
Final Report

Sanitary Sewer Overflows Emergency Response Plan (SSOERP)

Prepared for
Boston Water and Sewer Commission



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Acronyms and Abbreviations

BEST	Boston Environmental Strike Team
BMP	Best Management Practice
CCTV	Closed Circuit Television
CD	Consent Decree
CE	Continuing Education
CMOM	Capacity, Management, Operations, and Maintenance
CSO	Combined Sewer Overflow
CSS	Combined Sewer System
CWA	Clean Water Act
DMR	Discharge Monitoring Report
DPH	Department of Public Health
EFS	Engineering Field Services
EPA	Environmental Protection Agency
FOG	Fats, Oil, and Grease
FSE	Food Service Establishment
GIS	Geographical Information System
GPS	Global Positioning System
iPad	Apple® iPad® device
MassDEP	Massachusetts Department of Environmental Protection
MS4	Municipal Separate Storm System
MWRA	Massachusetts Water Resources Authority
NPDES	National Pollutant Discharge Elimination System
O&M	Operation and Maintenance
PIO	Public Information Officer
PM	Preventive Maintenance
POTW	Publicly Owned Treatment Works
PPE	Personal Protective Equipment
SSO	Sanitary Sewer Overflow
SSS	Sanitary Sewer System
SSOERP	Sanitary Sewer Overflow Emergency Response Plan
SWMM	Storm Water Management Model
WWTP	Waste Water Treatment Plant
W&C	Woodard & Curran

Introduction

1.1 Objectives

The objective of this Sanitary Sewer Overflow Emergency Response Plan (SSOERP) is to provide a standardized set of actions for the Boston Water and Sewer Commission (BWSC) staff to follow in the event of an unpermitted discharge (overflow) from the sanitary and combined sewer system. In addition, the adoption and implementation of the SSOERP should accomplish these objectives:

- Minimize an SSO's impact on public health, public safety, and property damage.
- Comply with regulatory and enforcement reporting and public notification requirements.
- Minimize the reoccurrence of SSOs.
- Minimize BWSC's liability.

1.2 Distribution and Maintenance of SSOERP

The SSOERP is meant to be a dynamic document and will be updated at least once every year and as necessary to reflect any changes in staffing, equipment, response procedures or notification requirements. A hard copy of the SSOERP will be maintained at 980 Harrison Avenue, Boston, MA and an electronic copy will be online, on the BWSC web site at www.bwsc.org and internally on BWSC common drives.

1.3 Organization of Plan

The contents of this SSOERP are organized around nine major topics covered in separate chapters as follows:

- Introduction (Chapter 1.0) includes description of the types of sewers and discharges addressed by the SSOERP and the definitions of common terms and acronyms used in this report.
- Regulatory framework (Chapter 2.0) gives a reference to federal and state laws that regulate sanitary sewer overflows.
- BWSC System and Resources (Chapter 3.0) outlines BWSC's collection system inventory and staff, equipment and hardware/software for responding to SSOs.
- Notification procedures (Chapter 4.0) describes procedures for receiving notifications of a possible SSO in BWSC, and protocols for internal notifications about confirmed SSOs within BWSC Collection System and initial notifications to MassDEP, EPA and other authorities such as the Massachusetts Wastewater Regional Authority (MWRA).
- Response to overflows (Chapter 5.0) covers field response procedures for SSOs. Summary SSO Emergency Response Activity Flowchart shows the notification and response procedure.
- Overflow documentation and reporting (Chapter 6.0) describes required reporting documents and timeframe for submittal to MassDEP and EPA.
- Public Notifications (Chapter 7.0) describes means of notifying the public affected by the overflow and protocols to follow in media notifications.
- Overflow post-remediation investigations and tracking (Chapter 8.0) describes activities after the SSO has been remedied in identifying SSO root causes and corrective and preventive measures.
- Training and preparedness (Section 9.0) covers staff training objectives and methods both initially on the onset of SSOERP and over time.

Appendices include the following:

- A quick reference tool for Yard Clerks and Field Personnel responding to SSOs ('Field Manual') is included in Appendix A.
- BWSC's service map area is shown in Appendix B.
- Appendix C includes BWSC staff contact information, notification logs, example work order, and SSO 24-Hour Report template.
- iPad application developed for field entry of SSO data and creation of SSO 24-Hour Report is presented in Appendix D.
- Overview of different methods that can be used for estimating overflow rates and total volume is given in Appendix E .
- Public notifications including SSO news release for media and residential reference material (door hangers, flier, brochure) are included in Appendix F.

1.4 Types of Sewage Overflows Addressed

Sanitary sewer overflow (SSO) is a term defined in the August 2012 Consent Decree (CD) between the United States Environmental Protection Agency (EPA) and the BWSC that is incorporated into the SSOERP's subsequent document discussion.

The CD defines an SSO as:

"Any overflow, spill, diversion, or release of wastewater from, or caused by, BWSC's Collection System. SSOs include, but are not limited to, discharges to waters of the United States from the BWSC's Collection System, as well as any release of wastewater from the BWSC's Collection System to public or private property that does not reach waters of the United States, including wastewater backups onto public streets, into buildings, or onto private property."

The CD also defines BWSC's Collection System as:

"The wastewater collection, storage and transmission system (a.k.a. sanitary and combined sewer system) owned or operated by the BWSC, including, but not limited to, all devices, sewersheds, pump stations, force mains, gravity sewer lines, manholes, and appurtenances."

By these definitions, SSO describes unauthorized dry or wet weather discharge events caused by or from the BWSC's sanitary sewer system (SSS) and combined sewer system (CSS). This SSOERP addresses these SSOs to establish response protocols.

BWSC is authorized to discharge wet weather related combined sewer discharges from 26 combined sewer overflows (CSOs). Wet weather discharge from these outfalls is not covered by this SSOERP.

The SSOERP also herein describes SSO's concerns according to its response and corrective action complexity. These different descriptions are important to clearly present how SSOs are addressed, tracked, and reported. Table 1 provides a summary of the two SSO complexity conditions and how they are further labeled and described.

TABLE 1
SSO Labeling Based on SSOs Complexity Conditions

SSO Complexity Conditions		SSO Label and Description
Response Complexity: Staff/equipment requirements to remedy	Priority 1	More complex root cause cannot be resolved by a First Responders crew and requires additional manpower and/or equipment, e.g., pipe collapse.
	Priority 2	Rather simple root cause resolved by a First Responders crew, e.g., pipe blockage, less than 100 gpm discharge.

1.5 Definitions

Noted definitions are taken directly from the CLF and U.S. v. BWSC et al Consent Decree (Consent Decree), 2004 EPA *Report to Congress: Impacts and Control of CSOs and SSOs* (U.S. EPA, 2004) , and 40 CFR 122.42 *Additional Conditions Applicable to Specified Categories of NPDES Permits* (40 CFR 122.42). Descriptions of assets are taken from other industry publications, including APWA, 1970. *Combined Sewer Regulator Overflow Facilities*.

Building Backup: shall mean any release of wastewater from the BWSC's Collection System into buildings or onto private property, except a release that is the result of blockages, flow conditions, or malfunctions of a building lateral or other piping/conveyance system that is not owned or operationally controlled by the BWSC, or is the result of overland, surface flooding not emanating from the BWSC's Collection System. (Consent Decree)

BWSC Geographic Information System (GIS): The Commission's digital mapping and geographic information system for their sanitary, combined, and storm water infrastructure system.

Bypass: The intentional diversion of waste streams from any portion of a treatment facility [40 CFR 122.42(m)].

Capacity: The design maximum flow, or loading, that a wastewater system and its components can handle in a specified period of time with predictable and consistent performance.

Catch Basin: An underground structure, typically fitted with a slotted grate, used to collect surface run-off and route it through underground pipes to a remote discharge location.

Cleanout: A vertical pipe with a removable cap extending from a private sewer lateral to the surface of the ground. It is used for access to the private service lateral for inspection and maintenance.

Closed-Circuit Television (CCTV): A method used to visually inspect the internal condition of pipes and sub-surface structures.

Collection System: The wastewater collection, storage and transmission system (a.k.a. sanitary and combined sewer system) owned or operated by the BWSC, including, but not limited to, all devices, sewer sheds, pump stations, force mains, gravity sewer lines, manholes, and appurtenances.

Combined Sewer System (CSS): A wastewater collection system owned by a municipality (as defined by Section 502(4) of the Clean Water Act) that conveys domestic, commercial, and industrial wastewater and storm water runoff through a single pipe system to a POTW (U.S. EPA, 2004, pg. GL-2).

Combined Sewer Overflow (CSO): A discharge of untreated wastewater from a combined sewer system at a (CSO) point prior to the head works of a publicly owned treatment works (POTW) (U.S. EPA, 2004, pg. GL-2).

Commission: Short name for Boston Water and Sewer Commission.

Disruption of Service: A disruption of service is an interruption of customers' sanitary sewer service due to various reasons, such as blockages, pipe failures, etc.

Dry Weather SSO: An SSO that occurs during dry weather conditions, most often as a result of blockages, line breaks, or mechanical/power failures in collection system. (U.S. EPA, 2004, pg. GL-2).

Environmental Protection Agency (EPA): United States Environmental Protection Agency.

First Responder: A qualified BWSC employee who performs an initial inspection of an SSO according to the established protocols discussed herein.

Force Main: A pressurized pipeline that conveys wastewater from a pump station.

FOG: Fats, Oils and Grease are compound fatty acids and glycerol components that originate from many food sources that are discharged to the Collection System as a result of food preparation activities from sources such as restaurants, food processing and preparation establishments, schools, hospitals, and residential properties.

Inflow and Infiltration (I/I): or “I/I” shall mean the total quantity of water from both Infiltration and Inflow without distinguishing the source.

Impacted Areas: Public or private property or waters of the United States where an SSO has come into contact.

Infiltration: shall mean the water that enters the Collection System (including sewer service connections) from the ground through such means as, but not limited to, defective pipes, pipe joints, connections or manholes. Infiltration does not include, and is distinguished from, Inflow. (Consent Decree)

Inflow: shall mean all water that enters the Collection System and sewer service connections from sources such as, but not limited to, roof leaders, cellar drains, yard drains, sump pumps, area drains, foundation drains, drains from springs and swampy areas, manhole covers, cross connections between storm sewers and sanitary sewers, catch basins, storm waters, surface runoff, street wash waters, or drainage. Inflow does not include, and is distinguished from, Infiltration. (Consent Decree)

Manhole: A manhole provides a connection point for gravity lines, private service laterals, or force mains, as well as an access point for maintenance and repair activities.

MassDEP: Massachusetts Department of Environment Protection.

MWRA: Massachusetts Water Resources Authority.

Overflow: An SSO.

Outfall: A point of discharge from a storm drain or combined sewer to a water body, wetland or land surface.

Particle Separator: A receptacle designed and installed to separate sand and grit from water.

Private Sewer: A sewer which is not owned by the Commission or the MWRA. Private sewers include, but are not limited to, building drains, building sewers, building storm drains, sewers, drains, catch basins and manholes located on private property and not located within an easement held by the Commission, and sewers and storm drains owned by municipalities and other public agencies. A private sewer extends from private property to the connection with Commission’s pipeline or manhole.

Publicly owned treatment works (POTW): A treatment works, as defined by Section 212 of the Clean Water Act that is owned by a state or municipality. This definition includes any devices and systems used in the storage, treatment, recycling, and reclamation of municipal sewage or industrial wastes of a liquid nature. It also includes sewers, pipes, and other conveyances only if they convey wastewater to a POTW treatment plant [40 CFR §403.3], (U.S. EPA, 2004, pg. GL-4). POTW also refers to the municipality or agency, as defined in CWA §502(4), which has jurisdiction over the treatment works and its operation [40 CFR 403.3(o), CWA § 502(4)].

Pump Station: A structure where energy is added to the wastewater generally to lift the wastewater to a higher elevation.

Regulator: A device or apparatus for controlling the quantity of admixtures of sewage and storm water admitted from a combined sewer collector line into an interceptor sewer, or pumping or treatment facilities, thereby

determining the amount and quality of the flows discharged through an overflow device to receiving waters or other points of disposal.

Sanitary Sewer Overflow (SSO): Any overflow, spill, diversion, or release of wastewater from, or caused by, the BWSC's Collection System. SSOs include, but are not limited to, discharges to waters of the United States from the BWSC's Collection System, as well as any release of wastewater from the BWSC's Collection System to public or private property that does not reach waters of the United States, including wastewater backups onto public streets, into buildings, or onto private property. (Consent Decree, pg. 11)

Sanitary Sewer System: A municipal wastewater collection system that conveys domestic, commercial, and industrial wastewater, and limited amounts of infiltrated ground water and storm water, to a POTW. Areas served by sanitary sewer systems often have a municipal separate storm sewer system to collect and convey runoff from rainfall and snowmelt (U.S. EPA, 2004, pg. GL-4).

Sewer Siphon: A sewer where the majority of the pipe's crown between the upper and lower manholes or junction chambers is below the hydraulic grade line and the pipe is filled with wastewater and under pressure. Also referred to as an inverted siphon or depressed sewer, it is designed to convey wastewater under highways, subways, other pipelines, channels, rivers, or other potential obstructions.

Sanitary Sewer Overflow Emergency Response Plan (SSOERP): BWSC spill and overflow response plan which provides structured guidance, including a range of field activities to choose from, for a uniform response to overflows.

Supervisory Control and Data Acquisition System (SCADA): SCADA is automated sensory control equipment that monitors the operation of the pump stations. The SCADA system will convey alarms when predetermined conditions occur. Monitoring parameters include, but are not limited to, power failures, high wet well levels, pump failures and high pipe depths that could potentially cause overflows.

Suspicious Substance: Any material not normally found in a wastewater system, including, but not limited to, caustic substances.

Tidegate: A flap or pinch gate, acting like a check valve, mounted on an outfall pipe and used as a water flow control structure. Tide gates close during incoming tides to prevent tidal waters from moving into the outfall pipe and open during outgoing tides or during rain events to allow waters to drain out via the outfall. The opening and closing of the gates is driven by a difference in water level on either side of the gate.

Waters of the United States: All waters that are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters subject to the ebb and flow of the tide. Waters of the United States include but are not limited to all interstate waters and intrastate lakes, rivers, streams (including intermittent streams), mudflats, sand flats, wetlands, sloughs, prairie potholes, wet meadows, play lakes, or natural ponds (U.S. EPA, 2004, pg. GL-5). (See 40 CFR §122.2 for the complete definition).

Wet Weather SSO: A discharge from a combined or sanitary sewer system that occurs in direct response to rainfall or snowmelt (U.S. EPA, 2004, pg. GL-5).

Regulatory Background

2.1 Regulations

SSOs and CSOs are subject to regulation under the Clean Water Act and in particular these sections:

- Section 301(a) prohibits the discharge of pollutants not in compliance with the Act;
- Section 301(b) requires compliance with both technology-based and water quality-based effluent limitations;
- Section 402(a) allows the issuance of National Pollutant Discharge Elimination System (NPDES) permits that allow pollutant discharges that meet the requirements of the Act; and,
- Section 402(b) allows the States to administer the NPDES permit program.

Implementation of the NPDES permit program is regulated under Title 40, Chapter I, Subchapter D of the Code of Federal Regulations.

The U.S. Environmental Protection Agency (EPA) has delegated responsibility for clean water programs to the State of Massachusetts. Massachusetts Clean Water Act (“Massachusetts Act”), ([Mass. Gen. Laws Ch. 21, §§ 26–53](#)) essentially mirrors the federal Clean Water Act and authorizes the Massachusetts Department of Environmental Protection (MassDEP) to adopt standards of minimum water quality and prescribe effluent limitations, permit programs and procedures applicable to the management and disposal of pollutants, including, where appropriate, prohibition of discharges.

The following state regulations are relevant for sanitary sewer overflows ¹:

- 310 CMR 40.0000 (Massachusetts Contingency Plan) – applies to any person required to notify the Department of a release or threat of release of oil and/or hazardous material and/or to perform one or more response actions at any site in Massachusetts without regard to the level of Department oversight, if any, of response actions at the site. Regulates construction, inspection and maintenance of sewage disposal systems.
- 310 CMR 15.00 (Minimum Standards for Sewage Disposal Systems) – regulates construction, inspection and maintenance of sewage disposal systems.
- 314 CMR 3.0 (Surface Water Discharge Permit Program) confers authority on the MassDEP to administer the NPDES permit program within the Commonwealth and issue general permits for surface water discharges.
- 314 CMR 5.00 (Ground Water Discharge Permit Program) allows MassDEP to control the discharge of pollutants to the waters of the Commonwealth.
- 314 CMR 7.0 (Sewer System Extension and Connection Permit Program) requires that persons owning or operating a sewer system notify MassDEP about any unanticipated SSOs as soon as the owner has knowledge of the event and no later than 24 hours after its first occurrence, and report the event on a form approved by the MassDEP within five days of the event. All the activities that lead up to the event must be reported; 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.
- 314 CMR 12.0 (Operation and Maintenance and Pretreatment Standards for Wastewater Treatment Works and Indirect Dischargers) regulates that all wastewater receives appropriate treatment before discharging to surface or ground waters as required by 314 CMR 3.00 and 5.00.

¹ Codes of Massachusetts Regulations (CMR) promulgated by Department of Environmental Protection (MassDEP) and Division of Water Pollution Control of EPA, pursuant to the Administrative Procedures Act ([M.G.L. c. 30A](#)) can be found at: <http://www.lawlib.state.ma.us/source/mass/cmr>

CSO discharges are regulated by MassDEP and US EPA in accordance with state and federal CSO policies and the State Water Quality Standards. BWSC is one of 24 CSO permittees that have NPDES permits issued by EPA Region 1 and MassDEP (Surface Water Discharge Permitting Program)². The following NPDES permit is relevant for a CSO control policy:

- NPDES Permit No. MA0101192 – authorizes BWSC to discharge combined sewage during wet weather events from 26 combined sewer overflows (CSOs) listed in the permit. The Permit requires that any CSO is only a result of wet weather, wet weather CSOs are in compliance with Clean Water Act (CWA) and the impact on water quality, aquatic biota and human health is minimized. Discharges of wastewater are not authorized under this permit. <http://www.epa.gov/region1/npdes/permits/bostonwsp permit.pdf>

Discharges from separate storm sewer system are regulated by the following permit:

- NPDES Permit No. MAS010001 – authorizes BWSC to discharge storm water and allowable non-storm water discharges from its municipal separate storm sewer system (MS4) into receiving waters. A total of 195 identified Separate Storm Sewer Outfalls and associated receiving waters are listed in the permit. Discharges of non-storm water are not authorized under this permit.

The following regulations by the Massachusetts Department of Public Health (MA DPH) are relevant for private property SSOs not caused by BWSC's Collection System:

- 105 CMR 400, (MA DPH State Sanitary Code) – Chapter I and Chapter II provide a set of standards that are designed to help determine if a dwelling is fit for human habitation.

2.2 Consent Decree

On August 23, 2012, BWSC entered into a Consent Decree with the U.S. EPA and MassDEP (No. 10250-RGS) to address, among other items, SSOs in an effort to improve water quality throughout the Commission's service area. Pursuant to Section VII, I of the Consent Decree, a Sanitary Sewer Overflow Emergency Response Plan (SSOERP) was required to be submitted to EPA and MassDEP within 90 days. The Commission must also report all SSOs within 24 hours via email to EPA and MassDEP pursuant to Section VII, E.

² Temporary reference: <http://www.mass.gov/dep/about/organization/aboutbrp.htm>

BWSC System and Resources

3.1 BWSC Collection System Inventory

BWSC serves approximately 89,000 customer accounts. A map of service area is included in Appendix B. The Commission owns and operates separate, combined, and storm water sewer systems. The systems are composed of approximately:

- 1,512 miles of sewers pipes – 677 miles of sanitary sewer, 185 miles of combined sewer (31 permitted combined CSO outfalls, total length approx. 4 miles) and 657 miles of storm sewer (206 outfalls).
- 991 common manholes (sanitary and storm sewer in the same manhole) + 47,794 regular manholes (sanitary sewer)
- 131 Individual siphon chambers
- 30,803 catch basins
- 9 pump stations
- 18 particle separators
- 81 regulators
- 58 tidegates

BWSC conveys its wastewater to the Massachusetts Water Resources Authority's (MWRA's) system. There are approximately 272 connections to the MWRA's sewers (197 public and 75 special connections). Approximately 69% of the BWSC's Collection System discharges to the MWRA's northern system and 31% discharges to the southern system.

3.2 BWSC Resources

3.2.1 Introduction

The administration and implementation of the SSOERP requires adequate staff, equipment, software/hardware resources and pre-planning. This section discusses current resources in BWSC and any future changes will be addressed in regular SSOERP updates (see sections 3.2.5 and 1.2).

3.2.2 Staff

Overview

The Operations Division (Operations) and the Engineering Field Services (EFS) Group, have primary responsibilities for responding to SSOs. The divisions' response teams, field supervisors, managers, and senior management involved in the SSOERP are shown in Figure 1 and their functional responsibilities are described in this section. In addition, Communications & Community Services Department is responsible for managing public relations and public notifications. The Office of General Counsel and Risk Management Department is responsible for receiving and managing customer claims.

Receiving Notifications and Responding to SSOs (Excluding Overflows at Pump Stations)

The Operations' **Yard Clerks** (Support Services of the Operations) serve as dispatchers. They generally receive notifications of sewage overflows over the phone or through emails, and identify a "First Responders crew" to send on-site. Currently, eight persons are employed as Yard Clerks.

The **Operations Response Crews** arrive on site and act as 'First Responders' crews. These field crews determine if a reported overflow is indeed an SSO, and if the response to the overflow is the responsibility of BWSC (or homeowners, MWRA, etc). If SSO is the responsibility of BWSC, the First Responders quickly assess the apparent

root cause of the SSO, how best to stop the SSO, stop the straight-forward SSOs, define and assess the impacted area, isolate the area and begin containment of overflow as appropriate. The First Responders are also responsible for conducting site clean-up after the SSO is resolved. Property owners are responsible for cleaning basements, etc.

BWSC has the following Operations Response Crews ready to respond to SSO events:

Average Mid-Week Sewer Crew Lineup

<i>Shift</i>	<i>Crew and Equipment</i>
7:30 am – 4 pm	1 catch basin, 2 Jet, 1 Sewer Flushing, 1 TV, 1 Vactor, 3 Supervisors
4 pm – 12 midnight	1 CB, 1 Jet, 1 Vactor, 1 Supervisor
12 midnight – 8 am	1 Jet, 1 CB or Sewer Flushing, 1 Supervisor

Operations Response Crews are staffed 24 hours a day, 365 days per year. All are two person crews except for catch basin trucks, which are single man. A total of between two and six Operations Response Crews are therefore available, with between 2 and 13 full time employees total.

Operations is also responsible for SSO post investigations and tracking, and for including the problem sewer in the preventive maintenance program or the capital projects listing for prioritization and scheduling.

The **Engineering Field Services (EFS) Response Crews** include the SSO Manager and other on-call employees who can provide additional support for more serious problems. They will assist Operations Crews, establish a remediation strategy, which may require mobilization of construction equipment to create a dam for initial containment of the SSO, setting up flow diversion pumping and completing sewer repairs. BWSC has two (2) EFS crews, each including a Field Foreman, Field Supervisors, and 3 per crew, available to respond to SSO events. EFS crews have staff, including the SSO Manager, available on-call 24 hours per day, 365 days per year.

The **SSO Manager** is an on-call, trained member of EFS response team responsible for the SSO investigation and communications with EPA and MassDEP. He/she goes to the site upon notification of an SSO if requested by the Operations Response Crew Field Supervisor. The SSO Manager works with the Operations crew to confirm or correct their findings about the root cause, their estimate of SSO volume and GIS mapping of SSO location (this identifies nearby receiving waters and catch basins).

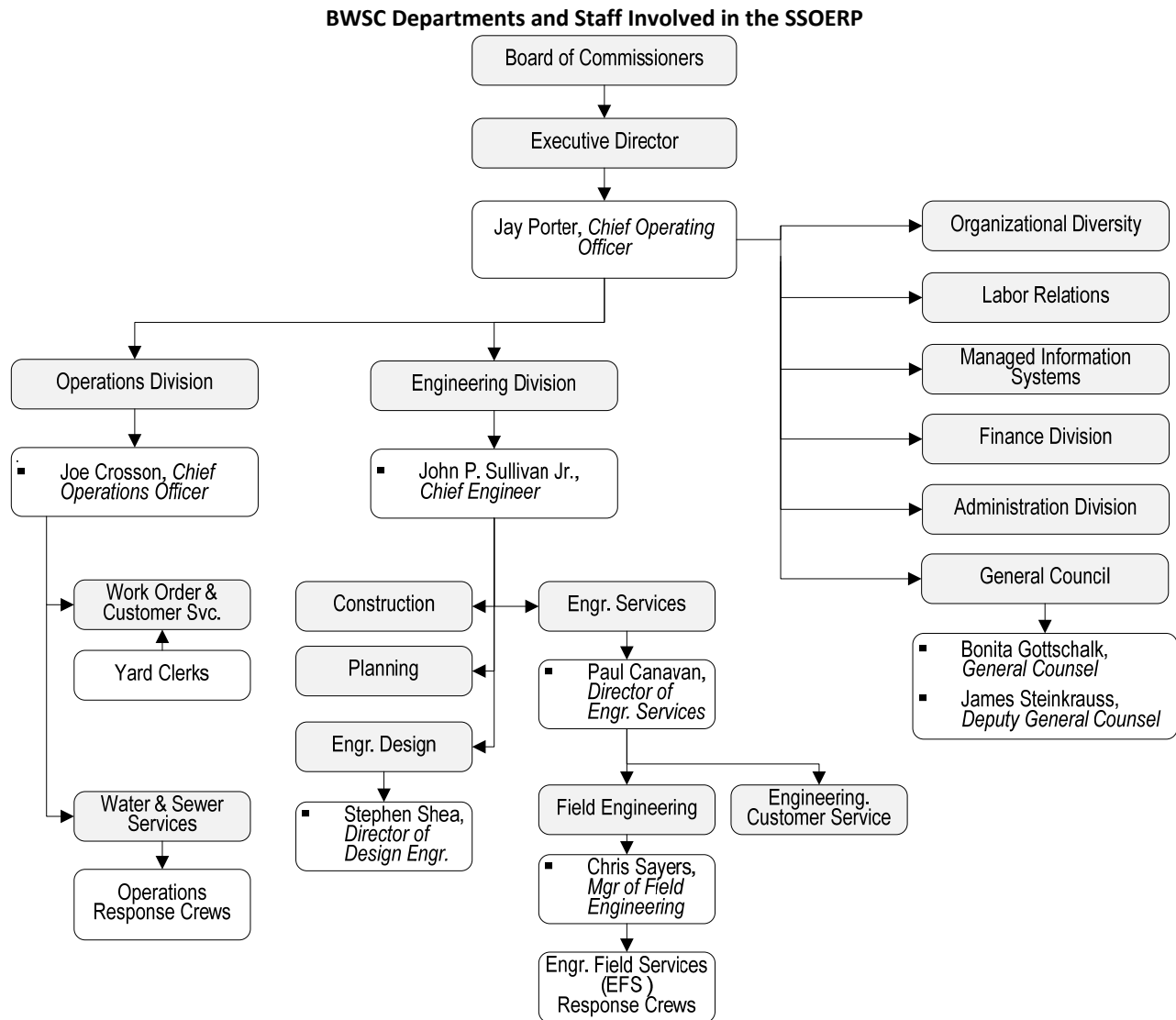
The SSO Manager is also responsible for submitting an initial SSO report to MassDEP and EPA Region 1 within 24 hours of the Yard Clerk first receiving notification of SSO (SSO 24-Hours Report). Within five days, the SSO Manager will prepare the final report (5-Day Final Report) summarizing the SSO occurrence and BWSC response, including root cause analysis conclusion and plan to prevent recurrence, and submit to MassDEP.

The SSO Manager is also responsible for adding the SSO event to the BWSC SSO database and for maintenance of the SSO database.

The designated **Manager of Field Engineering** within the Engineering Field Services Group is responsible for reviewing the 5-Day Final Report prepared by the on call SSO Manager for completeness and accuracy before it is submitted to the MassDEP. This person is also responsible for including SSOs in the 6-month compliance report to EPA.

The names of senior management that must be notified about each SSO are shown in the BWSC SSO Notification Log included in Appendix C.1. The Yard Clerk is responsible for internal notifications about SSO and private building backups.

FIGURE 1



There may be instances where it is deemed that the resources needed to adequately address a problem require effort beyond BWSC forces. In these situations, BWSC may enlist the aid of an Operations Division emergency contractor. Operations Division awards annual emergency and on-call contracts for this work. The list of Annual Response Contractors is included in Appendix C.2.

The Deputy Director from Communications & Community Relations Department is responsible for managing public notification and public relations. The Risk Manager from the Office of General Counsel is responsible for receiving and managing customer claims.

Responding to Overflows at Pump Stations

BWSC has contracted the operations and maintenance of Commission's nine sewer and storm pump stations to Woodard & Curran (W&C), an engineering company responsible for the day-to-day operations and management, including implementation of a predictive maintenance (PM) program, equipment repair and replacement, and emergency response during storm events. The Engineering Field Services Department manages the contract with W&C.

Eight out of nine pump stations operate automatically and are unmanned. Each of these stations has a Supervisory Control and Data Acquisition System (SCADA) installed which gives alarm when predetermined conditions occur at the station. Monitoring includes, but is not limited to, power failures, high wet weather well levels, and pump failures that can cause overflows. The remaining ninth pipe station, the Union Park Pumping Station (UPPS), includes the Combined Sewer Overflow Detention and Treatment Facility (CSO), which is designed to screen, disinfect, allow settling, and dechlorinate combined sewer overflow flows during wet weather events only. The UPPS/CSO is manned on a continuous basis, even though it normally activates only during wet weather. SCADA is also used at the UPPS/CSO.

W&C has been inspecting pump stations on regular basis and performing service and periodic calibration of the flow meters, level sensors, alarms, and SCADA equipment. There are currently eight full time W&C employees managing and operating the pump stations, including Project Manager, Operators, Master Electrician, and Mechanic.

3.2.3 Equipment

The Operations Response Crews use the following equipment for responding to SSO events as needed and requested by the Operations Response Crew Field Supervisor:

- Hydraulic flusher (Jet Truck/Sewer Flushing Truck) – for primary response
- Combination cleaner/vacuum truck
- Dump truck
- Backhoe and trailer
- Crew truck
- Pick-up truck
- CCTV inspection truck
- Misc. supporting equipment (sand bags, signage, public access restriction rope/tape, lime, bleach, etc)

The EFS crews may utilize the following equipment during followup investigations:

- CCTV inspection truck
- Standard First Responder Truck
- Pole Camera
- Misc. supporting equipment

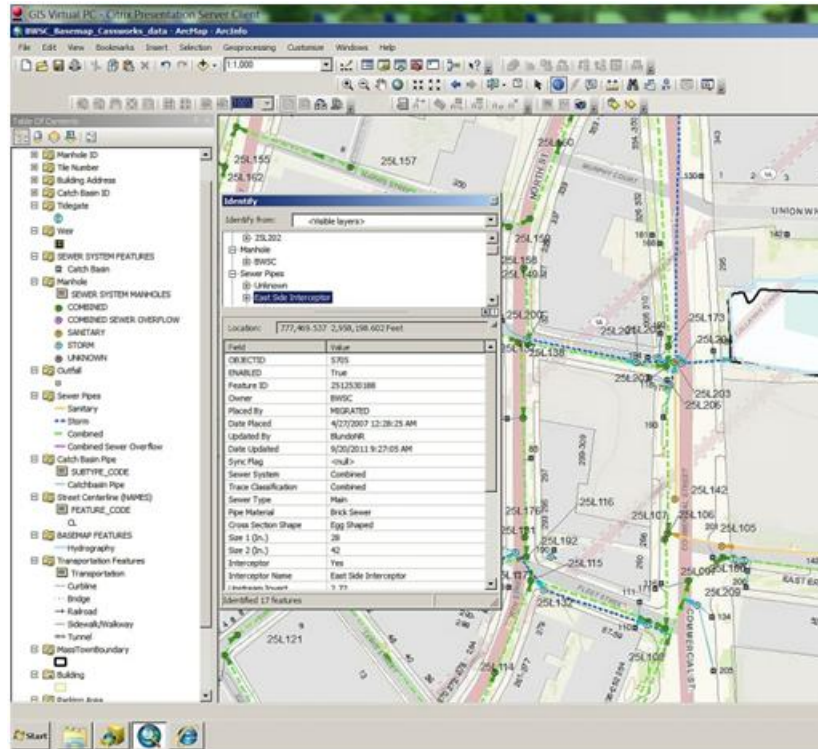
Combination cleaner/vacuum truck may be used by Contractors if needed.

3.2.4 Software Resources

BWSC utilizes CASS WORKS® software for inventory and maintenance activities (corrective and preventive maintenance scheduling). Operations department utilizes CASS WORKS for managing work orders and handling contractor work. CASS WORKS runs on Oracle database platform and is connected to BWSC's ArcGIS geodatabase. The GIS Mapping System enables tracking the locations and conditions of sewer mains, manholes and other assets (Figure 2).

FIGURE 2

Example BWSC GIS Asset Information Display



BWSC has an SSO Database (Oracle) with a Microsoft Access interface used for reporting and storing records of SSOs (see about SSO tracking in Chapter 6.6), and managed by the designated Manager of Field Engineering. In addition, BWSC has developed in-house an Apple® iPad® (iPad) application to track and report SSOs and private building backups reported to the Commission (see Appendix D).

BWSC has two hydraulic models to assess the capacity of sewer collection systems, one for sanitary/combined sewers and the other of storm sewers. Both models use the Mike Urban, SWMM 5, model, which integrates with an ArcGIS geodatabase of BWSC's sewer systems. The sanitary/combined sewer model includes BWSC sanitary sewers 24-in. or greater and combined sewers 36-in. or greater, combined sewer regulators, CSO outfalls, plus selected components of MWRA collection systems.

3.2.5 Periodic Resources Review

The Engineering Department will perform quarterly reviews of staff preparedness, software/hardware updates, and equipment inventory changes necessary to respond to SSOs. Any quarterly updates will be consolidated into the annual SSOERP update by the designated Manager of Field Engineering.

Overflow Notification Procedures

4.1 Overview

Chapter 4 describes how BWSC receives notifications of SSO events and how each receipt of a notification triggers other internal and external notifications. Chapter 5 describes how BWSC responds to SSOs and reporting requirements to MassDEP, EPA, other agencies and general public are explained in Chapters 6 and 7. Portions of Chapter 4's notifications produces are shown in Section 5.6's Summary SSO Emergency Response Activity Flowchart.

4.2 Receipt of SSO Notification

The Yard Clerk in the Operations Division receives notifications of possible SSOs from multiple sources such as listed in Table 2. Notifications typically come from individuals who observe the event – residents, fire, police, MWRA, 911, or other agencies. Notifications can also be received through emails submitted online or Mayors office email

In addition, Commission's employees/staff can call the Yard Clerk directly via the Customer Service phone line at (617) 989-7000.

Table 2 provides a listing of the phone and internet address and hours of operation that will provide the most direct means of notification to BWSC and ultimately the Yard Clerk to initiate a response.

TABLE 2
Phone and Internet Numbers/Address to Notify BWSC of a Potential SSO

Connection	Number or Address	Hours of Operation
BWSC Main Office Number	(617) 989-7000	24 hours a day, 7 days a week
Customer Service	(617) 989-7800	Monday–Friday 8am–5pm, Wednesday 8am – 7pm
Operations	(617) 989-7900	24 hours a day, 7 days a week
TTY	(617) 989-7780	Monday–Friday 8am–5pm
Nextel	Operations Base 1 108*12858*1	24 hours a day, 7 days a week
	Operations Base 108*12858*46	
Email	mayor@cityofboston.gov	24 hours a day, 7 days a week

If during the initial SSO notification call the location or source is determined to be from the MWRA operated collection system, the Yard Clerk will notify the MWRA at 617-305-5940.

Otherwise, if the potential SSO appears to be the BWSC's responsibility, BWSC promptly initiates the SSOERP. Yard Clerks create a Work Order documenting the caller identification, location of the problem, general nature of the problem, contact information and, if acceptable to the caller, a callback number on the outcome. A screenshot of an example Work Order created in CASS WORKS database is included in Appendix C.6.

Next, the Work Order is assigned to the Operations field crew nearest to the site (the Operations Response crew), which is determined by the GPS tracking or dispatch information available to Yard Clerks. The First Responder crew responds as quickly as possible after receiving notification.

4.3 Internal Notifications within BWSC

After arrival on site, the First Responders crew will confirm whether the SSO is caused by the BWSC collection system. If the First Responders crew determines that the SSO is not BWSC's responsibility then the Field Supervisor will call the Yard Clerk and the Work Order is closed.

When the First Responders confirm the SSO is the responsibility of the BWSC, they will contact the Field Supervisor (if not already at the scene) who will call the Yard Clerk to make the confirmation. At this time the Yard Clerk will notify the on-call SSO Manager about the SSO. The Yard Clerk will also send out an internal email notice about the SSO to BWSC personnel included on the notification log shown in Appendix C.1.

4.4 External Immediate Notifications

4.4.1 Notifications to MassDEP and EPA

Notifications within 24 Hours

BWSC Yard Clerks provide immediate notification to the MassDEP by phone, once receiving confirmation that the SSO is the responsibility of the BWSC. MassDEP is notified for any privately caused SSOs exceeding 100 gallons or determined potentially may impact public health (such as a continuous discharge). The following phone numbers are used:

- MassDEP Northeast Regional Office in Wilmington, MA
 - During regular business hours, 978-694-3215
 - Outside regular business hours, or on weekend or holidays, 888-304-1133, available 24 hours a day.

If it is suspected that an overflow may have resulted in an oil or hazardous material release, BWSC shall report it immediately to:

- MassDEP Emergency Spill Response toll free number, 1-888-304-1133, available 24 hours a day.

BWSC shall also prepare required documentation as described in section 6.1, which includes an initial SSO report within 24 hours submitted by email to both:

- EPA Region 1: borci.todd@epa.gov, and
- MassDEP: kevin.brander@state.ma.us, claire.golden@state.ma.us,

and a final SSO report within 5 days submitted by email to:

- MassDEP: kevin.brander@state.ma.us, claire.golden@state.ma.us

4.4.2 Notifications to Other Authorities

BWSC may notify other entities about an SSO event as described below.

Notifications within 2 Hours

If the overflow resulted in a fish kill, BWSC must notify the following agency by phone, within two hours of becoming aware of the fish kill:

- Massachusetts Division of Fisheries and Wildlife (DFW), by calling:
 - Monday through Friday, 8:00 AM - 4:30 PM, 508-389-6330.
 - After normal business hours or on holidays and weekends, 508-722-9811 (Fish Kill Pager) or 1-800-632-8075 (Environmental Police Radio Room).

If the overflow may affect beach or swimming areas, or public drinking water intakes, BWSC shall notify by phone, within two hours of becoming aware of the discharge, the following agency:

- Department of Conservation and Recreation (DCR). DCR posts red flags at harbor beaches when bacterial water quality is poor. DCR's telephone hotline: 617-626-4972

- Boston Department of Public Health (DPH), by calling: 617-534-5965.

Appendix C.5 lists other agencies that may need to be notified, depending on the situation.

Notifications within 24 Hours

If the overflow caused by the problem on the private property has potential of public health and environmental impact (wastewater is flowing onto the street or into a storm sewer catch basin or involves multiple properties) and the homeowner is unable or unwilling to take appropriate and timely measures to resolve the matter, BWSC may notify by email (see Appendix C.3, C.4 and C.5 for contact names and emails) or phone:

- Inspectional Services Department (ISD,)
- Massachusetts Department of Public Health (DPH),
- Boston Public Health Commission.

BWSC may notify by email MWRA and neighboring towns and cities if they could be affected by SSO occurrence (see Appendix C.5 for contact names and emails):

- Town of Dedham,
- City of Cambridge,
- City of Somerville,
- City of Everett,
- City of Chelsea,
- City of Revere,
- City of Newton,
- Town of Brookline,
- Town of Milton.

4.4.3 Support Request Calls

BWSC may call the police at the following phone number to request they provide protection to the field crews and public if an SSO occurrence and/or related response activities obstruct traffic or pose potential safety concerns:

- City of Boston Police Department: 617-343-4200

BWSC will call Boston Fire Department in cases wastewater backing up into a building poses a potential fire hazard or a risk of electrical shock. Fire hazards can be created if the wastewater rising in the building can displace appliances which may break a gas line. People in flooded basements may be subject to electrical shock if wastewater reaches electrical outlets or electric motors in the furnace, freezer, washer, dryer and other appliances. BWSC should call:

- Fire Department number: 911

4.4.4 Notification Logs

Notification logs containing names of people to be notified about an SSO and the responsible party for each of these notifications are included in Appendix as follows:

- **Internal SSO Email Notification Log** (Appendix C.3) is used by Yard Clerk. At appropriate time (Step 8b in the Summary SSO Emergency Response Activity Flowchart, Section 5.6), Yard Clerk will send an email to a group mailing list including everyone on the log. Yard Clerk will record the time in CASS WORKS when this email is sent.
- **External SSO Phone Notification Log** (Appendix C.4) is used by Yard Clerk.
 - Part I. Yard Clerk will make a phone call to the MassDEP (Step 8b in the Summary SSO Emergency Response Activity Flowchart, Section 5.6) and record the time when the call was made for future reference.

- Part II. SSO Manager will make notifications to shown agencies as necessary (Step 10c in the Summary SSO Emergency Response Activity Flowchart, Section 5.6).
- **External SSO Email Notification Log** (Appendix C.5) is used by SSO Manager. The manager will email notifications to agencies as needed (Step 10c in the Summary SSO Emergency Response Activity Flowchart, Section 5.6) and submit by email the SSO 24-Hour Report to MassDEP and EPA Region (Step 15 in the Summary SSO Emergency Response Activity Flowchart, Section 5.6). The log will be used to record which emails were sent and time of these emails for future reference.

Response to Overflows

5.1 Overview

Responders to overflows might find that either the SSO is still active at the time they arrive on site or that the SSO has resided and is no longer active. Each SSO has its own unique conditions to assess and respond to but for active SSOs the primary objective is to first get the SSO stopped. This is particularly applicable the larger the SSO rate of flow. There may be cases where a very quick containment action, such as blocking flow to a nearby catch basin, may prevent significant consequences but normally getting the SSO stopped will result in the least overall impact. Field conditions, and the experience and judgment of the SSO responders, must drive the actions of the team to protect public health and minimize environmental harm.

5.2 Site Investigation

5.2.1 Initial Assessment

The Operations Response Crew nearest to the location of the apparent SSO will arrive at the site as quickly as possible (the First Responders Crew). This crew will contact their Field Supervisor, who will promptly notify Yard Clerk to either affirm the SSO is the responsibility of the BWSC or that it is not and the work order should be closed.

5.2.2 Stopping Active Flow

Stopping active flow is the priority. The following provides general guidance on the general sequence of immediate response activities that should be applied if the SSO is active at the time the First Responders crew arrives on site:

- Quickly assess the overflow location and how to position the jet truck over the sewer.
- Decide if a very quick containment action will prevent or significantly minimize the spill to reach a water body.
- Initiate sewer cleaning and observe whether the SSO resides.
- If the jet truck activities do not stop the SSO, then solicit Engineering Field Service Crew support or additional Operations Crew support until resolved.
- Once the SSO is under control, any spill that has reached an area where public may come in contact with the wastewater the area should be isolated and an appropriate signage posted warning about the potential exposure hazard, with the BWSC main number for additional information.

If the flow is not active or occurs at small rate (less than 100 gpm discharge), the First Responders crew should still give priority stopping the event, then to containment, and then correct the cause of SSO. Public health must be protected at all times.

5.2.3 Assessment

Without interfering with the quick mitigation of the SSO, the Field Supervisor should try to obtain and document the following information:

1. Estimate the severity of overflow. This is accomplished through the iPad SSO response application, which includes questions regarding:
 - Was there potential for public exposure?
 - Has the overflow reached a waterway?
 - Did the overflow cause a traffic hazard due to displaced manhole cover or street flooding?
 - Was there a building backup?
 - Did the overflow involve a private/industrial sewer lateral?

- Did the SSO reached a storm water collection system?
 - Was the cause of the SSO apparent, for example:
 - a. Was it related to blockage in the sewer?
 - b. Was it related to a sewer collapse?
 - c. Was it related to a power outage or pump station failure?
2. Estimate the initial overflow rate. Initial estimate can be made using pictures and tables (refer to Appendix D).
- Note: If possible, data will be gathered at different times during the overflow as the discharge rate generally changes over time. The flow rates and duration should be estimated at the time the crew arrives at site, repeated at least once later, and the final estimation of the total volume should be done when the overflow has stopped.
3. Determine the general location and cause of the blockage by visual inspection, if possible.
- Visually inspect MHs downstream and upstream of the SSO to determine flow patterns/surge depths. iPad comment fields may be used to capture this information. If the SSO occurred on private property, determine if the pipe blockage was in the BWSC system (see 'Protocol for Locating Pipe Blockage Resulting in Private Property SSO' in Appendix A.4).
4. Document the overflow. The Operations Response Crew Field Supervisor will document the SSO using BWSC's iPad application (Appendix D) including the following information:
- The location of the SSO: the nearest address, cross street, GPS Coordinates, and the collection system structure ID, i.e., manhole ID, cleanout ID, pump station ID, pipe ID, inside structure.
 - All actions with a timeline.
 - All data required for reporting purposes in Section VII, E of the Consent Decree.

5.2.4 Containment

Once the SSO impacted area has been assessed measures should be taken by the First Responders to minimize the public's exposure to the overflow by isolating and containing any active overflow. Applicable measures include temporary flow diversions (sand bags, etc.) to keep flow from spreading further and reaching waters of the United States or causing additional damage. In areas where the SSO is significant in volume/duration and cannot be quickly remedied, temporary pumping should be set up to "pump around" the blocked sewer segment.

The Field Supervisor or the SSO Manager will document the containment measures taken using BWSC's iPad application (Appendix D) by selecting the resources used from drop-down lists, and adding comments as necessary.

5.3 SSO Caused by Problem in BWSC Collection System

5.3.1 Correcting Cause of SSO

If the SSO is from or caused by the BWSC collection system and confirmed by the Operations Response Crew's Field Supervisor, the Yard Clerk will be notified who in turn will forward the notification to an on-call SSO Manager. The SSO Manager will contact the Field Supervisor on site to discuss and determine if additional expert help is needed on site to remedy the SSO.

If the cause of overflow appears to be blockage in the BWSC collection system, the Operations Response Crews will give immediate attention to relieving the blockage. Cleaning equipment appropriate to the situation will be used to hydroflush, rod, or hand rod the pipe and clear the blockage. BWSC may utilize a sand trap positioned at a downstream manhole to catch any debris released. If using the rodder, rods will be run from a downstream manhole to the blockage. Once the blockage is broken, the rods and cleaning tools are pulled out. Photos of blockage removal activities should be taken, as appropriate, to help document the extent of the debris found in the line. Private property owners are responsible for relieving blockages in their own laterals.

If the cause of the SSO appears to be more serious problem than an isolated blockage in the pipe (e.g., collapsed pipe), or if the cause is not apparent, the Field Supervisor should request expert help and the SSO Manager should provide additional manpower/equipment as necessary from the Operations department. The occurrence or timing of these additional root cause investigations will affect the content of the five day reporting documentation.

If the overflow occurs because of failure on a force main (pipe break, air valves failure) or siphon, appropriate repairs will be done to stop the overflow and as soon as possible and thereafter, a thorough condition assessment should be conducted of the adjoining pipe sections.

5.3.2 Site Clean-up

After an SSO is stopped and contained the Operations Response Crew should perform the site clean-up to restore the spill site. Property owners are responsible for cleaning their own site. The crew should consider site specific remedies depending on location, geography, geology, traffic volume, and public access to the affected area. Any debris or residuals from the SSO that remain in the affected area should be removed and the area stabilized/disinfected using water/bleach solution of 20:1 (3/4 cup of bleach per gallon). Lime or other suitable chemical can be used to kill pathogens and control odors.

If the overflow reached the storm drains, standing wastewater should be pumped out from them if reasonably possible into the sewer system. Sewer or SSO non-hazardous materials removed from the cleaning operation should be transported to the Commission's facility at Alford Street for proper disposal.

Some site clean-up guidance includes:

- a) Make every effort to remove as much debris as reasonably possible from street/sidewalks/driveways, pavement. If possible, manually remove sewerage debris from discharge point and transport to disposal site.
- b) Set-up a berm to contain flush water so it can be pumped to the sewer. Flush area with water, unless raining (3x amount of SSO, if possible). Contain used wash water and afterwards remove it. Record the volume of flush water recovered. Return flush water to sanitary sewer. If the discharge is from the CSS, sewage may be washed into the collection system.
- c) Spray disinfectant on impacted public areas where human contact may occur (streets and structures in the neighborhood) and any equipment that came in contact with wastewater using water/bleach solution of 20:1 (3/4 cup of bleach per gallon). Rinse the area and return the rinse water to the sewer. Do not use disinfectant if it may enter storm sewer where it will not be fully recovered before entering a water body.
- d) If overflow has entered receiving waters (or has potential to), Field Supervisor will consult with SSO Manager to collaboratively identify the scope of the cleanup effort.
- e) If the overflow reached the storm sewers, pump out standing wastewater from them and discharge into the sanitary sewer system and disinfect the storm sewers. Remove any plugs from the storm sewers if they were used to contain the overflow.
- f) Photograph the impacted area after cleaning.

The Field Supervisor or the SSO Manager will document site cleanup measures taken using BWSC's iPad application (Appendix D) through comment fields and selecting from actions/resources in drop-down lists.

5.3.3 Finalizing Documentation

Once an SSO has been remedied and site cleaned, the Field Supervisor will determine final estimated volume of discharge. The Field Supervisor will complete documentation about the SSO using BWSC's iPad application (Appendix D) and synch it to the SSO database. The Field Supervisor will notify him/her about the completed field activities and the SSO Manager will review the SSO data collected and submit the Initial SSO 24-Hour Report to MassDEP and EPA Region 1 by email (see Section 4.4.1).

5.4 SSO on Private Property

If the cause of an SSO is a blockage on private property, the Yard Clerk will be notified the SSO is a private sewer backup. The Field Supervisor will notify the homeowner that the blockage is in their private lateral and that BWSC does not have legal authority to maintain or perform work on privately owned laterals. The homeowner will be encouraged to hire a licensed plumber that can remove the blockage and is advised further remedial action and given the 'SSO Reference Guide Brochure' (Appendix A.3).

If homeowner is not at home, a completed 'SSO Notice Door Hanger' will be left at the door if an SSO event has been verified or suspected as occurring that may impact the property.

The Field Supervisor will be assigned to monitor the private property situation and assess the potential for exposure to public property, public health, and waters of the state.

If the homeowner is unable or unwilling to take appropriate and timely measures to resolve the matter, BWSC may decide to initiate steps to minimize the potential of public health and environmental impact. For instance, sewage from the private property that flows into the street or into a storm sewer catch basin may be contained and a signage posted until the property owner responds. BWSC will notify City of Boston Inspection Services (ISD) and Public Health Department (PHD) about these occurrences (see 4.4.2). BWSC may also temporarily terminate water service to the property to cease an ongoing SSO if the property owner does not respond.

The cost of cleaning and damages resulting from a private property caused SSO are the responsibility of the property owner. A customer may submit damage claims to the Commission. Claims are managed by the Risk Manager within the Office of General Counsel.

BWSC will not report SSOs caused by blockages on private property to MassDEP and EPA Region 1 but will document these occurrences in the SSO database, unless it causes a public health issue or enters a public way.

5.5 SSO Caused by Pump Station Failures

For any pump station alert that involves an overflow, Woodard & Curran (W&C) executes the requirements of SSOERP and takes appropriate action to contain the overflow.

W&C must investigate any alarm events at the unmanned pump stations within 30 minutes and take the necessary actions, including notifying the Engineering Field Services Department staff immediately. W&C does not report directly to the regulators and the SSO Manager will report SSOs caused by Pump Station Failures to MassDEP and EPA Region 1.

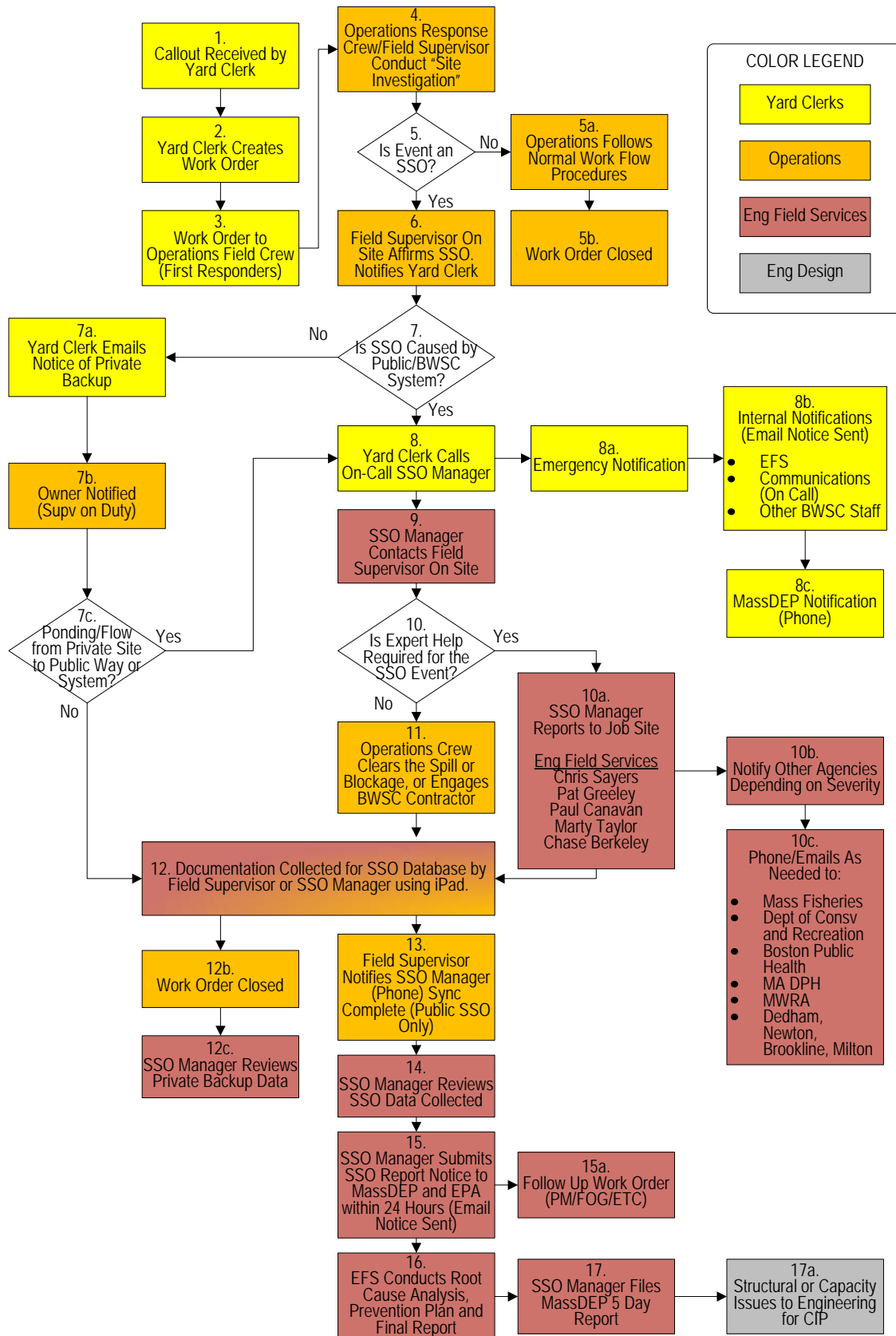
If the overflow occurs because of power outage or pump station mechanical failure, backup power is used and by-pass pumping to the nearest downstream manhole is setup if needed. All pump stations except for one, Commonwealth Avenue Underpass Pumping Station (CAUPS), have backup power available, either onsite generators or a manual transfer switch and generator receptacle for a portable generator, in the event of a power outage. By-pass pumping (2, 4, and 6 inch portable pumps) and a portable emergency standby generator on trailers are available for use as there are no built in bypass lines at the pump stations.

In case of an SSO, W&C is required to produce a Pre-Event and Pre-Activation Notification Report and a Rain Event Report (time and date, duration, pumping times, pumping totals, hydrographs, chemical usage, volume of screenings, process control readings).

5.6 Summary SSO Emergency Response Activity Flowchart

FIGURE 3

Summary SSO Emergency Response Activity Flowchart



Overflow Documentation and Reporting

6.1 Overview

SSO reporting and tracking requirements are specified in the Consent Order. BWSC should report all SSOs from or caused by their Collection System (except from permitted CSOs) to EPA and MassDEP by email and maintain their locations on a map of the Collection System.

Level 2 SSOs (i.e., multiple discharge locations in relatively close proximity stemming from a common root cause - see Table 1 in Section 1.4) may be documented and reported as one “area-wide SSO event”. The documentation for an area-wide SSO event must clearly specify each discharging location and report a total volume of spill from each discharging location.

BWSC will report both SSO Level 1 and 2 (see Section 1.4) to EPA and MassDEP in the same manner.

6.2 Reporting within 24 Hours

BWSC shall fill in the “BWSC SSO 24 Hour Report” (see Appendix C.8) in the field using iPad application described in Appendix D, or comparable paper form if necessary in Appendix C.8. This initial SSO report includes the following information:

1. Date and time SSO began (was reported to the BWSC Yard Clerk); time SSO was confirmed; date and time SSO was stopped; schedule for its termination if SSO is still ongoing;
2. Location of the event, including nearest property address;
3. Source of notification (property owner, field crew, police, etc.);
4. Weather Conditions (clear/no rain, rain, snow melt);
5. Root cause of the event (debris, FOG or root blockages, collapsed pipe, mechanical, electrical, or structural failures, hydraulic overloading, vandalism, unknown);
6. Source of SSO (cause on publicly or privately owned portion of sewer system);
7. Estimated gallons of wastewater released;
8. Method used to estimate the volume (visual or calculated);
9. Measures taken to stop the overflow (cleared blockage, plug, mat, etc);
10. Measures taken to decontaminate the affected area (trash removal, wash down, disinfection, etc);
11. Measures taken to prevent future overflows at the same location (further investigation, increase PM frequency, etc);
12. Final disposition of SSO (storm drain, surface water body, street/curb, contained area, other);
13. Location of nearest down gradient stormwater catch basin, its ID and distance from SSO location;
14. Name of the receiving water body to which the catch basin discharges if SSO occurred on the ground or street.
15. If wastewater entered any surface water, name of the surface water and location where it entered the surface water.
16. Estimated gallons of wastewater discharged to the MS4 or surface water, and method used to estimate the volume.
17. Date overflow was reported to EPA and MassDEP.

18. Map(s) attached to the report (yes/no).

For required items such as time of occurrence, causes of incident, volume of overflow, etc., the SSO Manager will provide best estimate or assessment at the time of this report.

The SSO Manager will submit the prepared documentation as initial 24 Hour SSO report with a map attached by email to:

- MassDEP: kevin.brander@state.ma.us, Claire.golden@state.ma.us
- EPA Region 1: borci.todd@epa.gov (617-918-1358)

The SSO Manager will copy designated BWSC staff and senior management to the email sent to MassDEP and EPA.

6.3 Reporting within 5 Days to MassDEP

Within five days, EFS should complete the post-remediation SSO investigation (see Chapter 8) and modify the initial SSO 24-Hour Report as needed. The report should include a characterization of the SSO, and a discussion of the planned actions to prevent recurrence. If the SSO requires further investigation to determine the cause that cannot be completed within five days due to complexity or scheduling issues, the report should state that ‘further investigation is necessary’ and the reason(s) why and an addendum to the report should be submitted when the investigation is completed (see Section 6.4). The 5-Day Report should be reviewed and approved by the designated Manager of Field Engineering and then submitted to MassDEP.

6.4 Addendum to 5-Day Report

Some SSOs require additional time to properly identify and correct the root cause. If the nature of the SSO is complex or will require special effort to determine the cause(s) and remedies, the anticipated schedule and basis for the schedule should be submitted to MassDEP as an addendum to the 5-Day SSO Report.

6.5 6-Month Compliance Reporting to EPA

The Commission should include information about each SSO in the 6-month compliance report due to Region 1 EPA for the period of time under Consent Decree (CD). The 6-month compliance reporting beginning on March 1, 2013, should be done on each March 1st and September 1st through termination of the CD.

The 6-month compliance report should include a chronological list of each of the following categories of SSO events that occurred during the reporting period:

- All overflows with a reasonable potential to reach surface waters such as releases to streets or areas with storm drain catch basins;
- Building/Private Property Backups; and
- Citizen reports of SSO events, including Building/Private Property Backups.

Each of the lists should include, but need not be limited to, the following information in summary format, based upon the iPad application data fields and SSO database compilation of those records:

1. Date and time when each event began and was discovered by, or reported to, the BWSC and the date when the event was stopped;
2. Location by address;
3. Final disposition of the SSO; and, if the release occurred to the ground or street, the location of the nearest down-gradient MS4 catch basin and the name of the receiving water to which the catch basin discharges;
4. If the release did not reach a catch basin or any other portion of the BWSC's MS4, a statement of whether the release did or did not reach any surface water. If the release reached a surface water, the name of the surface water and a description of the location where the release reached the surface water;

5. Source of notification;
6. Cause(s) of the event;
7. Determination of whether the event was caused by blockages or hydraulic limitations within the publicly-owned portion of the Collection System;
8. Measures taken to stop the event;
9. Estimated gallons of wastewater released, the estimated gallons of wastewater that reached a surface water, and the bases for those estimates;
10. Date the overflow was reported to EPA and MassDEP;
11. Measures taken to prevent future overflows at the same location; and
12. Date of the last SSO that occurred at the event location.

The 6-month compliance report should also include GIS map or figure indicating the location of each SSO event including reported Building/Private Property Backups.

The semi-annual compliance reports should capture the SSO events in six-month reporting periods and detail whether the cause of these events was investigated, and if so, what the investigation determined and the steps taken to prevent another SSO in the same area due to the same cause or repeat themselves in similar locations.

6.6 Tracking SSOs

BWSC shall maintain a database of documented SSO events (SSO Database) and track SSO occurrences in the BWSC Geographic Information System (GIS), with links to details in the SSO Database. The SSO Database is an Oracle based software database, and the SSO Manager or other EFS staff use a Microsoft Access user interface to perform reporting. The SSO Database is also linked to the Commission's CASSWORKS work order management system. The tracking will be useful in determining situations where problems are recurring and where priority should be given to additional maintenance or condition assessment conducted.

Public Notifications

7.1 Overview

BWSC should notify the public potentially impacted by a local SSO occurrence and coordinate the need for any further notification with the Public Health Department.

7.2 Signage

Sign posting provides a warning of potential public health risks due to sewage contamination. Contamination warning signs should be posted at sewer overflow sites when the overflow is in a public area and/or enters a waterway until the site is determined to be cleaned. The public is often interested in overflows and may come to the site to watch clean-up operations or drive through the spill. Every effort should be made to inform and warn the public of the dangers of coming into contact with raw sewage. Access to the affected area should be restricted to authorized personnel only. The Field Supervisor will make final decision about posting the signage.

7.3 Door Hangers

Where warranted, BWSC may use a door hanger with blank fields for the date and location of overflows that can be filled in as needed in the field and left for customers. The Field Supervisor will decide if distributing door hangers is needed. Appendix A.2 includes the appropriate door hanger.

The door hanger includes ways customers can contact BWSC for more information. Follow-up information will be provided to customers concerning additional remediation and/or their responsibility if the source of the overflow is their service line (roots, grease, debris or extraneous flow).

7.4 Media Notification

In extreme cases, such as SSOs that potentially pose a large-scale exposure, BWSC may notify the media. The media notification protocol involves the following steps:

1. The First Responders Field Supervisor confirms that the SSO has reached surface waters or public areas.
2. The First Responders Field Supervisor informs the Yard Clerk.
3. Yard Clerk publishes appropriate notifications and informs the on-call SSO Manager as well as the on-call Communications & Community Relations Department representative.
4. Where appropriate, the Yard Clerk will also notify the City of Boston via the Mayor's 24 Hour Hotline.
5. The Deputy Director of Communications & Community Relations or on-call Communications & Community Relations Department representative should consult with Commission staff if media notification is needed.
6. If warranted, the on-call Communications & Community Relations Department representative should contact the newspapers, television and radio stations identified in Appendix F.

Press release issued by BWSC should identify the problem, the causes, and actions being taken to resolve the issue. BWSC maintains a standard news release on SSO that can be quickly adapted to the particular situation.

The Deputy Director of Communications & Community Relations or on-call representative may also give interviews to requested media.

7.5 BWSC Web Site

BWSC will post on its web site a 24-hour notice of SSOs, including unpermitted CSOs but excluding building backups caused by problems on service laterals. The postings should include, at a minimum, the following

information: date and time of SSO occurrence, duration, location, estimated volume of the overflow, overflow cause and corrective action taken to remedy the SSO.

The web site will also include a 2-week history of SSOs and enable historical queries of SSOs. The Commission will publicize twice per year to local television and newspapers how to report SSO events. Also, see the attached Public Service Announcement, Press Release and related information in Appendix F.

Post-Remediation SSO Investigations and Tracking

8.1 Purpose of Investigations and Tracking

The purpose of a post-response SSO investigation is to;

- Reduce the risk of another SSO happening in the future at the same location for the same or similar reason.
- Develop a plan for a proper corrective action if the root cause is determined to require a long-term solution such required to correct system-wide capacity issues.

Root cause resolution complexity and the corrective action period required vary. Investigations and corrective actions in this Chapter apply primarily those that are quickly resolved. Complex or unique SSOs require additional time to identify root cause (e.g., hydraulic modeling) and perform the corrective action (6 months or more).

8.2 Performing Post-Remediation Investigations

The investigation is performed by Operations after the SSO has been stopped and/or contained. In many cases, the initial documentation recorded by the Operations Field Supervisor or SSO Manager (i.e., the initial BWSC SSO 24-Hour Report) will properly describe the situation, root cause, and remedy. In other cases, there may be contributory factors or additional information disclosed that was not initially available that needs to be considered. For example, addition investigation and enforcement action may be needed to support pursuing an apparent illicit discharge or violation of the BWSC FOG program.

The post-remediation investigation may include activities such as:

- Reviewing the SSO 24-Hour Report
- Reviewing past maintenance records;
- Conducting a CCTV inspection as soon as possible after the SSO to determine the condition of the line segment and;
- Interviewing staff who responded to the SSO.

Additional resources to consider using as part of the SSO Investigation:

- GIS – configuration of sewer system in vicinity of affected area.
- CASSWORKs historical maintenance and complaint records
- SSO Database – records of past SSOs in the affected area.
- Location and records for Food Service Establishments (FSE).
- Location, type and records for industries in vicinity of affected area.

In some cases, the investigation may include hydraulic modeling of the conveyance system to evaluate capacity or operational issues. For these more complex root cause investigations, the investigation team (which is likely to include both Operations and EFS staff) will issue a report for use in the 5 day SSO regulatory report, and also as supporting information for the 6 month SSO report.

8.3 CCTV Inspection

A post-remediation CCTV inspection of the pipe as necessary should identify structural defects in the pipe, FOG or other blockage indicators that may have contributed to the overflow. CCTV inspections would aid in the identification of offset joints, protruding lateral connections, roots, collapsed pipes, or sags in pipes where debris or grease is likely to accumulate and in time cause additional overflows. If such is the case, appropriate data shall be tracked in CASSWORKs database and preventative maintenance of the pipe segment modified and/or pipe renewal planned as appropriate. The post-remediation CCTV inspection may extend to adjacent pipes and aid in

further identification of upstream or downstream sources that are the cause of the SSO or function in a contributory role.

The post-remediation CCTV when combined with other inspection methodologies may also aid in the identification of I/I sources that contribute to the wet weather capacity related SSOs. In some cases other methods such as manhole inspections, building inspections, dye testing can be included in the investigation to find sources of I/I, if considered appropriate.

The CCTV could be forgone in those cases where it appears to already be sufficient information for determining the root cause of the SSO and the remedial action has been sufficient. Such may be the case related to a pump station or forcemain failure.

8.4 Hydraulic Modeling

A post-remediation investigation may include a review of the hydraulic modeling of the conveyance system to evaluate capacity or operational issues. BWSC has two hydraulic models to assess the capacity of sewer collection systems, one for sanitary/combined sewers and the other of storm sewers³. The sanitary/combined sewer model includes BWSC sanitary sewers 24-in. or greater and combined sewers 36-in. or greater, combined sewer regulators, overflow conduits and CSO outfalls, plus components of MWRA collection systems. The hydraulic models are managed through Engineering Planning Department.

Hydraulic modeling will aid in the identification of capacity issues and required system upgrades to remedy these issues.

8.5 Recurrent SSOs

Recurrent SSOs are those known to have occurred at the same general location more than once in two consecutive years. BWSC should keep track of these SSOs in the SSO by feature identification number, street address, and coordinates. Recurrent SSOs may be dry or wet weather events and a separate list of recurrent SSOs should be maintained for the two types of weather related SSOs.

BWSC performs an analysis of its SSOs annually for the current year and previous years, updating the list as appropriate. If data indicates that an SSO site is no longer active within the two year period it should be removed from the list. Likewise, the annual analysis may introduce new SSO locations that are recurrent and these sites are added to the list.

Pipe segments where wet weather recurrent SSOs are located should be inspected after significant rain events. The significant rain event in this SSOERP is chosen by BWSC. The following guidelines are for conducting the post-rainfall SSO inspections:

1. Perform baseline sewer system inspections to document each site in dry weather conditions.
2. Perform inspections during normal business hours following a rainfall equal to or exceeding the significant rain event.
3. Staff assigned to perform these inspections shall comply with the BWSC guidance for safety in assessing areas that could be affected by excessive rainfall (erosion and flooding that limit or prevent access).
4. If an SSO is observed, staff should follow the protocols described in this SSOERP and take appropriate actions. Staff should document the location, date, time, and rainfall amount in the preceding 24 hours along with an indication that an SSO was observed.
5. If no SSO is observed, staff should document the location, date, time, and rainfall amount in the preceding 24 hours. If this location continues to demonstrate no SSO following such inspections after 2 consecutive years, the site should be removed from the list of recurrent SSOs in the SSO database.

³ Both models use the Mike Urban model, which integrates BWSC ArcGIS geodatabase, and have SWMM 5 model built within the Mike Urban model.

6. If evidence is present to indicate that an overflow may have occurred but the overflow stopped before arrival of the inspection crew, BWSC should follow the protocols in this SSOERP and take appropriate actions. Notification procedures should indicate that BWSC observed evidence of a potential overflow but could not confirm the occurrence or duration of such an event.

Dry weather recurrent SSOs indicate 'hot spots' and the need to resolve the root cause rather than just increase the frequency of preventive maintenance of the pipe segment.

8.6 Potential SSO Location Based on Visual Evidence

BWSC field crews may come upon evidence of a past overflow during the normal course of operations. Upon such discovery, BWSC Operations Response Crews should clean up the area and remove debris associated with the prior overflow. BWSC should add the location to the wet weather list of recurrent SSOs and inspect these locations at each significant rainfall event. BWSC may consider adding a measuring device or flow level indicator in a manhole as a spot confirmation of the flow level that occurred since the last inspection visit.

8.7 Potential SSO Locations for Failed Pump Stations

Pump stations are not required to be inspected after a significant rain event unless the SCADA alarms were triggered but also should be inspected in the event that a lift station had a major disruption in power.

8.8 Preventive and Corrective Collection System Measures

Possible follow-up preventive Collection System measures include:

- Securing manhole lids.
- Targeted sewer rehabilitation or replacement.
- Modifications to scheduled sewers for high-frequency cleaning and maintenance.
- Accelerating planned or ongoing capital improvement projects.

Potential preventive measures sorted by defects causing SSOs and their root causes are listed herein.

8.8.1 Defect Causing SSO: Blockage or Restriction in Pipe

(a) Root cause: Roots

Develop a preventative management strategy to chemically treat roots or perform high frequency cleaning and CCTV inspections on this segment of pipe. Most root masses can be removed using high pressure hydraulically driven root cutting devices. Some root masses must be removed by performing a point repair to remove the section of pipe (joint or crack) through which the roots have entry to the pipe.

(b) Root cause: FOG

The BWSC FOG Program is under development and will include protocols to work with the local Food Establishment Services (FSE) to reduce the amount of FOG entering the sewer system. The FOG Program will include procedures for addressing problematic FSEs when they are identified as part of an SSO root cause investigation or from regularly scheduled FSE inspections. Regardless, FOG can be removed by jet washing or the combination of jet washing and hydraulically driven cutters.

(c) Root cause: Collapsed Pipe (includes sag and offset failures)

Perform pipe repairs or replace the pipe as part of the Preventive Maintenance or Capital Improvement Plan.

(d) Root cause: Private Lateral

Private property owner is responsible for repairs.

(e) Root cause: Debris/Sediment Introduced by External Source

If debris has been introduced by an external source which cannot be identified, it may be an act of vandalism. Consider system-wide or local outreach (depending on the magnitude of the debris and act of vandalism) in response to the act.

If it appears that illicit dumping of debris into the sewer system is ongoing, develop a strategy for additional investigation to identify the source and take appropriate enforcement action to prosecute vandals. In the event that this debris is from a waste hauler illegally dumping into manholes in the collection system, coordinate the appropriate investigation procedures with the Boston Environmental Strike Team (BEST) to identify the violator and prosecute accordingly.

Another option is to install locking manhole covers to deter unauthorized access to manholes in areas that are considered in a high risk of vandalism or illicit dumping.

8.8.2 Defect Causing SSO: Lift Station Failure

(a) Root cause: Pump Malfunction

Check if preventative maintenance activities are being performed as planned. Inspect the pump for the cause of malfunction. If the source is extraneous debris, further investigation of the gravity sewer may be necessary to determine the magnitude of the debris or if this was an isolated event. Additional preventative maintenance strategies may be necessary depending on the assessment of the pumps.

(b) Root cause: Power Failure

Assess the reliability for power feed to the area to confirm that the power supply is reliable. If there is an elevated risk of power failure or if this pump station is a high risk station, plan a permanent backup generator as a future capital investment.

(c) Root cause: Controls Failure

The investigation will determine the probable cause of failure to the controls. Control failures may be the result of faulty level detectors or failures of individual components. Woodard & Curran shall confirm the reliability of SCADA and telemetry communications and determine redundant means to alleviate risks. If power surges or lightning strikes result in failures, determine site specific means to eliminate power spikes or provide additional grounding. Include high frequency inspection of these stations following electrical storms in the preventative maintenance program.

(d) Root cause: Valve or Piping Defect

Replace defective components.

8.8.3 Defect Causing SSO: Force Main Failure

(a) Root cause: Air Release Valve Failure

Air release valves should be regularly inspected. If the valve is identified as not functioning properly and/or appears significantly corroded, replace the valve or perform the appropriate preventative maintenance measures.

(b) Root cause: Break in Force Main

While the force main break is being repaired (open cut point repair), assess the condition of the pipe in the adjoining sections. Additional corrosion investigation may be performed using ultrasonic methods or by taking pipe samples to assess defects in wall thickness. If there appears to be evidence of corrosion in the pipe wall, perform additional investigation to determine the extent of corrosion and need for additional pipe replacement as a preventative measure.

8.8.4 Defect Causing SSO: Siphon Failure or Blockage

(a) Root cause: Debris

Consider measures to improve the operation of the siphon minimize accumulation of grit and debris due to lack of scour velocity in the line. Perform a sonar and/or CCTV inspection of the siphon pipes to determine if debris or sediment is restricting the flow.

(b) Root cause: Corrosion

Make appropriate repairs of pipe damaged by the corrosion. Consider the addition of appropriate chemicals that hinder the formation of hydrogen sulfide to minimize corrosion or other measures to improve the operation of the siphon.

8.8.5 Defect Causing SSO: Capacity Deficiency

(a) Root cause: Inflow/Infiltration (Capacity)

Make appropriate repairs to eliminate sources of I/I based on a structured I/I flow and rainfall monitoring plan and subsequent sewer system evaluation survey and analysis.

(b) Root cause: Excessive Baseflow

If hydraulic modeling determined that portions of the sewer system exceed the capacity of the collection and conveyance system plan upgrades as appropriate to be considered in CIP planning.

Training and Preparedness

9.1 Training Objectives

The objective of staff training is to educate employees involved in implementing the SSOERP plan on how to perform and document the procedures in the program. In fall of 2012, BWSC initiated training sessions focused on developing the knowledge base for staff responsibilities and execution of their duties. The training provided instructions to Yard Clerks on how to better communicate with people reporting SSOs. The training also included guidance for field crews on how to respond properly and effectively to SSO events, perform adequate cleanup, and mitigate the potential impacts of SSOs on public health and the environment.

The training aims at informing staff how to identify and resolve deficiencies in the Collection System that could result in SSOs before they actually happen. BWSC identified personnel to receive training in SSO reporting and record keeping, primarily individuals that are First Responders to an SSO event, and the personnel involved in reporting an SSO to the regulatory agencies.

BWSC plans to include periodic simulated drills to confirm staff understanding and refine operating procedures. Staff will participate in annual refreshers concerning the SSOERP as well as auditing SSOERP for performance improvements identified from field observations.

The Organizational Diversity Department in BWSC will lead the effort to train staff concerning the SSOERP activities and will periodically review field procedures to observe experience demonstrated in the field. From these periodic observations, he/she will determine how best to construct the training for staff members. The training experts within this department will also track training programs required or completed for the appropriate staff through PeopleSoft or other database tracking tools.

BWSC plans to annually assess staff skills and knowledge as well as preparedness to apply the SSOERP and to also identify skill requirements for future employees and assess the needs for refresher training. Any new equipment that BWSC acquires or method/techniques BWSC would adopt in the future may also create the need for additional training will be coordinated with the Organizational Diversity Department.

9.2 Training Methods

BWSC plans to utilize different methods to train the staff involved in responding to the SSOs. They include methods such as:

- On-the-job training (OJT) carried out by having experienced employees provide direct field training and guidance to new employees. The experienced employees observe performance of trainees through field observation and track progress of their skills and knowledge improving.
- Peer assessments performed by having competent employees assess whether the trainees are fully trained.
- Classroom training offered to the employees by having them attend on-site or off-site workshops or webinars.

9.3 Effectiveness of Training

Training for the selected employees will be tracked and documented. A record of training sessions will document the type of training, instructors' names, date and time, duration, subject and participants. Sign-in sheets and any handouts will be kept on file.

Different approaches will be used to assess improvement in the competency of employees, e.g., informal comments of other employees, on the job observations, staff review sessions with all employees, and reports from peers, managers or customers.

9.4 Response and Safety Training Program

The hazards in the collection systems are many and varied. BWSC staff involved in responding to SSOs receive the safety training as described herein.

9.4.1 Confined Space Entry Safety Training

This training, conducted every other year, is supplied by the Organizational Diversity Department and is designed to instruct employees on proper procedures as defined in OSHA 29 CFR 1910.146. The training includes:

- Identifying permit and non-permit required confined spaces
- The roles of the confined space supervisor, attendant, and entrant
- Gas detection systems
- Ventilation systems
- Personal Protective Equipment (PPE)
- Non-entry rescue equipment and procedures

9.4.2 Excavation and Trenching Safety Training

This training is supplied by the Organizational Diversity Department and trains employees on methods and standards as defined in OSHA 29 CFR 1926.650. The training includes:

- Competent person responsibilities.
- Protective systems.
- Sloping and benching.
- Soil classification.
- PPE.

9.4.3 Hazard Communication Training

New employees receive “Right to Know” training through the Organizational Diversity Department. Refresher training is supplied to employees that may encounter hazardous chemicals, and also annually.

9.4.4 AED/CPR/First Aid Training

BWSC has an Emergency Response Team of 48 people from across all departments. Special training is offered to these individuals, including AED/CPR/First Aid certification training.

The Organizational Diversity Department performs supplemental safety trainings throughout the year on various topics such as back safety, heat stress, PPE, work zone design and awareness, fire training, asbestos.

Monthly safety training sessions are performed each month by supervisors covering safety issues pertaining to their job activities. Regular safety briefs are also done by supervisors and crew leaders.

Appendix A

Field Manual

BWSC Sanitary Sewer Overflows Emergency Response Plan (SSOERP)

Guidelines and Procedures Field Manual

Quick Reference Tool for Yard Clerks and Field Personnel

A.1. Introduction

BWSC SSO response team is available 24/7/365 to respond to any public health or environment problem related to an illicit discharge of sanitary sewerage.

The following guidelines and procedures address the manner in which notifications about these events should be received and response to the events handled by the BWSC employees when applicable.

A.2. Receiving Notifications about SSO

What to tell a homeowner reporting SSO on private property:

- Clearly communicate who will respond, estimated time they will arrive and what area(s) will need to be accessed.
- Clearly communicate that a blockage in the sewer main line will be promptly cleared, but that BWSC is not allowed to work on a blockage in the property owner's/resident's sewer lateral line. Use general terms that the caller can understand, and give the caller your name for future reference.
- Show concern and empathy for the property owner/resident, but do not admit or deny liability.
- Instruct the caller to turn off any appliances that use water and to shut off any faucets inside the home.
- Instruct the caller to keep all family members and pets away from the affected area.
- Instruct the caller to place towels, rags, blankets, etc. between areas that have been affected and areas that have not been affected.
- Instruct the caller not to remove any contaminated items – let the professionals do this.
- Instruct the caller to turn off their HVAC System.
- Instruct the caller to move any uncontaminated property away from impacted areas.

A.3. Responding to SSO in the Field

Operations crews (First Responders) arriving at site should remember the following:

- (1) Assessment
- (2) Stopping Active Flow
- (3) Containment
- (4) Correction
- (5) Cleanup
- (6) Notifications

A. Assessment

- a. Upon arriving at the discharge site, evaluate the impact on surrounding area and estimate the extent of SSO.
- b. Contact Yard Clerk to confirm the following information.

- Exact location and condition of site.
- Public or private collection system.

Note: If SSO occurs on private property, follow 'Protocol for Locating Pipe Blockage' to determine where the blockage is located.

- Request expert help (SSO Manager and additional manpower/equipment) if necessary.
- c. Document all information using iPad application.

B. Stopping Active Overflow

- a. Consider a very quick containment action if needed.
- b. Position the jet truck over the sewer. Initiate sewer cleaning and observe whether the SSO resides. If necessary, solicit Engineering Field Service Crew support.

C. Containment

- a. Contain surface discharge and isolate the discharge to the site
 - Obstruct entry points into the storm water system using sand bags, hay bales, inflatable plugs, etc.
 - Set up temporary pumping around the spill, between the manhole upstream from the SSO location and first dry manhole downstream, if necessary.
 - Barricade, flag, or hazard tape the affected area to minimize potential contact with the public.
- b. Notify other agencies (MWRA, nearby municipalities, Mass Fisheries, etc) if became or can potentially be affected by SSO

D. Correction

- a. If cause of SSO is in the BWSC collection system
 - For apparent inline sewer blockage (grease, roots, or debris), clear blockage as soon as possible.
 - If pipe cleaning cannot remedy the SSO or different corrective action is needed, request expert help from SSO Manager
- b. If cause of SSO is due to pump station failure
 - Woodard & Curran (W&C) will take necessary actions within 30 minutes of any alarm
- c. If cause of SSO is on Private Property
 - Notify affected property owners as soon as possible of the event and corrective action they need to take.
 - If the homeowner is unable/unwilling to take action:
 - Remove discharged sewage from private property as well as any that strays onto public property
 - Notify City of Boston Inspection Services (ISD) and Public Health Department (PHD)
 - Temporarily terminate water service to the property if necessary to cease an ongoing SSO or prevent a public health hazard
- d. Notify other agencies (MWRA, nearby municipalities, Mass Fisheries, etc) if became or can potentially be affected by SSO

E. Cleanup

- a. Remove debris from site.

- If possible, manually remove sewerage debris from discharge point and transport to the Materials Handling Facility (Alfred Street) for processing to landfill.
- b. Disinfect site and equipment
 - Use water/bleach solution of 20:1 (3/4 cup of bleach per gallon).
 - Contain used wash water and afterwards remove it.

Note: If the discharge is from the CSS, sewage may be washed into the collection system.

- c. Remove or decontaminate soil/plants as necessary
- d. If overflow entered receiving waters (or has potential to)
 - Field Supervisor and SSO Manager together identify the scope of cleanup needed
- e. If the overflow reached storm drains
 - Pump out wastewater and return it to sanitary sewer
 - Record the volume recovered
 - Flush impacted sections of storm drain with water (3x amount of SSO, if possible) and return flush water to sanitary sewer
 - Record the volume of flush water recovered
 - Remove any plugs from the storm drains if needed
 - Photograph storm drain catch basin after cleaning

F. Notifications

- Create SSO 24-Hour Report (Field Supervisor or SSO Manager) using iPad application
- Submit the report to MassDEP and EPA Region 1 by email.

A.4. Protocol for Locating Pipe Blockage that Causes a Private Property SSO

Purpose:

To determine location of pipe blockage suspected of causing SSO on private property by visual observation of flow condition in cleanouts on the private property and manholes in the area.

Steps:

Go to the cleanout at the property line (if there is such) and observe if there is any retained wastewater in it:

If the cleanout is dry, the blockage is located in the lateral between the cleanout and the house/SSO location. Marked as ① in Figure 4. Proceed to step 4.

If the cleanout shows retained wastewater, the blockage is located downstream either in the remaining portion of the private lateral (lower lateral) or somewhere in the main. Proceed to step 2.

Go to the manhole downstream of the lateral connection to the main (see the drawing) and observe the flow conditions:

- a. If the manhole is dry, the blockage is in the sewer main between the lateral connection and the manhole. Marked as ② in Figure 4. Proceed to step 4.
- b. If the manhole is full, the blockage is further downstream. Proceed to step 3.

Go to the manhole further downstream and observe the flow conditions.

- a. If the manhole is dry, the blockage is in the sewer line upstream of it. Marked as ③ in Figure 4. Proceed to step 4.

b. If the manhole is not dry, the blockage is further downstream. Repeat step 3.

If CCTV equipment is available on site, CCTV inspect the mainline to verify blockage and identify the type of blockage (e.g., roots, grease or silt debris, litter, rocks, etc.). The inspection would help selecting the proper method of blockage removal.

If CCTV equipment is not available on site, try to remove the cause of spill by performing hydraulic cleaning. If this does not succeed, try mechanical cleaning (rodding, root cutting).

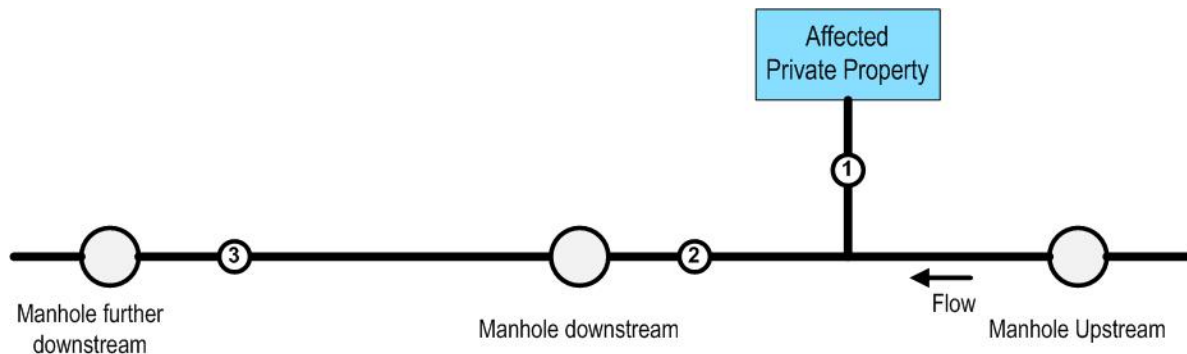


Figure 4. Schematic of SSO (building backup or spill from cleanout) and possible pipe blockage locations (1, 2 or 3)

A.5. Guidance For Media Communications

In the event that response staff needs to respond to the media, the following are key steps to assist staff in dealing with the media or public (from McELROY COMMUNICATIONS, Ten Brief Keys to Surviving Media Interviews).

1. **FOCUS** – Have in mind a short, clear central message which takes no more than 10-15 seconds to state. Be able to say it in six different ways, if necessary.
2. **BE DECISIVE/KNOWLEDGEABLE/PROFESSIONAL** – In manner and appearance, you must create audience confidence in you.
3. **BE PLEASANT/FRIENDLY/NON-THREATENING** – If they don't like you, they won't believe your message. Otherwise, just restate the central theme.
4. **NEVER ANSWER HYPOTHETICALS** – Restate the facts and emphasize the central theme.
5. **NEVER SAY "NO COMMENT"** – Make a positive response, even if it's just to restate the central message. If you don't know the answer, say so, and promise to find the answer and get back to the reporter with it if possible.
6. **BE BRIEF** – Don't give the editors the chance to decide which 10 seconds of your answer they will use. Give them a 10-second answer and leave them no choice.
7. **BE WARY** – Never assume that you can let your guard down because the reporter is "friendly" or has done "friendly" stories in the past.
8. **NOTHING IS "OFF THE RECORD"** – Don't use this statement.
9. **AVOID JARGON, ACRONYMS, AND TECHNICAL TERMS** – Having to explain can sound condescending. Having to explain and not explaining can cost you the audience's attention and trust.
10. **GET A PIO BRIEFING** – Get a briefing from the Public Information Officer (PIO)⁴ before the briefing and report back afterward on how it went.

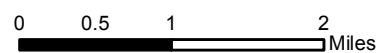
⁴ Deputy Director or on-call representative of Communications and Community Relations Department

Appendix B

Service Area Map

Service Area Map Interceptor Abbreviations

BWSC	
BMI	Boston Main Interceptor
DBC	Dorchester Brook Conduit
DBS	Dorchester Brook Sewer
DHLS	Dorchester High Level Sewer
DI	Dorchester Interceptor
EBLLS	East Boston Low Level Sewer
ESI	East Side Interceptor
FFC	Foul Flow Conduit #2
FSS	Faneuil Street Sewer
HPAS	Hyde Park A venue Sewer
NASI	New Albany Street Interceptor
NBMI	New Boston Main Interceptor
NESI	New East Side Interceptor
NESI-SB	New East Side Interceptor South Branch
OSBC	Old Stony Brook Conduit
RCC	Roxbury Canal Conduit
RCS	Roxbury Canal Sewer
RI	Roslindale Interceptor
SoBI	South Boston Interceptor
SBI	Stony Brook Interceptor
SBVS	Stony Brook Valley Sewer
SWCI	South West Corridor Interceptor
TAHLS	Talbot A venue High Level Sewer
WRLLS	West Roxbury Low Level Sewer
WSI	West Side Interceptor
MWRA	
BBS	Brighton Branch Sewer
BMC	Boston Marginal Conduit
BMDRS	Boston Main Drainage Relief Sewer
CBS	Cambridge Branch Sewer
CPC	Columbus Park Connection
CRVS	Charles River Valley Sewer
CTBS	Charlestown Branch Sewer
EBBS	East Boston Branch Sewer
HLS	High Level Sewer
MSI	Moore Street Interceptor
NMTS	North Metropolitan Trunk Sewer
NVS	Neponset Valley Sewer
SCRS	South Charles Relief Sewer
SMHLS	South Metropolitan Sewer
UNVS	Upper Neponset Valley Sewer
WERS	Wellesley Extension Relief Sewer



Appendix C

Log Forms

C.1. BWSC Responsible Personnel Contact Information

Name	Title	Phone	Email
Tom Bagley	<i>Deputy Director of Communications</i>	617-989-7361	BagleyTR@bwsc.org
Chase Berkeley	<i>Deputy Superintendent of Operations</i>	617-989-7272	BerkeleyC@bwsc.org
Paul Canavan	<i>Dir. of Engr. Services</i>	617-989-7226	CanavanP@bwsc.org
Joseph Crossen	<i>Chief Operations Officer</i>	617-989-7267	CrossenJF@bwsc.org
Gerry Dwyer	<i>Chief Administrative Officer</i>	617-989-7335	DwyerGF@bwsc.org
Bonita Gottschalk	General Counsel	617-989-7366	GottschalkBM@bwsc.org
Pat Greeley	<i>Deputy Dir. of Engr. Services</i>	617-989-7219	GreeleyP@bwsc.org
Charlie Jewell	<i>Director of Planning</i>	617-989-7431	JewellC@bwsc.org
Vincent Mannering	<i>Executive Director</i>	617-989-7333	ManneringVG@bwsc.org
John Jay Porter	<i>Chief Operating Officer</i>	617-989-7330	PorterJJ@bwsc.org
John Sullivan, Jr.	<i>Chief Engineer</i>	617-989-7444	SullivanJP@bwsc.org
Chris Sayers	<i>Manager of Field Services</i>	617-989-7220	SayersC@bwsc.org
Steven Shea	<i>Dir. of Engr. Design</i>	617-989-7425	SheaSP@bwsc.org
James Steinkrauss	<i>Deputy General Counsel</i>	617-989-7312	SteinkraussJJ@bwsc.org
Marty Taylor	<i>Field Service Engineer</i>	617-989-7221	TaylorMC@bwsc.org
Dmitri Vidalis	<i>Field Service Engineer</i>	617-989-7224	VidalisD@bwsc.org

C.2. Outside SSO Response Contractors

Table 3: Emergency and on-call contractors

Contract No.	Activity	Company
12-303-002	Repairs to sewers and drains	C Naughton Corp
12-303-004	Sewerage Works Repairs	Giugliano Corporation
12-303-008	Catch Basin Cleaning	Roadway Maintenance
12-303-009	TV Inspection	Rapid Flow Inc.

C.3. Internal SSO Email Notification Log

SSO Location: _____

Date: _____

Time BWSC notified of SSO: _____

Responsible Party for SSO Notifications: Yard Clerk

Name	Time of Notice
Operations	
1. Joseph Crossen, <i>Chief Operations Officer</i>	
2. Chase Berkeley, <i>Deputy Superintendent of Operations</i>	
Engineering Field Services	
3. Chris Sayers, <i>Manager of Field Services</i>	
4. Paul Canavan, <i>Dir. of Engr. Services</i>	
5. Pat Greeley, <i>Deputy Dir. of Engr. Services</i>	
6. Marty Taylor, <i>Field Service Engineer</i>	
7. Dmitri Vidalis, <i>Field Service Engineer</i>	
Communications	
8. Tom Bagley, <i>Deputy Director of Communications</i>	
Senior Management	
9. Vincent Mannering, <i>Executive Director</i>	
10. John Jay Porter, <i>Chief Operating Officer</i>	
11. Bonita Gottschalk, <i>General Counsel</i>	
12. James Steinkrauss, <i>Deputy General Counsel</i>	
13. John Sullivan, Jr., <i>Chief Engineer</i>	
14. Gerry Dwyer, <i>Chief Administrative Officer</i>	

Name: _____ Phone: _____

C.4. External SSO Phone Notification Logs

SSO Location: _____

Date: _____

Time BWSC notified of SSO: _____

Responsible Party for SSO Notifications: Yard Clerk

PART I.

Agency	Time of Notice
MassDEP	
<i>During regular business hours, and spill up to 100 gal:</i> 978-694-3215	
<i>After business hours, or spill equal to or exceeding 100 gal:</i> 617-556-1133 or 888-304-1133	
<i>If oil or hazardous material release suspected: 888-304-1133</i>	

PART II (If requested by SSO Manager)

Agency	Time of Notice
1. Mayor's 24 Hour 617-635-4500	
2. MA Division of Fisheries <i>Reporting fish kills only.</i> <i>During regular business hours: 508-722-9811</i> <i>After business hours: 508-722-9811 or 800-632-8075</i>	
3. Inspectional Services Department (ISD) <i>Reporting SSO on private laterals only.</i> 617-961-3309 (Regina Hansen, Asst. Housing Director)	
4. Department of Conservation and Recreation (DCR) 617-626-4972	
5. Boston Police 617-635-4500	
6. Fire Department number 911 or 617-343-2880	

Name: _____ Phone: _____

C.5. External SSO Email Notification Log

SSO Location: _____

Date: _____ Time BWSC notified of SSO: _____

Responsible Party for SSO Notifications: *SSO Manager* Name: _____

Phone Number: _____

Agency	Time of Notice
<p>MANDATORY</p> <p>1. EPA Region 1, Todd Borci, Borci.Todd@epamail.epa.gov</p> <p>2. MassDEP, Kevin Brander, kevin.brander@state.ma.us</p> <p>MassDEP, Claire Golden, Claire.Golden@state.ma.us</p>	
<p>AS NEEDED</p> <p>3. MWRA</p> <p>Michael Hornbrook, michael.hornbrook@mwra.state.ma.us</p> <p>Stephen Cullen, stephen.cullen@mwra.state.ma.us</p> <p>John Vetere, john.vetere@mwra.state.ma.us</p> <p>Carolyn Fiore, carolyn.fiore@mwra.state.ma.us</p> <p>Andrea Rex, andrea.rex@mwra.state.ma.us</p>	
<p>4. MA Department of Public Health (MA DPH)</p> <p>Suzanne Condon, suzanne.condon@state.ma.us</p> <p>Al DeMaria, alfred.demaria@state.ma.us</p>	
<p>5. Boston Public Health Commission</p> <p>Dr. Barbara Ferrer, bferrer@bphc.org</p> <p>Anita Barry, ABarry@bphc.org</p> <p>Leon Bethune, LBethune@bphc.org</p>	
<p>6. Town of Dedham</p> <p>Cathy Cardinale, ccardinale@dedham-ma.gov</p> <p>Michael Thorton, MThorton@dwwd.org</p> <p>Stephanie Costa, scosta@dwwd.org</p>	
<p>7. City of Newton</p> <p>Linda Walsh, lwash@newtonma.gov</p>	
<p>8. Town of Brookline</p> <p>Alan Balsam, abalsam@brooklinema.gov</p>	
<p>9. Town of Milton</p> <p>Michael Blanchard, mblanchard@townofmilton.org</p>	
<p>10. City of Cambridge</p> <p>William Dwyer, wdwyer@cambridgema.gov</p>	

11. City of Somerville Richard Willette, 617-666-3311	
12. City of Everett Roberto Santamaria, 617-394-2256	
13. City of Chelsea Joe Foti, 617-466-4200	

C.6. Contact List for Hazardous Material Spill Response

BWSC Field Engineering	State Licensed Contractors
Chris Sayers, <i>Manager of Field Services</i> Marty Taylor, <i>Field Service Engineer</i> Patrick Greeley, <i>Deputy Dir. of Engr. Services</i>	Licensed Hazardous Waste Transporters Authorized for Emergency Response Clean-up in Massachusetts Advanced Pollution Control Bridgewater, MA 508-843-8881
Public or Regulatory Agencies	
City of Boston Fire Department 911 or 617-343-2880 Boston Public Health Commission Office of Environmental Health 617-534-5965 MassDEP Northeast Region Emergency Response 978-661-7600 National Response Center 800-424-8802 U.S. Coast Guard	Clean Harbors Braintree, MA 800-oil-tank Cyn Environmental Services Stoughton, MA 800-242-5818 Enpro Services, Inc. Newburyport, MA 800-946-6900 General Chemical Corp Framingham, MA 508-872-5000

<p>Marine Safety Office</p> <p>617-223-3000</p>	<p>BWSC Licensed Site Professional</p>
<p>MWRA</p> <p>TRAC Department</p> <p>617-242-6000 (regular working hours)</p> <p>617-305-5940 (after hours)</p>	<p>GEI</p> <p>Woburn, MA</p> <p>781-721-4000</p> <p>Bill Simmons, emergency cell 781-507-6865</p>

C.7. BWSC Work Order Request

Microsoft Access

Work Order Info

Work Order Nbr: 00000048501

Work Order Date: 10/07/2011

Initial Contact Time: 12:00

Contacted By: OSHEN, CHRISTOPHER

Supervisor: MOLLEY, MELVIN

Field Crew: DET CREW 02

Notified By: TELEPHONE CALL BY PUBLIC

Buttons: New WO, Refresh, 24h Report

Tabs: Account/Location, Source and Priority, Event Description, Containment and Remediation, Preliminary Cause, Notification and Reporting, Images

Address: 142

Street: MADISON PARK CT

Cross Street: DEWITT DR

Neighborhood: ROXB

GPS

Accuracy: 3784

X-Coordinate: 42.525925

Y-Coordinate: -71.1206

Nearest CB: 191079

Distance: 50

Location Description: BWSC line down and running. SSO caused by blockage in private lateral. A total of 50 gallons from the SSO discharged from a toilet. Owner fixed plumber to clear blockage. Owner responsible for cleaning area. No impacts to any catch basins or water bodies, confined to building.

Records: 1 of 26

Form View

Figure 5. Screenshot of CASS WORKS Sewer Investigation Work Order created by Yard Clerk

C.8. BWSC SSO 24-Hour Report

SSO 24 Hour Report

NPDES Permit No. MAS010001

Boston Water and Sewer
Commission

Name: _____

Title: _____ Date: _____

Times:

SSO
Began/Reported:SSO
Confirmed:SSO
Stopped:Ongoing SSO
Scheduled End:

Location, Nearest Address/Cross Street: _____

Source of Notification: _____

Weather Conditions:

Clear/No Rain

☐

Raining

☐

Snow Melt

☐

Root Cause of Event:

Piping/Siphons:

Debris

☐

F.O.G.

☐

Roots

☐

Pipe Collapse

☐

Hydraulic

☐

Other

☐

Pump Stations/Regulators:

Structural

☐

Mechanical

☐

Electrical

☐

Vandalism

☐

Other

☐

Source of SSO:

Commission

☐

Private

☐

Estimated Volume:

Gallons

Estimating Method:

Visual

☐

Calculated

☐

Measures taken to stop overflow:

Cleared Blockage

☐

Bypass Pump

☐

None Req.

☐

Plug

☐

Excavation

☐

Other

☐

Mat

☐

Sandbag

☐

Measures taken to decontaminate:

Trash Removal

☐

Wash Down

☐

Owner Resp.

☐

Disinfection

☐

Vactor

☐

Other

☐

Measures taken to prevent future overflows:

Further Invest.

☐

Owner Resp.

☐

Other

☐

Unique Occur.

☐

Increase PM Freq.

☐

SSO 24 Hour Report

NPDES Permit No. MAS010001


**Boston Water and Sewer
Commission**
This event resulted in the discharge of sewage into a:

Storm Drain

☐
☐

Surface Water Body

☐
☐

Street/Curb

Contained Area

Other

☐
Location, ID of, and distance to nearest down gradient catch basin:
Estimated Volume Discharged:

Gallons

Estimating Method:

Visual

☐

Calculated

☐
Receiving Water Body:

Boston Harbor

☐

Boston Inner Harbor

☐

Brook Farm Brook/Charles River

☐

Brookline Drains to Tannery

☐

Brookline Drains to Village

☐

Bussey Brook/Charles River

☐

Canterbury Brook/Charles Riv.

☐

Chandler Pond/Charles River

☐

Charles River

☐

Chelsea River

☐

Cow Island Pond/Charles River

☐

DCR Drain to Charles

☐

DCR Drain to Dorchester Bay

☐

DCR Drain to Muddy River

☐

DCR Drain to Neponset

☐

Dorchester Bay/Boston Harbor

☐

Goldsmith Brook/Charles River

☐

Jamaica Pond/Charles River

☐

Mill Pond/Mother Brook/Nep.

☐

Millers River/Charles River

☐

Mother Brook/Nep. River

☐

Muddy River/Charles River

☐
Muddy River-Leverett Pond/
Charles River
☐

Mystic River

☐

Neponset River

☐

Neponset River via Davenport

☐

None Shown/Charles River

☐

Sprague Pond/Nep. River

☐

To Brookline Drains

☐

To Dedham

☐

To Newton Drains

☐

To Somerville Drains

☐

Unnamed Wetlands

☐

Unnamed Stream

☐

Unnamed Stream/Charles Riv.

☐

Wetland- Stony Brook Res.

☐

Wetlands/Charles River

☐

Wetlands/Nep. River

☐

Unknown

☐
Location release entered Surface Water:
Additional Comments:
Date Reported to:

EPA:

MDEP:

BWSC Communications Notified:

Yes

☐

No

☐
Map(s) Attached:

Yes

☐

No

☐
Signature:
Date:

Appendix D

iPad Tracking and Reporting

BWSC has developed an iPad application to track and report SSOs which. The application is used in the field by the Operations Crew Supervisor or the SSO Manager. The application consists of eight forms as described in this Appendix and will push contents of each form to the SSO database (Oracle) when Synch button is pressed. For proper synching, the device must be connected to the BWSC wireless network.

The application is opened by clicking the appropriate icon ('SSO Icon') on the iPad screen. Upon opening, the application will load all work orders created on the device in hand in descending numeric order.

Work Order Information Form (iPad Screenshot #2, Figure 6) creates a new SSO event by entering the Cassworks Sewer Investigate Work Order # provided by the Yard Clerk plus the following information:

- Initial contact Date: The date BWSC was informed about the SSO event.
- Initial Contact Time: The time (24hr clock) BWSC was informed about the SSO event.
- Contacted By: The person who informed BWSC about the SSO event.
- Supervisor Manager: The on-call SSO Manager responding to the SSO event.
- Field Crew Assigned: The field crew responding to the SSO event.




The subsequent forms are filled in the field.

Camera Form (iPad Screenshot #2 in Figure 7) allows the user to take a picture and associate the picture with the current work order.

Account/Location Information Form (iPad Screenshot #3: Figure 8) allows the user to enter address. 'Neighborhood' will be auto populated based on the street name. 'GPS' field gets the current coordinates of the iPad and this button should only be clicked when the user is at the location of SSO event.

SSO Source and Priority Form (iPad Screenshot #4: Figure 9) allows the user to specify if the SSO is a private or Commission based event and the priority of SSO (Priority 1 events are more severe than Priority 2 events).

Description of Event Form (iPad Screenshot #5: Figure 10) allows the user to enter date and time the SSO started and the following:


- Spill Appearance Point: Where the spill is coming from. If manhole is selected the user will be presented with a Get Manhole button. Clicking on this will bring up a Google Street view map with red pins representing each manhole. The user will select a pin by clicking on it and then clicking on the  symbol to get the manhole id.
- Estimated Current Spill Rate: The number of gallons per minute coming from the sewer. When this button is pushed, an array of photos appears which the user can use to estimate the spill rate. Clicking this button again will remove the array of photos.
- Get Closest CB ID: Closest Down Gradient Catch Basin to the SSO event. Clicking on this button brings up a Google Street view map with purple pins representing each catch basin. The map will be centered at the current location of the iPad and every catch basin within .25 miles of the current location will be displayed. The user can select a catch basis by clicking on a pin and then clicking on the  symbol.
- Distance to closest Catch Basin: Distance to the closest **Down Gradient** Catch Basin in feet from the SSO event.
- Event Resulted in discharge of sewage into surface water body: Answering yes to this will display a text box which allows the user to enter the volume of discharge and the volume estimated method (calculated or estimated).
- Event Resulted in discharge of sewage into catch basin: The user can click on the Get Catch Basin ID button which brings up a Google Street view map with purple pins representing each catch basin. The map will be centered at the current location of the iPad and every catch basin within .25 miles of the current location will be displayed. The user can select catch basins by clicking on a pin and then clicking on the  symbol.
- Final Spill Destination: Where the sewage ended up.

Containment and Remediation Form (iPad Screenshot #6: Figure 11) allows entering the date and time the crew arrived at the scene of the SSO event, the date and time the spill ended, plus the following:

- Containment Measures: The measures taken to contain the event. When this button is selected a multi-select/multi-option list appears. The user can select multiple options by clicking on them.
- Clean Up Measures: Measures taken to clean up the SSO event. This is a multi-select/multi-option list.
- Equipment on Site: Select from a list of BWSC's equipment. This is a multi-select/ multi-option list.
- Prevent Future Overflow: Measures taken to prevent an SSO event at this location in the future.

Preliminary Cause Form (iPad Screenshot #7: Figure 12) offers several multi-select/multi-option lists of items to specify preliminary assessed cause of SSO. One list is associated with piping/siphon, one with pumping station, one with regulator and one with weather. Capacity issue is one additional option for the SSO cause.

Notification and Reporting Form (iPad Screenshot #8: Figure 13) offers a list of various city/state departments which may need to be notified about the SSO event.



The screenshot shows an iPad interface for a work order management application. At the top, the status bar displays 'Verizon', signal strength, time '3:23 PM', and battery level '100%'. Below the status bar is a navigation menu with seven buttons: 'Work Order Information' (highlighted in blue), 'Camera', 'Account/Location Information', 'Source and Priority', 'Description of Event', 'Containment and Remediation', 'Preliminary Cause', and 'Notification and Reporting'. The main content area is titled 'Work Order Information' and contains several input fields with labels: 'Work Order Number', 'Initial Contact Date' (with the value '09/20/2012'), 'Initial Contact Time', 'Contacted By', 'Supervisor Manager', and 'Field Crew Assigned'. At the bottom, there is a control bar with navigation buttons '<<', '<', '>', and '>>', a status indicator 'Record 0 of 0', and action buttons 'New', 'Save', 'Delete', 'Synch Work Order', and 'Synch Images'.

Verizon 3:23 PM 100%

Work Order Information Camera

Account/Location Information Source and Priority Description of Event

Containment and Remediation Preliminary Cause Notification and Reporting

Work Order Information

Work Order Number

Initial Contact Date 09/20/2012

Initial Contact Time

Contacted By

Supervisor Manager

Field Crew Assigned

<< < Record 0 of 0 > >>

New Save Delete

Synch Work Order Synch Images

Figure 6. iPad Screenshot #1: Work Order Information

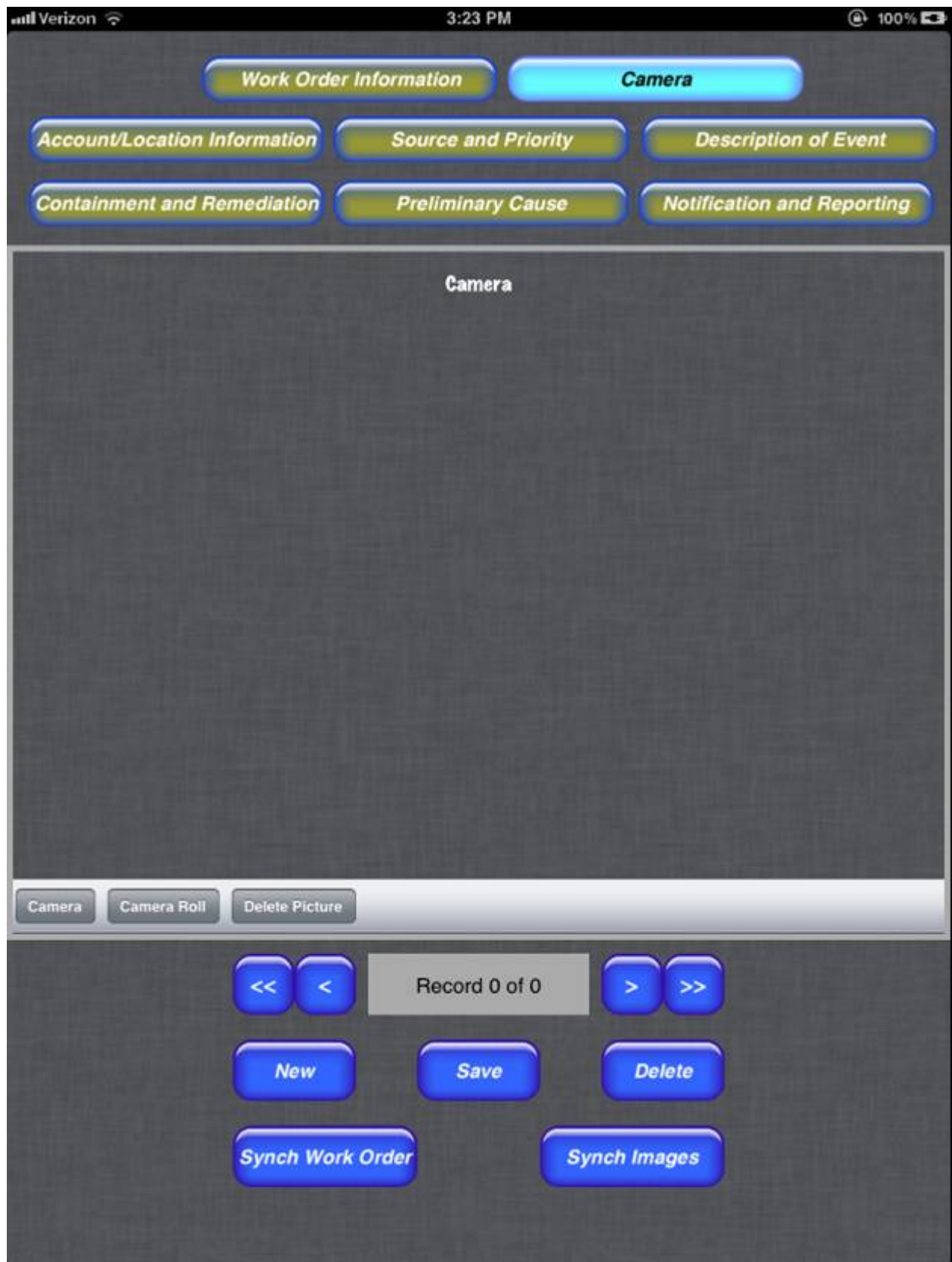


Figure 7. iPad Screenshot #2: Camera

Verizon 3:23 PM 100%

Work Order Information **Camera**

Account/Location Information **Source and Priority** **Description of Event**

Containment and Remediation **Preliminary Cause** **Notification and Reporting**

Account/Location Information

Address

Street

Cross Street

Neighborhood

GPS Accuracy feet

X-Coordinate

Y-Coordinate

Location Description

<< < Record 0 of 0 > >>

New **Save** **Delete**

Synch Work Order **Synch Images**

Figure 8. iPad Screenshot #3: Account/Location Information

Verizon 3:23 PM 100%

Work Order Information Camera

Account/Location Information **Source and Priority** Description of Event

Containment and Remediation Preliminary Cause Notification and Reporting

Source and Priority

SSO Source

Priority

<< < Record 0 of 0 > >>

New Save Delete

Synch Work Order Synch Images

Figure 9. iPad Screenshot #4: SSO Source and Priority

Verizon 3:23 PM 100%

Work Order Information **Camera**

Account/Location Information **Source and Priority** **Description of Event**

Containment and Remediation **Preliminary Cause** **Notification and Reporting**

Description of Event

Est Spill Start Date 09/20/2012 **Est Current Spill Rate** gallons/minute

Est Spill Start Time Estimated volume of spill recovered gallons

Spill Appearance Point

Get Closest CB ID Distance to Closest Catch Basin feet

Final Spill Destination

Event resulted in discharge of sewerage into surface water body **YES** **NO**

Event resulted in discharge of sewerage into storm water catch basin **YES** **NO**

<< < Record 0 of 0 > >>

New **Save** **Delete**

Synch Work Order **Synch Images**

Figure 10. iPad Screenshot #5: Description of Event

Verizon 3:23 PM 100%

Work Order Information **Camera**

Account/Location Information **Source and Priority** **Description of Event**

Containment and Remediation **Preliminary Cause** **Notification and Reporting**

Containment and Remediation

Est Crew Arrival Date 09/20/2012

Est Crew Arrival Time

Containment Measures

Clean Up Measures

Equipment On Site

Est Spill End Date 09/20/2012

Est Spill End Time

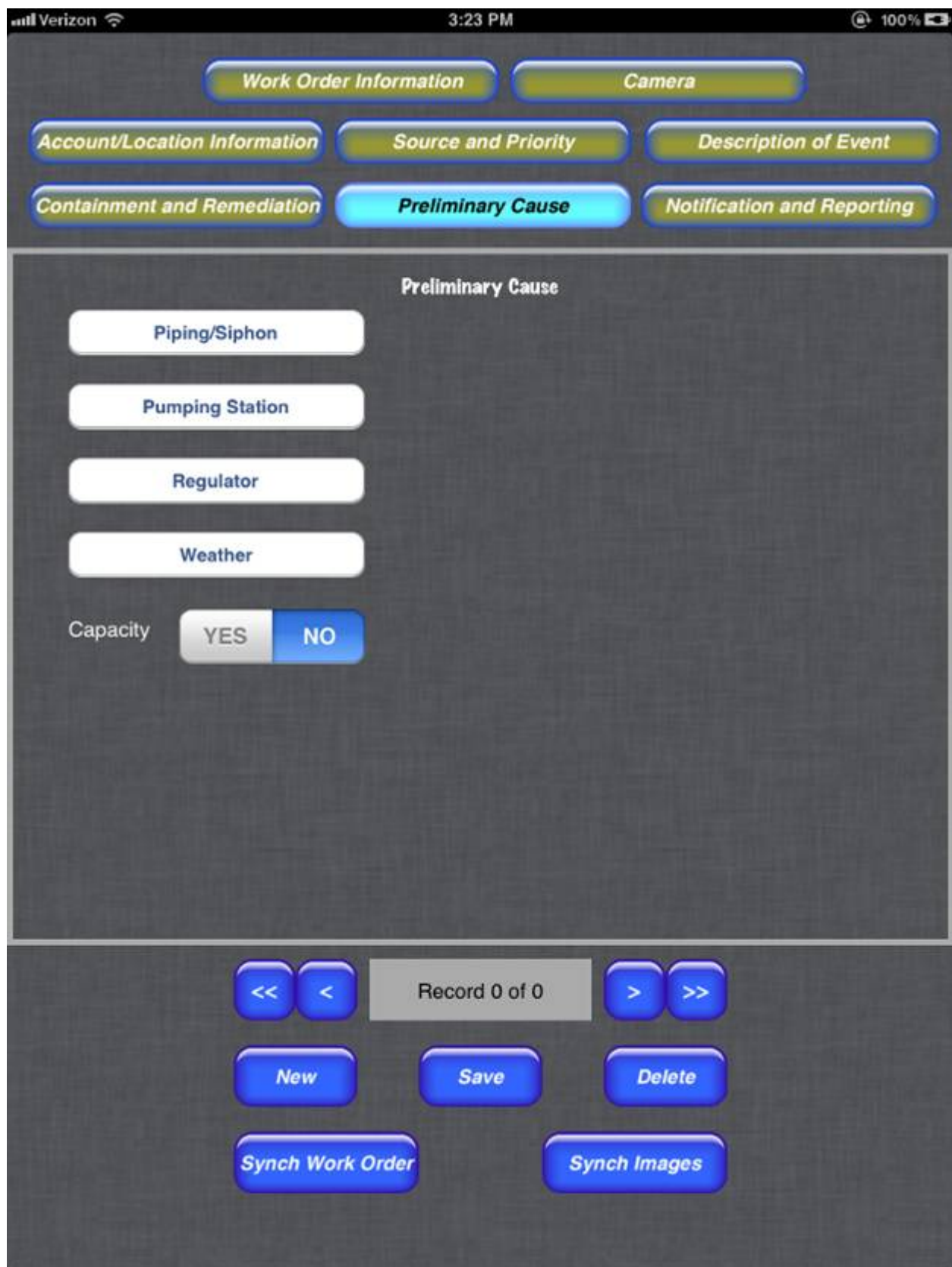
Prevent Future Overflow

<< < Record 0 of 0 > >>

New Save Delete

Synch Work Order Synch Images

Figure 11. iPad Screenshot #6: Containment and Remediation



The screenshot shows an iPad interface for a work order tracking application. At the top, the status bar displays 'Verizon', signal strength, time '3:23 PM', and battery level '100%'. Below the status bar is a menu of buttons: 'Work Order Information', 'Camera', 'Account/Location Information', 'Source and Priority', 'Description of Event', 'Containment and Remediation', 'Preliminary Cause' (highlighted in blue), and 'Notification and Reporting'. The main content area is titled 'Preliminary Cause' and contains four white buttons stacked vertically: 'Piping/Siphon', 'Pumping Station', 'Regulator', and 'Weather'. Below these is a 'Capacity' label followed by two buttons: 'YES' (highlighted in blue) and 'NO'. At the bottom of the screen is a navigation bar with several controls: left navigation buttons '<<' and '<', a central status box 'Record 0 of 0', right navigation buttons '>' and '>>', and action buttons 'New', 'Save', 'Delete', 'Synch Work Order', and 'Synch Images'.

Verizon 3:23 PM 100%

Work Order Information Camera

Account/Location Information Source and Priority Description of Event

Containment and Remediation **Preliminary Cause** Notification and Reporting

Preliminary Cause

Piping/Siphon

Pumping Station

Regulator

Weather

Capacity YES NO

<< < Record 0 of 0 > >>

New Save Delete

Synch Work Order Synch Images

Figure 12. iPad Screenshot #7: Preliminary Cause

Notification and Reporting

EPA notified	YES	NO	City of Boston Police Department notified	YES	NO
DEP notified	YES	NO	Neighboring towns notified	YES	NO
Map attached showing catch basins, surface waters and topography	YES	NO	Incident report filed	YES	NO
MA Department of Public Health notified	YES	NO	On going Investigation	YES	NO
Inspectional Services Department notified	YES	NO	Other notifications	YES	NO
MA Division of Marine Fisheries notified	YES	NO			

Navigation buttons: << < Record 0 of 0 > >> New Save Delete Synch Work Order Synch Images

Figure 13. iPad Screenshot #8: Notification and Reporting

Appendix E

Estimating SSO Rate and Volume

E.1. Overview

A variety of approaches exist for estimating the volume of a sanitary sewer overflows. This appendix documents four methods that are most often employed:

- Eyeball estimate.
- Area and depth of overflow.
- Duration and flow rate.
- Overflow volume calculation.

The person preparing the estimate should use the method most appropriate to the sewer overflow in question and use the best information available.

E.2. Method 1: Eyeball Estimate

The volume of small overflows can be estimated using an “eyeball estimate”. To use this method imagine the amount of water that would overflow from a bucket or a barrel. A bucket contains 5 gallons and a barrel contains 50 gallons. If the overflow is larger than 50 gallons, try to break the standing water into barrels and then multiply by 50 gallons. This method is useful for contained overflows up to approximately 100 gallons.

E.3. Method 2: Area and Depth of Spill

The volume of most small spills that have been contained can be estimated using this method. The shape, dimensions, and the depth of the contained wastewater are needed. The shape and dimensions are used to calculate the area of the spills and the depth is used to calculate the volume.

Area of spill (sq.ft)	=	(1)
Depth of discharge (ft)	=	(2)
Estimated volume of discharge (cu.ft)	=	(3) = (1) × (2)
Estimated volume of discharge (gallons)	=	(4) = (3) × 7.48

E.4. Method 3: Duration and Flowrate

Calculating the volume of larger spills, where it is difficult or impossible to measure the area and depth, requires a different approach. In this method, duration of the overflow and the flow rate are estimated separately and the volume calculated based on these estimates.

E.4.1. Duration Estimate

The duration is the elapsed time from the time the spill started to the time that the flow was restored.

Start Time. The start time is sometimes difficult to establish. Here are some approaches:

1. Local residents can be used to establish start time. Inquire as to their observations. Spills that occur in rights-of-way are usually observed and reported promptly. Spills that occur out of the public view can go on longer. Sometimes observations like odors or sounds (e.g., water running in a normally dry creek bed) can be used to estimate the start time.
2. Changes in flow on a downstream flowmeter can be used to establish the start time. Typically the daily flow peaks are “cut off” or flattened by the loss of flow. This can be identified by comparing hourly flow data during the spill event with flow data from prior days. This method will likely only be effective with consistent weather.
3. Conditions at the spill site change over time and can be used to establish the start time. Initially there will be limited deposits of toilet paper and other sewage solids. After a few days to a week, the sewage solids form a light-colored residue. After a few weeks to a month, the sewage solids turn dark. The quantity of toilet paper

and other materials of sewage origin increase over time. These observations can be used to estimate the start time in the absence of other information. Taking photographs to document the observations can be helpful if questions arise later in the process. This method is valid for spills that have been occurring for a long time and may be used in conjunction with either of the above methods.

4. It is important to remember that spills may not be continuous. Blockages are not usually complete (some flow continues). In this case the spill would occur during the peak flow periods (typically 10:00 to 12:00 and 13:00 to 16:00 each day). Spills that occur due to peak flows in excess of capacity will occur only during, and for a short period after, heavy rainfall.

End Time. The end time is usually much easier to establish. Field crews on-site observe the “blow down” that occurs when the blockage has been removed. The “blow down” can also be observed in downstream flow meters.

E.4.2. Flow Rate Estimate

The flow rate is the average flow that left the sewer system during the time of the spill. There are several ways to estimate the flow rate:

1. **Manhole Flow Rate Chart:** This chart, included in A.1.E.6.1, shows sewage flowing from manhole covers at a variety of flow rates. The observations of the field crew can be used to select the appropriate flow rate from the chart. If possible, photographs are useful in documenting basis for the flow rate estimate.
2. **“No Manhole Cover” Table:**
3. **Table 4 (in Appendix A.1.E.6.2)** gives calculated flow rates from manhole with cover removed, based on the maximum height of the water measured (inches) coming out of the maintenance hole above the rim.
4. **“Manhole Pick Hole” Table:** Table 5 (in Appendix A.1.E.6.3) gives calculated flow rates through manhole pick holes.
5. **Lift stations/force mains:** flow rate at the pumping station during overflow, in gallons per minute, if known.
6. **Flow meter:** Changes in flows in downstream flow meters can be used to estimate the flow rate during the spill.

Reference: The two tables, “No Manhole Cover” and “Manhole Pick Hole”, were developed by Ed Euyen, Civil Engineer, P.E. No. 33955, California, for Sacramento County Sanitation District 1. Used here with permission from Sacramento Regional County Sanitation District [Mitchell Maidrand, MSA].

E.4.3. Spill Volume Calculation

Once duration and flow rate have been estimated, the volume of the spill is the product of duration (hours or days) and the flow rate (gallons per hour or gallons per day).

Duration (minutes or days)	=	(1)
Flow Rate (gpm or gpd)	=	(2)
Estimated volume of discharge (gallons)	=	(3) = (1) × (2)

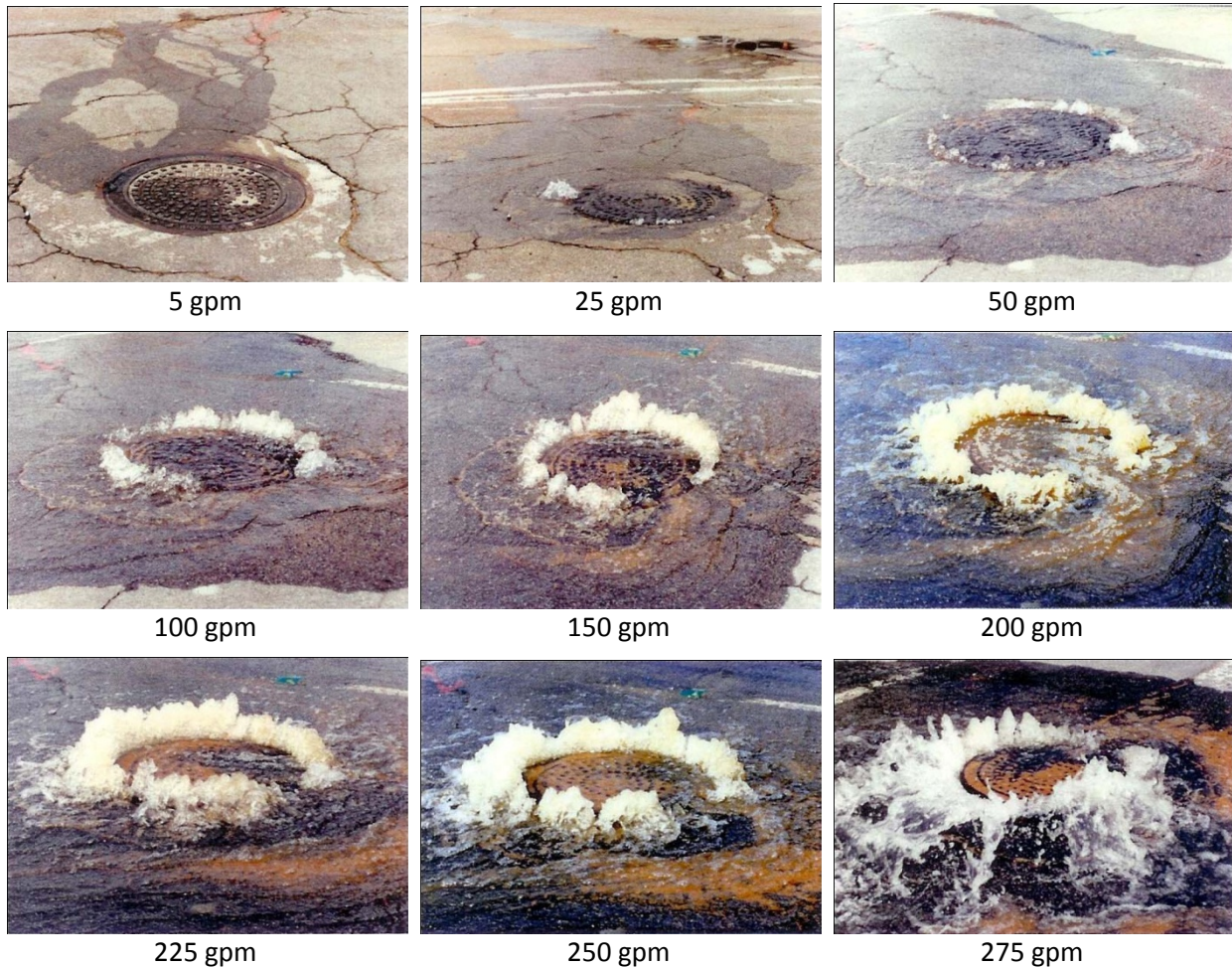
E.5. Method 4: Duration and Number of Residential Homes

Once the location of the spill is known, the number of upstream residential homes can be determined from the sewer maps. Multiply the number of homes by 200 to 250 gallons per day per home, or 8 to 10 gallons per hour per home.

Duration of spill (hrs)=	=	(1)
Duration of spill (days)=	=	(2) = (1)/24
Number of upstream residential homes=	=	(3)
Estimated volume of discharge (gallons)	=	(4) = (2) × (3) × 225

E.6. Manhole Estimating Chart and Tables

E.6.1. Manhole Flowrate Chart



E.6.2. "Manhole Cover Removed" Table

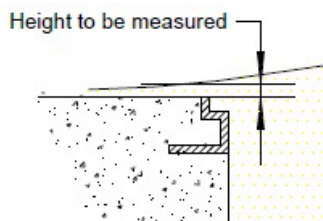


Figure 14. SSO flow out of manhole with cover moved

SSO flow rates out of manhole with cover removed can be estimated using Table 4, based on the maximum height of the water coming out of the manhole measured above the rim (Figure 14), where:

H Height of spout above manhole rim

Q SSO Flow

Dmin Min. sewer size in which these flows are possible

The formula used is based on discharge over curved weir -- bell mouth spillways for 2" to 12" diameter pipes.

Table 4: Estimated SSO Flow Rates Out of Manhole with No Manhole Cover in Place

24-in. cover				36-in. cover			
H (in.)	Q (gpm)	Q (MGD)	Dmin (in.)	H (in.)	Q (gpm)	Q (MGD)	Dmin (in.)
1/8	28	0.04		1/8	49	0.07	
1/4	62	0.09		¼	111	0.16	
3/8	111	0.16		3/8	187	0.27	6"
½	160	0.23		½	271	0.39	
5/8	215	0.31	6"	5/8	361	0.52	8"
¾	354	0.51	8"	¾	458	0.66	
7/8	569	0.82	10"	7/8	556	0.80	10"
1	799	1.15	12"	1	660	0.95	12"
1 1/8	1,035	1.49		1 1/8	1,035	1.49	
1 ¼	1,340	1.93	15"	1 ¼	1,486	2.14	15"
1 3/8	1,660	2.39		1 3/8	1,951	2.81	
1 ½	1,986	2.86		1 ½	2,424	3.49	18"
1 5/8	2,396	3.45	18"	1 5/8	2,903	4.18	
1 ¾	2,799	4.03		1 ¾	3,382	4.87	
1 7/8	3,132	4.51		1 7/8	3,917	5.64	21"
2	3,444	4.96	21"	2	4,458	6.42	
2 1/8	3,750	5.40		2 1/8	5,000	7.20	24"
2 ¼	3,986	5.74		2 ¼	5,556	8.00	
2 3/8	4,215	6.07		2 3/8	6,118	8.81	
2 ½	4,437	6.39		2 ½	6,764	9.74	
2 5/8	4,569	6.58	24"	2 5/8	7,403	10.66	
2 ¾	4,687	6.75		2 ¾	7,972	11.48	30"
2 7/8	4,799	6.91		2 7/8	8,521	12.27	
3	4,910	7.07		3	9,062	13.05	
				3 1/8	9,604	13.83	
				3 ¼	10,139	14.60	
				3 3/8	10,625	15.30	36"
				3 ½	11,097	15.98	
				3 5/8	11,569	16.66	
				3 ¾	12,035	17.33	
				3 7/8	12,486	17.98	
				4	12,861	8.52	

24-in. cover				36-in. cover			
H (in.)	Q (gpm)	Q (MGD)	Dmin (in.)	H (in.)	Q (gpm)	Q (MGD)	Dmin (in.)
				4 1/8	13,076	18.83	
				4 ¼	13,285	19.13	
				4 3/8	13,486	19.42	

E.6.3. "Manhole Pick Hole" Table

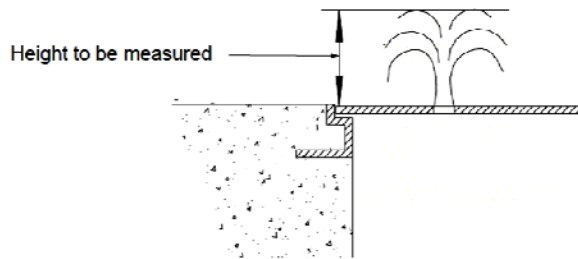


Figure 15. SSO flow out of manhole pick hole

Where:

H..... Height of spout above manhole cover

Q SSO Flow

The formula used for calculating is $Q = C_c \times V \times A$, where Q is equal to the quantity of the flow in gallons per minute, C_c is equal to the coefficient of contraction (.63), V is equal to the velocity of the overflow, and A is equal to the area of the pick hole. If all units are in feet, the quantity will be calculated in cubic feet per second, which when multiplied by 448.8 will give the answer in gallons per minute. (One cubic foot per second is equal to 448.8 gallons per minute, hence this conversion method).

Table 5: Estimated SSO Flowrates Out of Manhole Pick Holes

H (in.)	Q (gpm)	H (in.)	Q (gpm)	H (in.)	Q (gpm)	H (in.)	Q (gpm)
1/8	1.0	2 5/8	4.4	5 1/8	6.2	7 5/8	7.6
¼	1.4	2 ¾	4.5	5 ¼	6.3	7 ¾	7.6
3/8	1.7	2 7/8	4.6	5 3/8	6.3	7 7/8	7.7
½	1.9	3	4.7	5 ½	6.4	8	7.7
5/8	2.2	3 1/8	4.8	5 5/8	6.5	8 1/8	7.8
¾	2.4	3 ¼	4.9	5 ¾	6.6	8 ¼	7.9
7/8	2.6	3 3/8	5.0	5 7/8	6.6	8 3/8	7.9
1	2.7	3 ½	5.1	6	6.7	8 ½	8.0
1 1/8	2.9	3 5/8	5.2	6 1/8	6.8	8 5/8	8.0
1 ¼	3.1	3 ¾	5.3	6 ¼	6.8	8 ¾	8.1
1 3/8	3.2	3 7/8	5.4	6 3/8	6.9	8 7/8	8.1
1 ½	3.4	4	5.5	6 ½	7.0	9	8.2
1 5/8	3.5	4 1/8	5.6	6 5/8	7.0	9 1/8	8.3
1 ¾	3.6	4 ¼	5.6	6 ¾	7.1	9 ¾	8.3
1 7/8	3.7	4 3/8	5.7	6 7/8	7.2	9 3/8	8.4
2	3.9	4 ½	5.8	7	7.2	9 ½	8.4

H (in.)	Q (gpm)	H (in.)	Q (gpm)	H (in.)	Q (gpm)	H (in.)	Q (gpm)
2 1/8	4.0	4 5/8	5.9	7 1/8	7.3	9 5/8	8.5
2 ¼	4.1	4 ¾	6.0	7 ¼	7.4	9 ¾	8.5
2 3/8	4.2	4 7/8	6.0	7 3/8	7.4	9 7/8	8.6
2 ½	4.3	5	6.1	7 ½	7.5	10	8.7

Note: At height of spout 6 ½ in. unrestrained cover will start to lift.

Appendix F

Public Notifications

Sanitary Sewer Overflow News Release (Example)

Boston Water and Sewer Commission

980 Harrison Avenue

Boston, MA 02119

617-989-7000

Fax: 617-989-7736



NEWS RELEASE

DATE XXXXXXXXX

For Immediate Release

For More Information

Contact:

Thomas Bagley

Deputy Director of
Communications

bagleytr@bwsc.org

(617) 989-7361

BWSC Alerts Customers to Sanitary Sewer Overflow (SSO)

BWSC issues an important notice to our customers and City of Boston residents near the location of [insert area(s)] concerning a sanitary sewer overflow.

“A sanitary sewer overflow or SSO occurred as a result of [heavy rain/ a blockage/ or other cause] at {insert area(s)},” said Thomas Bagley, Deputy Director of Communications. “The Commission responds to all SSOs in a manner consistent with state and federal laws and we want to make sure our customers, City of Boston residents and anyone in the area of {insert location} avoid contact with any SSO flows. The Commission will post applicable signs and barricades, and will disinfect the area as needed once the SSO is remedied.”

Overflows can pose hazards similar to backups from facilities in public restrooms or your own home, so please make sure that you, your family, and your pets avoid contact with the overflow. If you, your family or pets come in contact with an SSO flow, please wash your hands or affected areas thoroughly with soap and water.

The Commission tracks and reports recent SSOs and provides tips on cleanup efforts and other wastewater information at <http://www.bwsc.org>. If you have questions or need to report an overflow, please call BWSC at (617) 989-7000.

Sanitary Sewer Overflow (SSO) Notice

On (date)

at _____ we responded to a reported blockage of the sanitary sewer service to your property.

We discovered a blockage in:

- ☐ The sanitary sewer main and cleared the line.
- ☐ The sanitary sewer lateral, which is your responsibility to maintain.

If you require assistance to clear the lateral, you can look in the Yellow Pages of your telephone book under “Sewer Contractors” or “Plumbing Drains & Sewer Cleaning”. A list of bonded contractors can also be found at the Commission’s website at www.bwsc.org. If you plan to hire a contractor to fix the problem, the Commission recommends getting estimates from more than one company.

If you, your family or pets come in contact with an SSO flow, please wash your hands or affected areas thoroughly with soap and water.

BWSC representative notes:

BWSC Representative:

For questions or comments or to report a Sewer Emergency, please call BWSC (617) 989-7000.

Boston Water and Sewer Commission

980 Harrison Avenue
Boston, MA 02119
617-989-7000
Fax: 617-989-7750



GENERAL PRECAUTIONS FOR SEWAGE CONTAMINATION ON RESIDENTIAL PROPERTY

If a sewer backup causes flooding in your home:

- Keep people and pets away from the affected areas.
- Do not attempt to clean it yourself.
- Turn off central heat and air-conditioning systems.
- Prevent flow from reaching floor vents by using towels or blankets as a berm. You can also remove the vent cover and stuff a towel in the opening to help prevent the flow from entering the vent.
- Leave items in the affected area for the experts to handle.

Homeowner Responsibilities

The homeowner is responsible for clearing any blockage in the home's plumbing system or private lateral and for any resulting flood damage to the structure. The homeowner is also responsible for damage that happens because a lateral was not properly installed.

If the sewage flooding was caused by blockage in your private lateral:

- Contact your plumber, especially if you had recent plumbing work, or chose someone from the list of recommended plumbers below.
- Call an experienced restoration company for cleanup and removal of affected surfaces. See the list of recommended cleaning contractors below.
- Report a claim to your homeowner's insurance carrier.

The Commission also has a Building Sewer Lateral Program that may provide some assistance, more information at www.bwsc.org.

Claims

If you believe you have a claim for damages from a sewage backup, you may file a claim with the Commission. The Commission also recommends that you contact your insurance carrier.

Plumbers& Cleaning Contractors

Contact information for bonded sewer and drain licensed contractors can be found at www.bwsc.org or you may contact a local plumber or cleaning company in the Yellow Pages.

Note: This information is provided to assist residents who experience an overflow of sewage on their property. It is not inclusive of events involving severe flooding, which can cause additional structural damage.

Public Notification Newspaper Contacts:

INDEPENDENT NEWSPAPER GROUP <ul style="list-style-type: none"> Back Bay Sun Beacon Hill Times Charlestown Patriot-Bridge East Boston Times Regional Review North End Debbie DiGregorio Ads.journal@verizon.net	BANNER PUBLICATIONS INC. <ul style="list-style-type: none"> Hyde Park Jamaica Plain Mattapan Dorchester Sandra L. Casagrand Sandra@bannerpub.com
EL PLANETA <ul style="list-style-type: none"> Dorchester East Boston Allston/Brighton John Miro, Senior Account Manager johnm@elplaneta.com	SAMPAN <ul style="list-style-type: none"> Chinatown Yu Ting Liu, Advertising Manager sampanads@aaca-boston.org
ELMUNDO NEWS <ul style="list-style-type: none"> Brighton/Fields Corner Cecilia Vidalas Cecilia@elmundoboston.com	GAZETTE PUBLICATIONS INC. <ul style="list-style-type: none"> Jamaica Plain Gazette Debbie DiGregorio ads@jamaicaplaingazette.com
COMMUNITY NEWS <ul style="list-style-type: none"> Allston-Brighton Tab Roslindale / West Roxbury Transcripts Carol Paris cparis@cnc.com cberg@cnc.com	SOUTH BOSTON ONLINE Cathie Noonan <ul style="list-style-type: none"> South Boston mail@southbostononline.com
REPORTER <ul style="list-style-type: none"> Dorchester Reporter Mattapan Reporter Haitian Reporter Jack Conboy jconboy@dotnews.com	POST GAZETTE <ul style="list-style-type: none"> North End Pamela Donnaruma postgazette@aol.com
BULLETIN PUBLICATIONS <ul style="list-style-type: none"> The Bulletin (Hyde Park & West Roxbury) Allston/Brighton Susan Yandell syandell@bulletinnewspapers.com	WORLD JOURNAL <ul style="list-style-type: none"> Chinatown Thomas Chang Thomas@wjboston.com ads@wjboston.com

Public Notification TV Stations:

NAME	ADDRESS	CITY/ST/ZIP	TELEPHONE	NEWS CONTACT	WEBSITE
BNN Live (Public Access)	3025 Washington Street	Boston, MA 02119	617-708-3200	Nancy Grace	https://www.bnnntv.org/
Neighborhood Network News (NNN)	640 Commonwealth Ave.	Boston, MA 02215	617-353-9700	Chris Lovett	http://www.nnnonline.org/
New England Cable News (NECN)	160 Wells Ave.	Newton, MA 02459	617-630-5000	News Desk	http://www.wuniv.com/
WBZ-TV Channel 4	1170 Soldiers Field Rd.	Boston, MA 02134	617-787-7000	News Desk	http://boston.cbslocal.com/
WCVB Channel 5	5 TV Place	Needham, MA 02494	781-449-0400	Colleen Marien	http://www.wcvb.com/
WFX-FOX 25	25 Fox Drive	Dedham, MA 02126	781-467-1300	Lisa Hall	http://www.myfoxboston.com/
WHDH-Channel 7	7 Bulfinch Place	Boston, MA 02114	617-725-0777	Ed Kosowski	http://www1.whdh.com/
WLVI Channel 56	75 Morrissey Blvd.	Boston, MA 02107	617-282-0938	Shawn Martin	http://www.cw56.com/
WUNI Channel 27 Univision (Spanish)	33 Fourth Avenue	Needham, MA 02494	781-433-2727	Sara Suarez	http://www.wuniv.com/

Public Notification Radio Stations:

NAME	ADDRESS	CITY/ST/ZIP	TELEPHONE	NEWS CONTACT	WEBSITE
WMJX 106.7 / WBOS 92.9 FM	55 Morrissey Blvd.	Boston, MA 02125	617-822-9600	Tina Gao	www.greatermediaboston.com
WROR-105.7 / WTKK 96.9 FM	55 Morrissey Blvd.	Boston, MA 02125	617-822-9600	Tina Gao	www.greatermediaboston.com
WRKO 680 AM (Talk)	20 Guest St.	Brighton, MA 02135	617-779-3500	Patrick Heenehan	www.wrko.com
WEEI 850 AM (Sports)	20 Guest St.	Brighton, MA 02135	617-779-3500	Patrick Heenehan	www.weei.com
WBZ 1030 AM	1170 Soldiers Field Rd.	Boston, MA 02134	617-787-7000	Ro Dooley-Webster	http://boston.cbslocal.com/station/wbz-news-radio/
WBZ 98.5 FM/ WODS 103.3 FM	83 Leo Birmingham Pkwy	Brighton, MA 02135	617-787-5000	Lee Dickerman	http://tunein.com/radio/985-The-Sports-Hub-s27533/
WEZE 590 AM / WROL 950 AM	500 Victory Road	Quincy, MA 02171	617-328-0880	Tim Szymanski	www.wezeradio.com
WTTT 150 AM (Spanish)	500 Victory Road	Quincy, MA 02171	617-328-0880	Tim Szymanski	
WKLB FM 102.5 FM	55 Morrissey Blvd.	Dorchester, MA	617-822-9600	George Knight	
WJMN 94.5 FM	10 Cabot Road, Suite 302	Medford, MA	781-663-2500	Joe Massei	
WBUR 90.0 FM	890 Commonwealth Ave	Boston, MA 02215	617-335-0900		www.wbur.org
WBMX 98.5 FM	83 Leo Birmingham Pkwy	Brighton, MA 02135	617-746-1300	Mike Mullaney	
WERS 88.9 FM	120 Boylston St.	Boston, MA 02116	617-824-8890	Peter Kirchoff	www.wers.org