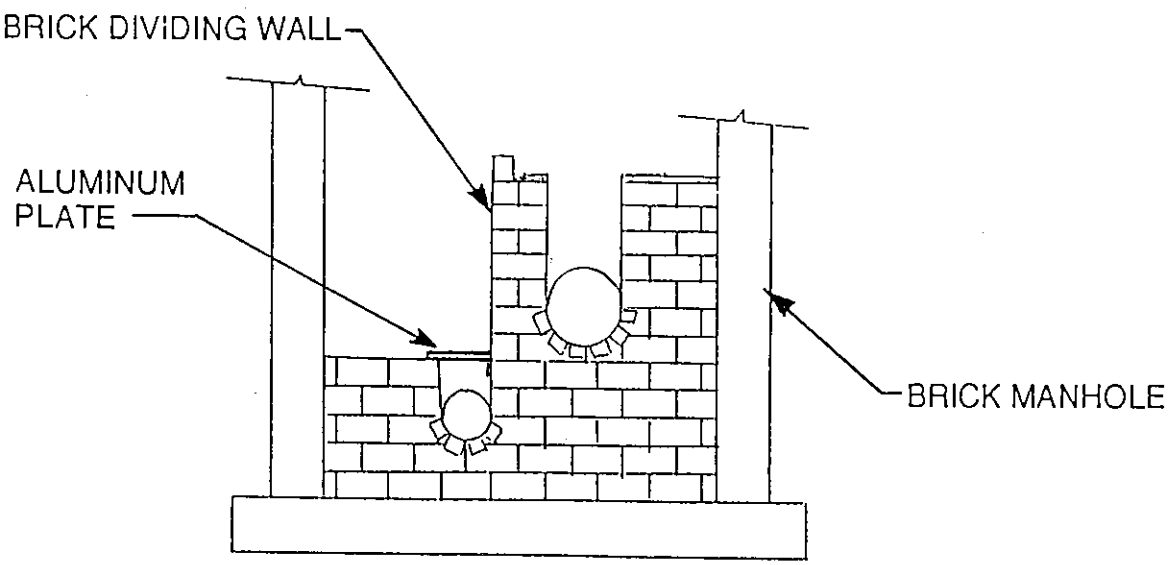
Photograph 52. Sewer Line Flushing – Field Visit No. 26 – View of hose and equipment in back of flusher truck.

Appendix 3
Schematic of Twin Invert Structure



PLAN

NOTE: THE SIZE AND CONTENTS OF THE UPPER AND LOWER INVERTS VARIES

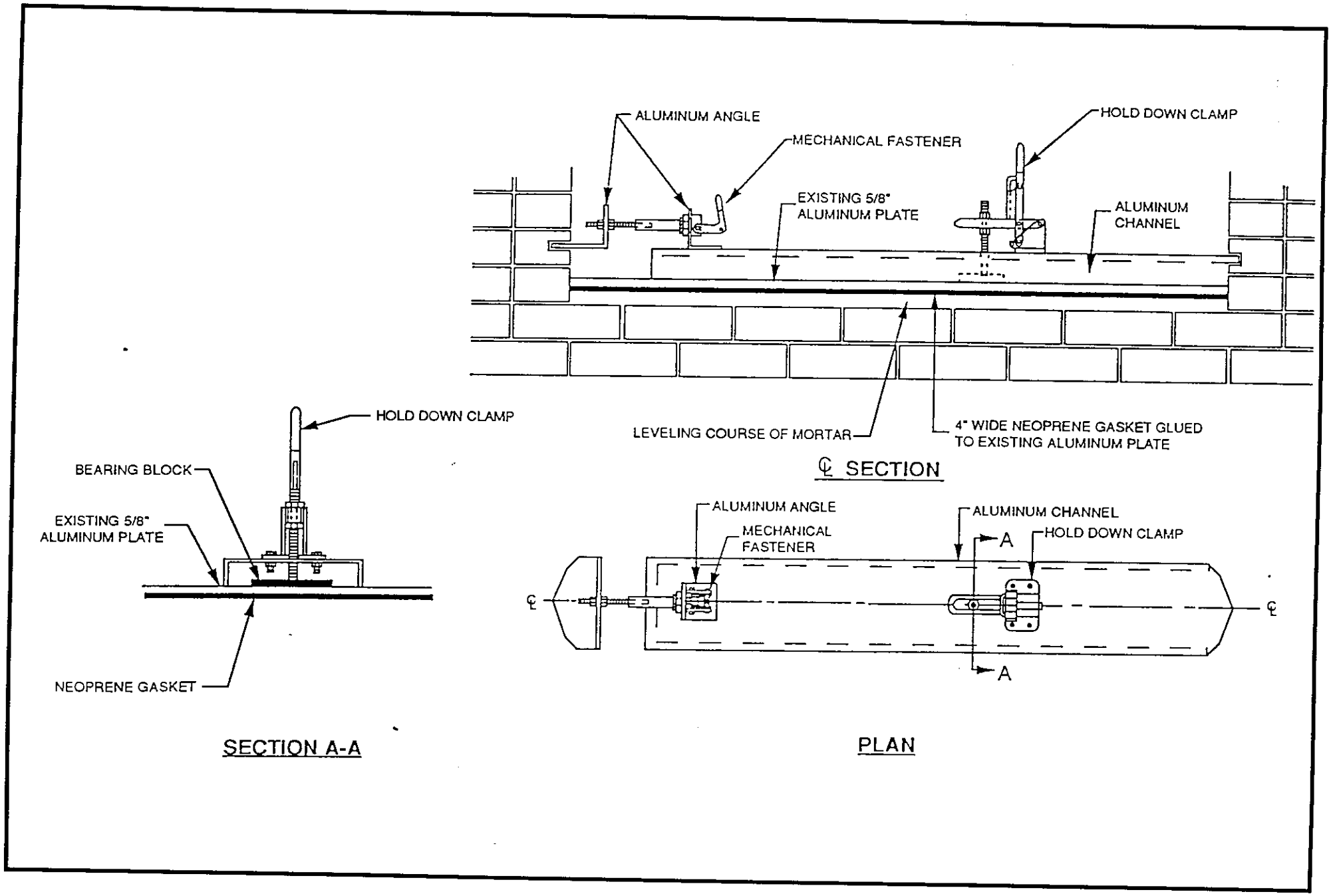


SECTION A-A

NOT TO SCALE

City of Worcester, Massachusetts
Department of Public Works

Figure 6-1
Twin Invert Manhole



City of Worcester, Massachusetts
Department of Public Works

Figure 6-2
Hold Down Device

Appendix 4
Twin Invert Map

CITY OF WORCESTER
TWIN INVERTS

Appendix 5
Summary of Possible Unauthorized Discharges

Year	Work Order No.	Problem Code	Location	Date Generated	Description	Work Order Notes	EPA Inspection Team Notes	Cause Based on City Work Order Notes
2010	1257662	SEWER BACKING UP IN HOUSE	99 DOWNING ST	1/24/2010	"SEWER BACKING UP IN BASEMENT"	1/24/2010: "called in crew for blocked sewer" 1/25/2010: "2-49 flushed and freed blocked sewer. Cause: Grease NO SSO"	Blockage in City sewer line due to grease. Cleared by City. Unclear why it states "NO SSO."	Grease
2010	1257872	SEWER BACKING UP IN HOUSE	15 CAMERON ST	1/25/2010	"OWNER OF SINGLE FAMILY HOME IS REPORTING THAT THE SEWER IS BACKING UP IN TO THE BASEMENT THROUGHT THE BASEMENTS BATHROOM. OWNER IS HOME NOW PLEASE ASSESS."	1/25/2010: "HI WATER 2-16 CHECKED SEWER WENT DOWN"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1257869	SEWER BACKING UP IN HOUSE	109 LAKE AVE	1/25/2010	"THERE IS SEWAGE BACKING UP IN THE RESIDENT BASEMENT"	1/25/2010: "High water, 2-32 spoke with owner's HAM"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1257750	SEWER BACKING UP IN HOUSE	87 OSCEOLA AVE	1/25/2010	"SEWER BACKING UP IN TO HOUSE, OWNER IS ON SITE NOW AND HAS GARABEDIAN PLUMBERS THERE. THEY HAVE CHEKCED OWNERS LINES AND THINK IT IS DUE TO THE CITYS SEWER LINES"	1/25/2010: "2-37 freed blocked sewer. Cause: gravel + others NO SSO"	Blockage in City sewer line due to grease. Cleared by City. Unclear why it states "NO SSO."	Grease
2010	1257893	SEWER BACKING UP IN HOUSE	31 SOUTHOLD RD	1/25/2010	"SAYS HE IS GETTING SOME SEWAGE BACKING UP INTO HIS CELLAR"	1/25/2010: "Blocked sewer freed by 2-37. Cause: grease NO SSO"	Blockage in City sewer line due to grease. Cleared by City. Unclear why it states "NO SSO."	Grease
2010	1257901	SEWER BACKING UP IN HOUSE	30 WHIPPLE ST	1/25/2010	"HAS WATER BACKING UP INTO A DRAIN IN THE CELLAR,,,ROTO-ROUTER IS THERE"	1/25/2010: "THIS WAS A BLOCKED SEWER" 1/26/2010: "2-49 freed blocked sewer Cause: Grease SSO"	Blockage in City sewer line due to grease. Cleared by City. Clearly identifies this as an SSO.	Grease
2010	1259873	SEWER BACKING UP IN HOUSE	28 CARO ST	2/10/2010	"MAINTENANCE PERSON FOR THIS MULTIFAMILY UNIT REPOERTING SEWER BACKING UP IN THE BASEMENT APARTMENT HE IS ON SITE NOW PLEASE ASSESS"	2/10/2010: "checked again by 4-5...found blocked sewer...refer to Joe B" 2/11/2010: "2-49 Freed blocked sewer. Not a SSO 30 galons of sewage spilled inside 28 Caro St. Cause:Grease & Rags"	Blockage in City sewer line due to grease and rags. Cleared by City. Unclear why it states "Not a SSO."	Grease
2010	1260027	SEWER BACKING UP IN HOUSE	1050 MAIN ST	2/12/2010	"HE IS ON THE SECOND FLOOR - CALLED SEWERS & SPOKE W/ VIOLET"	2/12/2010: "2-37 Freed blocked sewer. Cause: Grease NO SSO 2-14 put 2 pails of sanfax in sanitary line in front of 1050 Main st."	Blockage in City sewer line due to grease. Cleared by City. Unclear why it states "NO SSO."	Grease
2010	1260741	SEWER BACKING UP IN HOUSE	946 PLEASANT ST	2/22/2010	"SEWER IS BACKING UP IN THE BASEMENT OF THIS SINGLE FAMILY HOME, OWNER IS ON SITE CURRENTLY PLEASE ASSESS."	2/22/2010: "2-37 freed blockage due to paper and grease homeowner had approximately 100 to 125 gallons of sewerage in his home"	Blockage in City sewer line due to paper and grease. Cleared by City.	Grease

Year	Work Order No.	Problem Code	Location	Date Generated	Description	Work Order Notes	EPA Inspection Team Notes	Cause Based on City Work Order Notes
2010	1261106	SEWER BACKING UP IN HOUSE	109 LAKE AVE	2/24/2010	"CALLED SEWERS & SPOKE WITH VIOLET"	2/24/2010: "Hi water, sewer going to the lake"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1261298	SEWER BACKING UP IN HOUSE	91 LAKE AVE	2/25/2010	"SEAWAGE BACKING UP INTO BASEMENT"	2/26/2010: "high water ok to close"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1261303	SEWER BACKING UP IN HOUSE	40 SOUTHOLD RD	2/25/2010	"SEWER BACKINGUP IN HOUSE"	2/26/2010: "2-49 checked sewer line entire street high water lines were surcharging sewer pending Harvey Muir 2-49 checked this morning 8:30 AM line is down and running 2-26-2010 ok to close per Harvey Muir"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1261394	SEWER BACKING UP IN HOUSE	19 ELMWOOD ST	2/26/2010	"SEWER IS BACKING UP IN HOUSE"	2/26/2010: "Keith Gilchrist checked it out it was high water ok to close 2-26-2010 Backwater valve program"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1261306	SEWER BACKING UP IN HOUSE	299 LOVELL ST	2/26/2010	"SEWER BACKING UP IN HOUSE REFERRED TO SEWERS 2-26-2010"	2/26/2010: "Hight Water" 2/26/2010: "Michelle Montanez 4508-410-9404 called in because sewage is still backing up in her basement. She is stating that the problem is getting worse. Called over to sewer and spoke with Sue." 2/26/2010: "still high water per Wayne Savage 2:10 Andre is speaking to owner about backwater valve"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1261324	SEWER BACKING UP IN HOUSE	6 OLEAN ST	2/26/2010	"THE PHONE NUMBER ABOVE IS FOR HER FATHER (FRANCIS) - CALLED SEWERS & SPOKE WITH VIOLET"	2/26/2010: "high water per 2-14 Wayne Savage ok to close per Harvey Muir"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1261526	SEWER BACKING UP IN HOUSE	77 ORIENT ST	2/27/2010	"SEWER BACKING UP INTO HOME"	2/27/2010: "BLOCKED SEWER" 3/1/2010: "Cataldo, Carota in truck 2-49 with Ballotte freed blocked sewer. Lots of grease no. SSO."	Blockage in City sewer line due to grease. Cleared by City. Unclear why it states "no. SSO."	Grease
2010	1263118	SEWER BACKING UP IN HOUSE	32 AMHERST ST	3/14/2010	"SEWER IN THE CELLAR"	3/14/2010: "2-37 K.Gilchrist responded, the homeowner's tell" since they are working in Beaver Brook he have this problem"??He have sewer in His house. There are HI water condition in this area." 3/15/2010: "John called in that sewage is still backing up in his hosue. Called over to sewers spoke with Sharon" 3/15/2010: "Per Sewer radio communication: Sewer lines are running fine, due to heavy rain they are at capacity."	Appears to be backup due to capacity issues in City sewer line.	Capacity

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2010	1263119	SEWER BACKING UP IN HOUSE	28 CARO ST	3/14/2010	"SEWER BACKING UP IN THE HOUSE"	3/14/2010: "Trench collapsing, Riccardi Construction in charge are in site in this moments 2-39 responded vac'ed MH until Riccardi get the neccessary people" 3/14/2010: "2-39 VAC'ED THE MH NEAR 28 CARO ST. MR. P.DUPRE VAC'ED 4 TRUCK FULL OF SEWER FOR RICCARDI CONSTRACTION."	Appears to be structural issue with City sewer line.	Structural
2010	1263120	SEWER BACKING UP IN HOUSE	91 LAKE AVE	3/14/2010	"OWNERS SAYS SEWAGE COMING INTO BASEMENT"	3/14/2010: "2-37 gilchrist responded this is a blocked sewer Cause HI water surcharging in all the Mh's in the Lake"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1263105	SEWER BACKING UP IN HOUSE	1350 PLEASANT ST	3/14/2010	"SEWER BACKING UP IN THE HOUSE"	3/14/2010: "2-49 freed blocked sewer. Cause: regular blocked One house was afected Mr.Smarra talked to hime owner's"	Blockage in City sewer line. Cleared by the City. Does "regular blocked" mean "regulator blocked"?	Blockage - Material not identified
2010	1263255	SEWER BACKING UP IN HOUSE	12 CRESWELL RD	3/15/2010	"THERE IS SEWAGE BACKING UP INTO THE RESIDENT BASEMENT"	3/15/2010: "high water in sewer systen due to rain. Will discuss BWV with owner."	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1263247	SEWER BACKING UP IN HOUSE	36 INTERVALE RD	3/15/2010	"PLUMBER IS AT THE SITE, SEWER BACKING UP IN HOUSE."	3/15/2010: "high water in sewer system due to rain. Will continue to monitor area.. Will discuss BWV program with owner"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1263269	SEWER BACKING UP IN HOUSE	109 LAKE AVE	3/15/2010	"SEWER BACKINGUP IN HOUSE THROUGH SINKS"	3/15/2010: "High water in area due to rain. Will discuss BWV program with owner."	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1263222	SEWER BACKING UP IN HOUSE	1 MABELLE ST	3/15/2010	"OWNER OF SINGLE FAMILY HOME EXPERIENCING SEWER BACK UP IN THE BASEMENT. HAS PLUMBERS ON SITE NOW WHO SAY IT IS COMING FROM CITY SIDE."	3/16/2010: "2-14 Hi water running fine"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1263217	SEWER BACKING UP IN HOUSE	59 MIDLAND ST	3/15/2010	"CALLED THIS OVER TO SEWERS SPOKE WITH SHARON"	3/15/2010: "2-28 need to pump and flush" 3/16/2010: "Hi water running fine 2-14 W.Savage"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1264202	SEWER BACKING UP IN HOUSE	27 CHANDLER ST	3/23/2010	"SEWER BACKING UP IN CELLAR."	3/24/2010: "This was a blocked sewer, freed at Irving @ Chandler. Possible broken pipe. Also will be TV'd. MUIR"	Blockage in City sewer line. Cleared by the City. Possibly broken pipe. CCTV inspection requested.	Structural
2010	1264759	SEWER BACKING UP IN HOUSE	18 LOWELL ST	3/27/2010	"OWNER SAYS SEWER BACKING UP IN HOUSE. HE HAD PLUMBER CHECK HIS LINE AND SAYS ITS BLOCKED"	3/27/2010: "called in crew for Blocked Sewer line Harvey Muir, John Carota, and Keith Alen. 3-27-2010." 3/29/2010: "Freed blocked"	Blockage in City sewer line. Cleared by the City.	Blockage - Material not identified

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2010	1264919	SEWER BACKING UP IN HOUSE	49 LITCHFIELD ST	3/29/2010	"OWNER OF THIS 3 FAMILY HOME REPORTING SEWER BACKING UP IN TO THE CELLAR OF THE BUILDING AT THE MOMENT, THEY ARE ON SITE NOW."	3/29/2010: "2-49 flush restriction ASsphalt and concrete in invert nned to be taken out. W.Savage" 3/30/2010: "9:30 am 2-49 flushed the line just in case No a Blocked..Talked to homeowner's. RAMM"	Blockage in City sewer line. Cleared by the City. Appears to be due to debris in the sewer line.	Debris
2010	1264927	SEWER BACKING UP IN HOUSE	1350 PLEASANT ST	3/29/2010	"CALLER STATES THIS IS AN ONGOING PROBLEM AND HE HAS SPOKEN TO JOE BUCKLEY ABOUT THIS PROBLEM IN THE PAST. CALLER STATES THERE IS AN AREA ACROSS THE STREET THAT GETS BLOCKED AND THE CITY LINE NEEDS TO BE FLUSHED."	3/29/2010: "sewer was blocked. 2-39 truck found a lot of grease. Sewer was freed and is running. Dupre/Carota"	Blockage in City sewer line due to grease. Cleared by City.	Grease
2010	1265088	SEWER BACKING UP IN HOUSE	44 BELLEVUE ST	3/30/2010	"SEWAGE IS BACKING UP INTO THE BASEMENT"	3/30/2010: "Hi Water OK to CLOSE"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1265143	SEWER BACKING UP IN HOUSE	67 DEERFIELD ST	3/30/2010	"WATER 1' DEEP IN CELLAR"	4/2/2010: "Hi water No problem w/house"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1265124	SEWER BACKING UP IN HOUSE	47 GREENFIELD ST	3/30/2010	"WATER AND SAWERAGE IS GOING INTO BASEMENT - HAS SUMP PUMP IS RUNNING BUT HAVING A HARD TIME KEEPING UP WITH IT."	3/30/2010: "2-42 Checked mh's in area. HI water. OK to close"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1265065	SEWER BACKING UP IN HOUSE	15 HAROLD ST	3/30/2010	"STARTED ABOUT AN HOUR AGO. ROBERT PUZO HOME OWNER IS ON SITE"	3/30/2010: "Hi Water water going down slowly"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1265129	SEWER BACKING UP IN HOUSE	12 JUNE ST	3/30/2010	"ENTRANCE IS AROUND THE BACK OF THE PROPERTY. LANDLORD CALLED AND STATED THAT TO THEIR KNOWLEDGE ITS ONLY THE BASEMENT APT THAT IS HAVING ISSUE WITH SEWER BACKING UP AND OVERFLOWING FROM TOILET."	3/30/2010: "High water OK to close"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1265099	SEWER BACKING UP IN HOUSE	18 KINNICUT RD SO	3/30/2010	"SEWAGE IS BACKING UP INTO THE HOUSE"	4/2/2010: "Hi water, line still up 4/1/10 Hi water"	Appears to be backup due to capacity issues in City sewer line.	Capacity

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2010	1265131	SEWER BACKING UP IN HOUSE	199 LAKE AVE	3/30/2010	"SEWERAGE BACKIN GUP INTO TUB (1ST FLOOR) AND HAS VERY FOUL ODOR AND ALSO FILLING TOILET BUT NOT OVERFLOWING YET"	3/30/2010: "A.Louzado responded talked to the Lady Hi water. - needs back water valve. ok to close"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1265119	SEWER BACKING UP IN HOUSE	6 MABELLE ST	3/30/2010	"OWNER OF SINGLE FAMILY HAVING SEWER BACKING UP IN TO HOUSE. OWNER IS ON SITE NOW AND USING TWO SUB-PUMPS BUT MORE SEWER IS COMING IN"	3/31/2010: "Paulino called in for an update, I spoke with Violet in Sewers she stated the sewers are running high and crews are checking the lines twice a day (morning & afternoon)."	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1265137	SEWER BACKING UP IN HOUSE	85 MOWER ST	3/30/2010	"WATER COMING OUT OF TOILET"	4/3/2010: "At 10:20 am sewer still surcharging" 4/5/2010: "At 10:55 am Sewer back to normal level"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1264968	SEWER BACKING UP IN HOUSE	6 OLEAN ST	3/30/2010	None noted	3/30/2010: "2-14 responded checked line they running high. HI Water - W.Savage"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1265046	SEWER BACKING UP IN HOUSE	16 SACHEM AVE	3/30/2010	"WATER AND SEWAGE IS BACKING UP INTO THE BASEMENT"	3/30/2010: "High water MH surcharging. 2-39 freed Blocked Sewer"	Appears to be backup due to capacity issues and a blockage in City sewer line.	Blockage - Material not identified
2010	1264944	SEWER BACKING UP IN HOUSE	101 SOUTH FLAGG ST	3/30/2010	None noted	3/30/2010: "2-14 and 2-49 responded this is a Hi Water condition all's MH's in the area are high so much rain."	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1265135	SEWER BACKING UP IN HOUSE	31 SOUTHOLD RD	3/30/2010	"STATES THAT THERE IS SEWERAGE BACKING UP INTO THE PROPERTY"	3/30/2010: "2-39 flushed from Greenwood to Southhold Hi water going down slowly OK to closed"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1265132	SEWER BACKING UP IN HOUSE	40 SOUTHOLD RD	3/30/2010	"SEWERAGE BACKING UP INTO PROPERTY. SAID THIS IS A RECURRENT ISSUE"	3/30/2010: "2-39 Flushed from Greenwood to Southold. High Water water going down slowly OK to close"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1265121	SEWER BACKING UP IN HOUSE	28 SPRING VALLEY RD	3/30/2010	"SEWER BACKING UP IN TO BASEMENT, PUMP IS NOT KEEPING UP.OWNER ON SITE NOW"	3/30/2010: "High water OK to close"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1265134	SEWER BACKING UP IN HOUSE	8 TIFFANY AVE	3/30/2010	"SAID THAT CHECK VALVE IS HOLDING THE BULK, BUT IS STILL LEAKING INTO BASEMENT."	3/30/2010: "Hi water ok to close"	Appears to be backup due to capacity issues in City sewer line.	Capacity

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2010	1265141	SEWER BACKING UP IN HOUSE	15 TIFFANY AVE	3/30/2010	"HAS BAD-SMELLING WATER BACKING UP...SPME DEBRIS"	3/30/2010: "2-42 spoke to owner's whole area has high water. OK to close"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1265094	SEWER BACKING UP IN HOUSE	61 VALLEY HILL DR	3/30/2010	"SEWER BACKING UP IN CELLAR, BATHROOM."	3/31/2010: "Hight water. Talked to home owner about Back Water Valve Program"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1265337	SEWER BACKING UP IN HOUSE	14 GAMBIER ST	3/31/2010	"SEWER BACKING INTO HOME"	4/2/2010: "Hight water. Talked with the owner"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1265336	SEWER BACKING UP IN HOUSE	5 GENEVA ST	3/31/2010	"SEWER BACKING UP INTO HOUSE"	4/2/2010: "Ground water coming in main line CHAD"	Appears to be backup due to capacity issues in City sewer line. No note for follow-up inspection.	Capacity
2010	1265323	SEWER BACKING UP IN HOUSE	128 INSTITUTE RD	3/31/2010	"SEWER BACKING UP IN CELLAR"	4/1/2010: :"J.Buckley checked this complaint and said is HI WATER OK to close"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1265300	SEWER BACKING UP IN HOUSE	17 KINNICUT RD SO	3/31/2010	"CALLER STATES THERE IS 4 1/2 FEET OF RAW SEWAGE IN HER BASEMENT AND THAT SHE HAS 2 PUMPS AND 2 WET VACS RUNNING"	3/31/2010: "2-14 W Savage responded he said is a HI WATER problem Pending" 4/2/2010: "Hi water"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1265215	SEWER BACKING UP IN HOUSE	97 NEWTON AVE NORTH	3/31/2010	None noted	3/31/2010: "Hi water"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1265489	SEWER BACKING UP IN HOUSE	44 BELLEVUE ST	4/1/2010	"REFER TO WORK ORDER 1265088 - CALLER STATES THERE IS STILL SEWER BACKING UP IN THE HOUSE - HE IS THE ROPERTY OWNER"	4/1/2010: "2-39 freed Blocked Sewer. Cause: Grease NO SSO"	Blockage in City sewer line due to grease. Cleared by City. Unclear why it states "NO SSO."	Grease
2010	1265541	SEWER BACKING UP IN HOUSE	26 ELMWOOD ST	4/1/2010	"SAYS THAT THEY HAVE WATER COMING UP IN HER YARD & INTO HER HOUSE."	4/2/2010: "Sewer actively coming back up through basement. Spoke with Violet and Dave Luft, says it was high water, house is built down lower than the rest of the neighborhood manhole is high, whole neighborhood is surcharging. Nothing they are able to do at this point."	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1265598	SEWER BACKING UP IN HOUSE	8 CRESWELL RD	4/2/2010	None noted	4/2/2010: "2-14 checked this is a Hi Water"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2010	1265657	SEWER BACKING UP IN HOUSE	50 MAYWOOD ST	4/2/2010	"SEWER BACKING UP IN CELLAR"	4/2/2010: "R.Maher and Randy Parent found blocked sewer lines." 4/5/2010: "2- 49 freed the blockage due to grease and rags gary mooskian checked the location on 4-5-2010 and it is running fine"	Blockage in City sewer line due to grease and rags. Cleared by City.	Grease

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2010	1269801	SEWER BACKING UP IN HOUSE	101 SOUTH FLAGG ST	5/8/2010	"CALLER SAYS THERE IS RAW SEWAGE COMING UP THROUGH HIS SHOWER DRAIN"	5/8/2010: "R.MAHER/R.PARENT RESPONDED AND IT WAS FOUND TO BE A BLOCKED SEWER" 5/10/2010: "Cause/ Grease: Vehicle #2-49 Freed the obstruction and reported that the cause was grease"	Blockage in City sewer line due to grease. Cleared by City.	Grease
2010	1270056	SEWER BACKING UP IN HOUSE	39 OBERLIN ST	5/11/2010	"3-4 INCHES OF SEWERAGE BACKED UP IN THIS SINGLE FAMILY'S BASEMENT. HOME OWNER ON SITE NOW"	5/12/2010: "Owner claim to have a foot of raw sewage in her cellar due to Blocked Sewer 5/10/10. Owners is responsable to clean up. She will contact Law Office. Cause:Grease, Gravel NO SSO"	Blockage in City sewer line due to grease and gravel. Cleared by City. Unclear why it states "NO SSO."	Grease
2010	1270902	SEWER BACKING UP IN HOUSE	8 NUTMEG DR	5/18/2010	"SEWAGE IS BACKING UP INTO THE RESIDENTS BASMENT"	5/18/2010: "2-14 responded to this blocked sewer . 2-37 flushed the line and freed the blockage Cause" Grease" NO SSO"	Blockage in City sewer line due to grease. Cleared by City. Unclear why it states "NO SSO."	Grease
2010	1274752	SEWER BACKING UP IN HOUSE	92 BIRCH ST	6/18/2010	"SEWER BACKING UP IN THE HOUSE"	6/18/2010: "complaint and w/2-49 flusher freed blocked sewer. Cause: Grease + NO SSO"	Blockage in City sewer line due to grease. Cleared by City. Unclear why it states "NO SSO."	Grease
2010	1277917	SEWER BACKING UP IN HOUSE	64 CHINO AVE	7/17/2010	"SEWER BACKING UP IN HOUSE"	7/17/2010: "AFTER ARRIVING THE CREW FOUND IT TO BE A BLOCKED SEWER LINE. CALLED IN A SEWER CREW (R. CALTADO, J.CAROTA, AND K. CHAREST) WHO FLUSHED THE LINE AND IT IS O.K. NOW." 7/22/2010: "Freed blockage no SSO"	Blockage in City sewer line. Cleared by City. Unclear why it states "no SSO."	Blockage - Material not identified
2010	1278516	SEWER BACKING UP IN HOUSE	77 MASSASOIT RD	7/22/2010	"SEWER BACKING UP"	7/22/2010: "2-49 freed blocked sewer ok to close"	Blockage in City sewer line. Cleared by City.	Blockage - Material not identified
2010	1281486	SEWER BACKING UP IN HOUSE	100 BARBER AVE	8/19/2010	"Sewerage is leaking into transformer outside the building in side parking lot. Next to Higgin's Armory."	8/19/2010: "2-49 freed the blockage 8-19-2010"	Blockage in City sewer line. Cleared by City.	Blockage - Material not identified
2010	1286024	SEWER BACKING UP IN HOUSE	1050 MAIN ST	9/25/2010	"CALLER HAVING TOILET BACKING UP IN APARTMENT. HE SAID THAT NORMALLY WHEN THIS HAPPENS, THE SEWER IS BLOCKED MAIN @ CAMBRIDGE STREET"	9/25/2010: "BLOCKED SEWER" 9/25/2010: "SEWER UNBLOCKED BY CATALDO AND CREW - W/O CLOSED" 9/27/2010: "Parent was operating flusher because clerk went through list and nobody was available. alot of grease and cigaretts some cardboard reason for blockage. This was not an SSO."	Blockage in City sewer line due to grease and debris. Cleared by City. Unclear why it states "This was not an SSO."	Grease

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2010	1287548	SEWER BACKING UP IN HOUSE	132 JUNE ST	10/7/2010	"the landlord is calling. a tenant of his reported to him that the sewer is backing up. he lives in the cellar apt. backing up in tubs, toilets."	10/7/2010: "2-49 freed blockage ok to close per John Dalbeck it was filled with grease it was not an SSO"	Blockage in City sewer line due to grease. Cleared by City. Unclear why it states "it was not an SSO."	Grease
2010	1288288	SEWER BACKING UP IN HOUSE	50 MAYWOOD ST	10/13/2010	"Sewage is backing up into the sink in the basement"	10/13/2010: "2-49 freed blockage full of sheets and rags ok to close"	Blockage in City sewer line due to sheets and rags. Cleared by City.	Debris
2010	1289095	SEWER BACKING UP IN HOUSE	11 EVERS ST	10/20/2010	"sewage backing up in house. 11 Evers Street. GNO Plumbing called this in, they are on site right now."	10/20/2010: "This was a blocked sewer was freed by 2-49 Cause :Grease and debris No SSO"	Blockage in City sewer line due to grease and debris. Cleared by City. Unclear why it states "No SSO."	Grease
2010	1289993	SEWER BACKING UP IN HOUSE	61 SEVER ST	10/27/2010	"Snaked the line but sewage is still backing up. Caller states the sewer line comes out on Roxbury St,"	10/27/2010: "2-37 freed blocked sewer Cause: mix debris NO SSO"	Blockage in City sewer line due to debris. Cleared by City. Unclear why it states "NO SSO."	Debris
2010	1290481	SEWER BACKING UP IN HOUSE	32 LAKESIDE AVE	11/1/2010	"Sewer backing up"	11/1/2010: "2-37 freed blockage full of grease and rags this was an SSO"	Blockage in City sewer line due to grease. Cleared by City. Clearly identifies this is an SSO.	Grease
2010	1291963	SEWER BACKING UP IN HOUSE	295 PLEASANT ST	11/15/2010	"Sewer backing up in cellar"	11/15/2010: "BLOCKED SEWER" 11/15/2010: "SEWER FREED"	Blockage in City sewer line. Cleared by City.	Blockage - Material not identified
2010	1292345	SEWER BACKING UP IN HOUSE	32 CAMBRIDGE ST	11/18/2010	None noted	11/18/2010: "full of grease 2-39 freed blockage ok to close per Wayne Savage"	Blockage in City sewer line due to grease. Cleared by City.	Grease
2010	1292561	SEWER BACKING UP IN HOUSE	105 SOUTH FLAGG ST	11/19/2010	"SEWERAGE BACKING UP IN CELLAR"	11/20/2010: "BLOCKED SEWER" 11/20/2010: "FREED UP SEWER, WAS FULL OF GREASE & RAGS" 11/20/2010: "Flushed line and found the cause to be GREASE/RAGS. Re-flushed line. Going to try and put sanfax in line later today. Crew Cataldo-Gilchrist-Hernandez with truck 2-37."	Blockage in City sewer line due to grease. Cleared by City.	Grease
2010	1292885	SEWER BACKING UP IN HOUSE	3 HOLT AVE	11/23/2010	"sewage backing up in cellar of 3 Holt Ave"	11/23/2010: "sewer filled with roots ok to close"	Does not specify whether blockage was in City sewer line or private lateral. Simply states "sewer filled with roots." Because the City checks its own lines, it appears that the accumulated roots were in the City sewer line.	Roots

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2010	1293602	SEWER BACKING UP IN HOUSE	105 SOUTH FLAGG ST	12/2/2010	"SEWER BACKING UP IN CELLAR. ALSO SHE HAS A PUMP IN HER CELLAR PUPMPING IT OUT"	12/2/2010: "ok to close 2-39 freed blocked sewer line it was a SSO roots"	Blockage in City sewer line due to roots. Cleared by City. Clearly identifies this as an SSO.	Roots
2010	1293787	SEWER BACKING UP IN HOUSE	1 CLAPP ST	12/3/2010	"Caller reporting sewer backing up in House"	12/3/2010: "homeowners problem blocked sewer 2-49 flushed not a SSO was full of grease and rags ok to close" 12/6/2010: "Spoke with John he states the rags & grease is coming from the resident at 5 Clapp St."	Work order states both that it was a "homeowner problem" and also indicates there was a blockage in the City sewer line due to rags and grease. Unclear why it states "not a SSO."	Grease
2010	1294414	SEWER BACKING UP IN HOUSE	11 CARLETON ST	12/11/2010	"GUFSTASON PLUMBING SAYS OWNERS HOUSE IS BACKING SEWAGE UP"	12/11/2010: "OVER A FOOT OF SEWAGE ENTERED BASEMENT OF #12 CARLETON STREET. BLOCKAGE WAS ON CITY LINE. SEWER WAS FREED UP BY R. CATALDO AND CREW" 12/13/2010: "Blockage freed by 2-37 crew Cataldo/Parent/Allen. Found rags and grease that caused blockage."	Blockage in City sewer line due to grease and rags. Cleared by City.	Grease
2010	1294407	SEWER BACKING UP IN HOUSE	17 LYMAN ST	12/11/2010	"OWNER STATES SEWAGE BACKING UP IN HOUSE"	12/11/2010: "REFERRED TO CREW FOR BLOCKED SEWER" 12/11/2010: "rocky and crew freed" 12/13/2010: "Lots of grease and debris found. Flushed line again. Cataldo/Berenson/Allen crew. To be TV'D ASAP"	Blockage in City sewer line. Cleared by City. Appears to have been caused by grease and debris. CCTV inspection requested.	Grease
2010	1294426	SEWER BACKING UP IN HOUSE	17 LYMAN ST	12/12/2010	"SEWER IS BACKING UP INTO HOUSE"	12/12/2010: "CREW FREED BLOCK SEWER" 12/12/2010: "MAHER AND CREW FOUND GRAVEL, SEWER LINE SHOULD BE CAMARA'ED"	Blockage in City sewer line. Cleared by City. Appears to have been caused by gravel. CCTV inspection requested.	Debris
2010	1295538	SEWER BACKING UP IN HOUSE	40 SOUTHOLD RD	12/23/2010	"sewage backing up in cellar. single family home. 40 southold rd."	12/23/2010: "BLOCKED SEWER" 12/23/2010: "BLOCKED SEWER IS CLEARED UP BY GILCHRIST & ARCOUETTE" 12/23/2010: "SEVERAL MANHOLES ON SOUTHHOLD RD NEEDS TO BE VACCUM" 12/27/2010: "ok to close blockage cleared / blockage due to shop rags and grease blockage cleared by c arcoute and k. gilchrist. open a new complaint for vac out manholes on southhold"	Blockage in City sewer line due to grease and rags. Cleared by City.	Grease
2011	1297036	SEWER BACKING UP IN HOUSE	299 LOVELL ST	1/8/2011	"HAS SEWER BACKING UP INTO HER BASEMENT"	1/8/2011: "IT'S A BLOCKED SEWER" 1/9/2011: "Freed blocked sewer, Cataldo, Macjewski, Allen. To be sanfaxed Monday morning"	Blockage in City sewer line. Cleared by City.	Blockage - Material not identified
2011	1297373	SEWER BACKING UP IN HOUSE	210 PARK AVE	1/11/2011	"Emergency - Commercial UPS - Store - she states sewer backing up in cellar"	1/11/2011: "per John Dalbeck ok to close was an SSO 2-49 freed blockage"	Blockage in City sewer line. Cleared by City. Clearly identifies this as an SSO.	Blockage - Material not identified

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2011	1298122	SEWER BACKING UP IN HOUSE	8 LYON ST	1/13/2011	"Sewage is backing up into the basement"	1/13/2011: "ok to close sewer blockage -2-37 freed blockage , not an sso blockage unknown ok to close out wayne savage is stating that shrewsbury st is running high"	Blockage in City sewer line. Cleared by City. Unclear why it states "not an sso." Appears that that may also be related to a capacity issue.	Blockage - Material not identified
2011	1300624	SEWER BACKING UP IN HOUSE	65 CROWNINGSHIELD RD	1/24/2011	"sewer backing up in cellar"	1/24/2011: "FOUND TO BE A BLOCKED SEWER, CALLED IN CREW TO FREE." 1/24/2011: "R.CATALDO AND CREW FREED UP"	Blockage in City sewer line. Cleared by City.	Blockage - Material not identified
2011	1301608	SEWER BACKING UP IN HOUSE	10 STEVENS RD	1/27/2011	"CALLER HAS SEWER BACKING UP INTO HOME - ROTO ROOTER HAS BEEN AT HOME AND SAID HE WENT OUT 100 FEET"	1/28/2011: "2-11 called in car plate over MH. Was able to get address and have owner move car. Sewer is blocked." 1/28/2011: "Sewer Freed By 2-37. Needs to be CCTV inspected. Flusher was having trouble aprox 50' from MH."	Blockage in City sewer line. Cleared by City. CCTV inspection requested.	Blockage - Material not identified
2011	1303860	SEWER BACKING UP IN HOUSE	210 WEST ST	2/4/2011	None noted	2/4/2011: "2-37 freed sewer"	Blockage in City sewer line. Cleared by City.	Blockage - Material not identified
2011	1304331	SEWER BACKING UP IN HOUSE	71 CAMBRIDGE ST	2/6/2011	"SEWER BACKING UP IN HOUSE"	2/6/2011: "water checked MH's. Sewer up in Cambridge Street. KB to call in crew to free sewer" 2/6/2011: "2-37 having trouble. pulling back gravel and brick. 2-39 to respond" 2/6/2011: "2-39 freed sewer. need to cctv sewer. flusher kept getting stuck"	Blockage in City sewer line. Cleared by City. CCTV inspection requested.	Blockage - Material not identified
2011	1304462	SEWER BACKING UP IN HOUSE	10 STEVENS RD	2/6/2011	"HAS SEWER BACKING UP INTO HER HOME"	2/6/2011: "K.GILCHRIST & K. CHAREST FREE UPA BLOCKED SEWER. REFER TO SEWER DEPT" 2/7/2011: "sewer freed. will cctv line"	Blockage in City sewer line. Cleared by City. CCTV inspection requested.	Blockage - Material not identified
2011	1306694	SEWER BACKING UP IN HOUSE	34 TORONITA AVE	2/24/2011	"this building is vacant because resident is in a nursing home - this was called in by his cousin Kenneth Carlson 203-885-5970"	2/24/2011: "2-37 freed blocked sewer 2-24-2011"	Blockage in City sewer line. Cleared by City.	Blockage - Material not identified
2011	1306912	SEWER BACKING UP IN HOUSE	121 HIGHLAND ST	2/25/2011	"STEVE FROM HIGHLAND LIQUORES AND BOYNTON RESTAURANT SAYS SEWER IS BACKING UP IN BUILDING"	2/25/2011: "Keith Gilchrest and Keith Allen for Meo3 and Meo 1 for blocked sewer at Boynton Rest /Liquor Store" 2/25/2011: "1 manhole in front of #15 Ormond Street and 2 manholes in front of Church on Ormond Street needs to be vaccumed asap or Monday 2-28-11 per R.Poske/Randy Parent and crew that freed blockage 2-25-11" 2/27/2011: "Sewer line loaded with grease. Blockage freed by 2-49 truck. Cataldo/Gichrist/Allen. Poske and Parent assisted. May have to be vaced Monday. No SSO."	Blockage in City sewer line due to grease. Cleared by City. Unclear why it states "No SSO."	Grease

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2011	1307582	SEWER BACKING UP IN HOUSE	16 SACHEM AVE	3/2/2011	"2-37 WILL RESPOND TO SEWER BACKING UP"	3/2/2011: "2-37 freed the blockage cause was grease and roots"	Blockage in City sewer line due to grease and roots. Cleared by City.	Grease
2011	1307687	SEWER BACKING UP IN HOUSE	41 UPLAND ST	3/3/2011	"HAS SEWER BACKING UP INTO HIS HOUSE, NEAR HIS BASEMENT FLOOR"	3/3/2011: "Sanitary sewer overflow at this location" 3/3/2011: "2-49 freed block sewer which was coming out of manhole in backyard (cause is paper products)"	Blockage in City sewer line due to paper products. Cleared by City. Clearly identifies this as an SSO.	Debris
2011	1307952	SEWER BACKING UP IN HOUSE	299 LOVELL ST	3/5/2011	None noted	3/5/2011: "SEWER FREED" 3/6/2011: "Blockage by grease"	Blockage in City sewer line due to grease. Cleared by City.	Grease
2011	1308122	SEWER BACKING UP IN HOUSE	60 BEAVER BROOK PKWY	3/7/2011	None noted	3/7/2011: "will be monitored until high water recedes" 3/7/2011: "Kelly called in stating that the water is still backing up in her house. Called over to sewers spoke to Rocky. Per Rocky the pipe in that area is full and they are running a 6 inch pump to alleviate the pressure. This should make the water stop backing up at the property. Informed resident of this."	Appears to be backup due to capacity issues in City sewer line.	Capacity
2011	1308013	SEWER BACKING UP IN HOUSE	30 MANN ST	3/7/2011	"caller states sewer backing in her washing machine, toilet."	3/7/2011: "crew has been dispatched per Radio communication" 3/7/2011: "monitor ground water" 3/9/2011: "Resident called in that the sewage is still backing up in her house and has been for the last 3 days. Called over to sewers spoke to Sue and she said that they will have someone check this location. Informed resident of this. Joe Buckley called and asked that I send him a copy of the work order" 3/9/2011: "The resident should consider Back Water Valve - Sewer Division has been on site twice. will return later today" 3/23/2011: "was high water due to rains/snow melt. mann st level has gone down"	Appears to be backup due to capacity issues in City sewer line. Recurring issue.	Capacity
2011	1307988	SEWER BACKING UP IN HOUSE	103 MOWER ST	3/7/2011	"sewage back up in cellar, there is also water flooding into the cellar as well. resident states that it IS a flooding condition. wife will be home today."	3/7/2011: "monitor high water" 3/28/2011: "Derek called because he is wondering if he can seek reimbursement for the sewage clean up in his house. i called sue in sewer division, she stated that derek should contact the law department. he is also wondering if the sewer division will eventually come up and fix the city sewer lines because this happens at least once a year."	Appears to be backup due to capacity issues in City sewer line. Recurring issue.	Capacity

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2011	1308137	SEWER BACKING UP IN HOUSE	210 PARK AVE	3/7/2011	"Sewerage is backing up through toilets"	3/7/2011: "Sanitary sewer overflow at this location" 3/7/2011: "2-39 crew freed the block sewer ok to close"	Blockage in City sewer line. Cleared by City.	Blockage - Material not identified
2011	1307969	SEWER BACKING UP IN HOUSE	101 SOUTH FLAGG ST	3/7/2011	None noted	3/8/2011: "Sanitary sewer overflow at this location"	Clearly identifies this is an SSO. No details given regarding cause.	Not identified
2011	1307964	SEWER BACKING UP IN HOUSE	8 TIFFANY AVE	3/7/2011	"HAS SEWER BACKING UP. NEED SOMEONE TO CHECK IT OUT BEFORE IT GETS WORSE"	3/7/2011: "ok to close high water per j. dalbeck"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2011	1308430	SEWER BACKING UP IN HOUSE	3 FARNUM TER	3/9/2011	"sewer backing up in house, plumber is at the sites."	3/9/2011: "sewer crew 2-49 flushed sewer believed to be broken - met water staff at 12:30 water excavation is source of broken line. Crew is on site." 3/11/2011: "see 1368756. water dept broke sewer main. main was repaired. sewer is now ok"	Backup appears to have been caused by break in City sewer line.	Structural
2011	1309511	SEWER BACKING UP IN HOUSE	28 CARO ST	3/17/2011	"Tom is the maintenance person for this property. A few days ago, there was sewage backing up in the toilet in basement apartment. Now, the drain pipe in the bathroom is leaking sewage. He is on site now"	3/17/2011: "2-39 freed blocked sewer full of gravel John Dalbeck spoke with maintenance man"	Blockage in City sewer line due to gravel. Cleared by City.	Debris
2011	1309453	SEWER BACKING UP IN HOUSE	35 FRUIT ST	3/17/2011	"SEWAGE BACKING UP IN BASEMENT. ACCORDING TO POLICE A PIPE IS CRACKED IN BASEMENT"	3/17/2011: "sewer from Cedar St. @ Seaver St. the diagonal connection had an unknown restriction holding back the line mr dupre is going to sign out the 2-39 and clean the remnants from the restriction. ok to close" 3/17/2011: "2-39 found lines loaded with Grease per Sal radio communication with field crew"	Blockage in City sewer line due to grease. Cleared by City.	Grease
2011	1309768	SEWER BACKING UP IN HOUSE	71 CAMBRIDGE ST	3/18/2011	"Sewerage backing up through the "pipe near the toilet" and in the toilet"	3/18/2011: "RICH & KEITH CHECKED IT OUT, IT'S A BLOCKED SEWER CALLED IN BOB GUSTAFSON, PAUL DUPRE, & TIM ROBIDOUX" 3/22/2011: "Donna from CM had homeowner calling back several times, asking for the city to clean up his basement. After a conversation with Mr. Buckley confirmed that the DPW would be unable to facilitate that request." 8/15/2011: "Per Joe Buckley sewer freed that evening contractor repair work on going"	Blockage in City sewer line. Cleared by City. Unclear why entry stating that the sewer was "freed" is dated about 5 months after the event occurred.	Blockage - Material not identified

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2011	1312204	SEWER BACKING UP IN HOUSE	117 HIGHLAND ST	4/8/2011	"sewer back up in cellar"	4/8/2011: "blocked through location between ormond street and west street" 4/8/2011: "249 freed blocked sewer"	Blockage in City sewer line. Cleared by City.	Blockage - Material not identified
2011	1312325	SEWER BACKING UP IN HOUSE	256 PARK AVE	4/9/2011	"sewage backing up from house/building"	4/9/2011: "called in Bob Gustafson/Foreman and Operator Robert Dupre Meo #3 and Meo #1 Keith Charest 4-9-11 for blocked sewage." 4/9/2011: "Crew freed blockage and all set"	Blockage in City sewer line. Cleared by City.	Blockage - Material not identified
2011	1312729	SEWER BACKING UP IN HOUSE	36 KING ST	4/13/2011	"sewage is backing up into the basement"	4/13/2011: "we flushed past their connection - freed blocked sewer and found grease and gravel"	Blockage in City sewer line due to grease and gravel. Cleared by City.	Grease
2011	1312790	SEWER BACKING UP IN HOUSE	20 SPRING VALLEY RD	4/13/2011	"raw sewer backing up in house - Worcester Fire Dept. is at the site now"	4/13/2011: "Sanitary sewer overflow at this location" 5/12/2011: "5-12-11 add note per J. Buckley sewer blockage was caused by grease"	Blockage in City sewer line due to grease. Cleared by City. Clearly identifies this as an SSO.	Grease
2011	1313164	SEWER BACKING UP IN HOUSE	18 STONELAND RD	4/18/2011	"W.P.D. CALLED OVER TO REPORT THAT SOMEONE AT 18 STONELAND RD. IS SAYING THAT THEY HAVE A PLUMMER AT THE HOUSE AND HE TOLD THEM TO CALL THE CITY TO REPORT RAW SEWAGE BACKING UP IN THE CELLAR"	4/18/2011: "BLOCKED SEWER" 4/18/2011: "BOB GUSTUFSON CALLED TO TELL US THEY FREED THE BLOCKED SEWER"	Blockage in City sewer line. Cleared by City.	Blockage - Material not identified
2011	1317624	SEWER BACKING UP IN HOUSE	119 HIGHLAND ST	5/30/2011	"THIS IS THE BOYTON RESTERAUNT AND THE SEWAGE IS BACKING UP IN THE SINKS"	5/30/2011: "called in a sewer crew to unblock this blockage" 5/30/2011: "Freed Sewer on Ormond Street. Manholes need to be vaccumed Also freed thru location to West Street as a result of Ormond Street Rich Maher & Keith Charest called in crew for blockage. 5-31-11"	Blockage in City sewer line. Cleared by City.	Blockage - Material not identified
2011	1319985	SEWER BACKING UP IN HOUSE	3 KNOWLTON AVE	6/17/2011	"sewage backing up in cellar. he is on site"	6/17/2011: "2-39 took care of blocked sewer at this location"	Blockage in City sewer line. Cleared by City.	Blockage - Material not identified
2011	1320186	SEWER BACKING UP IN HOUSE	3 KNOWLTON AVE	6/20/2011	"sewer backing up in cellar, owner is on site now."	6/20/2011: "2-39 flushed and vaced sanitary sewer"	Appears to be blockage in City sewer line. Cleared by the City. Recurring issue. Entry on 6/17/2011 as well.	Blockage - Material not identified
2011	1321513	SEWER BACKING UP IN HOUSE	6 PILGRIM AVE	7/4/2011	"HAS SEWER BACKING UP INTO HIS HOUSE. HIS HOUSE IS @ THE SPLIT OF PILGRIM @ DELL"	7/4/2011: "POSSIBLE BROKEN SEWER MAIN ON PILGRIM AVE TRIED FLUSHING WENT 50' FEET NO MORE. WAS PULLING ROCKS & GRAVEL BACK POLITO IS WORKING ON THE STREET AND HAS A TRENCH THAT GOES ACROSS WHERE FLUSHER IS GETTING STUCK. 6 PILGRIM AVE HAS SEWAGE ENTERING HOME PLEASE KEEP HIM INFORM"	Backup appears to have been caused by break in City sewer line.	Structural

Year	Work Order No.	Problem Code	Location	Date Generated	Description	Work Order Notes	EPA Inspection Team Notes	Cause Based on City Work Order Notes
2011	1321594	SEWER BACKING UP IN HOUSE	57 GREAT BROOK VALLEY AVE	7/5/2011	"sewage backing up in cellar"	7/5/2011: "per 2-14 the problem was grease was blocking the sewer. ok to close"	Blockage in City sewer line due to grease. Cleared by City.	Grease
2011	1321595	SEWER BACKING UP IN HOUSE	63 GREAT BROOK VALLEY AVE	7/5/2011	"sewage backing up in cellar"	7/5/2011: "per 2-14 grease was the problem. Freed by 2-39. ok to close"	Blockage in City sewer line due to grease. Cleared by City.	Grease
2011	1325111	SEWER BACKING UP IN HOUSE	159 MILL ST	8/4/2011	"Sewer Backing up in house, she sates the manhole cover is in front of 155 Mill St. near the grassy area."	8/4/2011: "BLOCKED SEWER" 8/8/2011: "per J. Dalbeck blockage here freed by 2-49. ok to close"	Blockage in City sewer line. Cleared by City. Unclear if sewer line was finally cleared four days after the complaint, or that is when the resolution was entered into the work order system.	Blockage - Material not identified
2011	1325941	SEWER BACKING UP IN HOUSE	85 PRESCOTT ST	8/11/2011	"Sewer backing up in House"	8/11/2011: "BLOCKED SEWER" 8/12/2011: "per R. Cataldo -Cataldo /Hopkins-49 and Arcouette -Labor Dupre-39 responded crew worked manholes. had to call in Dupre to vac six manholes and flush. A lot of grase/oil/rags /debris was in manholes. 39 crew to return in morning to inspect manholes. ok to close."	Blockage in City sewer line. Cleared by City. Significant grease, oil, rags, and debris.	Grease
2011	1327788	SEWER BACKING UP IN HOUSE	7 HAROLD ST	8/28/2011	None noted	8/28/2011: "high water receded ok to close cause of restriction high water" 8/28/2011: "ok to close high water has receeded"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2011	1327749	SEWER BACKING UP IN HOUSE	14 HILTON AVE	8/28/2011	None noted	8/28/2011: "monitor high water" 8/28/2011: "per B. Gustafson 2-26 water level down. ok to close"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2011	1327791	SEWER BACKING UP IN HOUSE	23 HILTON AVE	8/28/2011	None noted	8/28/2011: "monitor high water" 8/28/2011: "per 2-26 B. Gustafson water is lower-ok to close"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2011	1327871	SEWER BACKING UP IN HOUSE	28 HILTON AVE	8/28/2011	None noted	8/28/2011: "pending high water sewers is to monitor" 8/28/2011: "per 2-26 B. Gustafson B. Ceffalo checked and the high water is down. ok to close."	Appears to be backup due to capacity issues in City sewer line.	Capacity
2011	1327857	SEWER BACKING UP IN HOUSE	45 HILTON AVE	8/28/2011	None noted	8/28/2011: "in sewers being monitored until high water receeds" 8/28/2011: "per 2-26 B. Gustafson water level is lower. ok to close."	Appears to be backup due to capacity issues in City sewer line.	Capacity
2011	1327810	SEWER BACKING UP IN HOUSE	101 SOUTH FLAGG ST	8/28/2011	None noted	8/28/2011: "monitor high water until it receeds" 8/28/2011: "per 2-49 K Gilchrist water subsided. ok to close"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2011	1329393	SEWER BACKING UP IN HOUSE	4 DORRANCE ST	9/8/2011	"sewage backing up in toilet in basement of this home"	9/8/2011: "per 2-49 all set high water. ok to close"	Appears to be backup due to capacity issues in City sewer line.	Capacity
2011	1329255	SEWER BACKING UP IN HOUSE	15 HAROLD ST	9/8/2011	None noted	9/8/2011: "Resident called back stating all of the manhole covers are starting to flow up." 9/8/2011: "per 2-49 high water -put covers back on . ok to close."	Appears to be backup due to capacity issues in City sewer line.	Capacity

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2011	1329288	SEWER BACKING UP IN HOUSE	22 ORAN ST	9/8/2011	"WPD states that sewer is coming up through the cellar of the house"	9/8/2011: "per 2-39 lines running slow-high water ok to close."	Appears to be backup due to capacity issues in City sewer line.	Capacity
2011	1334808	SEWER BACKING UP IN HOUSE	67 DEERFIELD ST	10/19/2011	"Sewage is backing up into the residents basement."	10/19/2011: "per 2-14 W. Savage the block is freed. Ok to close"	Blockage in City sewer line. Cleared by City.	Blockage - Material not identified
2011	1338454	SEWER BACKING UP IN HOUSE	33 CANTERBURY ST	11/9/2011	None noted	11/10/2011: "per J. Dalbeck 2-11 2-39 and 2-49 flushed and vac'd this blocked sewer. I t was blocked with gravel and grease. ok to close."	Blockage in City sewer line due to grease. Cleared by City.	Grease
2011	1339352	SEWER BACKING UP IN HOUSE	159 MILL ST	11/15/2011	"sewer back up in cellar"	11/15/2011: "per 2-39 P. Dupre he flushed the line and rags and grease were blocking the line. ok to close."	Blockage in City sewer line due to grease and rags. Cleared by City.	Grease
2011	1340627	SEWER BACKING UP IN HOUSE	24 BAXTER ST	11/28/2011	"Happened before, thought it was an internal pump problem, there was a blockage in the street. Several years ago."	11/28/2011: "GAVE IT TO RICH & KEITH TO CHECK IT OUT. IT WAS BLOCKED SEWER" 11/28/2011: "FREE BLOCKED SEWER. BLOCKED SEWER WAS CAUSED BY ROOTS. REFER TO SEWER DEPT FOR CAMERA." 11/30/2011: "sewer freed not an sso"	Blockage in City sewer line due to roots. Cleared by City. CCTV inspection requested. Unclear why it states "not an sso."	Roots
2011	1341221	SEWER BACKING UP IN HOUSE	700 SOUTHBRIDGE ST	12/3/2011	"called to a resurant ... he has a line going 200' out but hasn't hit any blockage ... says he has alot of water coming back, which isn't normal"	12/3/2011: "Crew flushed and vacc'd line and took a lot of gravel from it" 12/5/2011: "per 2-26 B. Gustafson not an SSO. ok to close."	Blockage in City sewer line. Cleared by City. Significant gravel removed.	Debris
2011	1343292	SEWER BACKING UP IN HOUSE	9 IRENE ST	12/28/2011	"per Gustafson Plumbing the sewer was backing up and nobody at the location was using water"	12/29/2011: "per 2-11 J. Dalbeck this sewer blockage was freed by 2-37 -NO SSO-Blocked by paper . ok to close."	Blockage in City sewer line due to paper. Cleared by City. Unclear why it states "NO SSO."	Debris
2012	1343762	SEWER BACKING UP IN HOUSE	25 CONVERSE ST	1/4/2012	"Sewer Backing up in cellar - plumber is at the sites"	1/4/2012: "BLOCKED SEWER CHECKED BY RICH & KEITH"	Blockage in City sewer line.	Blockage - Material not identified
2012	1344034	SEWER BACKING UP IN HOUSE	12 LAKESIDE AVE	1/6/2012	"Sewer Backing Up in House at 12 LAKESIDE AVE, plumber is at the site"	1/6/2012: "BLOCKED SEWER, CALLED IN BOB GUSTAFSON, K.GILCHRIST, & T.MACJEWSKI" 1/6/2012: "SEWER SANITATION OVERFLOW ON LAKESIDE AVE" 1/10/2012: "per 2-26 B. Gustafson blocked sanitary sewer freed by 2-37 Gilchrist and Macjewski-caused by grease-had night man treat it with Sanfax. It is SSO. Will give to Andre."	Blockage in City sewer line due to grease. Cleared by City. Clearly identifies this is an SSO.	Grease
2012	1344391	SEWER BACKING UP IN HOUSE	38 DIX ST	1/11/2012	"caller will be on site in about 15 minutes"	1/11/2012: "per 2-39 P. Dupre flushed line -got a little gravel. After lunch will vac line ."	Appears to be problem with City sewer line which was addressed by flushing.	Debris
2012	1344694	SEWER BACKING UP IN HOUSE	100 GROVE ST	1/12/2012	"Backup at Commonwealth Mgmt"	1/13/2012: "ok to close not an S.S.O. blockage has been removed"	Does not specify whether blockage was in City sewer line or private lateral. Unclear why it states "not an S S.O."	Blockage - Material not identified

Year	Work Order No.	Problem Code	Location	Date Generated	Description	Work Order Notes	EPA Inspection Team Notes	Cause Based on City Work Order Notes
2012	1347253	SEWER BACKING UP IN HOUSE	1 SAMSOSET RD	2/3/2012	"Plumber is a the sites, his name is Scott, Cell number is 508-873-1103, sewer backing up in cellar."	2/3/2012: "2-39 freed the blocked sewer. It was full of grease OK to close per Wayne Savage 2-14 (complaint truck)"	Blockage in City sewer line due to grease. Cleared by City.	Grease
2012	1347981	SEWER BACKING UP IN HOUSE	13 ASHMONT AVE	2/12/2012	"CALLER REPORTS THAT THERE IS SEWAGE "BUBBLING" FROM THE DRAIN IN THE FLOOR IN THE CELLAR"	2/12/2013: "PER R. GUSTAFSON - BLOCKED SEWER HAS BEEN FREED - IT WILL NEED MORE ATTENTION ON MONDAY MORNING 2/13/12" 2/14/2012: "per 2-40 K. Bicknell 2-39 pumped and flushed and freed the sewer here. It was due to grease and gravel. NO SSO. ok to close."	Blockage in City sewer line due to grease and gravel. Cleared by City. Unclear why it states "NO SSO."	Grease
2012	1350484	SEWER BACKING UP IN HOUSE	4 ASHMONT AVE	3/6/2012	"Sewer backing up in cellar in three family home. Plumber was working at home today. This is not the first time that this has happened."	3/6/2012: "per 2-14 John Dalbeck --2-49 freed the blockage at this location (Ashmont at Quinsigamond Ave) It was full of mud, debris, etc it is now surcharging 2-14 crew will check again this afternoon."	Blockage in City sewer line due to "mud, debris, etc." Cleared by City.	Debris
2012	1350721	SEWER BACKING UP IN HOUSE	2A IDALLA AVE	3/7/2012	"HAS SEWER BACKING UP & HAS A PLUMBER ON SITE. PLUMBER WOULD LIKE SOMEONE TO CALL BACK."	3/7/2012: "2-37 FREED UP A PARTIAL BLOCKED. IT WAS DUE TO GREASE." 3/7/2012: "RANDY SPOKE WITH JOE BUCKLEY ABOUT 2A IDALLA AVE. PER ORDER OF MR. BUCKLEY RANDY WAS ADVISED TO CALL A SEWER CREW IN. ALSO MR. BUCKLEY WILL HAVE MAIN LINE CAMERA FOR TOMORROW MORNING 3/8/12 FOR IDALLA AVE."	Blockage in City sewer line due to grease. Cleared by City. Follow-up CCTV inspection requested.	Grease
2012	1352772	SEWER BACKING UP IN HOUSE	611 MAIN ST	3/21/2012	"SEWAGE BACKING UP INTO REGISTRY OF MOTOR VEHICLES"	3/21/2012: "BLOCKED SEWER - TOLD TO CALL IN CREW" 3/21/2012: "PER T. ROBIDOUX - BLOCKED SEWER FREED - ALOT OF GREASE"	Blockage in City sewer line due to grease. Cleared by City.	Grease
2012	1357247	SEWER BACKING UP IN HOUSE	58 VALLEY HILL DR	4/14/2012	"SEWAGE BACKING UP IN BASEMENT"	4/14/2012: "BLOCKED SEWER FREED UP" 4/17/2012: "Result was paper no sso and no grease"	Blockage in City sewer line due to paper. Cleared by City. Unclear why it states "no sso."	Debris
2012	1357986	SEWER BACKING UP IN HOUSE	67 HIGHLAND ST	4/19/2012	"sewer back up in cellar"	4/19/2012: "per 2-39 P. Dupre freed blocked sewer. ok to close."	Blockage in City sewer line. Cleared by the City.	Blockage - Material not identified
2012	1357907	SEWER BACKING UP IN HOUSE	3 KNOWLTON AVE	4/19/2012	None noted	4/19/2012: "per 2-39 P. Dupre vac and flushed the line and owner is not having a problem now. ok to close"	Appears to be problem with City sewer line which was addressed by flushing.	Blockage - Material not identified
2012	1358219	SEWER BACKING UP IN HOUSE	67 HIGHLAND ST	4/20/2012	None noted	4/20/2012: "BLOCKED SEWER CALLED IN CHAD ARCOUETTE, JOHN CAROTA, KEITH CHAREST." 4/20/2012: "FREED UP THE BLOCKED SEWER"	Blockage in City sewer line. Cleared by the City. There is an entry for the same address on the previous day (4/19/2012).	Blockage - Material not identified
2012	1358155	SEWER BACKING UP IN HOUSE	3 KNOWLTON AVE	4/20/2012	"Sewer backing up in cellar. This is the third time that this has happened."	4/26/2012: "per John Dalbeck - this was freed by 2-39 OK to close this WO 4-20-2012"	Appears to be problem with City sewer line which was then cleared by the City. There is an entry for the same address on the previous day (4/19/2012).	Blockage - Material not identified

Year	Work Order No.	Problem Code	Location	Date Generated	Description	Work Order Notes	EPA Inspection Team Notes	Cause Based on City Work Order Notes
2012	1359137	SEWER BACKING UP IN HOUSE	3 KNOWLTON AVE	4/30/2012	"per Dave Harris Health Dept called- there is still a problem at this location, Sewer dept has been there 4 times in the past two weeks."	4/30/2012: "2-26 Bob Gustafson was called --- 2-39 responded sewer dept flushed and vac'd the sewer line it is running fine at this time"	Appears to be problem with City sewer line which was then cleared by the City. This is a recurring issue. There are entries for the same address on 4/19/2012 and 4/20/2012.	Blockage - Material not identified
2012	1359751	SEWER BACKING UP IN HOUSE	51 UPLAND GARDENS DR	5/3/2012	"SEWER BACKING UP INTO BULDING 51 AAND ALSO COMNING OUT OF STREET"	5/4/2012: "per Chad Arcouette 2-49 Teddy Macjewski freed the blocked sewer. It was full of GREASE OK to CLOSE 5-4-2012"	Blockage in City sewer line due to grease. Cleared by City.	Grease
2012	1359974	SEWER BACKING UP IN HOUSE	3 KNOWLTON AVE	5/7/2012	None noted	5/7/2012: "at 9 00 Wayne Savage called the sewer office -2-37 flushed the sewer line TWICE They will go back to this location (3 Knowlton Ave) this afternoon to check the situation." 5/7/2012: "This WO can be closed for now This is an ongoing problem Andre Louzado will check this location for the backwater valve program"	Appears to be problem with City sewer line which was then cleared by the City. This is a recurring issue. There are entries for the same address on 4/19/2012, 4/20/2012, and 4/30/2012.	Blockage - Material not identified
2012	1360684	SEWER BACKING UP IN HOUSE	18 DARBY ST	5/10/2012	"Sewer backing up in cellar, plumber is at the site he open the manhole cover he states the distribution plug is off is sitting at the bottom of the manhole"	5/10/2012: "per 2-14 J. Dalbeck there was a sewer block at this location. NOT AN SSO. Blocked with diapers, handiwipes etc. ok to close and open new work order for pump and flush at a later date."	Blockage in City sewer line due to "diapers, handwipes, etc."	Debris
2012	1361083	SEWER BACKING UP IN HOUSE	54 LYMAN ST	5/14/2012	"Caller is the property owner and states this is the 3rd time this has happened over a 3 year span"	5/14/2012: "per Tim Robidoux 2-14 ---2-39 Paul Dupre flushed and freed the blockage- it was FULL of GREASE They could not get in touch with the owner Everything is all set."	Blockage in City sewer line due to grease. Cleared by City.	Grease

Year	Work Order No.	Problem Code	Location	Date Generated	Description	Work Order Notes	EPA Inspection Team Notes	Cause Based on City Work Order Notes
2012	1362861	SEWER BACKING UP IN HOUSE	40 SOUTHOLD RD	5/27/2012	"CALLER STATES THAT THE SEWAGE IS BACKING UP IN HIS CELLAR DRAIN"	5/27/2012: "THERE ARE SEVERAL HOUSES THAT ARE EFFECTED BY THIS SEWER BLOCK. #"s 40 AND 42 SOUTHOLD RD. HAD CALLED HERE ABOUT THE BLOCK AND #"s 45-47 SOUTHOLD RD. CAME OUT TO SPEAK WITH MR. PARENT WHEN HE WAS UP IN THE AREA. THESE TWO ARE A DUPLEX AND THEIR FOUNDATION IS LOWER THAN THE OTHER HOUSES AROUND THEM." 5/27/2012: "MR. PARENT AND MR. DUPRE PULLED THE PIECE OF P.V.C. PIPE OUT FROM THE FRONT OF THE INVERT PIPE WHICH RELEASED THE BLOCK AND ALLOWED THE SEWER TO FLOW BACK DOWN WHERE IT'S SUPPOSED TO BE. NOW IT IS DOWN AND RUNNING FINE." 5/29/2012: "ok to close and open a sewer line to be tv'd at this same section of sewer"	Blockage in City sewer line due to piece of PVC pipe. Cleared by City. Follow-up CCTV inspection requested.	Debris
2012	1363168	SEWER BACKING UP IN HOUSE	40 SOUTHOLD RD	5/30/2012	"Caller states he had a blockage in the system on Sunday which was relived from the crew and since then he has had sewage backup"	5/30/2012: "John Dalbeck and crew were there-2-39 flushed the line- DID NOT VAC OK to CLOSE"	Appears to be problem with City sewer line which was then cleared by the City. This is a recurring issue. There is an entry for the same address on 5/27/2012.	Blockage - Material not identified
2012	1368541	SEWER BACKING UP IN HOUSE	419 BELMONT ST	7/5/2012	"SEWER BACKING UP INTO BUILDING"	7/5/2012: "PARENT RESPONDS/ DAVE HARRIS RESPONDS - SEWER IS BLOCKED" 7/6/2012: "Chad Arcouette, Dave Harris responded and Paul Dupre 2-39 vac"d the blockage Lines are running fine"	Blockage in City sewer line. Cleared by the City.	Blockage - Material not identified
2012	1377031	SEWER BACKING UP IN HOUSE	34 RICHMOND AVE	9/1/2012	"sewage backing up into cellar and flooding it"	9/1/2012: "blocked sewer was freed by 4-26 (Gustafson) & crew (Caron, Sands) at 1130" 9/4/2012: "per 2-26 B. Gustafson blocked sanitary sewer-freed by J. Carota and W. Sands. Not an SSO-roots. ok to close."	Blockage in City sewer line due to roots. Cleared by City. Unclear why it states "Not an SSO."	Roots
2012	1377103	SEWER BACKING UP IN HOUSE	20 LORING ST	9/4/2012	"Resident stating that there is sewage backing up into his house. Says that he has been having problems since a tree was removed due to the asian beetle."	9/4/2012: "per Tim Robidoux the sewer line was flushed by 2-49 Bob Berenson It was full of sticks, rags, debris could Not get in touch with the homeowner. OK TO CLOSE 9-4-2012"	Blockage in City sewer line due to sticks, rags, and debris. Cleared by City.	Debris
2012	1378757	SEWER BACKING UP IN HOUSE	14 MARCH ST	9/15/2012	"sewage backing up in house"	9/15/2012: "Sewer blocked called in crew" 9/15/2012: "Bob Gustafson and crew clear blocked sewer lines." 9/17/2012: "per 2-37 Carota/Sanda freed blockage. Not an SSO -caused by paper towels/debris. ok to close"	Blockage in City sewer line due to paper towels/debris. Cleared by City. Unclear why it states "Not an SSO."	Debris

Year	Work Order No.	Problem Code	Location	Date Generated	Description	Work Order Notes	EPA Inspection Team Notes	Cause Based on City Work Order Notes
2012	1379248	SEWER BACKING UP IN HOUSE	14 MARCH ST	9/19/2012	"Sewer backing up in cellar, happened last weekend as well."	9/19/2012: "per 2-14 T. Robidoux states that 2=39 P. Dupre freed the blockage at this location. Not known what is was blocked with. ok to close."	Appears to be problem with City sewer line which was then cleared by the City. This is a recurring problem. There is an entry for the same address on 9/15/2012.	Blockage - Material not identified
2012	1384585	SEWER BACKING UP IN HOUSE	26 WASHBURN ST	11/2/2012	"Caller reporting Sewer Backing up in house"	11/2/2012: "per 2-26 B. Gustafson states this sewer was blocked. It was blocked with grease. Block was Colton at Washburn. Not SSO. Freed by 2-37 B. Berenson. ok to close."	Blockage in City sewer line due to grease. Cleared by City. Unclear why it states "Not SSO."	Grease
2012	1384692	SEWER BACKING UP IN HOUSE	1160 WEST BOYLON ST	11/4/2012	"Restaurant backing up"	11/4/2012: "Sewer line is blocked. Called in Bob Gustafson, Wayne Neff, and Juan Reyes. 11-4-12 For blockie." 11/4/2012: "FREED BLOCKED SEWER" 11/5/2012: "per 2-37 W. Neff/Reyes freed the blocked sewer. Caused by grease /Not an SSO. ok to close. This was reported per 2-26 B. Gustafson."	Blockage in City sewer line due to grease. Cleared by City. Unclear why it states "Not SSO."	Grease
2012	1387516	SEWER BACKING UP IN HOUSE	189 HOPE AVE	11/28/2012	"Resident calling to report sewage backing up into the bathroom through the toilet."	11/28/2012: "per 2-14 T. Robidoux states that 2-49 B. Hopkins freed blocked sewer. ok to close."	Blockage in City sewer line. Cleared by the City.	Blockage - Material not identified
2012	1388127	SEWER BACKING UP IN HOUSE	5 SAUGUS PL	12/3/2012	"Sewer backing up in House"	12/5/2012: "per 2-26 B. Gustafson states 2-49 freed this on 12-3-12. 2-39 vac'd Saugus Place and Cambrisge Street at Saugus Place (vac'd and flushed) on 12-5-12. ok to close."	Blockage in City sewer line. Cleared by the City.	Blockage - Material not identified
2012	1390642	SEWER BACKING UP IN HOUSE	10 LUNELLE ST	12/24/2012	"When running the washing machine and flushing the toilet it drain water is backing up. resident unsure if it is sewage. believes it is coming from the sewage pipe."	12/26/2012: "per 2-26 B. Gustafson sanitary invert on Lunelle at Lafayette is full of roots. 2-39 flushed and 2-45 will clean invert. ok to close." 12/26/2012: "per 2-17 S. Smarra 2-28 J. Toussaint removed scoops from the manhole. ok to close."	Blockage in City sewer line due to roots. Cleared by City.	Roots
2012	1391385	SEWER BACKING UP IN HOUSE	194 BURNCOAT ST	12/28/2012	"sewage backing up in the house back check failed need assistance"	12/28/2012: "per 2-8 T. Robidoux states the sewer was blocked at this location. 2-37 B. Hopkins freed the blockage. It was full of grease. ok to close."	Blockage in City sewer line due to grease. Cleared by City.	Grease
2012	1391515	SEWER BACKING UP IN HOUSE	109 LAKE AVE	12/28/2012	"resident has sewage coming out of her shut off. sink is filled with water"	12/28/2012: "THE PROBLEM IS WITH THE PUMP STATION. METHUEN CONSTRUCTION WAS CALLED IN. UNSURE OF RESULTS." 12/29/2012: "WE WERE CALLED BACK TO THIS ADDRESS BECAUSE THE SEWER HAD RE-BLOCKED." 12/29/2012: "SEWER LINE IS FREED UP AND RUNNING FINE"	Appears to be issue with pump station or blockage in City sewer line which caused back up.	Blockage - Material not identified

Year	Work Order No.	Problem Code	Location	Date Generated	Description	Work Order Notes	EPA Inspection Team Notes	Cause Based on City Work Order Notes
2012	1391523	SEWER BACKING UP IN HOUSE	18 ORMOND ST	12/29/2012	"CALLER REPORTS SEWAGE BACKING UP INTO HOUSE"	12/31/2012: "per 2-26 B. Gustafson states this was freed by 2-39 on 12-29-13 Dupre/Reyes. This was also re-checked on 12-31-12 and 2-14 C. Arcouette put half of a 5lb. bucket of sanfax down it near the church. ok to close."	Appears to be blockage in City sewer line. Cleared by the City.	Blockage - Material not identified

Appendix 6
SSO ERP Cover Page and Excerpt

Report

City of Worcester, MA

Sewer System Overflow (SSO)
Emergency Response Plan (ERP)

May 2005

Weston&Sampson

Weston & Sampson Engineers, Inc.
Five Centennial Drive
Peabody, MA 01960-7985

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2.0 FACTORS THAT INFLUENCE OVERFLOW RESPONSE

2.1 Existing Sewer System

The City of Worcester covers approximately 37 square miles and serves a residential population in excess of 170,000. The DPW operates and maintains approximately 426 miles of sanitary and combined sewers. The existing system consists of approximately 360 miles of sanitary sewers and approximately 65 miles of combined sanitary sewer. Additionally, there are 29 sanitary sewer-pumping stations and approximately 290 miles of storm sewers. Figure 1, located in Appendix B, depicts the city's service area. The City of Worcester service area is served by both sanitary and combined sewers. In general, sanitary sewers serve the newer and more outlying portions of the service area. Combined sewers exist primarily in the older and downtown areas.

2.2 Sanitary Sewer Overflow Locations

SSOs that have been identified in the past are listed in Table 1, located in Appendix C. This table will be updated regularly to assist in managing SSOs.

2.3 Overflow Destination

The receiving water body is the point where a SSO enters a surface stream, river, or lake once it leaves the collection system. An understanding of this is necessary to ensure the proper execution of an overflow response.

In addition to a receiving water body, sewer overflows can enter the environment at one or more of the following destinations:

- Low lying areas
- Storm sewers (CBs)
- Basements

Appendix 7
Cleaning Plan Excerpt

City of Worcester
Department of Public Works & Parks

Sanitary Sewer System Priority Cleaning Plan
February 3, 2006

The Worcester Department of Public Works & Parks (DPWP) Sanitary Sewer System Priority Cleaning Plan is designed to guide staff decision-making relative to which portions of the collection system need regular cleaning and maintenance to restore and maintain flow capacity. It is impractical and unnecessary to clean the entire sanitary sewer system on a regular basis, as many sections of the system are not prone to flow restrictions. The need, then, is for a plan that will direct staff to focus on areas that would be most prone to restrictions and blockage and to suggest cleaning methods and frequencies that would best address the problem.

The Priority Cleaning Plan uses four general assessment methods to locate actual and potential problem areas in the collection system. Data garnered from these four major areas is used to make informed decisions that help maintain quality sewer service while considering current and future systemic needs, balanced with environmental responsibility. All sewer cleaning requires system plan review and system inspection. Sewer system capacity is maintained and increased by the removal of inflow and infiltration and the removal of flow limiting restrictions. Causes of restrictions include but are not limited to; fats, oils, and grease (FOG), root intrusion, solids build-up, structural degradation and structural failure.

<u>Collection System Assessment</u>

1. Service-Based

Many years of institutional knowledge, along with complaint response and CCTV inspections, has produced a list of problem areas and procedures for maintenance. Please see Attachment D- Flusher List. DPWP cleans or flushes these sections regularly, typically twice per month, dependent on a variety of factors. DPWP also uses enzyme treatments and chemical treatments for system segments with excessive grease build-up. Full implementation of the FOG Program will slow or limit the need for grease treatment programs. The current Flusher List changes over time as new problem areas are located and permanent solutions are implemented for historically difficult areas. Sewer segments below minimum grade, which are unable to maintain a self-cleaning velocity, or having hydraulic restrictions due to a structural connection to an interceptor are the most common problem areas. These segments require regular cleaning to maintain service. Other locations requiring regular cleaning are identified by recurring complaints of sewer trouble from homeowners and businesses, documented sanitary sewer overflows and routine inspections.

Appendix 8
2006 Flusher List

Attachment D

Flushing List

#	Location
1	Lyon Street @ Demarco Terrace
2	Fletcher Street (Notify#12 before flushing)
3	Plantation Street @ Franklin Street
4	Plantation St.@ Tampa St. first M.H. on Tampa St.
5	Locust Ave. @ #37 Alvarado Avenue
6	Dallas St. @ End in location
7	Cohasset St. @ Hilton Ave. & Elmire Ave. sewer location
8	Lake Avenue @ Bay Edge Drive
9	Nathaniel St. Notify # 29 first
10	Greenfield #25
11	Heywood St. @ Massasoit Road M/H near island
12	Providence St. @ Upsala St. on Providence
13	Ester St @ Henrietta
14	Thenius Street @ Stebbins Street
15	#35 Southold Road
16	Fifth Avenue @ Millbury Street
17	Perry Ave. @ Millbury Street on side walk
18	#14 Ashmont Ave. @ Quinsigamond / Western interceptor
19	#55 Ellsworth Street 'High leval sewer '
20	Lafayette Street @ Millbury Street
21	Saugus Place @ Cambridge St. / interceptor
22	Stafford Street @ Blockbusters :Parking lot
23	Heard St @ Hadwen Park sewer location
24	#17 Henderson Avenue
25	#45 Wildwood Avenue
26	Oppisite #1350 Pleasant Street
27	Guild Road @ Pleasant Street
28	921 Pleasant Street
29	#68 Dick Drive on Sidewalk @ Donna Road
30	#4 Grove St Heights
31	#5 Dogwood Road
32	Woodridge Road Check end of Street
33	208 Saint Nicholas Ave. Sewer Location to Uncatena Ave.

#	Location
34	Achushnet Ave. sewer location to 22 Sachem Ave.
35	Country Club Blvd. on Island
36	134 Barnard Road on sidewalk
37	#100 Grove Street
38	# 3 Wachusette Street @ Home Street
39	Ormond Street, several spots
40	#14 Winslow Street @ Pleasant Street
41	#1 Mabelle Street
42	#46 June Street
43	#21 Reed Street
44	Longfellow Road second M.H. in
45	Knowles Road at end
46	66 Glendale Street
47	2 Fourth Street
48	Bergin Lane
49	Beaver Street
50	Birch Street sewer location to Park Avenue
51	Lakeside Avenue @ Lovell Street
52	Genoa Street @ dead end
53	Mapletree Lane n@ Enfield Street
54	Parker Street @ Mayfield Street
55	Massasoit Rd., Between Kenberma Rd. & Crowingshield Rd.
56	Cumberland Street sewer location to W.Boylston Street
57	Park Avenue @ Coes Street Near Funeral home

Most locations are flushed bi-monthly.

Appendix 9
Updated Flusher List

FLUSHER HOT LIST

#		Checked by	Flushed by
1	Lyon @ Shrewsbury St.		
2	Fletcher St. (notify #12 before flushing)		
3	Plantation St. @ Franklin St.		
4	Plantation St. @ first M.H. on Tampa (diversion)		
* 5	Locust Ave. @ # 37 Alvarado		
6	Dallas St. @ Enid in location		
7	Cohasset St. @ Hilton and Elmire Location		
8	Lake Ave @ Bay Edge + Whitla Dr		
9	Lake Ave @ Sherbrook Ave		
10	Nathaniel St. (notify # 29 first)		
11	# 25 Greenfeild St.		
12	Heywood St. @ Massasoit Rd (M.H. near island)		
13	Providence St. @ Upsala (on Providence St.)		
14	Esther St. @ Henrieta St.		
15	Thenius St. @ Stebbins St.		
16	# 35 Southold Rd.		
17	Fifth Ave @ Millbury St.		
18	Perry Ave @Milbury St. (sidewalk)		
19	# 14 Ashmont (runs High into Quinsigamond Ave)		
20	# 55 Ellsworth St. (High level Sewer)		
21	Lafaytte St. @ Millbury St.		
22	Saugus Place @ Cambridge St. (Both local lines)		
23	Stafforfd St. @ Block Buster Parking Lot		
24	Heard St. At Park		
25	# 17 Henderson Ave		
26	# 45 Wildwood Ave		
27	Opposite side of 1350 Pleasant St.		
28	Guild Rd. @ Pleasant St.		
29	# 63 Moreland St.		
30	Moreland St. @ Orrison St.		
31	# 333 Mower St.		
32	# 921 Pleasant st		
33	# 68 Dick Dr. (on sidewalk) @ donna Rd. (thru location)		
34	# 4 Grove St. Heights		
35	# 5 Dogwood Rd.		

36	Woodridge Rd. Check @ end		
37	# 208 Saint Nicholas St. To Uncantena Ave.		
38	Acushnet Ave. Location #22 Sachem Ave.		
39	Country Club Blvd. (Various Locations)		
40	# 134 Barnard Rd. on sidewalk		
41	West Boylston St. (The Eagle)		
42	# 100 Grove St.		
43	# 3 Wachusett St. @ Holme St.		
44	Ormond St. (several spots)		
45	# 14 Winslow @ Pleasant St.		
46	Abbott St. @ #40 Chandler St. (After winslow)		
47	# 1 Mabelle St.		
48	# 46 June St.		
49	# 21 Reed St.		
50	June @ Chandler (Post Office to #132)		
51	Longfellow rd. (2nd M.H. in		
52	Knowles Rd.		
53	# 59 Greendale St.		
54	# 2 Fourth St.		
55	Bergin Lane		
56	Beaver St.		
57	Birch St. to Park Ave.		
58	Lakeside Ave. @ lovell St.		
59	Veterans @ Garland		
60	# 2 Genoa St. (dead end)		
61	Maple Tree Lane @ Enfeild St.		
62	Parker St. @ Mayfeild St.		
63	Massasoit Rd. (between Kenberma And Crowningsheild)		
64	Park Ave @ Coes St.		
65	# 23 Sachem Ave (off Clark St.)		
66	# 1050 Main St. @ Cambridge St.		
67	#11 Saratoga Dr.		
68	#64 Chino Ave		
69	Clarendon St @ Fairmont (Flush both ways)		

Appendix 10
Summary of Recurring Backups

Address	Dates	Cause*	Location Included on Hotspot Flusher List?	Notes
44 BELLEVUE ST	3/30/2010	Capacity	No	Not applicable
	4/1/2010	Grease		
71 CAMBRIDGE ST	2/6/2011	Blockage - Material not identified	Yes	The address with recurring backups is approximately 0.1 mile northwest of hotspot location No. 21 "Saugus Place @ Cambridge St. / interceptor" included on 2006 Flusher List. This location is also included on the updated flusher list as No. 22.
	3/18/2011	Blockage - Material not identified		
28 CARO ST	2/10/2010	Grease	No	Not applicable
	3/14/2010	Structural		
	3/17/2011	Debris		
67 DEERFIELD ST	3/30/2010	Capacity	No	Not applicable
	10/19/2011	Blockage - Material not identified		
15 HAROLD ST	3/30/2010	Capacity	No	Not applicable
	9/8/2011	Capacity		
67 HIGHLAND ST	4/19/2012	Blockage - Material not identified	No	Not applicable
	4/20/2012	Blockage - Material not identified		
3 KNOWLTON AVE	6/17/2011	Blockage - Material not identified	No	Not applicable
	6/20/2011	Blockage - Material not identified		
	4/19/2012	Blockage - Material not identified		
	4/20/2012	Blockage - Material not identified		
	4/30/2012	Blockage - Material not identified		
	5/7/2012	Blockage - Material not identified		
109 LAKE AVE	1/25/2010	Capacity	No	Not applicable
	2/24/2010	Capacity		
	3/15/2010	Capacity		
	12/28/2012	Blockage - Material not identified		
91 LAKE AVE	2/25/2010	Capacity	No	Not applicable
	3/14/2010	Capacity		
299 LOVELL ST	2/26/2010	Capacity	No	Not applicable
	1/8/2011	Blockage - Material not identified		
	3/5/2011	Grease		
17 LYMAN ST	12/11/2010	Grease	No	Not applicable
	12/12/2010	Debris		
1050 MAIN ST	2/12/2010	Grease	Yes	Not identified as a hotspot location on the 2006 Flusher List, but this address is included as No. 66 on the updated flusher list.
	9/25/2010	Grease		
14 MARCH ST	9/15/2012	Debris	No	Not applicable
	9/19/2012	Blockage - Material not identified		

50 MAYWOOD ST	4/2/2010	Grease	No	Not applicable
	10/13/2010	Debris		
6 OLEAN ST	2/26/2010	Capacity	No	Not applicable
	3/30/2010	Capacity		
210 PARK AVE	1/11/2011	Blockage - Material not identified	No	Not applicable
	3/7/2011	Blockage - Material not identified		
1350 PLEASANT ST	3/14/2010	Blockage - Material not identified	Yes	This address was included as hotspot location No. 26 on the 2006 Flusher List. It is also included on the updated flusher list as No. 27 "Opposite side of 1350 Pleasant Street."
	3/29/2010	Grease		
16 SACHEM AVE	3/30/2010	Blockage - Material not identified	Yes	The 2006 Flusher List includes "Achushnet Ave. sewer location to 22 Sachem Ave" as hotspot location No. 34 on the list. The address with recurring backups is within approximately 200 feet to the northwest of 22 Sachem Ave. The updated flusher list includes this same hotspot location as No. 38 and also includes 23 Sachem Avenue, which is approximately 250 feet southeast of the address with recurring backups.
	3/2/2011	Grease		
101 SOUTH FLAGG ST	3/30/2010	Capacity	No	Not applicable
	5/8/2010	Grease		
	3/7/2011	Not identified		
	8/28/2011	Capacity		
105 SOUTH FLAGG ST	11/19/2010	Grease	No	Not applicable
	12/2/2010	Roots		
31 SOUTHOLD RD	1/25/2010	Grease	Yes	The 2006 Flusher List includes "35 Southold Road" as hotspot location No. 15 on the list. The address with recurring backups is within approximately 200 feet to the east of the listed hotspot location. The updated flusher list also includes this hotspot location as No. 16.
	3/30/2010	Capacity		
40 SOUTHOLD RD	2/25/2010	Capacity	Yes	The 2006 Flusher List includes "35 Southold Road" as hotspot location No. 15 on the list. The address with recurring backups is within approximately 50 feet to the west of the listed hotspot location. The updated flusher list also includes this hotspot location as No. 16.
	3/30/2010	Capacity		
	12/23/2010	Grease		
	5/27/2012	Debris		
	5/30/2012	Blockage - Material not identified		
20 SPRING VALLEY RD	4/13/2011	Grease	No	Not applicable
	3/30/2010	Capacity		
10 STEVENS RD	1/27/2011	Blockage - Material not identified	No	Not applicable
	2/6/2011	Blockage - Material not identified		
8 TIFFANY AVE	3/30/2010	Capacity	No	Not applicable
	3/7/2011	Capacity		

* Based on the EPA Inspection Team's review of the notes included in the City's CSRS work order entries.

Appendix 11
CMOM Plan Excerpt

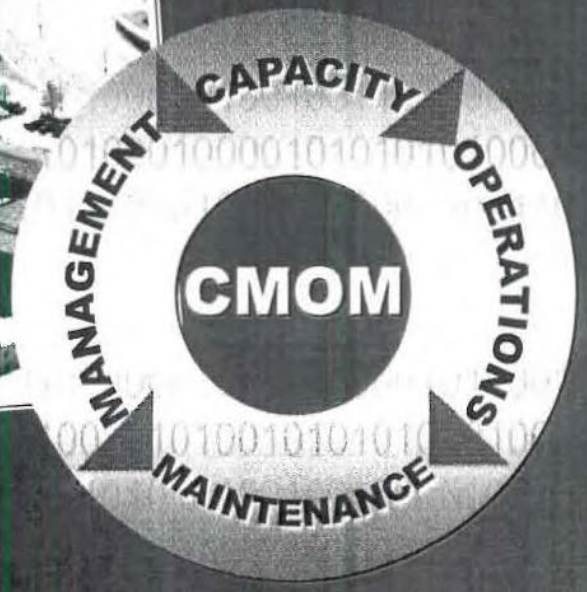
CDM

City of Worcester

Administrative Order Docket No. 05-21

Capacity, Management, Operations and Maintenance (CMOM) Program Implementation Plan Schedule

April 28, 2006



Implementation Schedule

Physical Inspection and Testing Program

The City of Worcester Long Term Preventive Maintenance Plan dated February 28, 2006, describes the Physical Inspection and Testing Procedures at the City. These procedures present the City's approach in meeting the requirements of the Administrative Order (AO).

The following is a schedule to improve on both the City's Televising (CCTV) and Manhole inspection program.

CCTV Program: CMOM requires an internal TV inspection program that provides visual inspection and facilitates condition evaluation and enables deterioration and changes to be tracked over time. The TV Inspection program requires written operation procedures and guidelines, and a method to rate the defects found during the inspection process.

Worcester has one televising crew, which include camera vehicles using the Pearpoint Self-contained CCTV, which will be replaced in year 2007. The Sewer Operations Division has a system to rate the condition of pipe using a rating system that ranks the condition of a segment of pipe from good to bad. The program has been developed over the years by field personnel and is understood by both Engineering and Sewer Operations Division, but no formal program is in place that includes written Standard Operating Procedures (SOPs). When personnel televise a sewer line, information is manually recorded and includes pipe size, type, length, structural rating, cleanliness of line and location.

Table 7

Current Gap
Gap The Sewer Operations Division has developed a program to rate the condition of a wastewater main. The program records information manually and is difficult to retrieve making prioritization and trend analysis difficult. There is no link to any work management or mapping system further limiting the usefulness of the data. Written procedures have not been developed increasing the possibility that the standards are inconsistently applied. Under current AO, the City is required to develop physical inspection and testing procedures to be used in the inspection and maintenance of the system. Under Section 7. Long Term Preventive Maintenance Plan - subsection a. Specifically, the Sewer Operations Division needs to identify the problem areas and prioritize the inspection of these areas.

Table 8

Implementation Plan & Schedule
Plan ▪ Develop an inspection plan that describes the procedures used to inspect sewer mains using the Sewer Operations Division televising system. Inspection should continue to focus on problem areas and establishing a program to correct these problem areas. Schedule Inspection and Testing Program – Section 7(a) ▪ Develop inspection plan (June 2006 – December 2007) ▪ Submit to EPA for Review 2008 ▪ Train employees (March 2008) ▪ Implementation (March 2008 – March 2009)

Manhole Inspection Program: The City of Worcester has approximately 10,600 manholes made of concrete and brick. Even thought the City will inspect manholes either through a contract or by City personnel, the City needs to have a formalized program.

Table 9

Current Gap
Gap The Sewer Operations Division does not have a formal manhole inspection program in place. The Sewer Operations Division needs to implement a program, which would include a tracking system. Under current AO, the City is required to develop physical inspection and testing procedures to be used in the inspection and maintenance of the system. Under Section 7. Long Term Preventive Maintenance Plan - subsection a.

Table 10

Implementation Plan & Schedule
Plan ▪ Develop a formal manhole inspection plan that describes the procedures used to inspect manholes, developing a standard form that will be used to gather information on the manhole. Schedule Inspection and Testing Program – Section 7(a) ▪ Develop Manhole Inspection Plan (June 2006 – December 2006) ▪ EPA Review ▪ Train employees (March 2007) ▪ Implementation (April 2007 – June 2007)

Appendix 12
Regulator Field Inspection Sheets for 2011 and 2012

2011 Regulator Field Inspection Sheets

2011 File Folder (in order received)

DJC 1/23/13

City of Worcester DPW & Parks
Sewer Operations Division

Date: 12-23-11

Inspector: 2-49 K. Allen / R. Hopkins

Weather: Cloudy

Name	Blocked ?	Surcharged ?	Gate / Weir condition	Flow	Structural concerns & Comments
Lincoln Street					
Garden Street ✓					
Washington Square					
Millbury at Ashmont ✓					
Millbury at Canton					
Millbury at Richland ✓					
Taylor at Millbury ✓					
Kelly Square/ Vernon Street ✓					
Pond at Water ✓					
Posner Square					
Grafton at Franklin ✓					
Southgate Place ✓					
Harrison Street At Water Street ✓					
Millbury at Lafayette Street ✓					
Millbury at Endicott ✓					
Southbridge at Sargent ✓					
Green at Madison Street					
Summer at Laurel ✓					
Thomas at Summer ✓					
Kelly Square Control Structure					

Date: 12-6-11

Inspector: T. Robidoux - K. Gilchrist

Weather: Light Rain

City of Worcester DPW & Parks
Sewer Operations Division

Name	Blocked ?	Surcharged ?	Gate / Weir condition	Flow	Structural concerns & Comments
Lincoln Street	—	—	—	—	
Garden Street	NO	Yes	—	Yes	
Washington Square	NO	Yes	—	Yes	
Millbury at Ashmont	NO	Yes	—	Yes	
Millbury at Canton	—	—	~~OK~~	—	
Millbury at Richland	Little	Yes	OK	Yes	Needs To Be Flushed and VAC 2-39 Freed
Taylor at Millbury	—	—	OK	NO	Always dry No Flow
Kelly Square/ Vernon Street	Little	Yes	—	Yes	Need Flushing
Pond at Water	NO	Yes	Good	Yes	
Posner Square	NO	Yes	OK	Yes	
Grafton at Franklin	NO	Yes	OK	Yes	
Southgate Place	NO	Yes	OK	Yes	
Harrison Street At Water Street	Little	Yes	Broke	Yes	Need To Be Flushed
Millbury at Lafayette Street	NO	✓	OK	Yes	~~[illegible]~~
Millbury at Endicott	NO	✓	OK	Yes	
Southbridge at Sargent	NO	Yes	OK	Yes	
Green at Madison Street	NO	Yes	OK	Yes	
Summer at Laurel	NO	Yes	OK	Yes	
Thomas at Summer	NO	Yes	OK	Yes	
Kelly Square Control Structure	NO	Yes	~~OK~~	Yes	

Date: 4/25/11

Inspector: Chad

Weather : Rain

City of Worcester DPW & Parks
Sewer Operations Division

Name	Blocked ?	Surcharged ?	Gate / Weir condition	Flow	Structural concerns & Comments
Lincoln Street					
Garden Street					
Washington Square					
Millbury at Ashmont				OK	
Millbury at Canton				ok	spill over
Millbury at Richland				ok	
Taylor at Millbury				ok	
Kelly Square/ Vernon Street				ok	
Pond at Water				ok	spill over
Posner Square					
Grafton at Franklin				ok	
Southgate Place				ok	
Harrison Street At Water Street			Hindge	ok	
Millbury at Lafayette Street				ok	
Millbury at Endicott				ok	Leak
Southbridge at Sargent				ok	
Green at Madison Street					
Summer at Laurel				ok	
Thomas at Summer				ok	
Kelly Square Control Structure				ok	spill over

Date: 3/3/2011

Inspector: 2-37

Weather : Sunny and Dry

City of Worcester DPW & Parks
Sewer Operations Division

Name	Blocked ?	Surcharged ?	Gate / Weir condition	Flow	Structural concerns & Comments
Lincoln Street					
Garden Street					
Washington Square					
Millbury at Ashmont	NO				
Millbury at Canton	NO				
Millbury at Richland	yes				FREED BY 2-37
Taylor at Millbury	NO				
Kelly Square/ Vernon Street	NO				
Pond at Water					
Posner Square					
Grafton at Franklin					
Southgate Place					
Harrison Street At Water Street					
Millbury at Lafayette Street					
Millbury at Endicott					
Southbridge at Sargent					
Green at Madison Street					
Summer at Laurel					
Thomas at Summer					
Kelly Square Control Structure			✓		TIP GATE OVERFLOWING

Date: 1/31/11

Inspector: Chad

Weather : Clear

City of Worcester DPW & Parks
Sewer Operations Division

Name	Blocked ?	Surcharged ?	Gate / Weir condition	Flow	Structural concerns & Comments
Lincoln Street				—	
Garden Street				—	
Washington Square				—	
Millbury at Ashmont				ok	
Millbury at Canton				ok	Restricted
Millbury at Richland				ok	
Taylor at Millbury				—	
Kelly Square/ Vernon Street				—	
Pond at Water				ok	
Posner Square				—	
Grafton at Franklin				—	
Southgate Place				—	
Harrison Street At Water Street			Bad Hinge	ok	
Millbury at Lafayette Street				ok	
Millbury at Endicott				ok	
Southbridge at Sargent				—	
Green at Madison Street				—	
Summer at Laurel				—	
Thomas at Summer				ok	
Kelly Square Control Structure				—	

2012 Regulator Field Inspection Sheets

Date: 12/19/12

Inspector: Robidoux – Lechaire

Weather: Cold / Dry

2012 File Folder (in order received)

DJC 11/8/13

City of Worcester DPW & Parks
Sewer Operations Division

#	Location	Blocked ?	Surcharged ?	Gate/Weir condicion	Flow	Structural concerns & comments
1	Lincoln St.					
2	Garden St.				✓	
3	Washington Square				✓	
4	Millbury at Ashmont				✓	
5	Millbury at Canton					
6	Millbury at Richland				✓	
7	Taylor at Millbury				✓	
8	Kelly Square / Vernon St.				✓	
9	Pond at Water					
10	Posner Square				✓	
11	Grafton at Franklin				✓	
12	Southgate Place					
13	Harrison St. at Water St.				✓	
14	Millbury St. at Lafayette St.				✓	
15	Millbury St. at Endicott				✓	
16	Southbridge at Sargent					
17	Green at Madison St.				✓	
18	Summer at Laurel				✓	
19	Thomas at Summer				✓	
20	Kelly Square Control Structure				✓	
21	Shamrock at Shrewsbury					
22	Risso Court at Shrewsbury					
23	Oleum Court at Shrewsbury					
24	Waitte at Shrewsbury					
25	Sewaro at Shrewsbury					
26	Laria at Shrewsbury					

Date: 11-8-12

Inspector: Juan R. Reyes

Weather: Snow with rain

City of Worcester DPW & Parks
Sewer Operations Division

#	Location	Blocked ?	Surcharged ?	Gate/Weir condicion	Flow	Structural concerns & comments
1	Lincoln St.	OK			OK	
2	Garden St.	OK			OK	
3	Washington Square	✓			✓	
4	Millbury at Ashmont	OK			OK	
5	Millbury at Canton	OK			OK	
6	Millbury at Richland	OK			OK	
7	Taylor at Millbury	OK			OK	
8	Kelly Square / Vernon St.	OK			OK	
9	Pond at Water	OK			OK	
10	Posner Square	OK			OK	
11	Grafton at Franklin	OK			OK	
12	Southgate Place	OK			OK	
13	Harrison St. at Water St.	OK			OK	
14	Millbury St. at Lafayette St.	OK			OK	
15	Millbury St. at Endicott	OK			OK	
16	Southbridge at Sargent	OK			OK	
17	Green at Madison St.	OK			OK	
18	Summer at Laurel	OK			OK	
19	Thomas at Summer	OK			OK	
20	Kelly Square Control Structure					
21	Shamrock at Shrewsbury					
22	Risso Court at Shrewsbury					
23	Oleum Court at Shrewsbury					
24	Waitte at Shrewsbury					
25	Sewaro at Shrewsbury					
26	Laria at Shrewsbury					

Regulators

Date: 10-11-12

Inspector: Robidoux Driver: Neff

Weather:

City of Worcester DPW & Parks
Sewer Operations Division

#	Location	Blocked ?	Surcharged ?	Gate/Weir condicion	Flow	Structural concerns & comments
1	Lincoln St.					
2	Garden St.					
3	Washington Square		✓			
4	Millbury at Ashmont		✓			
5	Millbury at Canton		✓			
6	Millbury at Richland		✓			
7	Taylor at Millbury		✓			
8	Kelly Square / Vernon St.		✓			
9	Pond at Water		✓			
10	Posner Square		✓			
11	Grafton at Franklin		✓			
12	Southgate Place		✓	✓		
13	Harrison St. at Water St.		✓	✓		Broken Gate
14	Millbury St. at Lafayette St.		✓			
15	Millbury St. at Endicott		✓			
16	Southbridge at Sargent		✓			
17	Green at Madison St.		✓			
18	Summer at Laurel		✓			
19	Thomas at Summer		✓			
20	Kelly Square Control Structure					
21	Shamrock at Shrewsbury					
22	Risso Court at Shrewsbury					
23	Oleum Court at Shrewsbury					
24	Waitte at Shrewsbury					
25	Sewaro at Shrewsbury					
26	Laria at Shrewsbury					

Date: 10-11-12

Inspector: Robidoux – Mooskian – Leclaire

Weather:

City of Worcester DPW & Parks
Sewer Operations Division

#	Location	Blocked ?	Surcharged ?	Gate/Weir condicion	Flow	Structural concerns & comments
1	Lincoln St.					
2	Garden St.					
3	Washington Square					
4	Millbury at Ashmont					
5	Millbury at Canton					
6	Millbury at Richland					
7	Taylor at Millbury					
8	Kelly Square / Vernon St.					
9	Pond at Water					
10	Posner Square					
11	Grafton at Franklin					
12	Southgate Place					
13	Harrison St. at Water St.					
14	Millbury St. at Lafayette St.					
15	Millbury St. at Endicott					
16	Southbridge at Sargent					
17	Green at Madison St.					
18	Summer at Laurel					
19	Thomas at Summer					
20	Kelly Square Control Structure					
21	Shamrock at Shrewsbury	no	no	?	low	good
22	Risso Court at Shrewsbury	no	no	?	low	good
23	Oleum Court at Shrewsbury	no	no	?	low	good
24	Waitte at Shrewsbury	no	no	?	low	no
25	Sewaro at Shrewsbury	no	no	?	low	no
26	Laria at Shrewsbury	no	no	Could use	low	none

Date: 9/28/12

Inspector: Robidoux Bedworth

Weather: Rain

City of Worcester DPW & Parks
Sewer Operations Division

#	Location	Blocked ?	Surcharged ?	Gate/Weir condicion	Flow	Structural concerns & comments
1	Lincoln St.	—	—	—		
2	Garden St.	—	—	—		
3	Washington Square		✓	✓		
4	Millbury at Ashmont		✓	✓		
5	Millbury at Canton		✓	✓		
6	Millbury at Richland		✓	✓		
7	Taylor at Millbury		✓	✓		
8	Kelly Square / Vernon St.		✓	✓		
9	Pond at Water		✓	✓		
10	Posner Square		✓	✓		
11	Grafton at Franklin		✓	✓		
12	Southgate Place	—	—	—		
13	Harrison St. at Water St.		✓	✓		
14	Millbury St. at Lafayette St.		✓	✓		
15	Millbury St. at Endicott		✓	✓		
16	Southbridge at Sargent	—	—	—		
17	Green at Madison St.		✓	✓		
18	Summer at Laurel		✓	✓		
19	Thomas at Summer		✓	✓		
20	Kelly Square Control Structure		✓	✓		
21	Shamrock at Shrewsbury	—	—			
22	Risso Court at Shrewsbury	—	—			
23	Oleum Court at Shrewsbury	—	—			
24	Waitte at Shrewsbury	—	—			
25	Sewaro at Shrewsbury	—	—			
26	Laria at Shrewsbury	—	—			

Date: 8/1/12

Inspector: Chad

Weather: Rain

Regulators

City of Worcester DPW & Parks
Sewer Operations Division

#	Location	Blocked ?	Surcharged ?	Gate/Weir condicion	Flow	Structural concerns & comments
1	Lincoln St.					
2	Garden St.					
3	Washington Square					
4	Millbury at Ashmont				ok	
5	Millbury at Canton	✓			ok	
6	Millbury at Richland	✓			ok	
7	Taylor at Millbury				ok	
8	Kelly Square / Vernon St.				ok	
9	Pond at Water				ok	
10	Posner Square					
11	Grafton at Franklin				ok	
12	Southgate Place					
13	Harrison St. at Water St.			Broke	ok	
14	Millbury St. at Lafayette St.				ok	
15	Millbury St. at Endicott				ok	
16	Southbridge at Sargent					
17	Green at Madison St.					
18	Summer at Laurel				ok	
19	Thomas at Summer				ok	
20	Kelly Square Control Structure				ok	
21	Shamrock at Shrewsbury					
22	Risso Court at Shrewsbury					
23	Oleum Court at Shrewsbury					
24	Waitte at Shrewsbury					
25	Sewaro at Shrewsbury					
26	Laria at Shrewsbury					

Date: 5/25/12

Inspector: Chad

Weather : clear

City of Worcester DPW & Parks
Sewer Operations Division

Name	Blocked ?	Surcharged ?	Gate / Weir condition	Flow	Structural concerns & Comments
Lincoln Street					
Garden Street				ok	
Washington Square				ok	
Millbury at Ashmont	✓			ok	2-39 Fraud Blockage ok
Millbury at Canton				ok	
Millbury at Richland				ok	
Taylor at Millbury				ok	
Kelly Square/ Vernon Street				ok	
Pond at Water				ok	
Posner Square					
Grafton at Franklin				ok	
Southgate Place					
Harrison Street At Water Street				ok	
Millbury at Lafayette Street				ok	
Millbury at Endicott				ok	
Southbridge at Sargent				ok	
Green at Madison Street				ok	
Summer at Laurel				ok	
Thomas at Summer				ok	
Kelly Square Control Structure				ok	

Date: 5/3/12

Inspector: Robidoux

Weather: Drizzle

Regulators

City of Worcester DPW & Parks
Sewer Operations Division

#	Location	Blocked ?	Surcharged ?	Gate/Weir condicion	Flow	Structural concerns & comments
1	Lincoln St.	NO			Good	
2	Garden St.	NO			Good	
3	Washington Square	NO			Good	
4	Millbury at Ashmont	NO			Good	
5	Millbury at Canton					
6	Millbury at Richland	NO			✓	
7	Taylor at Millbury	NO			✓	
8	Kelly Square / Vernon St.	NO			✓	
9	Pond at Water	NO			✓	
10	Posner Square	NO			✓	
11	Grafton at Franklin	NO			✓	
12	Southgate Place	NO			✓	
13	Harrison St. at Water St.	NO			✓	
14	Millbury St. at Lafayette St.	NO			✓	
15	Millbury St. at Endicott	NO			✓	
16	Southbridge at Sargent	NO			✓	
17	Green at Madison St.	NO			✓	
18	Summer at Laurel	NO			✓	
19	Thomas at Summer	NO			✓	
20	Kelly Square Control Structure	NO				
21	Shamrock at Shrewsbury					
22	Risso Court at Shrewsbury					
23	Oleum Court at Shrewsbury					
24	Waitte at Shrewsbury					
25	Sewaro at Shrewsbury					
26	Laria at Shrewsbury					

Regulators -

City of Worcester DPW & Parks
Sewer Operations Division

Date: 2-9-12

Inspector: Robidoux - Beckwith

Weather : Sunny

Name	Blocked ?	Surcharged ?	Gate / Weir condition	Flow	Structural concerns & Comments
Lincoln Street	NO	yes		Good	
Garden Street	No	yes		Good	
Washington Square	NO	yes		Good	
Millbury at Ashmont	NO	yes		Good	
Millbury at Canton	NO	yes		Good	
Millbury at Richland	NO	yes		Good	
Taylor at Millbury	NO	yes		Good	
Kelly Square/ Vernon Street	NO	yes		Good	
Pond at Water	NO	yes		Good	
Posner Square	No	yes		Good	
Grafton at Franklin	NO	yes		Good	
Southgate Place	NO	yes		Good	
Harrison Street At Water Street	NO	yes		Good	
Millbury at Lafayette Street	NO	yes		Good	
Millbury at Endicott	NO	yes		Good	
Southbridge at Sargent	NO	yes		Good	
Green at Madison Street	NO	yes		Good	
Summer at Laurel	NO	yes		Good	
Thomas at Summer	NO	yes		Good	
Kelly Square Control Structure	No	yes		Good	

Date: 1-9-12

Inspector: Robidoux/Allen/Quijada

Weather: Cold - Sunny

City of Worcester DPW & Parks
Sewer Operations Division

Name	Blocked ?	Surcharged ?	Gate / Weir condition	Flow	Structural concerns & Comments
Lincoln Street					
Garden Street				✓	
Washington Square				✓	
Millbury at Ashmont				✓	
Millbury at Canton					
Millbury at Richland				✓	
Taylor at Millbury				✓	
Kelly Square/ Vernon Street				✓	
Pond at Water				✓	
Posner Square				✓	
Grafton at Franklin				✓	
Southgate Place				✓	
Harrison Street At Water Street				✓	
Millbury at Lafayette Street				✓	
Millbury at Endicott				✓	
Southbridge at Sargent				✓	
Green at Madison Street				✓	
Summer at Laurel				✓	
Thomas at Summer				✓	
Kelly Square Control Structure				✓	

Date: 1-3-12

Inspector: T. Robidoux

Weather : Cold

City of Worcester DPW & Parks
Sewer Operations Division

Name	Blocked ?	Surcharged ?	Gate / Weir condition	Flow	Structural concerns & Comments
Lincoln Street			✓	✓	
Garden Street			✓	✓	
Washington Square			✓	✓	
Millbury at Ashmont			✓	✓	
Millbury at Canton			✓	✓	
Millbury at Richland			✓	✓	
Taylor at Millbury			✓	✓	
Kelly Square/ Vernon Street			✓	✓	
Pond at Water			✓	✓	
Posner Square			✓	✓	
Grafton at Franklin			✓	✓	
Southgate Place			CRUZE	✓	
Harrison Street At Water Street			—BG	✓	
Millbury at Lafayette Street			✓	✓	
Millbury at Endicott			✓	✓	
Southbridge at Sargent			✓	✓	
Green at Madison Street			✓	✓	
Summer at Laurel			✓	✓	
Thomas at Summer			✓	✓	
Kelly Square Control Structure			✓	✓	

Date: 1-4-12

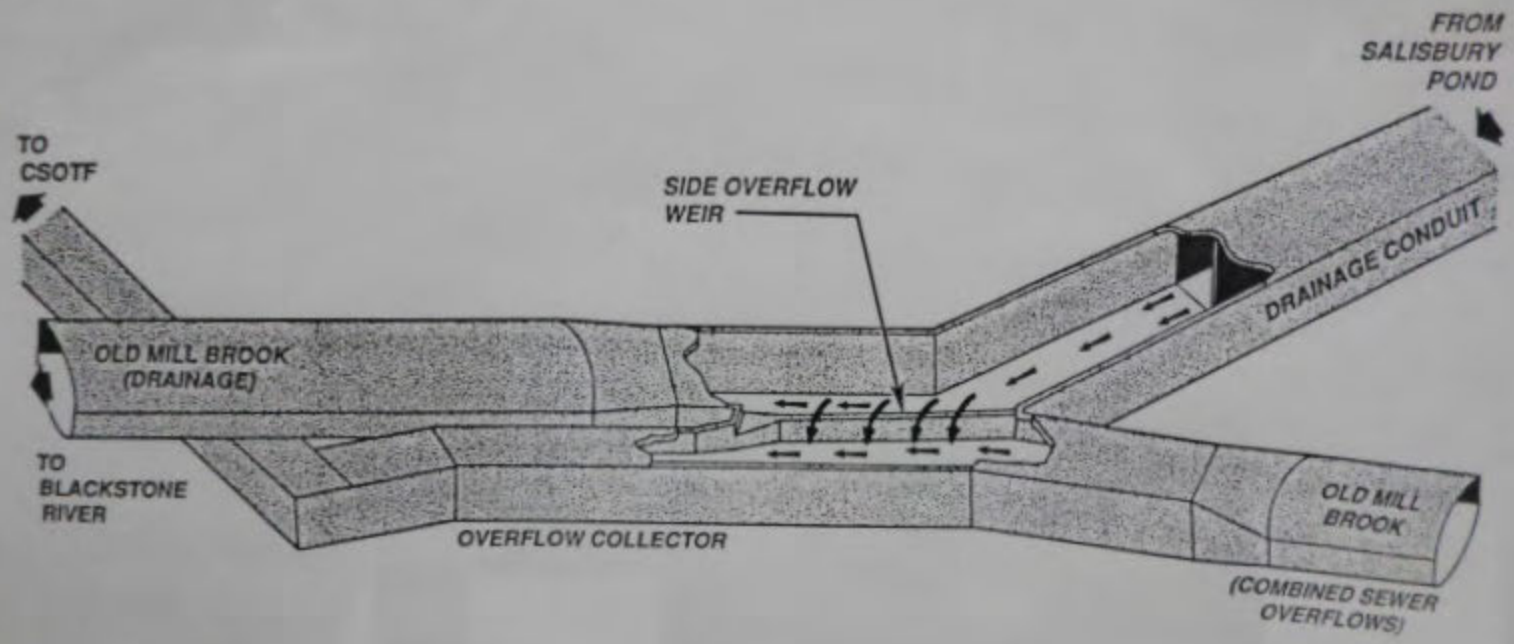
Inspector: Juan R. Rojas

Weather: rain

City of Worcester DPW & Parks
Sewer Operations Division

#	Location	Blocked ?	Surcharged ?	Gate/Weir condicion	Flow	Structural concerns & comments
1	Lincoln St.				ok	
2	Garden St.				ok	
3	Washington Square				ok	
4	Millbury at Ashmont				ok	
5	Millbury at Canton				ok	
6	Millbury at Richland				ok	
7	Taylor at Millbury				ok	
8	Kelly Square / Vernon St.				ok	
9	Pond at Water				ok	
10	Posner Square					
11	Grafton at Franklin				ok	
12	Southgate Place					
13	Harrison St. at Water St.				ok	
14	Millbury St. at Lafayette St.				ok	
15	Millbury St. at Endicott				ok	
16	Southbridge at Sargent					
17	Green at Madison St.				ok	
18	Summer at Laurel				ok	
19	Thomas at Summer				ok	
20	Kelly Square Control Structure				ok	
21	Shamrock at Shrewsbury					
22	Risso Court at Shrewsbury					
23	Oleum Court at Shrewsbury					
24	Waitte at Shrewsbury					
25	Sewaro at Shrewsbury					
26	Laria at Shrewsbury					

Appendix 13
Schematic for Old Mill Brook Conduit Interconnection



SYSTEM INTERCONNECTION

NOT TO SCALE

Fay, Spofford & Thorndike, Inc.

SOUTHBRIDGE ST.
OVERFLOW COLLECTOR
QUINSIGAMOND AVE.
OVERFLOW COLLECTOR
COMBINED SEWER
OVERFLOW TREATMENT
FACILITY
PUMPED
(DRY WEATHER FLOW)
EFFLUENT
CONDUIT
INFLUENT CONDUIT
BY-PASS
TO UPPER
BLACKSTONE
REGIONAL
WASTEWATER
TREATMENT
FACILITY
MAIN INTERCEPTOR
MILL BROOK
HARDING ST.
OVERFLOW
COLLECTOR
DRAINAGE CONDUIT
FROM SALISBURY
POND
MILL BROOK
TO BLACKSTONE
RIVER
SYSTEMS OPERATIONS
NOT TO SCALE
FST
Fay, Spofford & Thorndike, Inc.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION I

DATE: November 13, 2012

SUBJ: City of Worcester, MA MS4 Inspection
Worcester, Massachusetts

FROM: Erin Trainor, Inspector

TO: File

REQUESTED BY: Doug Koopman (OES)

I. Background Information

A. Date, Time of inspection: Wednesday, October 31, 2012, 08:00 AM

B. Weather Conditions: Overcast and cool, approximately 40 degrees F

C. USEPA Representatives: Erin Trainor
Doug Koopman

D. Site Representative: Michael V. O'Brien, City Manager
City of Worcester
455 Main Street, Worcester, MA 01608
Phone: (508) 799-1175, Fax: (508) 799-1208

E. Address: Various locations within the City of Worcester, Massachusetts

II. Purpose of Inspection

The purpose of the inspection was to identify illicit connections or illegal discharges within the City of Worcester Municipal Separate Stormwater Sewer System (MS4) that may adversely impact the water quality in Poor Farm Brook, Weasel Brook, Beaver Brook, and Middle River. Samples were collected from ten (10) stormwater outfalls and/or culverted streams in accordance with the Environmental Investigations and Analysis (EIA) unit Stormwater Program Plan.

III. Description of Sampling Locations

- In-stream sample collected along Weasel Brook at Kendrick Field, identified as Kendrick (42.307996743 N, 71.800505649 W).
- Outfall located along Ararat Street, identified as Ararat (42.312794757 N, 71.803639416 W).
- Outfall located at the end of Pompano Road, identified as Pompano (42.30173411 N, 71.780672925 W).
- Outfall located on Clark Road, identified as Clark (42.312489584 N, 71.775037716 W).
- In-stream sample collected along Poor Farm Brook at Tacoma Road, identified as Tacoma (42.306979227 N, 71.769039271 W).
- In-stream sample collected along Beaver Brook at the Mill Street bridge crossing, identified as Mill (42.246240971 N, 71.833205486 W).
- In-stream sample collected along Middle River at St. Johns cemetery, identified as St. Johns (42.23891791 N, 71.821130937 W).
- In-stream sample collected along Middle River from the south culvert of the McKeon Road bridge crossing, identified as McKeonA (42.242347578 N, 71.80888752 W).
- In-stream sample collected along Middle River from the center culvert of the McKeon Road bridge crossing, identified as McKeonB (42.242347578 N, 71.80888752 W).
- In-stream sample collected along Middle River from the north culvert of the McKeon Road bridge crossing, identified as McKeonC (42.242347578 N, 71.80888752 W).

IV. Inspection Observations and Findings

On Tuesday, September 18, 2012, EPA inspectors Doug Koopman and Erin Trainor conducted an announced Compliance Sampling Inspection (CSI) of the City of Worcester MS4 at ten (10) locations which discharge into Poor Farm Brook, Weasel Brook, Beaver Brook, and Middle River. The inspection started in Worcester at approximately 08:00 AM. At the time of the inspection, the weather was overcast and approximately 40 degrees Fahrenheit. Approximately 2 inches of rain was recorded in the area within 72 hours of the inspection.

The City of Worcester was issued NPDES Permit MAS010002 for discharging storm water from its municipal separate storm sewer system (MS4) which became effective on October 30, 1998. The permit expired five years later on October 30, 2003; however, EPA administratively continued the permit as allowed by regulation.

Three of the sampling locations described in Section III were field screened using test kits for ammonia, chlorine, and surfactants. All samples were analyzed at the EPA New England Regional Laboratory (NERL) for E.Coli, Enterococcus, and pharmaceutical and personal care products (PPCPs) including: Atenolol, Acetaminophen, Cotinine, 1,7-Dimethylxanthine, Caffeine, Carbamazepine, and Metoprolol. In-situ measurements for conductivity, salinity, and temperature were also recorded. The following tables summarize the findings. Photographs are included. Laboratory results are anticipated to be available October 2012.

End of Report

Summary of Worcester, MA MS4 Inspection, October 31, 2012

Sample ID	Kendrick	Ararat	Pompano	Clark	Tacoma	Mill	St. Johns
Time	08:25	08:45	09:30	10:00	10:40	11:25	11:45
Latitude / Longitude	42.307996743 N, 71.800505649 W	42.312794757N / 71.803639416W	42.30173411N / 71.780672925W	42.312489584N / 71.775037716W	42.306979227N / 71.769039271W	42.246240971N / 71.833205486W	42.23891791N / 71.821130937W
Description of Location	In-stream sample collected along Weasel Brook at Kendrick Field.	Outfall located along Ararat Street.	Outfall located at the end of Pompano Road.	Outfall located on Clark Road.	In-stream sample collected along Poor Farm Brook at Tacoma Road.	In-stream sample collected along Beaver Brook at the Mill Street bridge crossing.	In-stream sample collected along Middle River at St. Johns cemetery.
Physical Observations	Moderate flow, no odor observed.	Flow approx. 10-15 GPM, suds present.	Flow approx. 5 GPM, some suds present, no odor observed.	Flow approx. 15 GPM, no odor observed.	Moderate flow, some suds present, no odor observed.	Moderate flow, some suds present, no odor observed.	High flow, no odor observed.
Temperature, ºC	14.7	15.3	15.2	16.0	13.4	13.5	13.8
Specific Conductivity, µS	409.8	950	514	381.7	375.6	235.3	216.5
Salinity, ppt	0.2	0.6	0.3	0.2	0.2	0.1	0.1
Ammonia, mg/l	NA	0	0	0.25	NA	NA	NA
Total Chlorine, mg/l	NA	0.00	0	0.02	NA	NA	NA
Detergent, mg/l	NA	1.0	<0.25	<0.25 (0.2)	NA	NA	NA

NA: Not analyzed
GPM: gallons per minute

Summary of Worcester MA MS4 Inspection, October 31, 2012

Sample ID	McKeonA	McKeonB	McKeonC
Time	12:10	12:15	12:20
Latitude/Longitude	42.242347578N / 71.80888752W	42.242347578N / 71.80888752W	
Description of Location	In-stream sample collected along Middle River from the south culvert of the McKeon Road bridge crossing.	In-stream sample collected along Middle River from the center culvert of the McKeon Road bridge crossing.	In-stream sample collected along Middle River from the north culvert of the McKeon Road bridge crossing.
Physical Observations	High flow, no odor observed.	Moderate flow, no odor observed.	Moderate flow, no odor observed.
Temperature, ºC	13.9	13.9	13.9
Specific Conductivity, µS	227	219.0	220.6
Salinity, ppt	0.1	0.1	0.1
Ammonia, mg/l	NA	NA	NA
Total Chlorine, mg/l	NA	NA	NA
Detergent, mg/l	NA	NA	NA

NA: Not analyzed
GPM: gallons per minute

Kendrick: In-stream sample collected along Weasel Brook at Kendrick Field.

Ararat: Outfall located along Ararat Street.

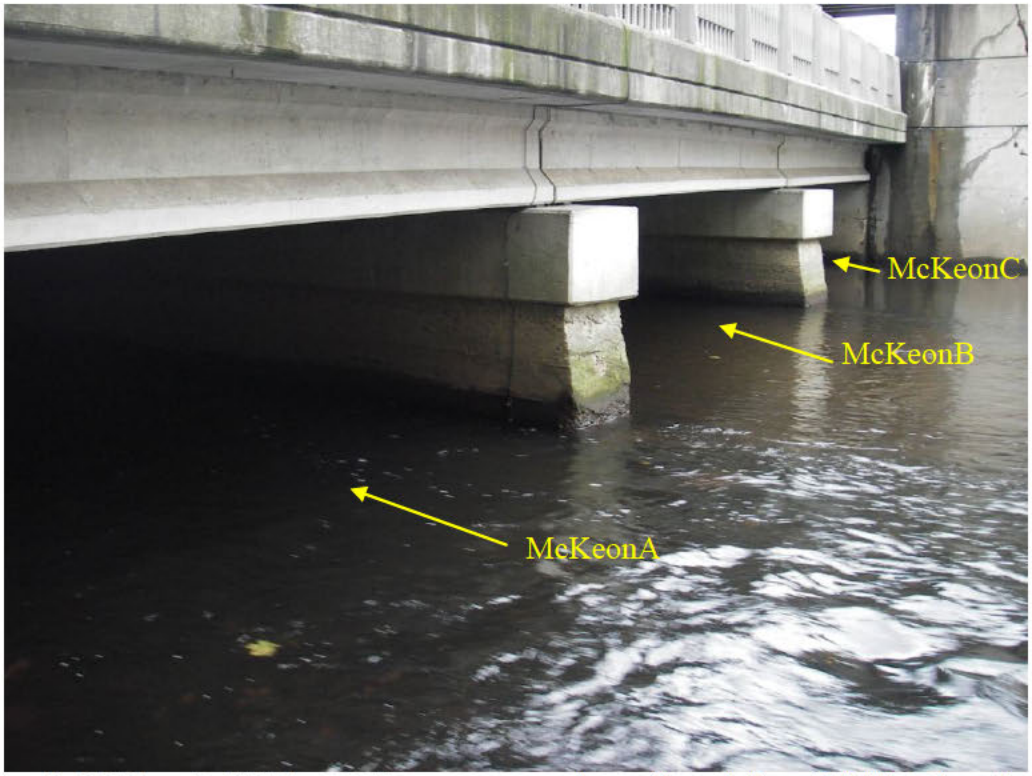
Pompano: Outfall located at the end of Pompano Road.

Clark: Outfall located on Clark Road.

Tacoma: In-stream sample collected along Poor Farm Brook at Tacoma Road.

Mill: In-stream sample collected along Beaver Brook at the Mill Street bridge crossing.

St. Johns: In-stream sample collected along Middle River at St. Johns cemetery.



McKeonA, McKeonB, McKeonC: In-stream samples collected from Middle River from the McKeon Road bridge crossing.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1
5 Post Office Square, Suite 100
Boston, MA 02109-3912

Memorandum - Enforcement Confidential

Date: 28 July 2010

Subj: NPDES Compliance Sampling Inspection
Municipal Separate Storm Sewer System (MS4)
City of Boston, MA

From: Todd Borci

To: File

On Wednesday, 28 July 2010, EPA inspector Todd Borci conducted an unannounced Compliance Sampling Inspection (CSI) of the City of Boston, Massachusetts's (the "City") Municipal Separate Storm Sewer System ("MS4").

29J212 and Bos017outfalls were sampled. The EPA Inspector inspected 2 large culverts, 29J212, a concrete outfall approximately 60" in diameter and Bos017, a concrete outfall approximately 72" in diameter.

At 7:15 AM, 29J212 surface water was fairly clear in appearance. Some suspended sediments and a slight musty odor was detected. Surface water samples were collected for following parameters: bacteria (e. coli and enterococcus); ammonia; surfactants; and chlorine. EPA collected an additional grab sample for field processing of surfactants, ammonia, and chlorine. Using Hach brand test strips for ammonia and a Chemetrics K-9400 field kit for surfactants, EPA personnel processed surface water samples collected at the location. The field kit indicated no detectable levels of ammonia (0.0 mg/l) and elevated levels surfactants (3.0 mg/l) in the sample location identified as "29J212". EPA personnel typically use 0.5 mg/l ammonia and 0.25 mg/l surfactants as threshold level screening concentrations, where locations with sample results equal to or greater than these concentrations may be indicative of illicit discharges.

At 7:16 AM, Bos017 surface water was fairly clear in appearance and a slight musty odor was detected. Surface water samples were collected for following parameters: bacteria (e. coli and enterococcus); ammonia; surfactants; and chlorine. EPA collected an additional grab sample for field processing of surfactants, ammonia, and chlorine. Using Hach brand test strips for ammonia and a Chemetrics K-9400 field kit for surfactants, EPA personnel processed surface water samples collected at the location.

Both field kits indicated elevated levels of ammonia (2.0 mg/l) and surfactants (3.0 mg/l) in the sample location identified as "Bos017." EPA personnel typically use 0.5 mg/l ammonia and 0.25 mg/l surfactants as threshold level screening concentrations, where locations with sample results equal to or greater than these concentrations may be indicative of illicit discharges.

Canterbury Brook outfall identified as CantB, at the intersection of Harvard Street and Hansborough Street in Boston, MA, was sampled. At 8:28 AM, EPA located the outfall just west of the intersection of Harvard Street and Hansborough Street. The EPA Inspector inspected a large culvert emerging from beneath Harvard Street. In addition, surface waters were gray/greenish in appearance and slightly cloudy indicating the presence of turbidity. The stream bank was covered in gray filamentous bacteria, a common indicator of sewage. Surface water samples were collected for following parameters: bacteria (e. coli and enterococcus); ammonia; surfactants; and chlorine. EPA collected an additional grab sample for field processing of surfactants, ammonia, and chlorine. Using Hach brand test strips for ammonia and a Chemetrics K-9400 field kit for surfactants, EPA personnel processed surface water samples collected at the location. Both field kits indicated elevated levels of ammonia (5.0 mg/l) and surfactants (0.3 mg/l) in the sample location identified as "CantB." EPA personnel typically use 0.5 mg/l ammonia and 0.25 mg/l surfactants as threshold level screening concentrations, where locations with sample results equal to or greater than these concentrations may be indicative of illicit discharges. Of particular note at this location was that although gray bacterial growth and slightly cloudy water were observed, EPA detected 0.37 mg/L chlorine in the sample. This concentration of chlorine is elevated for such a sample, and may significantly decrease the bacterial concentration in the sample.

Photo 1: 7/28/10 View facing east of Canterbury Brook outfall. Note cloudy gray/green

color to stream.
Arnold Arboretum outfall identified as 15F288, in Boston, MA, was sampled. At 9:02 AM, EPA located the brick, rounded outfall to the right of the main entrance at approximately \ Wednesday, 28 July 2010. The EPA Inspector inspected a large culvert approximately 5' in diameter. 15F288 surface water was clear in appearance and a sharp musty odor was detected. Water was seeping out from the walls of the culvert. Surface water samples were collected for following parameters: bacteria (e. coli and enterococcus); ammonia; surfactants; and chlorine. EPA collected an additional grab sample for field processing of surfactants, ammonia, and chlorine. Using Hach brand test strips for ammonia and a Chemetrics K-9400 field kit for surfactants, EPA personnel processed surface water samples collected at the location. The field kits indicated elevated levels of ammonia (0.75 mg/l) and surfactants (0.20 mg/l) in the sample location identified as "15F288." EPA personnel typically use 0.5 mg/l ammonia and 0.25 mg/l surfactants as threshold level screening concentrations, where locations with sample results equal to or greater than these concentrations may be indicative of illicit discharges.

Photo 2: 7/28/10 View facing east of Arnold Arboretum outfall (15F288).

An outfall identified as Mudd1, in Boston, MA, was sampled. At 9:55 AM, EPA located and inspected the stone, semi-circle culvert on Wednesday, 28 July 2010. Mudd1 surface water was cloudy in appearance, odorless, and contained suspended sediments. The stream bed was not visible. Surface water samples were collected for following parameters: bacteria (e. coli and enterococcus); ammonia; surfactants; and chlorine.

EPA collected an additional grab sample for field processing of surfactants, ammonia, and chlorine. Using Hach brand test strips for ammonia and a Chemetrics K-9400 field kit for surfactants, EPA personnel processed surface water samples collected at the location. The field kits indicated elevated levels of ammonia (5.0 mg/l) and surfactants (0.15 mg/l) in the sample location identified as "Mudd1." EPA personnel typically use 0.5 mg/l ammonia and 0.25 mg/l surfactants as threshold level screening concentrations, where locations with sample results equal to or greater than these concentrations may be indicative of illicit discharges.

Photo 3: 7/28/10 View facing MUDD1 outfall.

An outfall identified as OF233, in Boston, MA, was sampled. At 11:00am, EPA located the concrete outfall on Wednesday, 28 July 2010. The EPA Inspector inspected a small culvert approximately 20"-30" in diameter. OF233 surface water was mostly clear in appearance with light oil sheen. A slightly musty odor was detected. Trash and debris was visible in the stream. Surface water samples were collected for following parameters: bacteria (e. coli and enterococcus); ammonia; surfactants; and chlorine. EPA collected an additional grab sample for field processing of surfactants, ammonia, and chlorine. Using Hach brand test strips for ammonia and a Chemetrics K-9400 field kit for surfactants, EPA personnel processed surface water samples collected at the location. The field kits indicated elevated levels of ammonia (2.0 mg/l) and surfactants (0.40 mg/l) in the sample location identified as "OF233." EPA personnel typically use 0.5 mg/l ammonia and 0.25

mg/l surfactants as threshold level screening concentrations, where locations with sample results equal to or greater than these concentrations may be indicative of illicit discharges.

Photo 4: 7/28/10 View facing OF233 outfall.

Jamaica Pond outfall identified as Jpond, in Boston, MA, was sampled. At 11:25 AM, EPA located the stream surfacing upstream from a manhole cover, clay pipe, and a dry stream bed on Wednesday, 28 July 2010. Jpond surface water was clear in appearance and a sharp musty odor was detected. Water was seeping out from the walls of the culvert. Surface water samples were collected for following parameters: bacteria (e. coli and enterococcus); ammonia; surfactants; and chlorine. EPA collected an additional grab sample for field processing of surfactants, ammonia, and chlorine. Using Hach brand test strips for ammonia and a Chemetrics K-9400 field kit for surfactants, EPA personnel processed surface water samples collected at the location. The field kits undetectable elevated levels of ammonia (0.0 mg/l) and low levels of surfactants (0.05 mg/l) in the sample location identified as “Jpond.” EPA personnel typically use 0.5 mg/l ammonia and 0.25 mg/l surfactants as threshold level screening concentrations, where locations

with sample results equal to or greater than these concentrations may be indicative of illicit discharges.

Photo 5: 7/28/10 View facing OF233 outfall.

Once received, the analytical data for this sampling effort will be attached to this report.

The inspection occurred during dry weather, as according to the National Oceanic and Atmospheric Administration the last measurable precipitation was 0.49” on 23 July 2010.

EPA has been and will continue to be in contact with BWSC and MassDEP as follow-up.

United States Environmental Protection Agency
Region I - EPA New England
5 Post Office Square
Boston, MA 02109-3912

Drafted Date: 4/24/14
Finalized Date: 4/25/14

Subj: Inspection Report for Reconnaissance Inspection on 4-15-14 and Sampling Inspection on 4-22-14 in Worcester, Massachusetts

From: Douglas Koopman, Environmental Engineer

Thru: Denny Dart, Water Enforcement Chief

To: File

I. Facility Information

A. Facility Name: City of Worcester

B. Sample Locations:

- City outfall "KB03" located at 130 Higgins Street
- Weasel Brook upstream of "KB03"
- City outfall "CM06" located on Platation Street
- Coal Mine Brook upstream of "CM06"
- Fitzgerald Brook upstream of "LQ3" located at 212 Lake Ave.
- Fitzgerald Brook downstream of "LQ3"
- Beaver Brook at 300 Chandler Street (Foley parking lot)
- City outfall "BB8" (Spaulding Street outfall) located at 148 Beaver Parkway
- Beaver Brook upstream of "BB8"
- City outfall "BB4"(Eddy's outfall)
- Beaver Brook upstream of "BB4"
- Kettle Brook at 219 James Street
- City CSO outfall

C. Facility Contacts: No contact was made with the City of Worcester prior to or during the Reconnaissance or Sampling events.

D. NPDES ID Number: MS4 permit MA010002

II. Background Information

A. Date and time of inspection:
Reconnaisance Inspection 4-15-14 from 9:00 am to 13:00pm by Doug Koopman, of EPA.

Sampling Inspection 4-22-14 from 8:30 to 13:45pm by Doug Koopman and Erin Trainer, of EPA.

B. Weather Conditions: On 4-15-14, the weather was overcast with light rain and temps in the mid 40's. On 4-22-14, the weather was hazy sun with temps in the 50's. it had not rained in the past 48 hours prior to sampling.

C. US EPA Representative(s): Douglas Koopman, on both dates
Erin Trainor, on 4-22-14

D. State/Local Representative(s): N/A

E. Federally Enforceable Requirements Covered During the Inspection: Clean Water Act Compliance (discharge without a permit) and compliance with MS4 permit MA010002.

F. Previous Enforcement Actions: N/A

III. Type and Purpose of Inspection

The purpose of the Reconnaissance inspection was to identify the locations of storm water pipes. The purpose of the Sampling Inspection was to sample storm water outfalls and streams that the Worcester Department of Public Works (DPW) has identified as outfalls of concern. The DPW inspects these outfalls weekly. EPA sampled some of these outfalls previously and this sampling event was conducted to sample the remaining locations.

IV. Facility Description

City of Worcester Storm Water Outfalls. See the accompanying power point document for pictures of the locations sampled. At the end of this report is the list of outfalls and brooks that are routinely checked by the City of Worcester.

V. April 22 Inspection

On April 22, 2014, Doug Koopman and Erin Trainor left the EPA lab in Chelmsford at 7:30 am to drive to Worcester. The samples were collected in the order outlined above. In an effort to get as many samples as possible and still get back to the Chelmsford lab within 6 hours of the first bacteria sample it was decided that no field kits would be used at the sample locations. At each location a sample was collected for bacteria (E-Coli and Enterococci) and one to run the Pharmaceutical Suite.

While collecting samples at 212 Lake Avenue Erin Trainor heard and saw a steady stream of water falling from the top of the culvert into Fitzgerald Brook (a picture of this is included in the power point presentation).

Sampling continued and the last sample was collected around 1:45pm. Doug Koopman and Erin Trainor arrived back at the Chelmsford Lab around 2:30 pm.

List of Outfalls and Brooks checked by City of Worcester
Entries with a check mark have previously been sampled by EPA

United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Laboratory Report

May 19, 2014

Erin Trainor - EIA / OEME
US EPA New England R1

Project Number: 14040014
Project: MS4 Worcester, MA
Analysis: HPLC/MS/MS Source Tracking Analysis
EPA Chemist: Peter Philbrook

Date Samples Received by the Laboratory: 04/22/2014

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIA-LCMS_STA.1.

The SOP is based on an EPA Regional Analytical Method developed at the EPA New England Laboratory.

Data were reviewed in accordance with the internal verification procedures described in the EPA New England Quality Manual for NERL.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8340 .

Sincerely,

Digitally signed by Dan Boudreau
DN: cn=Dan Boudreau, o=EPA, ou=EIA, email=boudreau.dan@epa.gov, c=US
Date: 2014.05.21 10:33:38 -04'00'

14040014$STA

Qualifiers

RL	Reporting limit
ND	Not Detected above reporting limit
NA	Not Applicable
NC	Not calculated since analyte concentration is ND
J1	Estimated value due to MS recovery outside accceptance criteria
J2	Estimated value due to LFB result outside acceptance criteria
J3	Estimated value due to RPD result outside acceptance criteria
J4	Estimated value due to LCS result outside acceptance criteria
B	Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 3 times the concentration in the blank.
R	No recovery was calculated since the analyte concentration is greater than four times the spike level.

MS4 Worcester, MA

HPLC/MS/MS Source Tracking Analysis

Client Sample ID:	KB03	Lab Sample ID:	AB47631
Date of Collection:	4/22/2014	Matrix:	Water
Date of Preparation:	4/28/2014	Amount Prepared:	500 mL
Date of Analysis:	5/12/2014		

CAS Number	Compound	Concentration ng/L	Dilution	RL ng/L	Qualifier
486-56-6	Cotinine	**0.54**	1	0.40	
103-90-2	Acetaminophen	ND	1	2.0	
29122-68-7	Atenolol	ND	1	2.0	
611-59-6	1,7-Dimethylxanthine	**26**	1	2.0	
58-08-2	Caffeine	**16**	1	4.0	
56392-17-7	Metoprolol	ND	1	2.0	
298-46-4	Carbamazepine	ND	1	0.40	

Surrogate Compounds	Recoveries (%)	QC Ranges
Primidone d5	64	54 - 110
Sulfamethazine 13C6	59	20 - 124

Comments:

MS4 Worcester, MA

HPLC/MS/MS Source Tracking Analysis

Client Sample ID:	WB01	Lab Sample ID:	AB47633
Date of Collection:	4/22/2014	Matrix:	Water
Date of Preparation:	4/28/2014	Amount Prepared:	500 mL
Date of Analysis:	5/12/2014		

CAS Number	Compound	Concentration ng/L	Dilution	RL ng/L	Qualifier
486-56-6	Cotinine	ND	1	0.40	
103-90-2	Acetaminophen	ND	1	2.0	
29122-68-7	Atenolol	ND	1	2.0	
611-59-6	1,7-Dimethylxanthine	ND	1	2.0	
58-08-2	Caffeine	**5.8**	1	4.0	
56392-17-7	Metoprolol	ND	1	2.0	
298-46-4	Carbamazepine	**0.86**	1	0.40	J

Surrogate Compounds	Recoveries (%)	QC Ranges
Primidone d5	47	54 - 110
Sulfamethazine 13C6	47	20 - 124

Comments:

J = Estimated value, continuing calibration verification (CCV) failed.

MS4 Worcester, MA

HPLC/MS/MS Source Tracking Analysis

Client Sample ID:	CM06	Lab Sample ID:	AB47634
Date of Collection:	4/22/2014	Matrix:	Water
Date of Preparation:	4/28/2014	Amount Prepared:	500 mL
Date of Analysis:	5/12/2014		

CAS Number	Compound	Concentration ng/L	Dilution	RL ng/L	Qualifier
486-56-6	Cotinine	ND	1	0.40	
103-90-2	Acetaminophen	ND	1	2.0	
29122-68-7	Atenolol	ND	1	2.0	
611-59-6	1,7-Dimethylxanthine	ND	1	2.0	
58-08-2	Caffeine	ND	1	4.0	
56392-17-7	Metoprolol	ND	1	2.0	
298-46-4	Carbamazepine	ND	1	0.40	

Surrogate Compounds	Recoveries (%)	QC Ranges
Primidone d5	50	54 - 110
Sulfamethazine 13C6	53	20 - 124

Comments:

MS4 Worcester, MA

HPLC/MS/MS Source Tracking Analysis

Client Sample ID:	CM	Lab Sample ID:	AB47635
Date of Collection:	4/22/2014	Matrix:	Water
Date of Preparation:	4/28/2014	Amount Prepared:	500 mL
Date of Analysis:	5/12/2014		

CAS Number	Compound	Concentration ng/L	Dilution	RL ng/L	Qualifier
486-56-6	Cotinine	ND	1	0.40	
103-90-2	Acetaminophen	**7.0**	1	2.0	
29122-68-7	Atenolol	ND	1	2.0	
611-59-6	1,7-Dimethylxanthine	ND	1	2.0	
58-08-2	Caffeine	**7.8**	1	4.0	
56392-17-7	Metoprolol	ND	1	2.0	
298-46-4	Carbamazepine	ND	1	0.40	

Surrogate Compounds	Recoveries (%)	QC Ranges
Primidone d5	53	54 - 110
Sulfamethazine 13C6	63	20 - 124

Comments:

MS4 Worcester, MA

HPLC/MS/MS Source Tracking Analysis

Client Sample ID:	FB down	Lab Sample ID:	AB47636
Date of Collection:	4/22/2014	Matrix:	Water
Date of Preparation:	4/28/2014	Amount Prepared:	500 mL
Date of Analysis:	5/12/2014		

CAS Number	Compound	Concentration ng/L	Dilution	RL ng/L	Qualifier
486-56-6	Cotinine	**3.7**	1	0.40	
103-90-2	Acetaminophen	**75**	1	2.0	
29122-68-7	Atenolol	**2.7**	1	2.0	
611-59-6	1,7-Dimethylxanthine	**24**	1	2.0	
58-08-2	Caffeine	**110**	1	4.0	
56392-17-7	Metoprolol	**3.1**	1	2.0	
298-46-4	Carbamazepine	**0.63**	1	0.40	J

Surrogate Compounds	Recoveries (%)	QC Ranges
Primidone d5	50	54 - 110
Sulfamethazine 13C6	61	20 - 124

Comments:
J = Estimated value, continuing calibration verification (CCV) failed

MS4 Worcester, MA

HPLC/MS/MS Source Tracking Analysis

Client Sample ID:	FB up	Lab Sample ID:	AB47637
Date of Collection:	4/22/2014	Matrix:	Water
Date of Preparation:	4/28/2014	Amount Prepared:	500 mL
Date of Analysis:	5/12/2014		

CAS Number	Compound	Concentration ng/L	Dilution	RL ng/L	Qualifier
486-56-6	Cotinine	**2.5**	1	0.40	
103-90-2	Acetaminophen	**66**	1	2.0	
29122-68-7	Atenolol	**4.0**	1	2.0	
611-59-6	1,7-Dimethylxanthine	**27**	1	2.0	
58-08-2	Caffeine	**95**	1	4.0	
56392-17-7	Metoprolol	**2.5**	1	2.0	
298-46-4	Carbamazepine	**0.57**	1	0.40	J

Surrogate Compounds	Recoveries (%)	QC Ranges
Primidone d5	61	54 - 110
Sulfamethazine 13C6	58	20 - 124

Comments: J = Estimated value, continuing calibration verification (CCV) failed

MS4 Worcester, MA

HPLC/MS/MS Source Tracking Analysis

Client Sample ID:	300 Chandler	Lab Sample ID:	AB47638
Date of Collection:	4/22/2014	Matrix:	Water
Date of Preparation:	4/28/2014	Amount Prepared:	500 mL
Date of Analysis:	5/12/2014		

CAS Number	Compound	Concentration ng/L	Dilution	RL ng/L	Qualifier
486-56-6	Cotinine	**2.9**	1	0.40	
103-90-2	Acetaminophen	**710**	5	10	
29122-68-7	Atenolol	**140**	1	2.0	
611-59-6	1,7-Dimethylxanthine	**29**	1	2.0	
58-08-2	Caffeine	**300**	1	4.0	
56392-17-7	Metoprolol	**2.4**	1	2.0	
298-46-4	Carbamazepine	**1.9**	1	0.40	J

Surrogate Compounds	Recoveries (%)	QC Ranges
Primidone d5	56	54 - 110
Sulfamethazine 13C6	46	20 - 124

Comments: J = Estimated value, continuing calibration verification (CCV) failed

MS4 Worcester, MA

HPLC/MS/MS Source Tracking Analysis

Client Sample ID:	BB8	Lab Sample ID:	AB47639
Date of Collection:	4/22/2014	Matrix:	Water
Date of Preparation:	4/28/2014	Amount Prepared:	500 mL
Date of Analysis:	5/12/2014		

CAS Number	Compound	Concentration ng/L	Dilution	RL ng/L	Qualifier
486-56-6	Cotinine	**3.7**	1	0.40	
103-90-2	Acetaminophen	**95**	1	2.0	
29122-68-7	Atenolol	**4.6**	1	2.0	
611-59-6	1,7-Dimethylxanthine	**17**	1	2.0	
58-08-2	Caffeine	**82**	1	4.0	
56392-17-7	Metoprolol	**3.3**	1	2.0	
298-46-4	Carbamazepine	**3.4**	1	0.40	J

Surrogate Compounds	Recoveries (%)	QC Ranges
Primidone d5	55	54 - 110
Sulfamethazine 13C6	57	20 - 124

Comments: J = Estimated value, continuing calibration verification (CCV) failed

MS4 Worcester, MA

HPLC/MS/MS Source Tracking Analysis

Client Sample ID:	BB8 up	Lab Sample ID:	AB47640
Date of Collection:	4/22/2014	Matrix:	Water
Date of Preparation:	4/28/2014	Amount Prepared:	500 mL
Date of Analysis:	5/12/2014		

CAS Number	Compound	Concentration ng/L	Dilution	RL ng/L	Qualifier
486-56-6	Cotinine	**13**	1	0.40	
103-90-2	Acetaminophen	**620**	5	10	
29122-68-7	Atenolol	**19**	1	2.0	
611-59-6	1,7-Dimethylxanthine	**110**	1	2.0	
58-08-2	Caffeine	**490**	5	20	
56392-17-7	Metoprolol	**8.9**	1	2.0	
298-46-4	Carbamazepine	**7.8**	1	0.40	J

Surrogate Compounds	Recoveries (%)	QC Ranges
Primidone d5	57	54 - 110
Sulfamethazine 13C6	48	20 - 124

Comments: J = Estimated value, continuing calibration verification (CCV) failed

MS4 Worcester, MA

HPLC/MS/MS Source Tracking Analysis

Client Sample ID:	BB4	Lab Sample ID:	AB47641
Date of Collection:	4/22/2014	Matrix:	Water
Date of Preparation:	4/28/2014	Amount Prepared:	500 mL
Date of Analysis:	5/12/2014		

CAS Number	Compound	Concentration ng/L	Dilution	RL ng/L	Qualifier
486-56-6	Cotinine	**82**	5	2.0	
103-90-2	Acetaminophen	**320**	5	10	
29122-68-7	Atenolol	**23**	1	2.0	
611-59-6	1,7-Dimethylxanthine	**670**	5	10	
58-08-2	Caffeine	**740**	5	20	
56392-17-7	Metoprolol	**1.9**	1	2.0	
298-46-4	Carbamazepine	**1.5**	1	0.40	J

Surrogate Compounds	Recoveries (%)	QC Ranges
Primidone d5	86	54 - 110
Sulfamethazine 13C6	92	20 - 124

Comments: J = Estimated value, continuing calibration verification (CCV) failed

MS4 Worcester, MA

HPLC/MS/MS Source Tracking Analysis

Client Sample ID:	BB4 up	Lab Sample ID:	AB47642
Date of Collection:	4/22/2014	Matrix:	Water
Date of Preparation:	4/28/2014	Amount Prepared:	500 mL
Date of Analysis:	5/12/2014		

CAS Number	Compound	Concentration ng/L	Dilution	RL ng/L	Qualifier
486-56-6	Cotinine	**5.3**	1	0.40	
103-90-2	Acetaminophen	**130**	1	2.0	
29122-68-7	Atenolol	**7.3**	1	2.0	
611-59-6	1,7-Dimethylxanthine	**35**	1	2.0	
58-08-2	Caffeine	**210**	1	4.0	
56392-17-7	Metoprolol	**1.9**	1	2.0	L
298-46-4	Carbamazepine	**1.9**	1	0.40	J

Surrogate Compounds	Recoveries (%)	QC Ranges
Primidone d5	59	54 - 110
Sulfamethazine 13C6	48	20 - 124

Comments: J = Estimated value, continuing calibration verification (CCV) failed

L= Estimated value, Below calibration range

MS4 Worcester, MA

HPLC/MS/MS Source Tracking Analysis

Client Sample ID:	KB	Lab Sample ID:	AB47643
Date of Collection:	4/22/2014	Matrix:	Water
Date of Preparation:	4/28/2014	Amount Prepared:	500 mL
Date of Analysis:	5/12/2014		

CAS Number	Compound	Concentration ng/L	Dilution	RL ng/L	Qualifier
486-56-6	Cotinine	**0.74**	1	0.40	
103-90-2	Acetaminophen	**5.6**	1	2.0	
29122-68-7	Atenolol	ND	1	2.0	
611-59-6	1,7-Dimethylxanthine	**1.8**	1	2.0	L
58-08-2	Caffeine	**12**	1	4.0	
56392-17-7	Metoprolol	ND	1	2.0	
298-46-4	Carbamazepine	**1.9**	1	0.40	J

Surrogate Compounds	Recoveries (%)	QC Ranges
Primidone d5	50	54 - 110
Sulfamethazine 13C6	50	20 - 124

Comments: J = Estimated value, continuing calibration verification (CCV) failed

L = Estimated value is below the calibration range

MS4 Worcester, MA

HPLC/MS/MS Source Tracking Analysis

Client Sample ID:	CSO	Lab Sample ID:	AB47644
Date of Collection:	4/22/2014	Matrix:	Water
Date of Preparation:	4/28/2014	Amount Prepared:	500 mL
Date of Analysis:	5/12/2014		

CAS Number	Compound	Concentration ng/L	Dilution	RL ng/L	Qualifier
486-56-6	Cotinine	**12**	1	0.40	
103-90-2	Acetaminophen	**120**	1	2.0	
29122-68-7	Atenolol	**6.8**	1	2.0	
611-59-6	1,7-Dimethylxanthine	**47**	1	2.0	
58-08-2	Caffeine	**280**	1	4.0	
56392-17-7	Metoprolol	**3.8**	1	2.0	
298-46-4	Carbamazepine	**1.7**	1	0.40	J

Surrogate Compounds	Recoveries (%)	QC Ranges
Primidone d5	62	54 - 110
Sulfamethazine 13C6	62	20 - 124

Comments: J = Estimated value, continuing calibration verification (CCV) failed

MS4 Worcester, MA

Laboratory Blank

Client Sample ID:	N/A	Lab Sample ID:	N/A
Date of Collection:	N/A	Matrix:	Water
Date of Preparation:	4/28/2014	Amount Prepared:	500 mL
Date of Analysis:	5/12/2014		

CAS Number	Compound	Concentration ng/L	Dilution	RL ng/L	Qualifier
29122-68-7	Cotinine	ND	1	0.40	
103-90-2	Acetaminophen	ND	1	2.0	
486-56-6	Atenolol	ND	1	2.0	
611-59-6	1,7-Dimethylxanthine	ND	1	2.0	
58-08-2	Caffeine	ND	1	4.0	
298-46-4	Metoprolol	ND	1	2.0	
56392-17-7	Carbamazepine	ND	1	0.40	

Surrogate Compounds	Recoveries (%)	QC Ranges
Primidone d5	50	54 - 110
Sulfamethazine 13C6	38	20 - 124

Comments:

Mstrix Spike Recovery

MS4 Worcester, MA

Sample ID: AB47634

PARAMETER	SPIKE ADDED ng/L	SAMPLE CONCENTRATION ng/L	MS CONCENTRATION ng/L	MS % REC	QC LIMITS (% REC)
1,7-Dimethylxanthine	120.0	ND	60.7	51	13 - 174
Acetaminophen	120.0	ND	97.2	81	23 - 138
Atenolol	120.0	ND	84.5	70	49 - 137
Caffeine	240.0	ND	185	77	31 - 156
Carbamazepine	24.0	ND	26.8	112	47 - 143
Cotinine	24.0	ND	23.7	99	46 - 121
Metoprolol	120.0	ND	78	65	60 - 140

Comments:

MS4 Worcester, MA

Laboratory Duplicate Results

Sample ID: AB47642

PARAMETER	SAMPLE RESULT ng/L	SAMPLE DUPLICATE RESULT ng/L	PRECISION RPD %	QC LIMITS
1,7-Dimethylxanthine	35	39	10.8	50
Acetaminophen	130	140	7.41	50
Atenolol	7.3	6.2	16.3	50
Caffeine	210	240	13.3	50
Carbamazepine	1.9	1.8	5.41	50
Cotinine	5.3	5.3	0.00	50
Metoprolol	1.9	1.5	23.5	50

MS4 Worcester, MA

Laboratory Fortified Blank (LFB) Results

PARAMETER	LFB AMOUNT SPIKED ng/L	LFB RESULT ng/L	LFB RECOVERY %	QC LIMITS %
1,7-Dimethylxanthine	120	81.0	68	64 - 135
Acetaminophen	120	94.7	79	48 - 122
Atenolol	120	116	97	52 - 128
Caffeine	240	201	84	68 - 126
Carbamazepine	24	29.8	124	65 - 121
Cotinine	24	24.1	100	60 - 120
Metoprolol	120	98.4	82	60 - 140

Comments:

Samples in Batch: AB47631, AB47633, AB47634, AB47635, AB47636, AB47637, AB47638, AB47639, AB47640, AB47641, AB47642, AB47643, AB47644

ENVIRONMENTAL PROTECTION AGENCY

REGION 1

CHAIN OF CUSTODY RECORD

PROJ. NO.	PROJECT NAME
14040014	Worcester MA MS4

SAMPLERS: (Signature) [signature]

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	$STA						REMARKS
	4/22/14	0850		X	KB03	1	X						
		0855			WB01								
		0950			CM06								
		1000			CM								
		1030			FB down								
		1040			FB up								
		1120			300 Chandler								
		1150			BB8								
		1152			BB8 up								
		1212			BB4								
		1215			BB4 up								
		1250			KB								
		1330			CS0								

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	4/22/14 1500				
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature) ESAT [signature]	Date / Time 4/22/14 15:00	Remarks	

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

3°C

14040014$STA

1- 10275

Inspection Conclusion Data Sheet (ICDS)

FY2010

Inspector: _Erin Trainor_____

Inspection Date: _October 31, 2012_____

Facility Name/Address: _City of Worcester, Massachusetts MS4 – Various Locations_____

Facility Manager/Title and Address (if different from facility address): Michael V. O'Brien, City Manager, 455 Main Street, Worcester, MA 01608.

Facility Contact/Title and Address (if different from facility address): Michael V. O'Brien, City Manager, 455 Main Street, Worcester, MA 01608.

1. Media Type: (Check one)

☐ CAA-Stationary ☐ CAA-Mobile Source ☐ CAA-112r
☐ CAA-NESHAP
☐ CWA-NPDES ☐ CWA-Pretreatment POTW ☐ CWA-Pretreatment IU
☐ CWA 311 ☐ CWA 404 **X** CWA-Stormwater
☐ EPCRA 313 ☐ EPCRA N313
☐ RCRA-C ☐ RCRA-I
☐ SDWA-UIC ☐ SDWA-PWSS
☐ TSCA-Lead Paint ☐ TSCA-PCBs ☐ TSCA-Core ☐ TSCA-AHERA

2. Did you observe deficiencies (potential violations) during the inspection?

☐ Yes **X** No

3. If you observed deficiencies, did you communicate them to the facility during the inspection?

☐ Yes **X** No

4. Deficiencies observed?

_____ Potential violation of a compliance schedule in an enforceable order.

_____ Potential failure to maintain a record or failure to disclose a document.

_____ Potential failure to maintain, inspect or repair equipment including meters, sensors, and recording equipment.

_____ Potential failure to complete or submit a notification, report, certification, or manifest.

_____ Potential failure to obtain a permit, product approval, or certification.

_____ Potential failure to follow a required sampling or monitoring procedure or laboratory procedure.

_____ Potential failure to follow or develop a required management practice or procedure.

_____ Potential failure to identify and manage a regulated waste or pollutant in any media.

_____ Potential failure to report regulated events such as spills, accidents, etc.

_____ Potential incorrect use of a material (e.g., pesticide, waste, product, etc.) or use of improper or unapproved material.

_____ Potential failure to follow a permit condition(s).

5 Did you observe or see the facility take any actions during the inspection to address the deficiencies communicated to the facility?

☐ Yes ☐ No **X** N/A only if #3 was NO.

If YES, check only the action(s) actually observed/seen or write in a short description of the action in the "optional" section. (Check all that apply)

Action(s) taken

_____ Complete(d) a Notification or Report

_____ Correct(ed) Monitoring Deficiencies

_____ Correct(ed) Record Keeping Deficiencies

_____ Implemented New or Improved Management Practices or Procedures

_____ Improved Pollutant Identification (e.g., Labeling, Manifesting, Storage, etc.)

_____ Reduced Pollution (e.g., Use Reduction, Industrial Process Change, Emissions or Discharge Change, etc.)

_____ Request(ed) a Permit Application or Applied for a Permit

_____ Verified Compliance with Previously Issued Enforcement Action - Part or All Conditions

The following common air or water pollutant(s) **should only be checked** if the "Reduced Pollution" line was checked.

Water: ☐ Ammonia ☐ BOD ☐COD ☐TSS ☐O/G ☐Total Coliform ☐D.O.
☐ Metals ☐Cyanide ☐ Other_____

Air: ☐ NOx ☐ SO2 ☐ PM ☐ VOC ☐ Metals ☐ HAPs ☐ CO
☐ Other_____

6. Did you provide general compliance assistance in accordance with the policy on the Role of the EPA Inspector in Providing Compliance Assistance During Inspections?

☐ Yes **X** No

7. Did you provide site-specific compliance assistance in accordance with the policy on the Role of the EPA Inspector in Providing Compliance Assistance During Inspections?

☐ Yes **X** No

Optional Additional Information: EPA inspectors may wish to provide a narrative description of actions taken by the facility or assistance to help the facility come into compliance. (Narratives may be used in national or regional reports to provide examples of EPA inspection outcomes).

Refer to inspection report.

United States Environmental Protection Agency
Region I - EPA New England
5 Post Office Square
Boston, MA 02109-3912

Drafted Date: 4/24/14
Finalized Date: 4/25/14

Subj: Inspection Report for Reconnaissance Inspection on 4-15-14 and Sampling Inspection on 4-22-14 in Worcester, Massachusetts

From: Douglas Koopman, Environmental Engineer

Thru: Denny Dart, Water Enforcement Chief

To: File

I. Facility Information

A. Facility Name: City of Worcester

B. Sample Locations:

- City outfall "KB03" located at 130 Higgins Street
- Weasel Brook upstream of "KB03"
- City outfall "CM06" located on Platation Street
- Coal Mine Brook upstream of "CM06"
- Fitzgerald Brook upstream of "LQ3" located at 212 Lake Ave.
- Fitzgerald Brook downstream of "LQ3"
- Beaver Brook at 300 Chandler Street (Foley parking lot)
- City outfall "BB8" (Spaulding Street outfall) located at 148 Beaver Parkway
- Beaver Brook upstream of "BB8"
- City outfall "BB4"(Eddy's outfall)
- Beaver Brook upstream of "BB4"
- Kettle Brook at 219 James Street
- City CSO outfall

C. Facility Contacts: No contact was made with the City of Worcester prior to or during the Reconnaissance or Sampling events.

D. NPDES ID Number: MS4 permit MA010002

II. Background Information

A. Date and time of inspection:
Reconnaisance Inspection 4-15-14 from 9:00 am to 13:00pm by Doug Koopman, of EPA.

Sampling Inspection 4-22-14 from 8:30 to 13:45pm by Doug Koopman and Erin Trainer, of EPA.

B. Weather Conditions: On 4-15-14, the weather was overcast with light rain and temps in the mid 40's. On 4-22-14, the weather was hazy sun with temps in the 50's. it had not rained in the past 48 hours prior to sampling.

C. US EPA Representative(s): Douglas Koopman, on both dates
Erin Trainor, on 4-22-14

D. State/Local Representative(s): N/A

E. Federally Enforceable Requirements Covered During the Inspection: Clean Water Act Compliance (discharge without a permit) and compliance with MS4 permit MA010002.

F. Previous Enforcement Actions: N/A

III. Type and Purpose of Inspection

The purpose of the Reconnaissance inspection was to identify the locations of storm water pipes. The purpose of the Sampling Inspection was to sample storm water outfalls and streams that the Worcester Department of Public Works (DPW) has identified as outfalls of concern. The DPW inspects these outfalls weekly. EPA sampled some of these outfalls previously and this sampling event was conducted to sample the remaining locations.

IV. Facility Description

City of Worcester Storm Water Outfalls. See the accompanying power point document for pictures of the locations sampled. At the end of this report is the list of outfalls and brooks that are routinely checked by the City of Worcester.

V. April 22 Inspection

On April 22, 2014, Doug Koopman and Erin Trainor left the EPA lab in Chelmsford at 7:30 am to drive to Worcester. The samples were collected in the order outlined above. In an effort to get as many samples as possible and still get back to the Chelmsford lab within 6 hours of the first bacteria sample it was decided that no field kits would be used at the sample locations. At each location a sample was collected for bacteria (E-Coli and Enterococci) and one to run the Pharmaceutical Suite.

While collecting samples at 212 Lake Avenue Erin Trainor heard and saw a steady stream of water falling from the top of the culvert into Fitzgerald Brook (a picture of this is included in the power point presentation).

Sampling continued and the last sample was collected around 1:45pm. Doug Koopman and Erin Trainor arrived back at the Chelmsford Lab around 2:30 pm.

List of Outfalls and Brooks checked by City of Worcester
Entries with a check mark have previously been sampled by EPA

United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Laboratory Report

May 19, 2014

Erin Trainor - EIA / OEME
US EPA New England R1

Project Number: 14040014
Project: MS4 Worcester, MA
Analysis: HPLC/MS/MS Source Tracking Analysis
EPA Chemist: Peter Philbrook

Date Samples Received by the Laboratory: 04/22/2014

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIA-LCMS_STA.1.

The SOP is based on an EPA Regional Analytical Method developed at the EPA New England Laboratory.

Data were reviewed in accordance with the internal verification procedures described in the EPA New England Quality Manual for NERL.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8340 .

Sincerely,

Digitally signed by Dan Boudreau
DN: cn=Dan Boudreau, o=EPA, ou=EIA, email=boudreau.dan@epa.gov, c=US
Date: 2014.05.21 10:33:38 -04'00'

14040014$STA

Qualifiers

RL	Reporting limit
ND	Not Detected above reporting limit
NA	Not Applicable
NC	Not calculated since analyte concentration is ND
J1	Estimated value due to MS recovery outside accceptance criteria
J2	Estimated value due to LFB result outside acceptance criteria
J3	Estimated value due to RPD result outside acceptance criteria
J4	Estimated value due to LCS result outside acceptance criteria
B	Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 3 times the concentration in the blank.
R	No recovery was calculated since the analyte concentration is greater than four times the spike level.

MS4 Worcester, MA

HPLC/MS/MS Source Tracking Analysis

Client Sample ID:	KB03	Lab Sample ID:	AB47631
Date of Collection:	4/22/2014	Matrix:	Water
Date of Preparation:	4/28/2014	Amount Prepared:	500 mL
Date of Analysis:	5/12/2014		

CAS Number	Compound	Concentration ng/L	Dilution	RL ng/L	Qualifier
486-56-6	Cotinine	**0.54**	1	0.40	
103-90-2	Acetaminophen	ND	1	2.0	
29122-68-7	Atenolol	ND	1	2.0	
611-59-6	1,7-Dimethylxanthine	**26**	1	2.0	
58-08-2	Caffeine	**16**	1	4.0	
56392-17-7	Metoprolol	ND	1	2.0	
298-46-4	Carbamazepine	ND	1	0.40	

Surrogate Compounds	Recoveries (%)	QC Ranges
Primidone d5	64	54 - 110
Sulfamethazine 13C6	59	20 - 124

Comments:

MS4 Worcester, MA

HPLC/MS/MS Source Tracking Analysis

Client Sample ID:	WB01	Lab Sample ID:	AB47633
Date of Collection:	4/22/2014	Matrix:	Water
Date of Preparation:	4/28/2014	Amount Prepared:	500 mL
Date of Analysis:	5/12/2014		

CAS Number	Compound	Concentration ng/L	Dilution	RL ng/L	Qualifier
486-56-6	Cotinine	ND	1	0.40	
103-90-2	Acetaminophen	ND	1	2.0	
29122-68-7	Atenolol	ND	1	2.0	
611-59-6	1,7-Dimethylxanthine	ND	1	2.0	
58-08-2	Caffeine	**5.8**	1	4.0	
56392-17-7	Metoprolol	ND	1	2.0	
298-46-4	Carbamazepine	**0.86**	1	0.40	J

Surrogate Compounds	Recoveries (%)	QC Ranges
Primidone d5	47	54 - 110
Sulfamethazine 13C6	47	20 - 124

Comments:

J = Estimated value, continuing calibration verification (CCV) failed.

MS4 Worcester, MA

HPLC/MS/MS Source Tracking Analysis

Client Sample ID:	CM06	Lab Sample ID:	AB47634
Date of Collection:	4/22/2014	Matrix:	Water
Date of Preparation:	4/28/2014	Amount Prepared:	500 mL
Date of Analysis:	5/12/2014		

CAS Number	Compound	Concentration ng/L	Dilution	RL ng/L	Qualifier
486-56-6	Cotinine	ND	1	0.40	
103-90-2	Acetaminophen	ND	1	2.0	
29122-68-7	Atenolol	ND	1	2.0	
611-59-6	1,7-Dimethylxanthine	ND	1	2.0	
58-08-2	Caffeine	ND	1	4.0	
56392-17-7	Metoprolol	ND	1	2.0	
298-46-4	Carbamazepine	ND	1	0.40	

Surrogate Compounds	Recoveries (%)	QC Ranges
Primidone d5	50	54 - 110
Sulfamethazine 13C6	53	20 - 124

Comments:

MS4 Worcester, MA

HPLC/MS/MS Source Tracking Analysis

Client Sample ID:	CM	Lab Sample ID:	AB47635
Date of Collection:	4/22/2014	Matrix:	Water
Date of Preparation:	4/28/2014	Amount Prepared:	500 mL
Date of Analysis:	5/12/2014		

CAS Number	Compound	Concentration ng/L	Dilution	RL ng/L	Qualifier
486-56-6	Cotinine	ND	1	0.40	
103-90-2	Acetaminophen	**7.0**	1	2.0	
29122-68-7	Atenolol	ND	1	2.0	
611-59-6	1,7-Dimethylxanthine	ND	1	2.0	
58-08-2	Caffeine	**7.8**	1	4.0	
56392-17-7	Metoprolol	ND	1	2.0	
298-46-4	Carbamazepine	ND	1	0.40	

Surrogate Compounds	Recoveries (%)	QC Ranges
Primidone d5	53	54 - 110
Sulfamethazine 13C6	63	20 - 124

Comments:

MS4 Worcester, MA

HPLC/MS/MS Source Tracking Analysis

Client Sample ID:	FB down	Lab Sample ID:	AB47636
Date of Collection:	4/22/2014	Matrix:	Water
Date of Preparation:	4/28/2014	Amount Prepared:	500 mL
Date of Analysis:	5/12/2014		

CAS Number	Compound	Concentration ng/L	Dilution	RL ng/L	Qualifier
486-56-6	Cotinine	**3.7**	1	0.40	
103-90-2	Acetaminophen	**75**	1	2.0	
29122-68-7	Atenolol	**2.7**	1	2.0	
611-59-6	1,7-Dimethylxanthine	**24**	1	2.0	
58-08-2	Caffeine	**110**	1	4.0	
56392-17-7	Metoprolol	**3.1**	1	2.0	
298-46-4	Carbamazepine	**0.63**	1	0.40	J

Surrogate Compounds	Recoveries (%)	QC Ranges
Primidone d5	50	54 - 110
Sulfamethazine 13C6	61	20 - 124

Comments:
J = Estimated value, continuing calibration verification (CCV) failed

MS4 Worcester, MA

HPLC/MS/MS Source Tracking Analysis

Client Sample ID:	FB up	Lab Sample ID:	AB47637
Date of Collection:	4/22/2014	Matrix:	Water
Date of Preparation:	4/28/2014	Amount Prepared:	500 mL
Date of Analysis:	5/12/2014		

CAS Number	Compound	Concentration ng/L	Dilution	RL ng/L	Qualifier
486-56-6	Cotinine	**2.5**	1	0.40	
103-90-2	Acetaminophen	**66**	1	2.0	
29122-68-7	Atenolol	**4.0**	1	2.0	
611-59-6	1,7-Dimethylxanthine	**27**	1	2.0	
58-08-2	Caffeine	**95**	1	4.0	
56392-17-7	Metoprolol	**2.5**	1	2.0	
298-46-4	Carbamazepine	**0.57**	1	0.40	J

Surrogate Compounds	Recoveries (%)	QC Ranges
Primidone d5	61	54 - 110
Sulfamethazine 13C6	58	20 - 124

Comments: J = Estimated value, continuing calibration verification (CCV) failed

MS4 Worcester, MA

HPLC/MS/MS Source Tracking Analysis

Client Sample ID:	300 Chandler	Lab Sample ID:	AB47638
Date of Collection:	4/22/2014	Matrix:	Water
Date of Preparation:	4/28/2014	Amount Prepared:	500 mL
Date of Analysis:	5/12/2014		

CAS Number	Compound	Concentration ng/L	Dilution	RL ng/L	Qualifier
486-56-6	Cotinine	**2.9**	1	0.40	
103-90-2	Acetaminophen	**710**	5	10	
29122-68-7	Atenolol	**140**	1	2.0	
611-59-6	1,7-Dimethylxanthine	**29**	1	2.0	
58-08-2	Caffeine	**300**	1	4.0	
56392-17-7	Metoprolol	**2.4**	1	2.0	
298-46-4	Carbamazepine	**1.9**	1	0.40	J

Surrogate Compounds	Recoveries (%)	QC Ranges
Primidone d5	56	54 - 110
Sulfamethazine 13C6	46	20 - 124

Comments: J = Estimated value, continuing calibration verification (CCV) failed

MS4 Worcester, MA

HPLC/MS/MS Source Tracking Analysis

Client Sample ID:	BB8	Lab Sample ID:	AB47639
Date of Collection:	4/22/2014	Matrix:	Water
Date of Preparation:	4/28/2014	Amount Prepared:	500 mL
Date of Analysis:	5/12/2014		

CAS Number	Compound	Concentration ng/L	Dilution	RL ng/L	Qualifier
486-56-6	Cotinine	**3.7**	1	0.40	
103-90-2	Acetaminophen	**95**	1	2.0	
29122-68-7	Atenolol	**4.6**	1	2.0	
611-59-6	1,7-Dimethylxanthine	**17**	1	2.0	
58-08-2	Caffeine	**82**	1	4.0	
56392-17-7	Metoprolol	**3.3**	1	2.0	
298-46-4	Carbamazepine	**3.4**	1	0.40	J

Surrogate Compounds	Recoveries (%)	QC Ranges
Primidone d5	55	54 - 110
Sulfamethazine 13C6	57	20 - 124

Comments: J = Estimated value, continuing calibration verification (CCV) failed

MS4 Worcester, MA

HPLC/MS/MS Source Tracking Analysis

Client Sample ID:	BB8 up	Lab Sample ID:	AB47640
Date of Collection:	4/22/2014	Matrix:	Water
Date of Preparation:	4/28/2014	Amount Prepared:	500 mL
Date of Analysis:	5/12/2014		

CAS Number	Compound	Concentration ng/L	Dilution	RL ng/L	Qualifier
486-56-6	Cotinine	**13**	1	0.40	
103-90-2	Acetaminophen	**620**	5	10	
29122-68-7	Atenolol	**19**	1	2.0	
611-59-6	1,7-Dimethylxanthine	**110**	1	2.0	
58-08-2	Caffeine	**490**	5	20	
56392-17-7	Metoprolol	**8.9**	1	2.0	
298-46-4	Carbamazepine	**7.8**	1	0.40	J

Surrogate Compounds	Recoveries (%)	QC Ranges
Primidone d5	57	54 - 110
Sulfamethazine 13C6	48	20 - 124

Comments: J = Estimated value, continuing calibration verification (CCV) failed

MS4 Worcester, MA

HPLC/MS/MS Source Tracking Analysis

Client Sample ID:	BB4	Lab Sample ID:	AB47641
Date of Collection:	4/22/2014	Matrix:	Water
Date of Preparation:	4/28/2014	Amount Prepared:	500 mL
Date of Analysis:	5/12/2014		

CAS Number	Compound	Concentration ng/L	Dilution	RL ng/L	Qualifier
486-56-6	Cotinine	**82**	5	2.0	
103-90-2	Acetaminophen	**320**	5	10	
29122-68-7	Atenolol	**23**	1	2.0	
611-59-6	1,7-Dimethylxanthine	**670**	5	10	
58-08-2	Caffeine	**740**	5	20	
56392-17-7	Metoprolol	**1.9**	1	2.0	
298-46-4	Carbamazepine	**1.5**	1	0.40	J

Surrogate Compounds	Recoveries (%)	QC Ranges
Primidone d5	86	54 - 110
Sulfamethazine 13C6	92	20 - 124

Comments: J = Estimated value, continuing calibration verification (CCV) failed

MS4 Worcester, MA

HPLC/MS/MS Source Tracking Analysis

Client Sample ID:	BB4 up	Lab Sample ID:	AB47642
Date of Collection:	4/22/2014	Matrix:	Water
Date of Preparation:	4/28/2014	Amount Prepared:	500 mL
Date of Analysis:	5/12/2014		

CAS Number	Compound	Concentration ng/L	Dilution	RL ng/L	Qualifier
486-56-6	Cotinine	**5.3**	1	0.40	
103-90-2	Acetaminophen	**130**	1	2.0	
29122-68-7	Atenolol	**7.3**	1	2.0	
611-59-6	1,7-Dimethylxanthine	**35**	1	2.0	
58-08-2	Caffeine	**210**	1	4.0	
56392-17-7	Metoprolol	**1.9**	1	2.0	L
298-46-4	Carbamazepine	**1.9**	1	0.40	J

Surrogate Compounds	Recoveries (%)	QC Ranges
Primidone d5	59	54 - 110
Sulfamethazine 13C6	48	20 - 124

Comments: J = Estimated value, continuing calibration verification (CCV) failed

L= Estimated value, Below calibration range

MS4 Worcester, MA

HPLC/MS/MS Source Tracking Analysis

Client Sample ID:	KB	Lab Sample ID:	AB47643
Date of Collection:	4/22/2014	Matrix:	Water
Date of Preparation:	4/28/2014	Amount Prepared:	500 mL
Date of Analysis:	5/12/2014		

CAS Number	Compound	Concentration ng/L	Dilution	RL ng/L	Qualifier
486-56-6	Cotinine	**0.74**	1	0.40	
103-90-2	Acetaminophen	**5.6**	1	2.0	
29122-68-7	Atenolol	ND	1	2.0	
611-59-6	1,7-Dimethylxanthine	**1.8**	1	2.0	L
58-08-2	Caffeine	**12**	1	4.0	
56392-17-7	Metoprolol	ND	1	2.0	
298-46-4	Carbamazepine	**1.9**	1	0.40	J

Surrogate Compounds	Recoveries (%)	QC Ranges
Primidone d5	50	54 - 110
Sulfamethazine 13C6	50	20 - 124

Comments: J = Estimated value, continuing calibration verification (CCV) failed

L = Estimated value is below the calibration range

MS4 Worcester, MA

HPLC/MS/MS Source Tracking Analysis

Client Sample ID:	CSO	Lab Sample ID:	AB47644
Date of Collection:	4/22/2014	Matrix:	Water
Date of Preparation:	4/28/2014	Amount Prepared:	500 mL
Date of Analysis:	5/12/2014		

CAS Number	Compound	Concentration ng/L	Dilution	RL ng/L	Qualifier
486-56-6	Cotinine	**12**	1	0.40	
103-90-2	Acetaminophen	**120**	1	2.0	
29122-68-7	Atenolol	**6.8**	1	2.0	
611-59-6	1,7-Dimethylxanthine	**47**	1	2.0	
58-08-2	Caffeine	**280**	1	4.0	
56392-17-7	Metoprolol	**3.8**	1	2.0	
298-46-4	Carbamazepine	**1.7**	1	0.40	J

Surrogate Compounds	Recoveries (%)	QC Ranges
Primidone d5	62	54 - 110
Sulfamethazine 13C6	62	20 - 124

Comments: J = Estimated value, continuing calibration verification (CCV) failed

MS4 Worcester, MA

Laboratory Blank

Client Sample ID:	N/A	Lab Sample ID:	N/A
Date of Collection:	N/A	Matrix:	Water
Date of Preparation:	4/28/2014	Amount Prepared:	500 mL
Date of Analysis:	5/12/2014		

CAS Number	Compound	Concentration ng/L	Dilution	RL ng/L	Qualifier
29122-68-7	Cotinine	ND	1	0.40	
103-90-2	Acetaminophen	ND	1	2.0	
486-56-6	Atenolol	ND	1	2.0	
611-59-6	1,7-Dimethylxanthine	ND	1	2.0	
58-08-2	Caffeine	ND	1	4.0	
298-46-4	Metoprolol	ND	1	2.0	
56392-17-7	Carbamazepine	ND	1	0.40	

Surrogate Compounds	Recoveries (%)	QC Ranges
Primidone d5	50	54 - 110
Sulfamethazine 13C6	38	20 - 124

Comments:

Mstrix Spike Recovery

MS4 Worcester, MA

Sample ID: AB47634

PARAMETER	SPIKE ADDED ng/L	SAMPLE CONCENTRATION ng/L	MS CONCENTRATION ng/L	MS % REC	QC LIMITS (% REC)
1,7-Dimethylxanthine	120.0	ND	60.7	51	13 - 174
Acetaminophen	120.0	ND	97.2	81	23 - 138
Atenolol	120.0	ND	84.5	70	49 - 137
Caffeine	240.0	ND	185	77	31 - 156
Carbamazepine	24.0	ND	26.8	112	47 - 143
Cotinine	24.0	ND	23.7	99	46 - 121
Metoprolol	120.0	ND	78	65	60 - 140

Comments:

MS4 Worcester, MA

Laboratory Duplicate Results

Sample ID: AB47642

PARAMETER	SAMPLE RESULT ng/L	SAMPLE DUPLICATE RESULT ng/L	PRECISION RPD %	QC LIMITS
1,7-Dimethylxanthine	35	39	10.8	50
Acetaminophen	130	140	7.41	50
Atenolol	7.3	6.2	16.3	50
Caffeine	210	240	13.3	50
Carbamazepine	1.9	1.8	5.41	50
Cotinine	5.3	5.3	0.00	50
Metoprolol	1.9	1.5	23.5	50

MS4 Worcester, MA

Laboratory Fortified Blank (LFB) Results

PARAMETER	LFB AMOUNT SPIKED ng/L	LFB RESULT ng/L	LFB RECOVERY %	QC LIMITS %
1,7-Dimethylxanthine	120	81.0	68	64 - 135
Acetaminophen	120	94.7	79	48 - 122
Atenolol	120	116	97	52 - 128
Caffeine	240	201	84	68 - 126
Carbamazepine	24	29.8	124	65 - 121
Cotinine	24	24.1	100	60 - 120
Metoprolol	120	98.4	82	60 - 140

Comments:

Samples in Batch: AB47631, AB47633, AB47634, AB47635, AB47636, AB47637, AB47638, AB47639, AB47640, AB47641, AB47642, AB47643, AB47644

ENVIRONMENTAL PROTECTION AGENCY

REGION 1

CHAIN OF CUSTODY RECORD

PROJ. NO.	PROJECT NAME
14040014	Worcester MA MS4

SAMPLERS: (Signature) [signature]

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	$STA						REMARKS
	4/22/14	0850		X	KB03	1	X						
		0855			WB01								
		0950			CM06								
		1000			CM								
		1030			FB down								
		1040			FB up								
		1120			300 Chandler								
		1150			BB8								
		1152			BB8 up								
		1212			BB4								
		1215			BB4 up								
		1250			KB								
		1330			CS0								

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	4/22/14 1500				
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature) ESAT [signature]	Date / Time 4/22/14 15:00	Remarks	

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

3°C

14040014$STA

1- 10275

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region I - EPA New England

Author: Andrew Spejewski

Finalized Date: 28 Sept 2012
Reviewed by:
Reviewed date:

I. Facility Information

A. Facility Name: Town of Weymouth MS4
B. Facility Location: Town of Weymouth Department of Public Works
120 Winter Street
Weymouth, MA 02188
C. Facility Contact: James Donovan
D. Contact Mailing Address: As above
E. Permit #: MAR41070

II. Background Information

A. Date of inspection: August 14, 2012
B. Weather Conditions: Clear, dry
C. US EPA Representative(s): Andrew Spejewski, EPA, Inspection lead
Denny Dart, EPA
Margie Brenner, EPA
D. State/Local Representative(s): No state representatives
E. Previous Enforcement Actions: A DEP consent order in the 1990s addressed sanitary sewer overflows in the Town.

Jeffrey Bina, Director of Public Works, Town of Weymouth, (781) 337-5100
James Donovan, Civil Engineer, Town of Weymouth, (781) 337-5100 x349
Andrew (Chip) Fontaine, Town Engineer, Town of Weymouth
(781) 337-5100 x318
Carter Fahy, Environmental Partners, (617) 637-0234
Samantha Woods, Executive Director,
North and South Rivers Watershed Association, Inc.
(781) 659-8168
Mary Ellen Schloss, Conservation Director

Pre-Inspection

The inspection was arranged two weeks in advance by Mr. Spejewski.

Opening Interview -- Andrew Spejewski

By previous arrangement, all EPA personnel arrived at the Department of Public Works (DPW) building at 120 Winter st at 8:00 AM.
In attendance were:

Jeffrey Bina, Director of Public Works, Town of Weymouth, (781) 337-5100
James Donovan, Civil Engineer, Town of Weymouth, (781) 337-5100 x349
Andrew (Chip) Fontaine, Town Engineer, Town of Weymouth (781) 337-5100 x318
Carter Fahy, Environmental Partners, (617) 637-0234
Samantha Woods, Executive Director, North and South Rivers Watershed Association, Inc. (781) 659-8168

[Mr. Bina left and rejoined the group at various times during the morning]

Mr. Spejewski and Ms. Dart showed their credentials. Mr. Spejewski explained the purpose of the inspection.

All information following, unless otherwise noted, is from statements by town personnel or town consultants present.

Background
The Town of Weymouth ("Town") has an area of 11,200 Acres 17.5 square miles and population of about 55,000, according to Town representatives.

According to Jeffrey Bina, the Town has spent tens of millions of dollars (sanitary) sewering the town and the Town is now almost entirely sewered. There has never been a combined sanitary/storm sewer in the Town.

They have two drinking water treatment plants, one is a year old 35 million dollar plant. They have surface water sources, Whitman's Pond and Weymouth Great Pond, as well as five ground water wells along the Mill River. There are also numerous wetlands and buffer zones in the Town.

The state roads in town are Route 18 and Route 53, and Superhighway, Route 3. There's also an unnumbered Columbian Street to Park to Oak, which is state. Route 3A is also state owned.

The former Weymouth Naval Air Station is located in Weymouth, now being redeveloped as Southfield with a state charter as a corporation. At the moment, the development is not managed by the Town of Weymouth. The Southfield area has separate drainage from the rest of the Town.

There are several non-municipal entities with stormwater discharges: There are rail lines and rail stations, which are all relatively new. There is a shopping mall in the Back River area. MWRA has a pumping station near the Fore River

The Town of Weymouth has a minor stormwater connection with Hingham on the south, and shares a border along Smelt Brook with Braintree on the north, but no significant interconnections.

The Town has two Recreational saltwater beaches (Wessagusset and George Lane) and two state parks. There are stormwater discharges to the beaches, but they were not sure of beach closures due to stormwater discharges. Lane Beach was closed for swimmer's itch last week.

According to the Town's Storm Drain Network map, the town has stormwater discharges to Fore River and the Back River, which both discharge to Boston Harbor. Back River is connected by fish ladders to Great Pond and has one of the most productive herring runs in the state.

Overview of Town MS4 program: Organization and Responsibilities

The Town Water and Sewer Department operates and maintains the sanitary system, though the DPW provides engineering for sanitary sewer design. The stormwater system is handled by Engineering and the DPW.

Mr. Fontaine is primarily in charge of MS4 compliance within DPW, under Mr. Bina.

The Town has contracted with Greenscapes to provide public education. The Health Department, Building Department, Conservation Department and Planning Departments sometimes get involved. (Five municipal departments.) They also interact with MA Department of Transportation. Mr. Fontaine stated that the Town had some formal committee meetings in the past (for instance when writing bylaws) but have not felt the need recently to formally convene.

The Town has a written Storm Water Plan, written by a consultant. Mr. Fontaine offered to send an electronic copy. He admitted it is not completely up to date.

There is a ten year old "Whitman's Pond Watershed Master Plan" for the town's ponds that included sediment testing, sampling, and a nutrient uptake sample. The plan recommended nutrient remediation measures and efforts to address invasive species. The Conservation Agent is currently coordinating an updated study by ESS.

Public Education/Involvement

Samantha Woods, Executive Director of North and South Rivers Watershed Association, Inc., ("NSRW") explained that they contract with the Town, and several other towns, to provide public education. Since 2003, NSRW has been educating homeowners on landscaping techniques to protect water quality. She provided samples of the Greenscape literature they have developed [Material is in hard copy inspection file]. Their web site is www.greenscapes.org.

The NSRW goes into fifth grade classrooms for a week each year and provides materials for teachers on water sources, pollution and conservation. The students play a game called "Watershed Jeopardy." They spend a half day at the school doing field trips to the water treatment plant, herring run and Whitman's Pond, and doing interactive water activities. They reach 500 students plus about 50 parent volunteers. In addition, they send a homework survey home with the students that they are to fill out with their parents.

NSRW uses press campaigns; they set up tables at events such as farmer's markets and the Town pumpkin festival ; they send brochures out with the water bills, and they use social media to reach residents. The web site reaches about 1800 people for all of the communities involved.

Right now, NSRW is providing generic public education but would like to move to education on the specific stormwater infrastructure needs of a particular community, in particular targeting businesses and other audiences aside from the general population. There are other partners in the Greenscapes program on the North Shore and Pioneer Valley.

The total program cost is $25,000 to $30,000 for the entire area. Weymouth pays about $5,000 per year. She offered to provide data on the number of people reached. She sends reports to David Tower at the Town.

Ms. Woods stated there had been a survey back around 2006; she stated (without prompting) that there was no baseline survey, so it was not particularly useful for tracking changes in attitudes. The only conclusion was that direct mail was not particularly cost-effective.

There is a Town storm drain stenciling program in the Whitman's Pond area. The Health Department reaches out to businesses and enforces against any that might have storm water pollution. The Health Department would also handle any public education related to dumping. The Water and Sewer Division has been wrestling with MA DOT regarding salting of Route 3 and its impact on drinking water wells. Norwell and Hanover also have concerns about salt discharges from MA DOT to surface and ground water sources.
[At this point, Ms. Woods left]

Illicit Connection Detection Program

Sanitary Sewer Overflows (SSOs)
According to town personnel, Weymouth was put under a DEP Consent Order in the early 1990s because of SSOs. They used to have a lot of issues with infiltration and inflow. They have lined or replaced sewer system sections that had high I/I or were undersized (spending tens of millions, according to Mr. Fontaine) They are currently working on a sewer repair project from Commercial Street to the end of the park on the Fore River. They are replacing 24 " concrete with 36" PVC. The pipe is below the high tide line and the sewer gasses and salt water have destroyed the concrete.

The Town stated that raising the price on water reduced consumption, which in turn reduced flows.

Town personnel could not remember the last SSO in the town, at least several years ago.

Mapping of Storm System
The Town has a GIS map of the storm system. A printed copy was shown during the audit. The map included outfalls, catchbasins, pipes, manholes and detention basins.

The map denotes out-of-network connections and manholes. To make the map, the Town started with a flyover to visually find catch basin grates and man-holes. The Town hired Beta Group to create the map. The contractor popped all man holes to verify pipe size.

There is a finer "assessor's" map set that provides close-up detailed maps of each area of town. This is available on the Town website but you need a Town login.

The map is available to town personnel from a website.

The outfalls are tracked on a database, which includes pictures and screening results.

Screening for Illicits

Consultants Beta Group observed all outfalls and sampled all the outfalls with dry weather flow. They did not pop manholes and sample in structures. Beta Group created a database with photographs and data. During the screening, Beta Group found some buried outfalls, which they call "bubblers." The Town provided a summary of Beta Group's test results for sampling at outfalls with dry weather flows [in file], with Beta Group concluding there were no illicits present. Mr. Fontaine admitted he did not remember what Beta Group's criteria for concluding no illicit were present. Mr. Fontaine stated for further screening, the town would develop criteria based on the new MS4 permit.
[The Beta Group results show results for 33 outfalls. Four had bacteria results between 100 and 200 cfu, in each of these, surfactants and ammonia results were low.]

The report notes storm pipes needing repair. According to Chip, each year, the DPW has a work list of repairs for stormwater pipes.

Mr. Fontaine said any complaints about overflows, flooding or illicit discharges from storm pipes would come into various departments of the Town, likely DPW or the Health Department. He said the departments coordinate closely.

According to Mr. Fontaine, the Health Department sometimes samples catch basins or stormwater outfalls in response to complaints. When repair is needed, the Health Department contacts the DPW. Mr. Fontaine said last week there was a state road oil spill into the stormwater catch basin and several Town departments responded.

Mr. Fontaine said the Health Department has found high bacteria in a few catch basins and the DPW has helped to resolve these. According to Mr. Fontaine, about five years ago the Health Department found an illicit that the DPW helped remove. In the area of Legion Field, a former high school football field, the storm drain system had high coliform levels. This was due to a septic system for the grandstand restrooms which have now been removed. At one point they saw high coliform on a tidal culvert on the Back River. The Health Department, with help from the DPW, sampled all the structures, dye tested septic systems, and didn't find the source, but Mr. Fontaine has not heard of bacteria issues at that location since then.

Mr. Fontaine has a file drawer called "Drainage Problems". Mr. Spejewski asked for a copy of the master list of projects. He provided a copy of the list [in file]. Mr. Spejewski asked about a typical project and Mr. Fontaine described the crushed culvert from Legion Field to Puritan Road. Mr. Spejewski asked whether the Puritan Road project was on the Drainage Problems list but it was not.

Dumping Prohibition

If there is dumping on town property, the Town puts up "no dumping" signs and the Health Department has installed video cameras and prosecuted dumpers. The Health Department ordinance allows them to levy fines for dumping. The DPW would not necessarily hear about dumping into stormwater catch basins unless the dumping affected the structures. Fontaine said the Health Department handles dumping in storm drains.

The Town has the authority to require removal of illicits [a town memo including a copy of the illicit discharge ordinance passed in 2008 is in the inspection file], but Mr. Fontaine did not know of any instances when this authority was exercised. He said that as Town Engineer, he is not aware of everything other departments do, so the Health Department might have required removal of illicit connections.

All ordinances are on the Town of Weymouth website.

The DPW handles all street sweeping and catch basin cleaning. Maintenance of sewers, if replaced in kind, is handled by the DPW as well [See below under Municipal Operations]. Engineering gets involved when there is a flooding problem that requires a bigger pipe or a design change.

[At this point, Ms. Dart left the inspection]

Municipal Operations

There is no long-term replacement plan for storm sewer infrastructure. Replacement as needed. There is a complaint/problem tracking system.

There is no plan or system for inspecting detention basins. The GIS system does include detention basins; personnel were unsure if this included privately-owned controls or not. The DPW does not require a maintenance plan for privately-owned stormwater controls; it is possible the Conservation Commission might for their projects.

Catchbasins are cleaned with a clamshell and a vacuum truck. They are tracked on a tally sheet. Sediment is stored at the yard with street sweepings and then removed by a contractor [a copy of a bill for removing sweepings is in the inspection file].
The town estimates about 350 are cleaned each year out of a total of about 4,000. [A copy of a catch basin cleaning log is in the inspection file]

Streets are swept with two brush sweepers. The entire town is swept in the spring, including school and town parking lots. Spot sweeping and busy streets are swept throughout the year.

Snow/ice control is mostly salt. The town mixes with sand if the amount of salt on hand gets low.

The Parks division is part of DPW. There is no master pesticide or fertilizer plan. Personnel stated there are only four fields maintained by the town, through a commercial contractor. DPW does have a certified pesticide applicator (also the arborist).

The town does no active training of DPW employees on stormwater.

The DPW yard performs vehicle maintenance for fire, police and DPW vehicles. The school department has a separate facility.

[The group toured the DPW Yard at 120 Winter St. There is a separate inspection report for the yard].

Industrial/Construction Project Regulation

Authority

If a construction project disturbs more than an acre, have to comply with state and federal stormwater requirements. If any project permit application comes in, the project goes through stormwater review. [A copy of a Town memo from 2008 including a copy of the newly passed stormwater management ordinance is in the case file].

Review

The planning department coordinates plan review, with the DPW and others commenting. The DPW Engineering group reviews plans for compliance with the MA stormwater guidelines.

Mr. Fontaine estimated about 4-5 projects per month are reviewed.

The town will accept detention basins at developments for town ownership.

Mr. Fontaine showed Mr. Spejewski files for projects in town. Mr. Spejewski examined the file for the Norma Road project. Documents showed several exchanges between the town and the developers regarding stormwater management at the site. [The inspection file includes copies of a page of comments from the DPW on erosion controls, and a copy of the first page of a cover letter from the project consultants to the Conservation Commission submitting a revised site plan, and addressing stormwater comments from the town. The second item, though addressed to the Conservation Commission, had a copy in the DPW files.]

Construction Site Erosion Control- DPW [See below for Conservation Agent interview]

The DPW may require erosion controls (the ConcComm also). The DPW may inspect sites for erosion issues. There is no set policy or guideline for number of inspections or required inspections of erosion controls at any point in the process.

The typical procedure if issues are noted is to contact the owner. If multiple calls are needed, notes will typically be made in the file. Additionally, the ConComm or Health Department could be contacted for action.

Some DPW personnel have attended erosion controls.

There is no set policy on when to inspect or number of inspections. While it has not been tested, Mr. Fontaine believes the DPW has sufficient authority to require erosion controls. The DPW can also hold the occupy permit if necessary.

Mr. Fontaine has a computer file listing active projects in town (Mr. Spejewski was shown the file) although there is currently no procedure for closing out and removing projects from the list.

[At this point, the group broke for lunch, after arranging for afternoon interviews at Town Hall with Conservation and the Health Department]

Plan Review/Erosion Control – Conservation Comission

Mr. Spejewski then interviewed Mary-Ellen Schloss, Town Conservation Agent.
Ms. Schloss stated that she only reviews projects within wetlands jurisdiction, but most projects are subject. Typically the DPW will not review projects as thoroughly if they know that Conservation is reviewing the project. At times, she will use a DPW engineer as a consultant for her review.

Ms. Schloss stated that she has gotten referrals about issues at sites from other town personnel.

There is no set policy on maintaining controls. In fact, according to Ms. Schloss, she is currently trying to get a subdivision owner to maintain a pond.

Ms. Schloss maintains a list of current projects on a spreadsheet with perhaps 10-15 active projects at any time. She does not track individual inspections.

Enforcement is generally informal, Ms. Schloss says there have been a couple of fines in the last 8 years. She stated that she puts significant effort into monitoring town-owned projects.

Ms. Schloss stated that she has not been involved in any sampling.

IDDE- Board of Health

Mr. Spejewski then interviewed Daniel McCormack, Director of Public Health and Matthew Brennan, Environmental Health Officer. Mr. McCormack said the Board has not done any recent sampling. The former director had done several different rounds of testing around 2007. Mr. McCormack believed plans of outfalls were obtained from the DPW.

Some signs of sewage had been found near the Fore River, but dye testing at a pump station revealed no discharges from the station.

The Health Department did receive copies of the Beta Group dry weather testing in 2004.

Mr. McCormack said the Health Department tests the two saltwater beaches in town, but the beaches are almost never closed due to bacteria. Mr. McCormack thought once in the last three years.

Mr. McCormack said about 450 properties in town were not on the sanitary sewer, though the Health Department is working to encourage moving these to sanitary sewers.

Mr. McCormack stated that the Board of Health inspects industrial facilities in town for stormwater concerns. He provided copies of several orders from the Board of Health requiring control of stormwater/washwater at industrial facilities in the town [in inspection file]

[*At this point, Mr. Spejewski and Ms. Brennan returned to the DPW yard*].
Mr. Spejewski conducted a closing conference with Mr. Fontaine and Mr. Bina. Mr. Spejewski noted that the Winter street yard was potentially subject to SPCC regulations but did not have a SPCC plan. Mr. Spejewski also noted that a five-year catchbasin cleaning schedule is slower than EPA Region I thinks is optimal. Finally, Mr. Spejewski expressed concern that, with investigations of potential illicit connections split between the DPW and the Health Department, there was the potential for investigations to fall through the cracks or be seen as optional by the Health Department, when investigations are a requirement of the MS4 Permit. Mr. Spejewski thanked them for their time and left the site.