

**City of Baltimore
Department of Public
Works**

Modified Consent Decree (MCD)
Revised Emergency Response Plan (ERP) for Sanitary Sewer
Overflows (SSOs)

Sanitary Sewer Overflow Consent
Decree Civil Action No. JFM-02-1524

November 16, 2024



Contents

1. Introduction and Overview	4
1.1. Purpose	4
1.1.1. ERP Goals	4
2. Building Backups	6
2.1. Introduction	6
2.2. Procedures for Addressing Mainline Blockages	7
2.3. Procedures for Addressing Collection System Lateral Blockages	8
2.4. Public Education on Building Backups	9
2.5. SOS Cleanup Program	9
3. Sanitary Discharge of Unknown Origin (SDUO) Notification	13
4. Collection System SSOs	14
4.1. Public Notification	14
4.2. List of Overflow Locations	14
4.3. Available Resources and Preparedness Training	15
4.4. Minimizing SSO Volume, Implementing Institutional Controls, and Notifying EPA, MDE, and BCHD	15
5. Pumping Station Overflows	16
5.1. Public Notification	16
5.2. Station-Specific Emergency Response Procedures	18
5.2.1. Eastern Avenue Pumping Station	18
5.2.2. Brooklyn Pumping Station	21
5.2.3. Dundalk Pumping Station	23
5.2.4. Jones Falls Pumping Station	26
5.2.5. Locust Point Pumping Station	29
5.2.6. Quad Avenue Pumping Station	31
5.2.7. McComas Street Pumping Station	33
5.2.8. Westport Pumping Station	36
5.2.9. Stony Run Pumping Station	39
5.3. Response Guide for Force Main Emergencies	42
6. Water Quality Sampling and Monitoring	43
6.1. Response Guide for Force Main Emergencies	43
6.2. Water Quality Monitoring	43
6.3. Sampling Protocol	44
6.3.1. Sample Parameters	44
6.3.2. Location and Schedule of Sampling	44
6.3.3. Quality Assurance/Quality Control	45
6.4. Reporting	45
7. ERP Training	47
7.1. Table O: Preparedness Training – ERP	48
7.2. Table P: Preparedness Training – SSOs	49
7.3. Table Q: Preparedness Training – Building Backups	50
8. Document Control	51

8.1. ERP Locations..... 51
 8.1.1. Working Copies 51
 8.1.2. Executive and Managers Copies..... 51
8.2. Document Control..... 51
8.3. ERP Review and Revisions..... 52
ATTACHMENT A..... 53
ATTACHMENT B 56
ATTACHMENT C 65
ATTACHMENT D..... 67
ATTACHMENT E 69

1. Introduction and Overview

1.1 Introduction

1.1. Purpose

The City of Baltimore (“the City” or “Baltimore City”) is operating its Wastewater Collection System under the terms of an MCD with the U.S. Environmental Protection Agency (EPA) and the Maryland Department of the Environment (MDE). Paragraph 16 of the MCD requires the City to submit a revised ERP to respond to an unpermitted release, spill, or discharge from the Collection System or in the event of a reported Building Backup.

1.1.1. ERP Goals

The ERP is intended to provide clear guidance for:

- Locating and eliminating the source of the overflow
- Notifying affected City agencies and departments, the general public, media outlets, and regulatory agencies

The table below provides a checklist of the MCD requirements and associated sections of the ERP.

MCD Ref.	MCD Requirement	ERP Plan Discussion Location
16.a.(i)	A detailed description of the actions the City will undertake to immediately provide notice to the public (through the local news media, online, and/or through other means) of the unpermitted discharge of pollutants from the wastewater treatment and Collection System	Section 4.0, Collection System SSOs
16.a.(ii)	A detailed description of the actions Baltimore will undertake to provide notice to the public of Sanitary Discharges of Unknown Origin (SDUOs), including information on location, volumes, affected water bodies, and the impact on water quality.	Section 3.0, SDUO Notification
16.a.(iii)	A detailed description of the actions the City will undertake to provide notice to EPA, MDE, state and local public health services, and other appropriate federal, state, and local agencies	Section 4.0, Collection System SSOs
16.a.(iv)	A detailed plan (including the development of response standard operating procedures) to minimize the volume of untreated wastewater discharged to surface waters and to minimize overflow volumes	Section 4.0, Collection System SSOs

MCD Ref.	MCD Requirement	ERP Plan Discussion Location
16.a.(v)	Identification of the personnel and resources that will be made available by the City to correct or repair the condition causing or contributing to the unpermitted release, spill, or discharge	Section 4.0, Collection System SSOs
16.a.(vi)	A plan to ensure the preparedness, including responsiveness training of City employees, contractors, and personnel of other affected City agencies necessary for the effective implementation of the ERP	Section 7.0, Preparedness Training
16.a.(vii)	A detailed monitoring, sampling, analysis, and reporting plan to determine if receiving water bodies have been adversely impacted by the discharge of wastewater associated with an overflow event	Section 6.0, Water Quality Sampling and Monitoring
16.a.(viii)	A plan for the implementation of institutional controls and actions to advise the public of, and limit access to and contact with, waterways, ground surfaces and resources affected by overflows from the City's Collection System	Section 4.0, Collection System SSOs

2. Building Backups

A Building Backup is defined as a sewage backup that is caused by blockages, flow conditions, or other malfunctions in the Collection System. The City investigates all reported Building Backups as summarized below.

2.1. Introduction

The Bureau of Water and Wastewater's (BWW) Utility Maintenance Division (UMD) investigates reported Building Backups. Building Backups are reported to the City through the 311 non-emergency system. The 311 System is a central call network that is available via telephone (311) and online 24 hours a day, seven days a week, for customers to initiate sewer-related Service Requests (SRs). Each complaint in the 311 system is assigned an SR number to track the complaint status.

Building Backup SRs are automatically forwarded from the 311 System to the Computerized Maintenance Management System (CMMS). Upon receipt of the CMMS SR, the Department of Public Works' (DPW) Control One Office reviews the SR and contacts a UMD supervisor, who assigns a UMD Investigator to investigate the SR. Once assigned, the SR is investigated no later than 48 hours after receipt of the SR.

The Investigator will also verify if the sewage backup is a Building Backup, as defined in Attachment D. If the investigation determines that the sanitary sewer system serving the affected premises is owned by a third party, the customer will be notified, and the SR will be referred to the appropriate entity.

The Investigator will examine the Collection System mainline by checking the first upstream and downstream manholes that are closest to the affected property. If these manholes are inaccessible or the flow is obstructed based on visual inspection, the Investigator will inspect the next downstream manhole and observe the flow. If the downstream Collection System manhole is holding water, the Investigator will check each subsequent, downstream manhole until a manhole is located where the mainline is flowing freely. Once the location of the suspected mainline issue is verified, the Investigator will contact Control One to create a Work Order (WO) and notify a UMD supervisor. The WO will be assigned to the appropriate crew by the UMD supervisor.

If it is determined that there is no mainline blockage, the lateral serving the property identified in the SR will be inspected through the external cleanout¹. If the cleanout is holding water, the Investigator will contact Control One to create a WO and notify a UMD supervisor, who will assign the WO to the appropriate UMD crew. If the property does not have an external cleanout, the external cleanout is not accessible, or the external cleanout is not holding

¹ The external cleanout is a private fixture regulated by the Building, Fire, and Related Codes of Baltimore City (Building Code). Pursuant to Section 6-101 of the Building Code, the City has adopted the International Plumbing Code (2015 edition), including, but not limited to, Section 708, et seq.

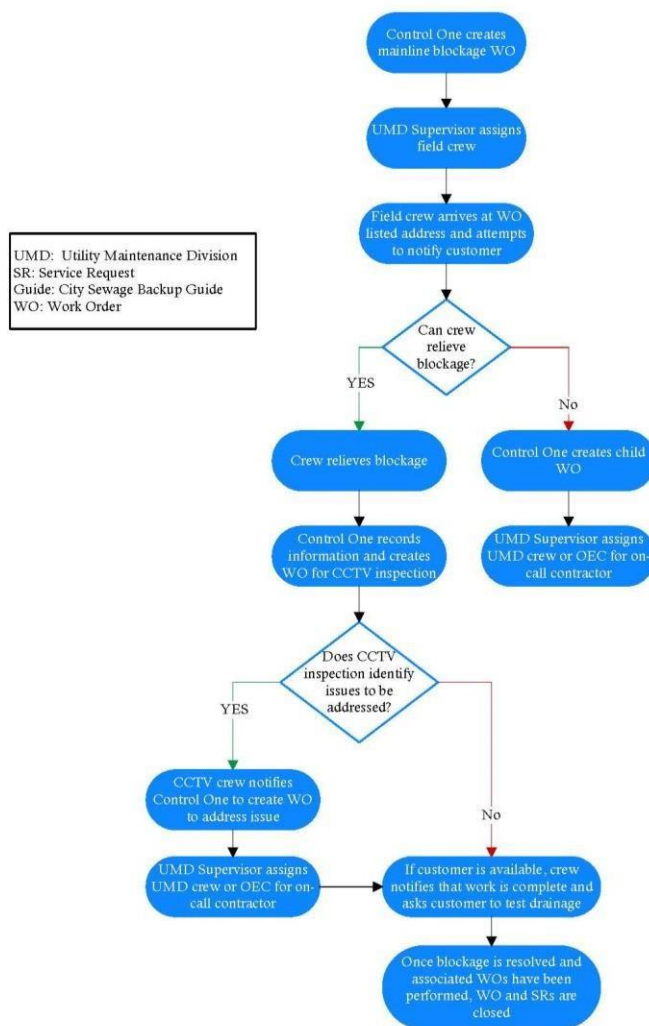
water, the Investigator will advise the customer to contact a licensed plumber to locate or install an external cleanout and clean the lateral from the building to the mainline. Once the customer has been notified, the SR will be closed.

At the conclusion of the investigation, the Investigator will provide the City’s Sewage Backup Guide (“the Guide”) to the affected premises identified in the SR, or if the resident prefers, provide information on how to access the Guide on the DPW website.

A single mainline blockage may result in multiple complaints in the 311 System, but only one WO will be generated to address the blockage. If an investigation determines that multiple SRs arise from the same issue(s), the SRs will be linked with the corresponding WO. An SR is resolved when the problem has been corrected and all related WOs have been updated and closed.

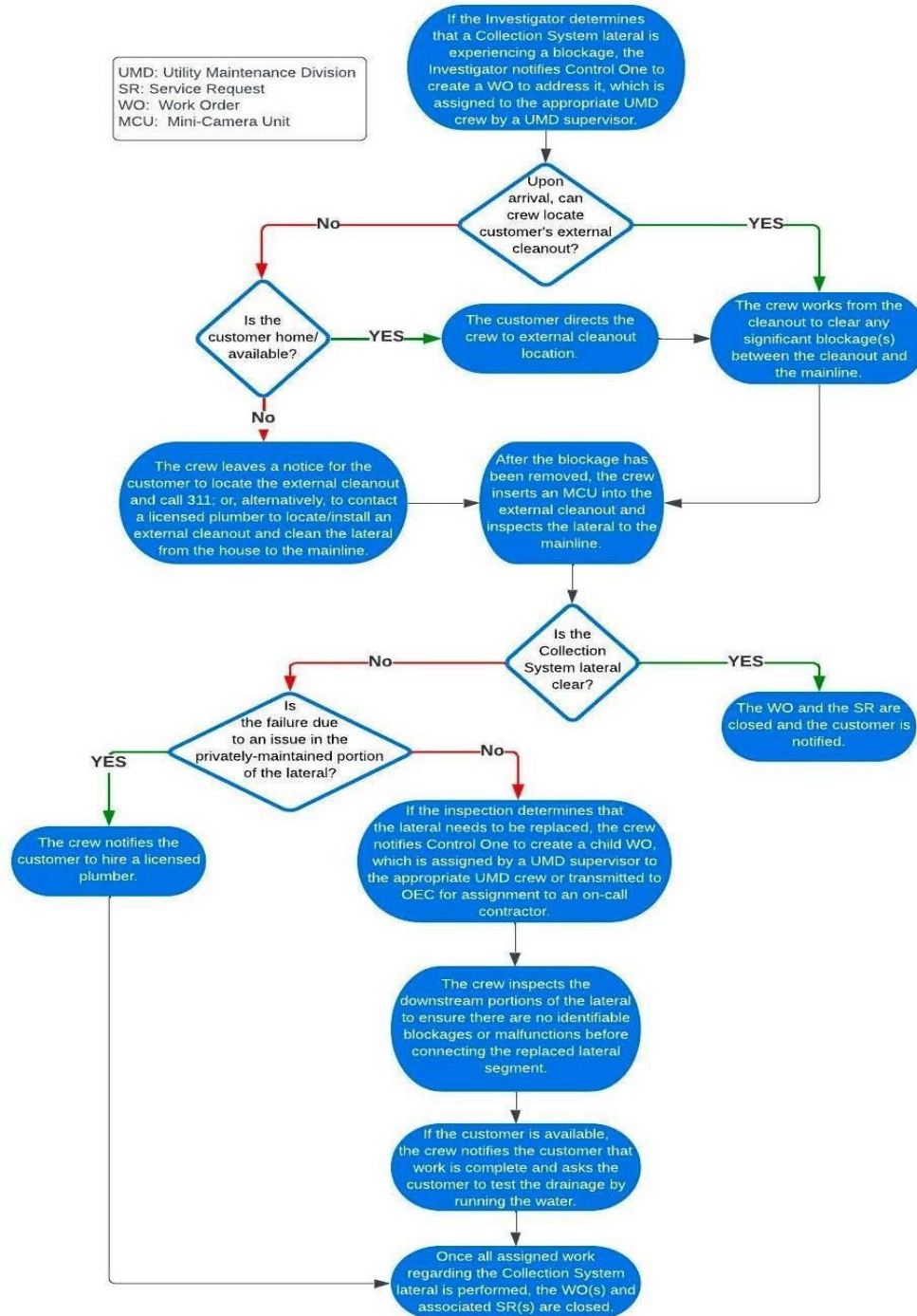
2.2. Procedures for Addressing Mainline Blockages

The City implements the following procedures shown in the below figure to address Building Backups arising from mainline blockages in the Collection System.



2.3. Procedures for Addressing Collection System Lateral Blockages

The City implements the following procedures in the below figure to address Collection System lateral blockages.



2.4. Public Education on Building Backups

DPW's Community Liaisons (of the Office of Strategic Alliances [OSA]) disseminate information regarding Building Backups through the DPW website, brochures, and similar methods, including the following:

- News releases
- Press conferences
- Public events
- Flyers, presentations, and related promotional materials distributed at meetings and events
- DPW website and social media accounts (e.g., Facebook, Instagram, Twitter, Nextdoor, YouTube)
- Media interviews and appearances
- Water bill inserts and messages

DPW's Office of Communications (OoC) developed Sewage Backup Guide brochures to detail three distinct sewage backup topics:

1. Understanding and Preventing Sewage Backups
2. Handling Sewage Backups
3. The Sewage Onsite Support (SOS) Cleanup Program

These brochures educate the public about sewage backups and the steps that individuals can take to report, clean up, document, and protect themselves, as well as potential health and safety issues related to contact with sewage. The brochures also cover the General Liability Claims Process administered by the Baltimore City Law Department. DPW has initiated a branded information campaign called "Clear the FOG," which is designed to dispel myths around disposal of Fats, Oils, and Grease (FOG) and encourage the proper disposal of FOG.

2.5. SOS Cleanup Program²

DPW established a Pilot Building Backup Expedited Reimbursement Program ("The Pilot Program") pursuant to Appendix E of the MCD. The Pilot Program reimburses City homeowners, renters, and other non-commercial occupants (homeowners) up to \$5,000.00 per dwelling unit, per qualifying event for reasonable, documented expenses arising from Building Backups, if a backup is the result of surcharging in the Collection System caused by capacity related wet-weather events (Capacity-Related Building

² The SOS/Basement Backup Program is currently the subject of ongoing negotiations between the City and EPA/MDE. If the negotiations result in substantive changes to the SOS/Basement Backup Program, the ERP will be reposted for additional public comment.

Backups [CRBB]). “Dwelling unit” is defined as provided in Section 1-137 of the Zoning Code of Baltimore County.

The Pilot Program began on April 6, 2018, and ran until April 6, 2021. A Long-Term Sewage Onsite Support (SOS) Cleanup Program was transmitted to EPA and MDE for consideration and received partial approval with further communications required for full approval. The Long-Term plan proposes to supersede the expedited reimbursement program with the SOS program, a direct response service that provides proactive cleaning and sanitizing services for a sewer building backup event at no cost to residential customers. The SOS Program provides cleaning, disinfection, and disposal services in the aftermath of a sewage backup to remove the health risk from the affected property. The SOS Program services are only available to clean and disinfect property damage caused by a capacity-related wet weather event. During the transition, both the pilot program and the new SOS program are active with descriptions for both provided below.

Pilot Building Backup Expedited Reimbursement Program

Historical events that occurred prior to April 6, 2018, are ineligible for reimbursement. The Pilot Program’s annual funding for reimbursement of costs was \$2,000,000.00. The DPW BWW administers the Pilot Program on the City’s behalf and makes all written determinations within 60 days of receiving all required information and documentation in support of an application for reimbursement under the Pilot Program. Reimbursements are limited to documented, reasonable expenses for cleanup, and disinfection of interior spaces that result from a verified CRBB. Applications are available online at the DPW website, in the DPW Customer Support and Services Division Walk-In Center in the lobby of the Abel Wolman Municipal Building, and upon request. Applications must be sent to BWW at the following address:

Baltimore City Department of Public Works
Office of Legal and Regulatory Affairs
Abel Wolman Municipal Building 200 Holliday
Street
Baltimore, MD 21202

Applications are accepted by email (reimbursement@baltimorecity.gov), U.S. mail, or an equivalent method of commercial delivery. Applications will be processed in the order they are received, and all applications will be finalized for acceptance or denial, provided that all supporting documentation and information is received from the applicant. If multiple applications are received for the same dwelling unit for expenses arising from the same event, the initial reimbursement (if any) will be subtracted from the aggregate \$5,000.00 limit for all subsequent applications pertaining to the same event for the same dwelling unit. If an application is missing necessary information, BWW will notify the applicant in writing if contact information is available. The application may be denied if the applicant fails to provide the necessary information within 365 days after notice from BWW. Homeowners with insurance determinations pending may supplement their application as provided below.

The Pilot Program was advertised through various media, including the DPW website, community outreach events, and billing inserts. Sewage backup informational brochures are distributed to

customers when the City responds to sewage backups as described in Section 2.1. In addition to the requirements stated above and provided in Appendix E of the MCD, the homeowner must file an application with BWW, at the address provided above, within 90 days of discovering the CRBB. The City recommends that homeowners promptly notify the City through the 311 System as soon as possible following discovery of the backup.

If a homeowner has an insurance policy that covers Building Backups, the insurance coverage must be used to its limit before the incident may be eligible for reimbursement through the pilot program. Cleanup and disinfection expenses covered by insurance are not eligible for reimbursement. Insurance deductibles may be eligible for reimbursement, provided that BWW receives documentation to demonstrate that the costs incurred were reasonable and related to disinfection and cleanup arising from a CRBB. Although applications must be received by BWW within 90 days after the incident, the homeowner may supplement the application with insurance-related documentation once a final determination is received from the insurance company. Applications with an insurance claim pending will be held in abeyance until the homeowner's insurance company issues a final determination, provided that the insurance documentation is received by BWW within 30 days after the homeowner receives the final determination from the insurance company³.

If BWW determines that an application is eligible for reimbursement, BWW will provide the homeowner with a final, written determination and include a release for signature and notarization. The release will be for the costs of cleanup and disinfection arising from the CRBB. BWW will not authorize reimbursement for any application until a signed release is received. Upon receipt of a signed release with the appropriate notarization, BWW will initiate the payment process. All payments will be issued by the Baltimore City Department of Finance in accordance with the City's established procedures. BWW will track applications received under the Pilot Program, including:

1. The date of the incident
2. The amount requested
3. The determination and associated rationale
4. The date of each determination

This data is reported on in the DPW Quarterly Reports (QRs). BWW will collaborate with the DPW Office of Fiscal Management and the Baltimore City Department of Finance to maintain proper accounting and documentation regarding funds disbursed under the Pilot Program.

Sewage Onsite Support (SOS) Cleanup Program

The SOS Cleanup Program services are only available to clean and disinfect property damage caused by a capacity-related wet weather event. A wet weather event occurs when at least ¼ inch of precipitation is recorded within a 24-hour period that causes the sewer lines to surcharge or overflow. If there is a light

³ Failure to provide any documentation in a timely manner may not extend any applicable notification required by law or any applicable statute of limitations.

rain for two to three hours, moderate rain for 30-60 minutes or heavy rain for 15 minutes, there was likely a wet weather event.

The SOS Cleanup Program does not provide services for damages caused by sewer basement backups that are not caused by capacity-related wet weather events. Non-wet weather backups include clogs caused by wet wipes, roots, fats, oil, and grease (FOG) or maintenance-related issues.

To qualify for DPW's SOS Cleanup Program; the cleanup request must be for damage caused by a backup that occurred during a capacity-related wet weather event, the customer must be a Baltimore City residential customer (e.g., a homeowner or tenant), the residential property owner, tenant or property manager must call 311 or visit the 311-services page to report the damage to DPW (the report to 311 must be made as soon as it is discovered), and the City must determine that the damage is caused by a capacity-related wet weather event.

Once the cause of the backup is confirmed to be a capacity-related wet weather event, DPW will deploy a team of professional cleaning contractors to:

- **Disinfect and Clean:** Eliminate dangerous viruses, bacteria, and other microorganisms from affected areas and remove all affected property.
- **Dispose and Remove:** Remove soiled carpet, flooring, furniture, and other affected property.
- **Deodorize:** Use professional-grade odor removal equipment, technologies, and processes to tackle unpleasant aromas.
- **Dehumidify and Dry:** Once hazardous materials and excess water has been removed and safely disposed of, completely dry and dehumidify affected areas.

DPW contracts with cleaning professionals to provide services under the SOS Program. Having professionals thoroughly clean the customer's home protects them from worrisome health risks associated with contacting raw sewage and can help the customer get their life back to normal as soon as possible.

3. Sanitary Discharge of Unknown Origin (SDUO) Notification

The DPW Office of Research and Environmental Protection (OREP) is responsible for investigating and tracking the elimination of illicit discharges to the storm sewer system. If an illicit discharge appears to be related to sewage but the source(s) cannot be identified, then the discharge is designated as an SDUO for further investigation. The City's investigation and tracking procedures are included in the SDUO Plan, which was updated and submitted to EPA and MDE on March 20, 2023. Within 24 hours of designation of an SDUO, the OREP field personnel shall notify the OoC Chief.

The notification shall provide the location of the discharge (outfall location), estimated discharge rate, stream name, and eight-digit watershed. Upon receipt, the DPW OoC Chief (or designee) will post a notice containing this information on the DPW website. The posted notice will also remind the public of the impact on water quality.

Within 48 hours of the SDUO designation, OREP field staff shall post temporary SSO notification signs at the outfall location until the SDUO is abated. OREP will post new temporary signage within a reasonable time after discovery if the signs are damaged or removed by a third party. For outfalls with chronic SDUOs, OREP field staff shall post permanent signage at the outfall until the SDUO is abated. Signs will be placed to maximize public outreach. DPW will notify the Baltimore City Health Department (BCHD) of sign placement. An outfall may be considered as having chronic SDUOs if the following conditions are encountered:

- SDUO lasts more than 90 days, or;
- Multiple SDUOs have been found in the outfall's drainage areas for the last two years.

A list of outfalls with chronic SDUOs shall be maintained and updated in the MCD QRs.

4. Collection System SSOs

4.1. Public Notification

Internal notification protocols are provided in Attachment B. As provided in Section 4.1 of Attachment B, the City will provide public notice of all confirmed SSOs that reached or are likely to reach surface waters or storm drains. Once an SSO is confirmed, the City will issue a public notice on the DPW website. DPW will also notify BCHD so that they may provide notice of confirmed SSOs. Public notices will provide pertinent information regarding each SSO when it becomes available, including the date and time at which the SSO began, the estimated volume of the discharge, and the name of the receiving water(s), if applicable. Notices will include an advisory regarding the adverse impact on water quality. The City’s procedures for notifying EPA, MDE, BCHD, and others are detailed in Sections 4.1 and 4.2.

4.2. List of Overflow Locations

The City has identified seven locations where SSOs are likely to occur during wet-weather events (Table B-1) and has designated these Emergency Notification System (ENS) sites. At the onset of an SSO event at ENS locations, the flow meter will send an email when the flow level reaches the manhole cover (“event has occurred”) and when the flow level recedes below the manhole cover (“return to normal”). Eleven structured SSO locations still occasionally activate during wet-weather events, as shown in the table below. The City monitors flow at SSO structures. If an SSO occurs, DPW will post temporary SSO notification signs to notify the public and will also notify BCHD of sign placement.

	Overflow Location	Asset Identification (ID)	Zip Code	Sewershed
1	1218 Armistead Way	S61II_025MH	21205	Herring Run
2	1124 Armistead Way	S63GG_013MH	21205	Herring Run
3	2121 Wicomico Rd.	S23W_001MH	21230	Low Level
4	1731 Chase St.	S43EE_034MH	21213	High Level
5	1819 E. Eager St.	S45CC_007MH	21213	Outfall
6	Belair Rd. at Herring Run Trail	S55YY_002MH	21206	Herring Run
7	Gwynns Falls at Leon Day Park	S11A_001MH	21216	Gwynns Falls

No	Overflow Location	Asset ID	Zip Code	Sewershed
67	Falls Rd., approximately 1,100 feet (ft.) northwest of US-1 bridge intersection	S31MM_013MH	21211	Jones Falls

No	Overflow Location	Asset ID	Zip Code	Sewershed
72	Rear of 428 East Preston St.	S37GG_007MH	21202	Jones Falls
152	N. Charles St. & W. Lanvale St.	S33II_004MH	21202	Jones Falls
154	N. Charles St. & W. Lafayette Ave.	S33KK_033MH	21201	Jones Falls
156	Charing Cross Rd. & Greenwich Ave.	S08G 001MH	21229	Gwynns Falls

4.3. Available Resources and Preparedness Training

UMD maintains various resources to address SSOs, including vacuum trucks, Closed-Circuit Television (CCTV) equipment, jetter trucks, backhoes, dump trucks, bypass pumps, power generators, and numerous vehicles. DPW Office of Engineering and Construction (OEC) also has available on-call contractors to supplement UMD's resources as needed.

DPW monitors response and reporting procedures for SSO events through an internal SSO Compliance Team. The Team coordinates the submittal of 5-Day Reports and provides support and training to First Responders and other staff involved in SSO response.

4.4. Minimizing SSO Volume, Implementing Institutional Controls, and Notifying EPA, MDE, and BCHD

If the situation requires additional resources and time to stop the discharge, crews may install bypass pumping to abate the SSO. The City's Standard Operating Procedure (SOP) for SSO events is summarized below, and the City's procedures for SSOs caused by Pumping Stations are prescribed in Section 5.

5. Pumping Station Overflows

5.1. Public Notification

Within DPW, BWW is responsible for the Operation and Maintenance (O&M) of all wastewater collection and treatment assets. Within BWW, the Wastewater Facilities Division oversees the O&M of pumping stations as listed in the table below.

Station	Location	Maximum Design Pumping Capacity (MGD) ^a	Relevant Section
Eastern Avenue	751 E. Ave.	100	Section 5.2.1
Brooklyn	3404 S. Hanover St.	18.5	Section 5.2.2
Dundalk	2203 Broening Highway	33.3	Section 5.2.3
Jones Falls	3600 Ash St.	55	Section 5.2.4
Locust Point	2290 E. Fort Ave.	3.6	Section 5.2.5
Quad Avenue	701 N. Point Rd.	30	Section 5.2.6
McComas	1800 Key Highway	1.1	Section 5.2.7
Westport	2911 Waterview Ave.	3.5	Section 5.2.8
Stony Run	2840 Sisson St.	17	Section 5.2.9

a MGD – Million Gallons per Day

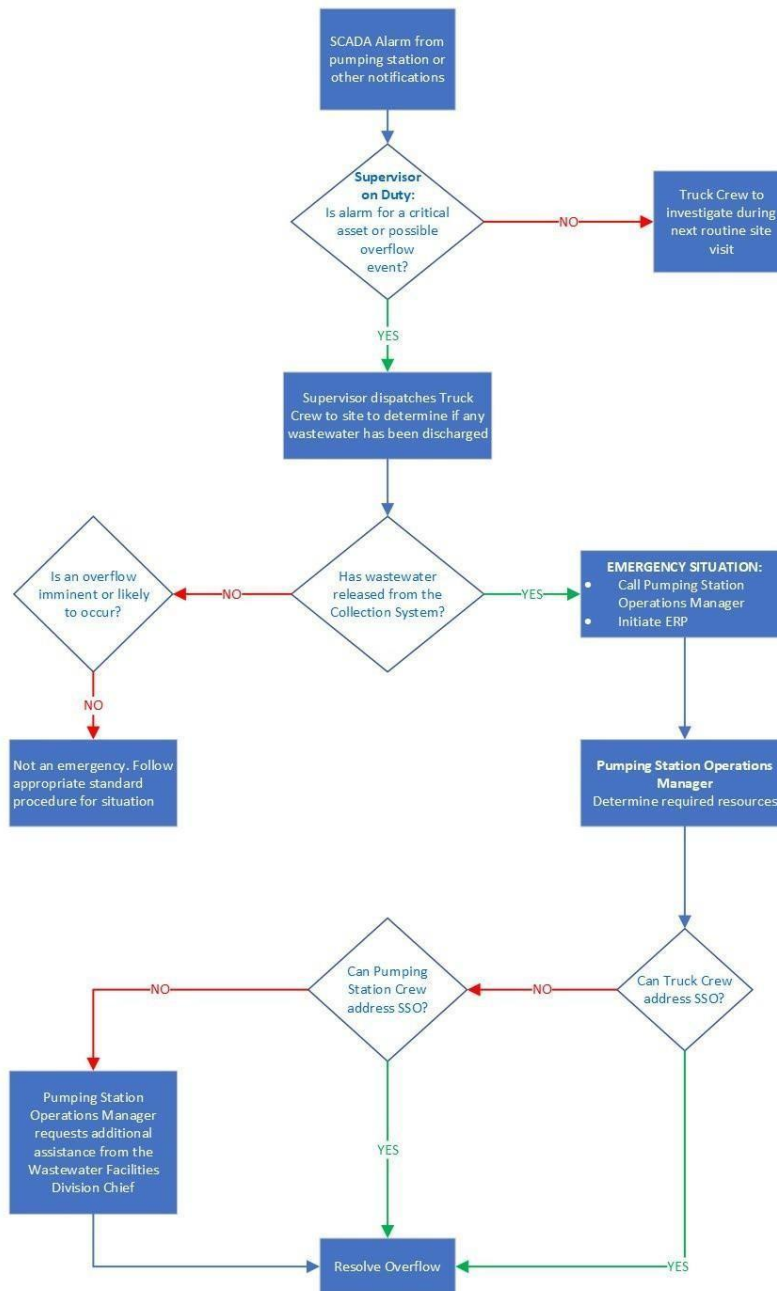
In the event of emergencies concerning any of the above-listed pumping stations, an internal communication protocol has been developed. The below table lists the key individuals in the communications protocol.

Emergency Contact List	
Name:	Chris Stielper
Organization:	Baltimore DPW
Title:	Manager of Pump Station O&M
Name:	Michael Hallmen
Organization:	Baltimore DPW
Title:	Chief, Wastewater Facilities
Name:	Paul Sayan
Organization:	Baltimore DPW
Title:	Acting Bureau Head, BWW
Name:	Khalil Zaied

Emergency Contact List	
Organization:	Baltimore DPW
Title:	DPW Acting Director

The figure below depicts a decision flow chart for notification and response in the event of pump station emergencies.

The tables in Section 5.2 contains station-specific emergency response procedures, and Section 5.3 contains general emergency procedures for force mains.



5.2. Station-Specific Emergency Response Procedures

5.2.1. Eastern Avenue Pumping Station

Directions for Police/Fire/EMS Dispatch: 751 Eastern Avenue, Baltimore. Fire/EMS access to Generator Building by gate on Fleet Street opposite the Marriott Hotel. Generator building is on your right.

Eastern Avenue Station	
Station Address:	751 Eastern Avenue, Baltimore, MD 21225
Station Telephone No.	(410) 396-5194
First Likely SSO Point	Manhole on intersection of President St./Eastern Ave. and manholes in the vicinity of the intersection of Aliceanna St. and S. Central Ave.
(Channel) Storage Capacity	Approximately 500,000 gallons; limited in-line storage
Est. Generator Run Time:	Approximately 24 hours, depending on flow
Influent Flow Rate	Estimated Storage Time
Minimum: 18 MGD	Approximately 40 minutes
Average: 22 MGD	Approximately 30 minutes
Maximum: 100 MGD	Approximately five minutes

- **Station:** The station is continuously staffed and is the control point for the Supervisory Control and Data Acquisition (SCADA) system.
- **Redundant power:** Station is equipped with dual utility feeders with automatic transfer switchgear, and two 2,000 kilovolt-ampere emergency generators. Duplex emergency generators support full station hydraulic capacity.
- **Portable gas detection:** Portable gas detection equipment is stored in the Electrical Room.
- **Pumps:** Five electric drive sewage pumps available.
- **Force main:** Three force mains in service.
- **Emergency bypass availability:** The nearest structure to bypass into would be the Main Outfall Interceptor several miles west of the station along Eastern Avenue. This will require the use of an on-call pumping contractor.
- **Likely collection system overflow point:** The first indication of an SSO will be within the station as the wet well overflows and floods the boiler room. The structure that is

likely to experience an SSO first (outside the pump station) is the sanitary sewer manhole at the intersection of Eastern Avenue and President Street. Also at risk are low-lying manholes and manholes in the vicinity of the intersection of Aliceanna St. and S. Central Ave.

Electrical Fault

1. Does the station have power?
 - Verify the station has power on all three phases by checking the metering on the 480-volt switchgear at the pump station. Voltage should read 480 volts +/- on all three phases.
 - If power is not present on all three phases, immediately request an electrician to respond. The station switchgear should only be operated by a qualified electrician.
 - Loss of one of the two utility feeds should automatically transfer load to the energized feeder. If both utility feeders fail, the station generators should start and transfer load. If manual starting of the generators is required, this can only be done by authorized personnel at controls in the Generator Building.

2. Do the pumps and auxiliary equipment have power?
 - Check that all circuit breakers are closed at the Motor Control Center (MCC).
 - Check that the motor starters have power on all three phases. In the event of failure of the soft-start control failure, the equipment should automatically revert to auxiliary direct-on-line starters.
 - Check for power to the seal water pumps and vacuum prime pump system. Check for vacuum on the common vacuum header gauge. Remember that the pumps cannot start on bubbler wet well level control unless and until the vacuum prime and seal water pumps are operating.

Mechanical Fault

1. Is the pump operating deck flooded?
 - Visually check the pump deck. At the Eastern Avenue Station, any leak in the vicinity of the sewage pumps will be readily apparent. Any leak or breakage in the force main header may occur within the force main header structure in front of the station along Eastern Avenue. The first indication of a break within this structure may be surcharging and an SSO in the area.
 - Immediately stop the affected sewage pump. In most cases it should be possible to isolate the leak or break by closing the appropriate valves as described in the station O&M Manual.

2. Is there a high Screening Channel Alarm, with or without a collection system SSO?

- First, verify this condition by manually inspecting the Screening Channel.
 - A high level in the Screening Channel indicates that the sewage pumps are not operating or are not conveying sufficient flow to the force main. If none of the pumps are operating and three-phase power is available, verify that the seal water and vacuum prime pumps are operating. Attempt manual start of any one electric pump. When starting a pump by “hand” switch at the MCC, remember these pumps start against a closed cone valve. Visually verify the pump cone valve is opening (about 120 seconds travel time) after starting the pump.
 - If the pump motors are running and no/low flow is indicated on the station flow meter, investigate valve positions, including cone and isolation valves, and verify that the pump couplings are intact. Attempt to return at least one pump to service.
3. Is there a low wet well alarm, with or without a collection system SSO?
- Investigate the bar screens. Both bar screens are normally operated in parallel, and failure/obstruction of both units would be unlikely. Check the bar screen circuit breakers located in the switchgear room. During normal daytime dry- weather flows, any one screen can accommodate station flow, so isolating one of the two screens is an option. It is not possible to bypass the screening channel entirely at the Eastern Avenue station.

Instrumentation and Control Fault

Alarm conditions as displayed at the operator’s control station are self-explanatory. See the Eastern Avenue Station O&M Manual for troubleshooting and repair of specific systems.

Eastern Avenue Station local control is provided by the station Programmable Logic Control (PLC). This system has multiple redundant features. In the unlikely event of complete PLC failure, the station will default to operating on the bubbler tube screening channel level control system.

5.2.2. Brooklyn Pumping Station

Directions for Police/Fire/EMS Dispatch: 3404 South Hanover Street, Baltimore. Brick structure; nearest intersection is South Hanover St. and Frankenfurst Avenue. Enter station from South Hanover driveway.

Brooklyn Station	
Station Address:	3404 S. Hanover Street, Baltimore, MD 21225
Station Telephone No.	(410) 396-9497
First Likely SSO Point	First manhole upstream from the Pumping Station on S. Hanover Street
Storage Capacity	Approximately 80,000 gallons (wet well); limited in-line storage
Est. Generator Run Time:	Approximately 2 ½ days
Influent Flow Rate	Estimated Storage Time
Minimum: 1.73 MGD	Approximately one hour, seven minutes
Average: 1.93 MGD	Approximately one hour
Maximum: 15.00 MGD ^a	Approximately eight minutes

^a Highest flow recorded

- **Station:** The station is monitored by SCADA system.
- **Power:** Station is equipped with emergency generator and Automatic Transfer Switch (ATS) for station service.
- **Pumps:** Two pumps with third standby/wet weather pump available.
- **Force main:** Alternate force main available.
- **Emergency bypass availability:** Flow can be diverted by pumping to the nearest gravity sewer manhole located on South Hanover Street, 530 ft. south of the station on the west side of the street.
- **Likely collection system overflow point:** First manhole upstream from the pumping station on South Hanover Street.

Electrical Fault

1. Does the station have power?
 - Verify the station has utility power present on all three phases of the three-phase service. This can be done by checking the display on the utility meter located in the station control room. If power is not present on all three phases, immediately request an electrician to respond.
 - Loss of one of three phases may, or may not, cause the generator to start and the ATS to transfer load from utility power to generator power. In an emergency situation involving loss of

one or more phases of the utility power, *and* the generator not starting automatically, manually start the generator and transfer load using the controls on the ATS.

2. Do the pumps and auxiliary equipment have power?

- Check that all circuit breakers are closed at the MCC. Remember that the pumps will not start on radar/bubbler wet well level control unless and until the vacuum prime and seal water pumps are operating.

Mechanical Fault

1. Is the dry well flooded?

- Visually check the pump deck. Any appreciable amount of water indicates a pipe break or equipment leak. If necessary, stop all sewage pumps and allow the sump pump to dewater the dry well. In most cases it should be possible to isolate the leak or break by closing the appropriate valves and re-starting the station.

2. Is there a high wet well alarm, with or without a collection system SSO?

- This indicates that the sewage pumps are not operating or are not conveying sufficient flow to the force main. If none of the pumps are operating and three-phase power is available, verify that the seal water and vacuum prime pumps are operating.
- Attempt manual start of the standby/wet weather Pump #3. Check the wet well level control systems: if these are inoperative, sewage pumps may be started manually at the MCC.
- If the pump motors are running, investigate valve positions, including check valves, and verify that the pump couplings are intact. Investigate suction line obstructions (uncommon, but possible). Attempt to return at least one pump to service.

3. Is there a low wet well alarm, with or without a collection system SSO?

- Investigate the bar screen. If it is blocked and cannot promptly be returned to service, isolate and bypass screening equipment using the procedure in the Brooklyn Station O&M Manual.
- If the bar screen is operating and there is low flow in the influent channel, investigate for an upstream gravity sewer break or obstruction.

Instrumentation and Control Fault

Alarm conditions reported via SCADA or station alarm are self-explanatory. See the Brooklyn Station O&M Manual for troubleshooting and repair of specific systems.

The Brooklyn Station local control is provided by the station PLC. This system has multiple redundant features. In the unlikely event of complete PLC failure, the station will operate on a single pump. Pump #3 will operate independently on wet well float control.

If the PLC fails, the station should be staffed continuously until the PLC is returned to service.

5.2.3. Dundalk Pumping Station

Directions for Police/Fire/EMS Dispatch: 2203 Broening Highway, Baltimore. Driveway is 200' north of the intersection of Broening Highway and Keith Avenue.

Dundalk Station	
Station Address:	2203 Broening Highway, Baltimore MD 21224
Station Telephone No.	(410) 396-7287
First Likely SSO Point	Manholes, immediate vicinity of the station
Storage Capacity	Approximately 150,000 gallons (wet well); limited in-line storage
Est. Generator Run Time:	14 to 15 hours
Influent Flow Rate	Estimated Storage Time
Minimum: 8.10 MGD	Between one to 1 ½ hours
Average: 9.82 MGD	Approximately one hour
Maximum: 33.00 MGD	Approximately 18 minutes

- **Station:** The station is monitored by SCADA system.
- **Power:** Station is equipped with dual utility feeders and emergency generator.
- **Three-gas detection system:** Alarm visible from outside of building near door.
- **Pumps:** Four identical sewage pumps available.
- **Force Main:** Reserve 36-inch (in.) force main available.
- **Emergency bypass availability:** Portable pumps can be used to pump from the wet well to the pump-around connection on the 36-in. force main and will require a manifold and valve installed. An access hatch is located on the south side of the station. One bypass option for this station if the sewage pumps are operable is to return the reserve (old) force main to service by closing the gate valve to the service force main and opening the 24-in. to the reserve (old) force main.
- **Likely collection system overflow point:** Manhole in the Trucking School parking lot, west of Dundalk Station.

Electrical Fault

1. Does the station have power?
 - Verify the station has power on all three phases by checking the metering on the switchgear. Voltage should read 480 volts +/- on all three phases. If power is not present on all three phases, immediately request an electrician to respond.
 - The station switchgear should only be operated by a qualified electrician. Loss of any or all phases should automatically start the station generator and transfer load. If manual

starting of the generator is required, this can only be done by controls on the ATS in the switchgear room.

2. Do the pumps and auxiliary equipment have power?

- Check that all circuit breakers are closed at the MCC. Single-phase loads have circuit breakers located in Panel L. Remember that the pumps cannot start on radar/bubbler wet well level control unless and until the vacuum prime and seal water pumps are operating. Bypass switches are provided on all Variable Frequency Drives (VFDs).

Mechanical Fault

1. Is the dry well flooded?

- Visually check the pump deck. Any appreciable amount of water indicates a pipe break or equipment leak. If necessary, stop all sewage pumps and allow the sump pump to dewater the drywell. In most cases it should be possible to isolate the leak or break by closing the appropriate valves and re-starting the station.
- The pump drive motors are not submersible. If the drive motors have been submerged, do not attempt to start them until they have been inspected by a qualified electrician. Begin planning for emergency bypass pumping.
- Any substantial leak caused by pipe breakage may require dewatering the drywell by vacuum truck.

2. Is there a high wet well alarm, with or without a collection system SSO?

Note: Dundalk Station is equipped with an auxiliary float system in the wet well to automatically run pumps at high wet well alarm levels.

- This indicates that the sewage pumps are not operating, are not conveying sufficient flow to the force main, or discharge valve is stuck/closed. If none of the pumps are operating and three-phase power is available, verify that the seal water and vacuum prime pumps are operating by checking the pressure and vacuum gauges, respectively.
- Attempt manual start of any one pump. When starting a pump by “hand” switch at the MCC, remember these pumps start against a closed cone valve. Visually verify the pump cone valve is opening (about 90 seconds travel time) after starting the pump. If the pump motors are running and no/low flow is indicated on the station flowmeter, investigate valve positions, including the plug and cone valves, and verify that the pump couplings are intact.
- Attempt to return at least one pump to service.

3. Is there a low wet well alarm, with or without a collection system SSO?

- Investigate the bar screens. Both bar screens are normally operated in parallel, and failure/obstruction of both units would be unlikely. Check the bar screen circuit breakers located in Panel WW in the switchgear room.

- Any one screen can accommodate station flow, so isolating one of the two screens is an option. As a last resort, the screen channel may be bypassed entirely with the flow entering the wet well from the influent bypass structure. This procedure should be undertaken only in an emergency. Unscreened solids entering the wet well will eventually rag and disable the pumps. The screening channel bypass procedure is described in the Dundalk Station O&M Manual.

Instrumentation and Control Fault

Alarm conditions reported via SCADA or station alarm are self-explanatory. See the Dundalk Station O&M Manual for troubleshooting and repair of specific systems.

The Dundalk Station operates under local control. Control loop failure will not interrupt the normal operation of the station.

Dundalk Station local control is provided by the station PLC. This system has multiple redundant features. In the unlikely event of complete PLC failure, the station will default to operating on the float wet well level control system. If the PLC fails, the station should be staffed continuously until the PLC is returned to service.

5.2.4. Jones Falls Pumping Station

Directions for Police/Fire/EMS Dispatch: 3400 Ash Street, Baltimore. West of the intersection of Clipper Mill Road and Ash Street.

Jones Falls Station	
Station Address:	3600 Ash Street, Baltimore MD 21211
Station Telephone No.	(410) 396-6579
First Likely SSO Point	None (station has 27" overflow relief gravity sewer) ^a
Storage Capacity	51,700 Gallons (wet well); 125,000 gallons (in-line storage)
Est. Generator Run Time:	Indefinite (diesel fuel)
Influent Flow Rate	Estimated Storage Time
Minimum: 13.0 MGD	20 minutes
Average: 17 MGD	15 minutes
Maximum: 42 MGD ^b	Six minutes

^a Low point of the 27-in. relief sewer located at 1911 Falls Road., immediately west of RR overpass

^b Highest flow recorded

- **Station:** The station is monitored by SCADA system.
- **Power:** Station is equipped with dual primary utility feeders, and emergency natural gas fired generator and a bus-tie breaker for station service.
- **Pump:** Four pumps are available – two in alternating service and two standby/wet weather.
- **Force main:** Two usable force mains – 30-in. (standby) and 54-in. (service).
- **Emergency bypass availability:** In the event the wet well overflows, the surcharge will have to be pumped to the nearest gravity sewer manhole. There is a 27-in. bypass relief sewer that can take some of the overflow. The station is provided with an emergency (additional) wet well.
- **Operational note:** In dry weather conditions, flow will normally bypass the station to the 27-in. relief sewer. This sewer may become surcharged during some wet-weather events, resulting in loss of hydraulic capacity and a possible high wet well level condition.
- **Likely collection system overflow point:** Because there is a bypass sewer that relieves the station overflow chamber, the first likely SSO point is the SSO #67 structure at 1911 Falls Road. Any flow from this point will enter Jones Falls.

Electrical Fault

1. Does the station have power?
 - Verify the station has utility power present on all three phases of the three-phase services. This can be done by checking the display on the utility meter located on the switchgear. If power is

not present on all three phases, immediately request an electrician to respond. It is unlikely that both 13.8-kilovolt feeders would be de-energized at the same time. Do not attempt to operate the primary power switchgear.

- Loss of one of utility power on both primary feeders will cause the generator to start and the ATS to transfer load from utility power to generator power. In an emergency situation involving loss of both 13.8-kilovolt feeders and the generator not starting automatically, manually start the generator and transfer load using the controls on the ATS. Follow the procedure described in the Jones Falls Station O&M Manual.

2. Do the pumps and auxiliary equipment have power?

- Check that all circuit breakers are closed at the MCC. In the unlikely event both bubbler tube systems and float switch wet well level controls are disabled, pumps can be started manually at the VFDs if three-phase power is available at the MCC. The pump seal water systems are interlocked through the VFD and should start before the pump starts on time delay. After starting pump, verify that the pump discharge valve *to the desired force main* (36-in. or 30-in.) has opened.
- Check for power for single-phase 120-voltloads at Panels LP-1 through LP-4. Upon loss of power to the PLC, the station will automatically switch to bubbler tube level control.

Mechanical Fault

1. Is the dry well flooded?

- Visually check the pump deck. Any appreciable amount of water indicates a pipe break or equipment leak. If necessary, stop all sewage pumps and allow the sump pumps to dewater the drywell. In most cases, it should be possible to isolate the leak or break by closing the appropriate valves and restarting the station.
- Note that the pump motors and related equipment are not submersible equipment. Do not attempt to re-energize this equipment if it has been submerged. The motors and related electrical connections must be inspected by a qualified electrician prior to returning them to service.

2. Is there a high wet well alarm, with or without a collection system SSO?

- This indicates that the sewage pumps are not operating, are not conveying sufficient flow to the force main, or discharge valve is stuck/closed. If none of the pumps are operating and three-phase power is available, check the wet well level control systems. In the unlikely event that both bubbler tube systems and the float controls are inoperative, sewage pumps may be started manually at the VFDs. If the pump motors are running, investigate the pump couplings

and valve positions, including the pump suction plug and outlet cone valves. Attempt to return at least one pump to service.

3. Is there a low wet well alarm, with or without a collection system SSO?

- Investigate the bar screens and screening channel. If one or the other screen is fouled or otherwise inoperative and cannot promptly be returned to service, isolate and bypass the screening channel using the procedure in the Jones Falls Station O&M Manual.
- If the screens are operating and there is low flow in the screening channels, investigate the 48-in. upstream gravity sewer for a break or obstruction.

Instrumentation and Control Fault

Alarm conditions reported via SCADA or station alarm are self-explanatory. See the Jones Falls Station O&M Manual for troubleshooting and repair of specific systems.

The Jones Falls Station operates under local PLC control. Control loop failure will not interrupt the normal operation of the station.

Jones Falls Station local control is provided by the station PLC. This system has multiple redundant features. In the unlikely event of complete PLC failure, the station will operate on bubbler tube level control.

In the event of PLC failure, the station shall be staffed until the PLC has been restored to operation.

5.2.5. Locust Point Pumping Station

Directions for Police/Fire/EMS Dispatch: 2290 E. Fort Avenue, Baltimore. Access is via E. McComas Street to East Fort. Go through the security gate and continue 425 ft. Turn right around the salt pile and continue for 260 ft. to a brick structure.

Locust Point Station	
Station Address:	2290 East Fort Avenue, Baltimore MD 21230
Station Telephone No.	(410) 396-7290
First Likely SSO Point	First manhole in front of the station
Storage Capacity	Approximately 45,000 gallons (wet well); limited in-line storage
Est. Generator Run Time:	Approximately 2 ½ days
Influent Flow Rate	Estimated Storage Time
Minimum: approximately 23,000 GPD ^a	Approximately six hours
Average: approximately 131,000 GPD	Approximately four hours
Maximum: 3.0 MGD	Approximately one hour

^a GPD – Gallons per Day

- **Note:** Transportation Worker Identification Card required for site access.
- **Station:** The station is monitored by SCADA system.
- **Power:** Station is equipped with emergency generator and ATS for station service. Gas detection system, with alarm visible outside the station.
- **Pump:** Two alternating dry-pit submersible pumps. Any one pump has firm capacity to operate the station.
- **Emergency bypass availability:** Portable pumps can be used to pump from wet well to the nearest gravity sewer manhole. The wet well may be accessed from outside the station at the wet well hatch. However, bypassing the entire station using portable pumps is feasible. If the 10-in. force main is operational, a portable bypass pump maybe discharged to a tee fitting installed on the force main on the pump deck. This will require a six-in. 150# connection to the flange.
- **Likely collection system overflow point:** Gravity manhole immediately north and in front of the station.

Electrical Fault

1. Does the station have power?
 - Verify the station has power on all three phases by checking using a meter at the main circuit breaker. Voltage should read 480 volts +/- on all three phases. If power is not present on all three phases, immediately request an electrician to respond.

- Loss of any of all phases should automatically start the station generator and transfer load. It is possible to manually start the generator at the generator control panel, and manually transfer load at the ATS. Directions for this procedure are in the Locust Point Station O&M Manual.
2. Do the pumps and auxiliary equipment have power?
 - Check that all circuit breakers are closed at the MCC. Branch circuit breakers for auxiliary equipment are also located at the MCC.
 - The pump motor soft starters may be manually bypassed.

Mechanical Fault

1. Is the dry well flooded?
 - Inspect the pump deck. Any appreciable amount of water indicates a pipe break or equipment leak. If necessary, stop all sewage pumps and allow the sump pumps to dewater the dry well. In most cases, it should be possible to isolate the leak or break by closing the appropriate valves and restarting the station.
2. Is there a high wet well alarm, with or without a collection system SSO?
 - This indicates that the sewage pumps are not operating or are not conveying sufficient flow to the force main. If none of the pumps are operating and three-phase power is available, attempt manual start of any on pump at the MCC.
 - If the pump motor(s) are drawing current and no/low flow is still indicated on the station flowmeter, investigate the valve positions, including check and isolation valves.
 - Because the Locust Point Station has no screening for solids, investigate possible raggings of the pump volute, discharge line, or check valves.
 - Investigate possible failure of the bubbler tube level control system, including a blocked bubbler tube.
 - Attempt to return at least one pump to service.
3. Is there a low wet well alarm, with or without a collection system SSO?
 - Verify the 12-in. wet well isolate sluice gate is in the open position. If there appears to be little flow entering the station, begin checking upstream manholes for either a break or obstruction in the gravity sewer upstream of the station.

Instrumentation and Control Fault

Alarm conditions reported via SCADA or station alarm are self-explanatory. See the Locust Point Station O&M Manual for troubleshooting and repair of specific systems.

Note: A failure of the bubble tube level control system will disable this station.

Any pump may be started manually at the MCC if the bubbler tube system is not operating.

The Locust Point Station operates under local control. Control loop failure will not interrupt the normal operation of the station.

Locust Point Station local control is provided by the station PLC. This system has multiple redundant

features. If the PLC fails, the station should be staffed continuously until the PLC is returned to service.

5.2.6. Quad Avenue Pumping Station

Directions for Police/Fire/EMS Dispatch: 701 S. North Point Road, Baltimore. Brick structure on the north side of Quad Avenue at the intersection of North Point Boulevard.

Quad Avenue Station	
Station Address:	701 North Point Road, Baltimore, MD 21224
Station Telephone No.	(410) 396-6077
First Likely SSO Point	62nd Street, Moore's Run side, and past the 62nd Street pumping station
Storage Capacity	Approximately 150,000 gallons; including in-line storage
Est. Generator Run Time:	Approximately 1 ½ days
Influent Flow Rate	Estimated Storage Time
Minimum: 2.21 MGD	Approximately one hour, 15 minutes
Average: 2.40 MGD	Approximately one hour
Maximum: 24.2 MGD ^a	Approximately nine minutes

^a Highest flow recorded

- **Station:** The station is monitored by SCADA system.
- **Power:** Station is equipped with emergency generator and ATS for station service.
- **Pumps:** Two pumps and third standby/wet weather pump available.
- **Force main failure:** A 20-in. bypass connection is provided on pump discharge manifold for connection to temporary piping. A temporary force main may not be an option due to the distance to the nearest gravity sewer manhole (approximately 1 mile west of the station on North Point Boulevard).
- **Emergency bypass availability:** Portable pump discharge line can be connected to the 20-in. flanged bypass connection on pump discharge outside the station.
- **Likely collection system overflow point:** First SSO will occur from a manhole located on the Moore's Run low-level interceptor at 62nd Street.

Electrical Fault

1. Does the station have power?
 - Verify the station has utility power present on all three phases of the three-phase service. This can be done by checking the display on the utility meter located on the switchgear. If power is not present on all three phases, immediately request an electrician to respond.
 - Loss of one of three phases may, or may not, cause the generator to start and the ATS to transfer load from utility power to generator power. In an emergency situation involves loss of one or more phases of the utility power, and the generator has not started automatically, manually start the generator and transfer load using the controls on the ATS. This procedure is described in the Quad Avenue Station O&M Manual.
2. Do the pumps and auxiliary equipment have power?

- Check that all circuit breakers are closed at the MCC. In the unlikely event both the radar and bubbler wet well level controls are disabled, pumps can be started manually at the VFDs if three-phase power is available at the MCC.
- Check for power for single-phase 120-volt loads at Panel A.
- Attempt many start of any one pump.
- After starting pump, verify that the pump cone valve has opened.

Mechanical Fault

1. Is the drywell flooded?
 - Visually check the pump deck. Any appreciable amount of water indicates a pipe break or equipment leak. If necessary, stop all sewage pump and allow the sump pump to dewater the dry well. In most cases, it should be possible to isolate the leak or break by closing the appropriate valves and restarting the station.
 - Check that the dry well pump-out valve is closed.
 - The dry well may also be dewatered by opening the dry well pump-out valve and manually starting Pump #1.
2. Is there a high wet well alarm, with or without a collection system SSO?
 - This indicates that the sewage pumps are not operating, are not conveying sufficient flow to the force main, or discharge valve is stuck/closed. If none of the pumps are operating and three-phase power is available, check the wet well level control systems. If both are inoperative, sewage pumps may be started manually at the VFDs.
 - If the pump motors are running, investigate valve positions, including the pump cone valves. Investigate suction line obstructions (uncommon, but possible). Attempt to return at least one pump to service.
3. Is there a low wet well alarm, with or without a collection system SSO?
 - Investigate the bar screen. If it is blocked and cannot promptly be returned to service, isolate and bypass screening equipment using the procedure in the Quad Avenue Station O&M Manual.
 - Bypass the screening channel only as a last resort. Solids in unscreened wastewater will eventually cause ragging of the pump volutes and pump failure.
 - If the bar screen is operating and there is low flow in the influent channel, investigate both upstream gravity interceptor sewers for a break or obstruction.

Instrumentation and Control Fault

Alarm conditions reported via SCADA or station alarm are self-explanatory. See the Quad Avenue Station O&M Manual for troubleshooting and repair of specific systems.

The Quad Avenue Station operates under local control. Control loop failure will not interrupt the normal operation of the station.

Quad Avenue Station local control is provided by the station PLC. This system has multiple redundant features. In the unlikely event of complete PLC failure, the station will default to operating on the bubbler tube wet well level control system. If the PLC fails, the station should be staffed continuously

until the PLC is returned to service.

5.2.7. McComas Street Pumping Station

Directions for Police/Fire/EMS Dispatch: 1800 Key Highway, Baltimore. One story brick structure located under the overpass of I-95 North, near the intersection of Key Highway and E. McComas Street.

McComas Street Station	
Station Address:	1800 Key Highway, Baltimore MD 21230
Station Telephone No.	(410) 396-3449
First Likely SSO Point	BG&E grass area near the marine terminal and manholes along McComas St. South of I-95.
Storage Capacity	Approximately 21,000 gallons (wet well); limited in-line storage
Est. Generator Run Time:	Approximately 3 ½ days continuous service
Influent Flow Rate^a	Estimated Storage Time
Minimum: approximately 20,000 GPD	Approximately five hours
Average: approximately 47,000 GPD	Approximately three hours
Maximum: approximately 443,000 GPD ^a	Approximately one hour

^a Highest flow recorded

- **Station:** The station is monitored by SCADA system.
- **Power:** The station is equipped with emergency generator and ATS for station service. Gas detection system, with alarm/gas concentrations visible outside the station.
- **Pumps:** Two duty and one standby/ wet weather pumps are available. All units are identical submersible dry-pit pumps.

Note: Although the pumps are fully submersible, their electrical connections are not. Flooding of the drywell to a depth of six ft. or greater will likely disable all three sewage pumps.

- **Force main:** Two parallel force mains (six-in. and 10-in.) discharging to the same point are available. The 10-in. force main is normally in service, with chain-operated valves located on the pump deck.
- **Emergency bypass availability:** A six-in. emergency bypass connection is provided on the six-in. force main outside the pump station. The nearest gravity sewer is located on Key Highway approximately 900 ft. from the station. The wet well can be dewatered by vacuum truck by removing the trash basket from the hatch immediately outside the station.
- **Likely collection system overflow point:** The BG&E property, grass area near the Marine Terminal and manholes along McComas St. south of Interstate 95.

Electrical Fault

1. Does the station have power?
 - Verify the station has power on all three phases by checking using a meter at the main circuit breaker. Voltage should read 208 volts +/- on all three phases. If power is not present on all three phases, immediately request an electrician to respond.
 - Loss of any or all phases should automatically start the station generator and transfer load. It is possible to manually start the generator at the generator control panel, and manually transfer load at the ATS. Directions for this procedure are in the McComas Street Station O&M Manual.
2. Do the pumps and auxiliary equipment have power?
 - Check that all circuit breakers are closed at the MCC. Branch circuit breakers for 120-volt auxiliary equipment are also located at the MCC.
 - The pump motor soft starters may be manually bypassed in the event of drive fault.

Mechanical Fault

1. Is the dry well flooded?
 - Inspect the pump deck. Any appreciable amount of water indicates a pipe break or equipment leak. If necessary, stop all sewage pumps and allow the sump pump to dewater the dry well. In most cases it should be possible to isolate the leak or break by closing the appropriate valves and re-starting the station.
 - Inspect the pump electrical junction boxes on the pump deck. If these have been submerged, do not attempt to start the sewage pumps until these connections have been inspected by a qualified electrician. If it is not possible to restart the sewage pumps without extensive electrical repairs, begin the provision of temporary bypass pumping using portable pumps.
2. Is there a high wet well alarm, with or without a collection system SSO?
 - This indicates that the sewage pumps are not operating, are not conveying sufficient flow to the force main, or discharge valve is stuck/closed. If none of the pumps are operating and three-phase power is available, attempt manual start of any one pump at the MCC.
 - If the pump motor(s) are drawing current and no/low flow is still indicated on the station flowmeter, investigate valve positions, including check and isolation valves.
 - Investigate possible failure of the bubbler tube level control system, including a blocked bubbler tube.
 - Attempt to return at least one pump to service.
3. Is there a low wet well alarm, with or without a collection system SSO?

- Investigate the trash basket outside the station. Lift using the hand winch and remove solids, as necessary. In an emergency, the station may be operated with the trash basket

removed, but this will eventually lead to obstruction of the pump volutes and discharge lines with solids.

- If the trash basket is clean and there appears to be little flow entering the station, begin checking upstream manholes for either a break or obstruction in the gravity sewer upstream of the station.

Instrumentation and Control Fault

Alarm conditions reported via SCADA or station alarm are self-explanatory. See the McComas Station O&M Manual for troubleshooting and repair of specific systems.

Note: A failure of the bubble tube level control system will disable this station.

The wet well floats are for alarm only and will not operate the sewage pumps. Any pump may be started manually at the MCC if the bubbler tube system is not operating.

The McComas Station operates under local control. Control loop failure will not interrupt the normal operation of the station.

McComas Station local control is provided by the station PLC. This system has multiple redundant features. If the PLC fails, the station should be staffed continuously until the PLC is returned to service.

5.2.8. Westport Pumping Station

Directions for Police/Fire/EMS Dispatch: 2911 Waterview Ave, Baltimore. On Waterview, at intersection of Cherry Hill Road. One story brick structure on the north side of the intersection.

Westport Station	
Station Address:	2911 Waterview Ave. Baltimore MD 21230
Station Telephone No.	(410) 396-7289
First Likely SSO Point	Wet well, flowing to storm drain on Waterview Ave as well as manhole at intersection of Waterview Ave. and Cherry Hill Rd.
Storage Capacity	Approximately 10,500 gallons (wet well); limited in-line storage
Est. Generator Run Time:	Two to 2 ½ days continuous service
Influent Flow Rate	Estimated Storage Time
Minimum: 50,000 GPD	Approximately four hours
Average: 77,500 GPD	Approximately three hours
Maximum: 134,000 GPD ^a	Approximately 1 ½ hours

- **Station:** The station is monitored by SCADA system.
- **Power:** The station is equipped with emergency generator and ATS for station service.
- **Pumps:** Two duty and one standby/wet weather pumps are available. All units are identical submersible dry-pit pumps.
- **Force main:** Station has a very short (~200-foot) force main, discharging to a structure on the southwest corner of Waterview Avenue and Cherry Hill Road. It is feasible to provide portable pumping and a temporary force main.
- **Emergency bypass availability:** Emergency bypass connection is not available on the force main. Because of the very short force main, a portable pump and bypass hose could be deployed. The bypass hose would need to cross Waterview Ave, so some means of protection (road plates, etc.) would be required. A police traffic detail would be required to implement this plan.
- **Likely collection system overflow point:** The station wet well and the first gravity manhole structure upstream of the station (located immediately south of the station within the fence) as well as manhole at intersection of Waterview Ave. and Cherry Hill Rd.

Electrical Fault

1. Does the station have power?

- Verify the station has power on all three phases by checking the metering on the ATS or MCC. Voltage should read 480 volts +/- on all three phases.
- If power is not present on all three phases, immediately request an electrician to respond. Loss of any or all phases should automatically start the station generator and transfer load.
- It is possible to manually start the generator at the generator control panel, and manually transfer load at the ATS. Directions for this procedure are in the Westport Station O&M Manual.

Mechanical Fault

1. Is the dry well flooded?

- Using a portable gas detector, go below and inspect the pump deck. Any appreciable amount of water indicates a pipe break or equipment leak.
- If necessary, stop all sewage pumps and allow the sump pump to dewater the dry well. In most cases it should be possible to isolate the leak or break by closing the appropriate valves and re-starting the station.

2. Is there a high wet well alarm, with or without a collection system SSO?

- This indicates that the sewage pumps are not operating, are not conveying sufficient flow to the force main, or the discharge valve is stuck/closed. If none of the pumps are operating and three-phase power is available, attempt manual start of any one pump at the MCC.
- If the pump motor(s) are drawing current and no/low flow is still indicated on the station flowmeter, investigate valve positions, including check and isolation valves.
- Investigate possible failure of the bubbler tube level control system, including a blocked bubbler tube.
- Attempt to return at least one pump to service.

3. Is there a low wet well alarm, with or without a collection system SSO?

- Investigate the bar screen. If it is fouled and not operating, first check the bar screen circuit breaker at the MCC. In an emergency, the screen channel may be bypassed directly to the wet well. This procedure is described in the Westport Station O&M Manual.
- If the bar screen is clean and there appears to be little flow entering the station, begin checking upstream manholes for either a break or obstruction in the gravity sewer upstream of the station.

Instrumentation and Control Fault

Alarm conditions reported via SCADA or station alarm are self-explanatory. See the Westport Station

O&M Manual for troubleshooting and repair of specific systems.

The Westport Station operates under local control. Control loop failure will not interrupt the normal operation of the station.

Westport Station local control is provided by the station PLC. This system has multiple redundant features. In the unlikely event of complete PLC failure, the station will default to operating on the bubbler tube wet well level control system. If the PLC fails, the station should be staffed continuously until the PLC is returned to service.

5.2.9. Stony Run Pumping Station

Directions for Police/Fire/EMS Dispatch: 2842 Sisson Street, Baltimore. Southwest corner of Sisson and W. 29th Streets. Access station via solid waste transfer facility driveway on 2840 Sisson St.

Stony Run Station	
Station Address:	2840 Sisson Street, Baltimore MD 21211
Station Telephone No.	(410) 243-1326
First Likely SSO Point	None; station bypasses by gravity
Storage Capacity	Approximately 20,000 gallons (wet well); 210,000 gallons (in-line storage)
Est. Generator Run Time:	Approximately 11 hours
Influent Flow Rate ^a	Estimated Storage Time
Minimum: 3.0 MGD	N/A ^a
Average: 7.0 MGD	N/A ^a
Maximum: 17.0 MGD	Approximately 20 minutes ^b

^a The station is a wet-weather station and during dry weather all incoming flow passes (by gravity) through the 24-in. Lower Stony Run Interceptor to Lower Jones Falls Interceptor.

^b This storage time reflects a condition when the gate valve on 24-in. Lower Stony Run Interceptor is closed and no flow passes through the Station. If the gate valve is open, the Station will not cause overflow upstream, rather the overflow may be downstream from Lower Jones Falls Interceptor.

- **Note:** During wet weather, station can receive flows from the 60-in. Stony Run Interceptor sewer and pump to the Jones Fall force main. Dry-weather flows normally bypass station west to the 24-in. Stony Run Interceptor.
- **Station:** The station is monitored by SCADA system.
- **Power:** Station is equipped with emergency generator and ATS for station service.
- **Pump:** Four pumps are available – two pumps provide station capacity of 17 MGD.
- **Force main failure:** Station can safely remain offline in dry-weather conditions. Bypass connection not provided on the station force main.
- **Emergency bypass availability:** Station can be bypassed by gravity. In an emergency, the wet well could be dewatered (using portable pumps) to the gravity manhole on the 24-in. Stony Run interceptor approximately 25 ft. west of the station concrete apron.
- **Likely collection system overflow point:** During very high wet-weather flows, structures along the Falls Road Interceptor may surcharge. There have been no known overflows from upstream collection system manholes.

Electrical Fault

1. Does the station have power?
 - Verify the station has utility power present on all three phases of the three-phase service. This can be done by checking the display on the utility meter located on the switchgear. If power is not present on all three phases, immediately request an electrician to respond.
 - Loss of one of three phases may, or may not, cause the generator to start and the ATS to transfer load from utility power to generator power. In an emergency situation involving loss of one or more phases of the utility power, and the generator has not started automatically, manually start the generator and transfer load using the controls on the ATS. Follow the procedure described in the Stony Run O&M Manual.
2. Do the pumps and auxiliary equipment have power?
 - Check that all circuit breakers are closed at the MCC. In the unlikely event both the radar and float switch wet well level controls are disabled, pumps can be started manually at the VFDs as long as three-phase power is available at the MCC. Before manually starting any pump, verify the pump volute is full of water by first cracking the one-in. ball air release valve. After starting pump, verify that the pump plug valve has opened.
 - Check for power for single-phase 120 V loads at Panel 1. Loss of power to the PLC and related instrumentation will disable the station.

Mechanical Fault

1. Is the dry well flooded?
 - Visually check the pump deck. Any appreciable amount of water indicates a pipe break or equipment leak. If necessary, first isolate the wet well using the electrically operated sluice gate. Pumps #1 and #4 are furnished with dry well dewatering connections on the suction side of these pumps. See the station O&M manual for valve positions required to dewater the wet well. In the event the suction side valves are submerged, it may be necessary to dewater the dry well using portable pumps.
 - Inspect the surge valve and related piping. A leak or break in this equipment could flood the dry well.
 - Check the six-in. suction line valves on Pumps #1 and #2 for breakage or leaks. This piping is cantilevered off the individual pump suction lines and represents a potential failure point.
2. Is there a high wet well alarm, with or without a collection system SSO?
 - This indicates that the sewage pumps are not operating, are not conveying sufficient flow to the force main, or discharge valve is stuck/closed. If none of the pumps are operating and three-phase power is available, check the wet well level

control systems. If both are inoperative, sewage pumps may be started manually at the VFDs. If the pump motors are running, investigate valve positions, including the pump plug valves.

- First, check that the operating pumps are primed by slightly cracking the pump volute air release valve. Investigate for uncommon, but possible, suction line obstructions or breaks. Attempt to return at least one pump to service.

3. Is there a low wet well alarm, with or without a collection system SSO?

- Investigate the grinder channels. If one or the other is fouled or otherwise inoperative and cannot promptly be returned to service, see the Stony Run Station O&M Manual for maintenance procedures.
- If the grinder(s) are operating and there is low flow in the influent channel, investigate the 60-in. upstream gravity interceptor sewer for a break. Because of the large diameter and high wet-weather flow in the interceptor, an obstruction would be unlikely.

Instrumentation and Control Fault

Alarm conditions reported via SCADA or station alarm are self-explanatory. See the Stony Run Station O&M Manual for troubleshooting and repair of specific systems.

The Stony Run Station operates under local PLC control. Control loop failure will not interrupt the normal operation of the station.

Stony Run Station local control is provided by the station PLC. This system has multiple redundant features. In the unlikely event of complete PLC failure, the station will not operate. In this case it is possible to operate the pumps manually via the VFD controls, with the understanding that the pumps are not operating under automatic wet well level control.

5.3. Response Guide for Force Main Emergencies

The purpose of this section is a guide to initiating an effective and timely response to situations common to operating sewage force mains. It is provided as general guidance and to help ensure an adequate response in emergency situations that cannot be anticipated or predicted.

Sewage force main failures have the potential to threaten human health and the environment and cause significant property damage. Force main failures can create a large SSO in a short period of time and have the potential to affect a larger section of the sewer service area than a gravity sewer blockage. Response to a force main failure may call upon every operational group within DPW having responsibility for O&M of the collection system, including the wastewater treatment plants.

Force main failures may result in serious spills requiring isolation of the force main segment to permit repair. In some cases, more than one pump station may be affected when a force main segment is taken out of service. The isolation of a damaged force main segment for repairs and the rerouting of normal sewage flow requires shutdown of affected pump stations and the closing and opening of key valves at pump stations and on the force main segment to be isolated. This situation requires extremely careful planning of force main segment isolation procedures, affected pump station shutdown procedures, SSO containment/cleanup, and expeditious repair of the force main.

Force main failures can result from a variety of causes including accidental damage from excavation activities, pipe age, subsidence, or washout of backfill, hydraulic surge, corrosion, or (most commonly) failure at an Air Release Valve (ARV) or buried fitting. Some actions that can be taken prior to an emergency include:

- Ensure that a qualified DPW representative is on site during any excavation by other City departments or private contractors taking place in the vicinity of gravity sewers or force mains.
- Organize and store emergency force main repair kits consisting of at least two lengths of pipe of the same material and diameter as the force main, along with several repair sleeves, couplings, restraining rods with hardware, etc. This ensures repair materials are available in the event of an emergency.
- Regularly inspect ARV structures and verify that each ARV is furnished with an operating ball valve installed in series with the ARV. Remember that ARVs that become “stuck open” are the primary cause of most force main SSOs.

6. Water Quality Sampling and Monitoring

6.1. Response Guide for Force Main Emergencies

In the event of a confirmed SSO of 10,000 gallons or greater, or as otherwise directed by the Bureau Head, BCHD, EPA, or MDE, OREP will implement monitoring, sampling, and analysis to assess and report the impact of the SSO on receiving water quality. OREP's sampling and monitoring will determine if receiving waters have been adversely impacted by the SSO, i.e., whether there is any decrease in background levels of dissolved oxygen and any increase in background levels of turbidity, fecal coliform, total coliform, or other applicable bacteriological standards.

The presence (or absence) of adverse impact from an SSO does not determine whether surface water is safe for recreation. MDE has listed all surface waters in Baltimore City as impaired for bacteria. As such, receiving water quality may not meet applicable parameters for full-body contact recreation, independent of the impact of a specific SSO event. The City discourages full-body contact with surface water and posts temporary SSO notification signs to this effect. In addition, there are no designated locations in Baltimore City for full-body contact recreation in surface water. If City recreation programs may involve infrequent water contact, such as kayaking, participants are provided appropriate educational materials. Similar messages are also disseminated on City websites.

The SSO sampling program supplements ongoing monitoring programs conducted by the City under its National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System permit, specifically, the Ammonia Screening (AS) and Stream Impact Sampling (SIS) programs. The AS program consists of weekly surface water monitoring at over 120 locations throughout the City, using field test kits for ammonia-nitrogen, chlorine, potential hydrogen (pH), temperature, dissolved oxygen, and conductivity. The SIS program consists of monthly surface water sampling at over 30 locations within the City, using laboratory analysis for nutrients, sediment, bacteria, metals, and other water quality indicators. The SIS program has been ongoing since 1997, and the AS program has been ongoing since 1998. The results of the AS and SIS programs provide background levels for turbidity, dissolved oxygen, and bacteria.

Additional information regarding these programs and their historical sampling results is available on the DPW website.

6.2. Water Quality Monitoring

If an SSO is confirmed to meet or exceed 10,000 gallons, the Wastewater General Superintendent will notify the OREP Water Quality Monitoring and Investigation (WQMI) Section to initiate SSO sampling. Upon notice, the OREP-WQMI Section Chief will initiate water quality sampling according to the procedures specified herein. The

OREP-WQMI Section Chief will function as the point of contact for the sampling event, provide coordination for laboratory analysis, and designate a field coordinator to oversee collection of samples.

6.3. Sampling Protocol

6.3.1. Sample Parameters

Samples collected as part of a response to an overflow event will be grab samples. Sampling parameters shall include:

- Field sampling:
 - Dissolved oxygen per Standard Method (SM) D988(C)
 - Turbidity per SM 2130 B
- Laboratory analysis (reference 40 CFR 136):
 - Five-day Biochemical Oxygen Demand (BOD) per SM 5210B
 - Total Suspended Solids (TSS) per SM 2540
 - Bacteriological standard:
 - E.coli Most Probable Number (MPN) count for non-tidal receiving waters per SM 9223 B, or:
 - Enterococci MPN count for tidal receiving waters per SM 9230 D

A Chain of Custody record shall accompany all samples for laboratory analysis. All samples collected will be identified on the Chain of Custody record with the sample date, time, volume, sampler, parameters to be analyzed, and the sample receiver.

All samples requiring laboratory analysis will be transported to the laboratory as soon as possible in coolers of ice and preserved according to the analytical method. Sample analyses will be performed within specified holding times for specific parameters. The holding time for bacteria (six hours) is most critical. Sampling may be limited by laboratory operation times; therefore, late afternoon sampling events should be limited. The laboratory shall indicate on the results records any analysis performed outside of the specified holding time.

6.3.2. Location and Schedule of Sampling

Sampling locations and schedule will be based on the Collection System asset that is overflowing, the receiving water(s), and the duration of the SSO event (i.e., if an SSO is not abated within five days). The sampling protocols are summarized in this table:

Protocol Type	Collection System Asset	Receiving water	Sampling Location	Frequency
1	Structured overflow	Any	Outfall ^{a,b}	Within one business day of notification
2	All other assets	Tidal	Outfall ^c	Within one business day of notification; and within two business days after abatement

Protocol Type	Collection System Asset	Receiving water	Sampling Location	Frequency
3	All other assets	Non-tidal	Outfall, ^a upstream (200 ft.), and downstream (minimum 200 ft.)	<p>Within one business day or notification</p> <p>Two business days after first sampling event</p> <p>Weekly from the first sampling event until the SSO abatement is complete</p> <p>Five business days after the SSO abatement is complete.</p>

^a Sample should be obtained from the flow within the outfall pipe. If no base flow is available, then sample the surface water at the outfall. If the outfall is not accessible, sample can be obtained from the surface water at the nearest accessible downstream location.

^b Surface waters at SSO structures typically discharging more than 10,000 gallons during an SSO are usually sampled as part of the SIS program.

^c If the outfall is not accessible, the sample may be obtained from the base flow within the pipe at the nearest upstream manhole as long as it is downstream from the SSO discharge to the storm system. Samples may be obtained from the tidal surface water at submerged outfalls.

6.3.3. Quality Assurance/Quality Control

All laboratories analyzing samples collected as part of this SSO monitoring shall have a current MDE-approved quality assurance plan and follow approved procedures for all analyses. The following Quality Assurance/Quality Control (QA/QC) samples shall be obtained and analyzed as follows:

- Duplicate samples shall be obtained from the same discrete sampling location throughout the SSO sampling duration and analyzed for bacteria and TSS. The precision of the method of analysis can be determined by the reproducibility of the results from the duplicate samples measured by the standard deviation of the duplicate samples.
- Blank samples shall consist of distilled water and shall be carried in the same cooler as the other surface water samples. One blank sample should be submitted for each qualifying SSO event and analyzed for bacteria and TSS. Blank samples should also be sampled in the field for turbidity. Blank samples should result in known values.

QA/QC samples shall be uniquely labeled and noted on the original field sheets. These samples will be submitted on the same Chain of Custody form as the other samples.

6.4. Reporting

Test results and analyses conducted pursuant to this ERP will be maintained by OREP and reported to EPA and MDE as provided below. The laboratory will ordinarily provide a final, written report within 10 business days of receiving samples. Within 14 days of receipt of the

laboratory report, the OREP-WQMI Section Chief will complete a written report referenced in Attachment E.

7. ERP Training

Lesson plans are included in Tables O, P, and Q.

7.1. Table O: Preparedness Training – ERP

Purpose	To provide management and response personnel with an understanding of the ERP
Duration	Four hours
Objective	<p>At the conclusion of this training program, the participants should be able to:</p> <ul style="list-style-type: none"> ● Describe the requirements of Paragraph 16 of the MCD ● Interpret the contents of the ERP ● Locate and identify those specific actions and procedures necessary to implement the plan in a timely and effective manner ● Understand response priorities and chain of command ● Identify specific individuals and their responsibilities ● Identify resources and their locations
Audience	<p>Utility Maintenance Division Supervisors, Superintendents, Investigators, and crews; Pollution Control Analysts; Public Information Officers; BCHD; and, as appropriate, employees from the following Offices in DPW:</p> <ul style="list-style-type: none"> ● OEC ● OREP-WQMI ● Control One
Training Aids	Handouts and PowerPoint presentations
References	ERP
Topics	<ul style="list-style-type: none"> ● Overview of the ERP ● Review decision charts ● Internal notification procedures ● SDUO notification procedures ● Pumping station emergency response procedures ● Force main emergency response procedures ● Siphon emergency response procedures with locations of blow-offs ● Collection System emergency response procedures ● Water quality sampling and monitoring ● Public notification procedures ● Incident reporting and documentation

7.2. Table P: Preparedness Training – SSOs

Purpose	To familiarize participants with the SOP for investigating, abating, reporting, and following up on SSOs
Duration	Four hours
Objective	At the end of the class, participants will be able to utilize the procedures in the SOP effectively when dealing with SSOs.
Audience	Utility Maintenance Division Supervisors, Superintendents, Investigators, and crews; Pollution Control Analysts; Public Information Officers; BCHD; and, as appropriate, employees from the following Offices in DPW: <ul style="list-style-type: none"> ● OEC ● OREP-WQMI ● Control One
Training Aids	Handouts and PowerPoint presentation
References	ERP Sections 3 through 6
Topics	<ul style="list-style-type: none"> ● Understanding the SOP ● Fielding the complaint from citizens ● Creating SRs ● Dispatching work to crews ● Creating Work Orders ● Notifying the appropriate regulatory agencies with preliminary SSO information and potential impacts ● Protecting public health and establishing SSO perimeters and control zones ● Containing the SSO ● Follow-up investigations and preventative steps ● Estimating SSO flow and volume ● Establishing an SSO timeline for the duration of the event

7.3. Table Q: Preparedness Training – Building Backups

Purpose	To familiarize participants with the SOP for investigating, abating, reporting, and following up on Building Backups
Duration	Four hours
Objective	At the end of the class, participants will be able to use the requirements of the SOP when investigating and addressing Building Backups.
Audience	Utility Maintenance Division Supervisors, Superintendents, Investigators, and crews; Public Information Officers; Customer Care Supervisors; BCHD; and, as appropriate, employees from the following Offices in DPW: <ul style="list-style-type: none"> ● OEC ● Control One
Training Aids	Handouts and PowerPoint presentation
References	ERP Section 2
Topics	<ul style="list-style-type: none"> ● Understanding the SOP ● Fielding the complaint from citizens ● Creating SRs ● Distribution of informational material during investigations ● Dispatching work to crews ● Creating Work Orders ● Addressing acute or catastrophic failures in Collection System laterals ● Protecting public health and providing customers with useful information

8. Document Control

This section describes the standard procedure(s) for control, periodic evaluation, and revision of the ERP.

8.1. ERP Locations

Copies of the ERP are issued to a number of specific users, as outlined below. The number of copies is limited to the extent possible in order to facilitate document control and revision.

8.1.1. Working Copies

A complete set of the ERP and all appendices will be maintained in both hard copy and electronic format at the following locations:

- Park Terminal
- West Side Maintenance Yard
- East Side Maintenance Yard
- All Pumping Stations
- Treatment Plants (Back River and Patapsco)
- Office of Legan and Regulatory Affairs at Abel Wolman Building

8.1.2. Executive and Managers Copies

Complete copies of the ERP will be issued to a number of City managers who may be directly involved with an emergency response. These include:

- Chief of Staff, Mayor's Office
- Director, DPW
- Bureau Head, BWW
- Chief, OoC
- Chief, OEC
- Division Chief, Information Technology (IT)
- Section Head, OREP-WQMI
- Operations Manager, Wastewater Pumping Stations
- Operations Supervisor, Wastewater Pumping Stations
- Wastewater General Superintendent, UMD
- Managers, Back River, and Patapsco Treatment Plants

8.2. Document Control

Hard copies and electronic copies of the ERP, and subsequent revisions thereto, are provided to those listed in Section 8.1.2. Each plan holder is responsible for maintaining their respective copy and incorporating revisions

as they are issued, typically annually. A read-only electronic version of the complete and up-to-date ERP is also provided annually.

8.3. ERP Review and Revisions

Maintenance of the ERP and issuance of revisions are the responsibility of OEC. All noted corrections, requested changes, or information to be added or deleted to the ERP should be reported to OEC for inclusion in the next revision. The OEC conducts the annual review of the ERP.

ATTACHMENT A

The formula for SSO volume is:

$$\text{SSO VOLUME} = (\text{FLOW RATE in Gallons per Minute [GPM]}) \times (\text{LENGTH OF TIME in MINUTES})$$

The following metrics are measured to aid in the process of SSO volume estimation:

- **Start Time** - The start time commences when the SSO is confirmed by the First Responder.
- **Stop Time** - The stop time is when there is no longer any verifiable discharge from the Collection System. This may occur as a result of DPW actions taken or because of a change of flow, inflow, and infiltration to the Collection System.

Note: If the SSO restarts, “Intermittent Flow” will be recorded with the start/stop times.

- **Estimate of the Flow Rate**

Flow rates can be estimated using one or a combination of the following methods:

1. Observe and record manhole overflow (with cover removed) – Completely remove manhole cover from overflowing manhole and measure height of water above the manhole frame. The height of flow should be measured at various locations around the frame with an average of these measurements used to convert into flow rate based on Table A-1.
2. Observe and record manhole overflow (with cover in place) – With the manhole cover in place, measure the height of overflow from the pick hole on the manhole. The height of the flow from the pick hole can be used to convert into flow rate based on Table A-2.
3. Observe and record overflow of wastewater into controlled container - If the overflow is being discharged to a storm sewer, and the overflow accounts for most of the flow into the storm sewer, it may be possible to measure the flow rate directly.

ESTIMATED SSO FLOW OUT OF A M/H WITH COVER REMOVED

24" FRAME

Water height above manhole frame in inches	SSO FLOW gpm
1/8	28
1/4	62
3/8	111
1/2	160
5/8	215
3/4	354
7/8	569
1	799
1 1/8	1,035
1 1/4	1,340
1 3/8	1,660
1 1/2	1,986
1 5/8	2,396
1 3/4	2,799
1 7/8	3,132
2	3,444
2 1/8	3,750
2 1/4	3,986
2 3/8	4,215
2 1/2	4,437
2 5/8	4,569
2 3/4	4,687
2 7/8	4,799
3	4,910

30" FRAME

Water height above manhole frame in inches	SSO FLOW gpm
1/8	39
1/4	87
3/8	149
1/2	216
5/8	288
3/4	406
7/8	563
1	730
1 1/8	1,035
1 1/4	1,413
1 3/8	1,806
1 1/2	2,205
1 5/8	2,650
1 3/4	3,091
1 7/8	3,525
2	3,951
2 1/8	4,375
2 1/4	4,771
2 3/8	5,167
2 1/2	5,601
2 5/8	5,986
2 3/4	6,330
2 7/8	6,660
3	6,986

36" FRAME

Water height above manhole frame in inches	SSO FLOW gpm
1/8	49
1/4	111
3/8	187
1/2	271
5/8	361
3/4	458
7/8	556
1	660
1 1/8	1,035
1 1/4	1,486
1 3/8	1,951
1 1/2	2,424
1 5/8	2,903
1 3/4	3,382
1 7/8	3,917
2	4,458
2 1/8	5,000
2 1/4	5,556
2 3/8	6,118
2 1/2	6,764
2 5/8	7,403
2 3/4	7,972
2 7/8	8,521
3	9,062

This estimating table was developed using tables in the Sewer Spill Estimation Guide, Orange County Area Waste Discharge Requirements Steering Committee, Orange County, CA. February 2014.

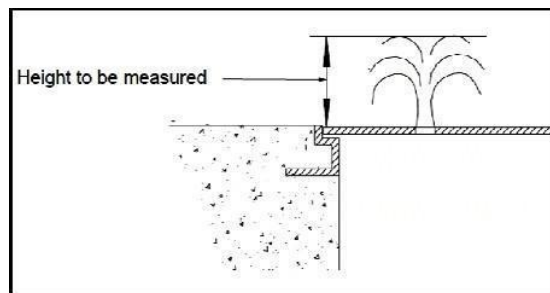
H (in.)	Q (GPM)	H (in.)	Q (GPM)	H (in.)	Q (GPM)	H (in.)	Q (GPM)
1/8	1.0	2 5/8	4.4	5 1/8	6.2	7 5/8	7.6
1/4	1.4	2 3/4	4.5	5 1/4	6.3	7 3/4	7.6
3/8	1.7	2 7/8	4.6	5 3/8	6.3	7 7/8	7.7
1/2	1.9	3.0	4.7	5 1/2	6.4	8.0	7.7
5/8	2.2	3 1/8	4.8	5 5/8	6.5	8 1/8	7.8
3/4	2.4	3 1/4	4.9	5 3/4	6.6	8 1/4	7.9
7/8	2.6	3 3/8	5.0	5 7/8	6.6	8 3/8	7.9
1.0	2.7	3 1/2	5.1	6.0	6.7	8 1/2	8.0
1 1/8	2.9	3 5/8	5.2	6 1/8	6.8	8 5/8	8.0

H (in.)	Q (GPM)	H (in.)	Q (GPM)	H (in.)	Q (GPM)	H (in.)	Q (GPM)
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	4.0	5.5	6 ½	7.0	9.0	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 ¼	8.3
1 7/8	3.7	4 3/8	5.7	6 7/8	7.2	9 3/8	8.4
2.0	3.9	4 ½	5.8	7.0	7.2	9 ½	8.4
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	5.0	6.1	7 ½	7.5	10.0	8.7

NOTE: At a spout height of 6 ½ in., an unrestrained cover will begin to lift.

H = Height of spout above manhole cover

Q = SSO Flowrate



ATTACHMENT B

PURPOSE

This SOP addresses procedures for response, investigation, abatement, reporting of, and follow-up investigation for SSOs from the public wastewater collection system to surface waters and/or stormwater system.

LEVEL OF SERVICE

RESPONSE TIME	One hour ⁴
ABATEMENT DURATION	One day ⁵
CLEAN-UP RESPONSE	Two days post-abatement or wet-weather event
CCTV FOLLOW-UP INSPECTION	Five days post-abatement or wet-weather event

DEFINITIONS

SSO

Any spill, release, or discharge of wastewater from any portion of the Collection System, except from NPDES permitted outfalls in accordance with the applicable permit.

It should be noted that any spill, release, or discharge from any portion of the sanitary sewage collection system into the environment is considered a sanitary sewer overflow, whether active or evidence thereof. A basement backup is an SSO if a discharge to the environment occurs during the pump out operation or in any other manner.

Active Overflow

A spill, release, or discharge from a cleanout, manhole, or broken pipe that is flowing at the time of arrival of the first responder.

Evidence of Overflow

A location where there is evidence of an overflow incident, but the SSO is not active when observed by the first responder.

This Annual Report is submitted pursuant to Paragraph 13 of the Modified Consent Decree (Civil Action No. JFM-02-1524). The report provides an update of the City of Baltimore Department of Public Works' (DPW's) wastewater operation and maintenance (O&M) activities and an analysis of the activities that were conducted during the reporting period. In accordance with the Modified Consent Decree (MCD), the report includes:

Dry-Weather Overflow

Any discharge from the Collection System that is unrelated to precipitation related flows (including storm water and snow melt runoff). It shall be presumed that flow in the Collection System more than 72 hours after a rain event or snow melt event is unrelated to rain or snow melt⁶.

⁴ One hour from receiving the radio call from Control One. Response time may vary during wet-weather events.

⁵ Applies to choked sanitary condition, not surcharged condition during wet-weather events.

⁶ Definition for the Baltimore City Modified Consent Decree and associated reporting

First Responder

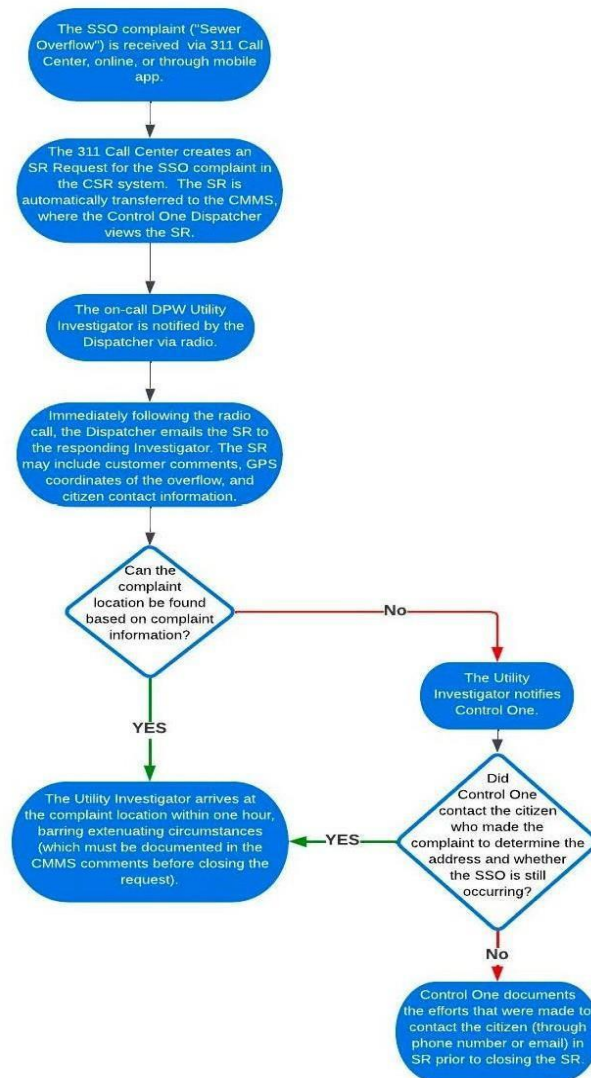
Utility Investigator from UMD, Pollution Control Analyst from OREP, or designated Consultant, to be followed by Sewer Maintenance Supervisor (UMD) if an active SSO is confirmed.

Event Notification System (ENS)

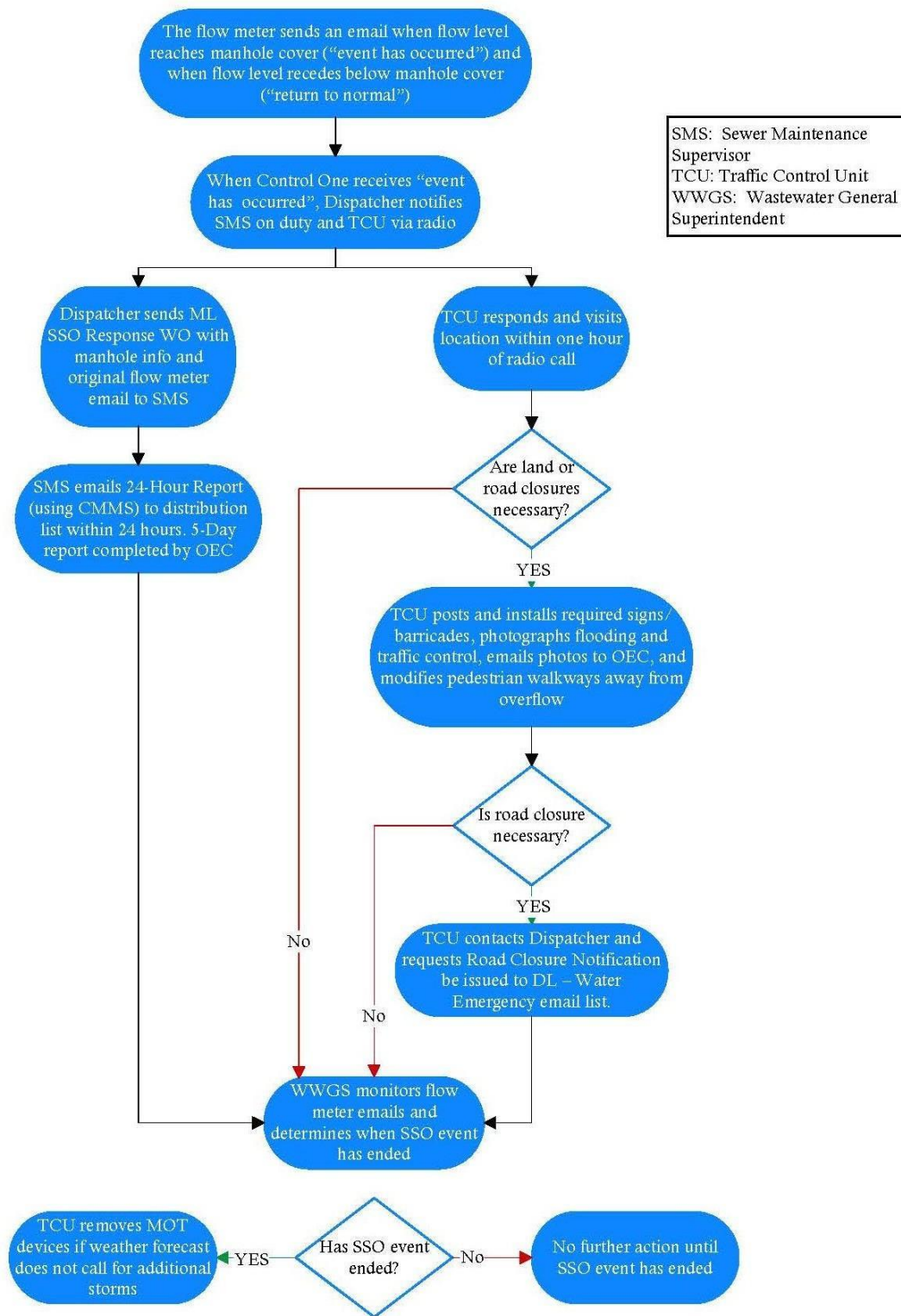
A flow meter installed in a manhole to alert the City of an SSO event.

PROCEDURE

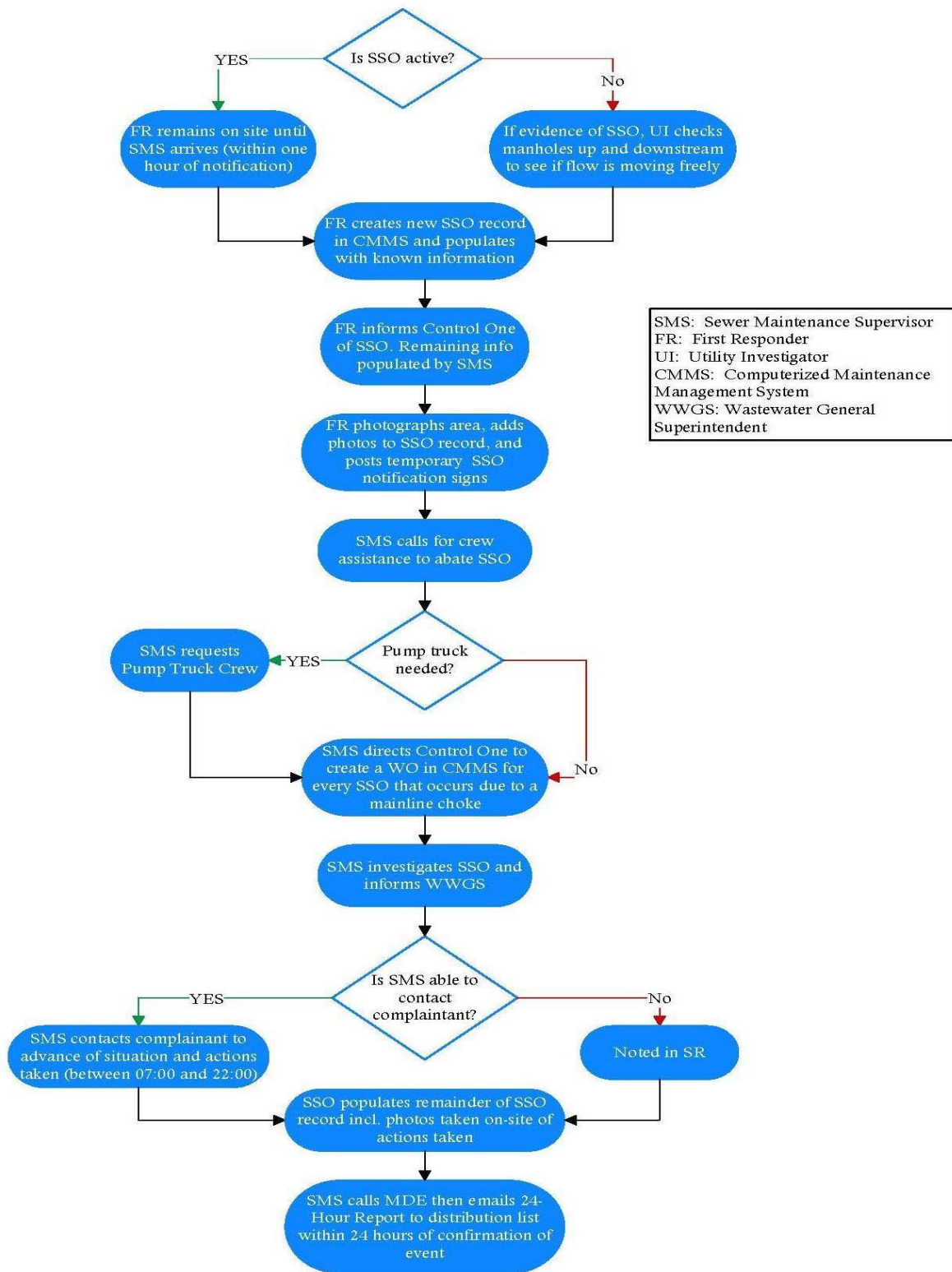
Fielding the Complaint Received via 311



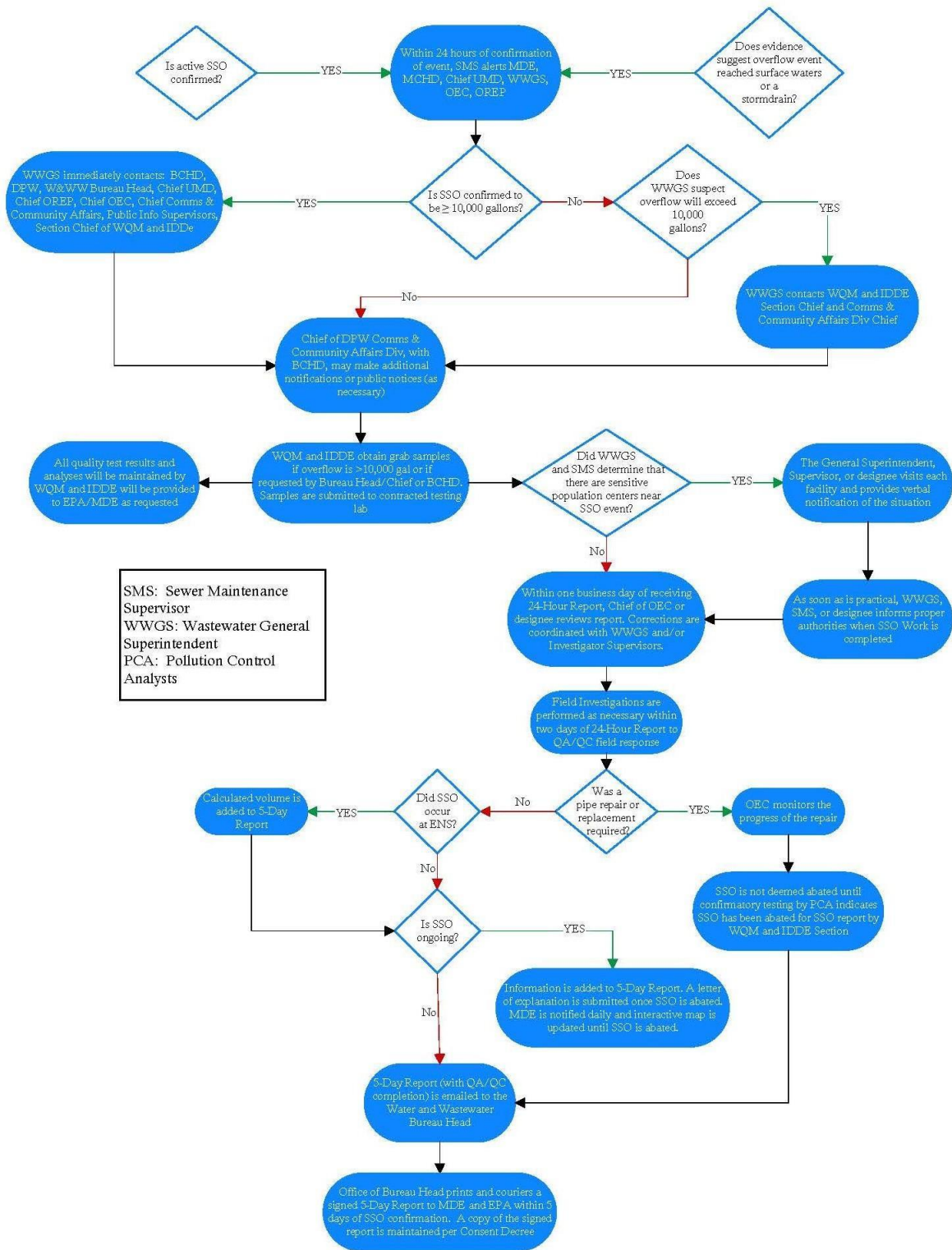
Responding to an Event Notification Alert



SSO Investigation



SSO Notifications and Reporting



Overflow Relief

1. The Sewer Maintenance Supervisor must determine the immediate discharge location of the SSO (e.g., storm drain, contained ponding, street curb gutter, body of water, stream bed). If onsite, the Pollution Control Analyst or designated Consultant may assist in identifying the discharge location.
2. The Sewer Maintenance Supervisor must request necessary materials and equipment needed to contain or isolate the SSO⁷ if not on hand. If it is impossible to contain or isolate the spill: cones, traffic barriers, yellow caution tape, and/or temporary SSO notification signs should be placed at potential access points to the spill site or receiving waters to protect public health.
 - a. Based on his/her professional opinion of the appropriate and necessary means, the Sewer Maintenance Supervisor must attempt to contain the SSO with sandbags, recover through vacuum truck, and/or divert to a downstream sewer manhole to prevent flows from reaching the Waters of the U.S. either by storm drain or by overland flow.
 - b. Where necessary to protect public health, the SSO location and the surrounding area must be cordoned off from the public, especially any areas where sewage has ponded or is running overland, with cones and/or yellow caution tape.
3. If the SSO is in a trafficked area, UMD must set up emergency traffic control. Assistance may be requested from DPW Traffic Control Unit. Signs should notify vehicles and pedestrians of flooded conditions and/or health risks as warranted.
4. The Sewer Maintenance Supervisor or designated field crew will investigate the mainline manhole upstream and downstream of the SSO location. After locating the first clear downstream manhole (not surcharging and free flowing), the field crews will begin to alleviate the blockage in the mainline.
5. If needed, the Sewer Maintenance Supervisor will request assistance or additional resources to relieve the blockage and/or determine the cause.
6. If necessary, to identify the cause of the blockage and alleviate the blockage, the Sewer Maintenance Supervisor will request CCTV of sewers and analyze the results of that inspection to determine further actions required (if any).
7. The Sewer Maintenance Supervisor determines whether bypass pumping is needed. If needed, they will request the Pump Truck Crew.
 - a. Where bypass is necessary, the Sewer Maintenance Supervisor will determine the correct pump and pipe sizes required based on the volume of flow, sewer pipe size, and depth of manhole and will develop the bypass pumping plan. If necessary, they will request assistance from OEC – Utility Projects Delivery Section.

⁷ The SSO must be contained to the maximum extent practicable, which is dependent on the rate of discharge.

- b. The Pump Truck Crew will set up a bypass pumping arrangement, as directed by the Sewer Maintenance Supervisor, to help relieve the SSO.
 - c. Should the SSO location require continued bypass pumping, the Sewer Maintenance Supervisor will notify the Wastewater General Superintendent.
8. The Sewer Maintenance Supervisor and crew will remain at the SSO site until the overflow is completely stopped⁸.
9. If the SSO condition is abated (i.e., overflow has stopped), but the cause cannot be resolved, the reason is documented by the Sewer Maintenance Supervisor in the response WO. When the SSO is stopped by relief of the choke, the Sewer Maintenance Supervisor will update and close the Computerized Maintenance Management System (CMMS) response WO. **If bypass pumping was required to abate the SSO, the work order shall not be closed until the line is taken off of the bypass pumping.** If access to CMMS is not available, the Supervisor will contact Control One to perform the update in CMMS. The original Service Request will automatically be closed once all the response WOs have been closed.

Cleanup of SSO Site

1. The Wastewater General Superintendent is responsible for ensuring the SSO site is cleaned up within 48 hours (two days) after the SSO condition has been abated or wet- weather event has ended. No readily identified residue (e.g., sewage solids, paper, rags, plastics, and rubber products) shall remain.
2. To the maximum extent possible, thoroughly flush the area clean of any sewage or wash- down water. Solids and debris are to be flushed, swept, raked, picked-up and transported for proper disposal or to the nearest sewer manhole, depending on the nature of the material. **Flushing of wastewater or associated debris into the storm water system or adjacent waterways is strictly prohibited.**
3. Where appropriate (e.g., public-accessible permeable surfaces such as grass, gravel, or sand), disinfect and deodorize the SSO site by liberally applying lime to the affected area.
4. Where sewage has resulted in ponding, pump the ponded area dry, and dispose of the residue in accordance with applicable regulations and policies.
5. Yellow caution tape placed to cordon off the spill site must be removed at the end of the clean-up phase.

⁸ Applies to choked sanitary mainline condition, not surcharged during wet-weather events, failed pipe requiring a repair, or house connection chokes.

Public Notification

1. In the event of a confirmed SSO, DPW initiates a coordinated effort to respond promptly and appropriately to the SSO. The City will provide public notice of all confirmed SSOs that reached or are likely to reach surface waters or storm drains. Once an SSO is confirmed, the City will issue public notices on the DPW website, within 24 hours of the SSO occurrence, utilizing an interactive map to identify the location of each SSO. DPW will also notify BCHD so that they may provide notice of confirmed SSOs via a social media or other website where BCHD regularly posts information. Public notices will provide pertinent information regarding each SSO, when it becomes available, including the date and time at which the SSO began, the estimated volume of the discharge, and the name of the receiving water if applicable. Notices will include an advisory regarding the adverse impact on water quality. Notifications may also be shared on the DPW website, Twitter feed, and disseminated via other social media tools. The City's procedures for notifying EPA, MDE, and BCHD are detailed in Section 4.4.1. The presence (or absence) of adverse impact from an SSO does not determine whether surface water is safe for recreation. MDE has listed all surface waters in Baltimore City as impaired for bacteria. As such, receiving water quality may not meet applicable parameters for full-body contact recreation, independent of the impact of a specific SSO event. The City discourages full-body contact with surface water, and there are no designated locations in Baltimore City for full-body contact recreation in surface water.
2. Temporary SSO notification signs (Figure 1) must be posted if any of the criteria below are met, regardless of the baseline water quality of the affected surface water. The notification signs must be as visible as possible.
 - a. The overflowing structure is inside or within 100 ft. of a public recreation area (i.e., park, ball field, playground, dog park, school yard, trail)
 - b. The overflowing structure is within 50 ft. of a waterway, stream, or wetland
 - c. The overflowing structure or debris from the overflow is within 50 ft. of a building and direct contact is likely
 - d. If SSO reached a waterway by direct means or through a storm drain a sign is placed along the impacted area of the waterway if accessible to people
3. The Sewer Maintenance Supervisor is responsible for ensuring that temporary signs are posted by the First Responders at all pedestrian-accessible access points to the contaminated area within 500 ft. of the spill site.
4. If the SSO is greater than or equal to 10,000 gallons, the signs will be removed by the Sewer Maintenance Supervisor, or his designee, when the Pollution Control Analysts have determined through sampling that the SSO-contaminated waters have returned to ambient conditions. If the SSO has not affected a body of water, water sampling is not feasible, and

no evidence of the SSO remains on site, the signs will be removed after 30 days, or per the direction of the Sewer Maintenance Supervisor.

5. If the SSO is less than 10,000 gallons, the signs will be removed by the Sewer Maintenance Supervisor, or his designee, after being posted for 14 days or the direction of the Sewer Maintenance Supervisor, assuming there is no evidence remaining.
6. Press Releases will be issued to alert the public of ongoing events, following large, dry- weather overflows, or as otherwise determined by the Chief of DPW Communications and Community Affairs Division, in concurrence with the BCHD. See <https://health.baltimorecity.gov/sanitary-sewer-overflows-ss0> and <https://health.baltimorecity.gov/newsroom/press-releases>



SSO Follow-up CCTV Investigation

1. A follow-up CCTV inspection will be completed within five days of the SSO being abated, following the procedures described in the Mainline CCTV SOP or Lateral CCTV SOP.

ATTACHMENT C

ACRONYMS AND ABBREVIATIONS

ARV	Air Release Valve
AS	Ammonia Screening
ATS	Automatic Transfer Switch
BCHD	Baltimore City Health Department
BOD	Biochemical Oxygen Demand
BWW	Bureau of Water and Wastewater
CCTV	Closed-Circuit Television
The City	Baltimore City or City of Baltimore
CMMS	Computerized Maintenance Management System
Control One	DPW's Control One Office
CRBB	Capacity-Related Building Backup
DPW	Department of Public Works
ENS	Emergency Notification System
EPA	U.S. Environmental Protection Agency
ERP	Revised Emergency Response Plan
FOG	Fats, Oils, and Grease
Ft.	Feet
GPD	Gallons per Day
GPM	Gallons per Minute
Homeowners	City Homeowners, Renters, and Other Non-Commercial Occupants
ID	Identification
Investigator	UMD Investigator
IT	Information Technology
MCC	Motor Control Center
MCD	Modified Consent Decree

MDE	Maryland Department of the Environment
MGD	Million Gallons per Day
MPN	Most Probable Number
NPDES	National Pollutant Discharge Elimination System
OREP	Office of Research and Environmental Protection
OoC	Office of Communications
OEC	Office of Engineering and Construction
O&M	Operation and Maintenance
OSA	Office of Strategic Alliances
pH	Potential Hydrogen
Pilot Program	Pilot Sewage Onsite Support (SOS) Cleanup Program
PLC	Power-line Communication
QA/QC	Quality Assurance/Quality Control
QR	Quarterly Report
SCADA	Supervisory Control and Data Acquisition
SDUO	Sanitary Discharge of Unknown Origin
SIS	Stream Impact Sampling
SM	Standard Method
SOP	Standard Operating Procedure
SR	Service Request
SSO	Sanitary Sewer Overflow
TSS	Total Suspended Solids
UMD	Utility Maintenance Division
VFD	Variable Frequency Drive
WO	Work Order
WQMI	Water Quality Monitoring and Investigation

ATTACHMENT D

GLOSSARY

Building Backup:	A wastewater or sewage release or backup into a building that is caused by blockages, flow conditions, or other malfunctions in the Collection System. A sewage backup or release is not a Building Backup if: (1) it is caused by blockages, flow conditions, or other malfunctions of a Private Lateral or other piping/conveyance system that is not owned or operationally controlled by Baltimore; or (2) is the result of overland, surface flooding not emanating from the Collection System.
Collection System:	Any collection and transmission system (including all pipes, force mains, sanitary sewer lines, combined sewer lines, if any, overflow structures, regulators, lift stations, pumping stations, manholes, and appurtenances thereto) owned by Baltimore City and designed to convey sewage to any treatment plant(s) or in wet weather to an overflow structure.
Day or Days:	Refers to calendar days. Pursuant to the Consent Decree, when a report or other deliverable is due on a Saturday, Sunday or any federal, state, or city holiday, the City has until the next calendar day that is not a holiday or weekend to submit the report or deliverable, with the exception of Sanitary Sewer Overflow reports required by Paragraph 17 of the Modified Consent Decree.
DPW:	Baltimore City Department of Public Works
First Responder:	DPW Utility Investigator, Pollution Control Analyst, or the City's authorized designee
MCD:	Modified Consent Decree entered by the United States District Court in Civil Action No. JFM-02-1524
Pumping Station:	Facilities composed of pumps that lift wastewater to a higher hydraulic elevation, including all related electrical, mechanical, and structural systems necessary to the operation of that pumping station. For the purposes of the

MCD, the term *pumping station* refers to the following facilities:

- (i) Eastern Avenue
- (ii) Brooklyn
- (iii) Dundalk
- (iv) Jones Falls
- (v) Locust Point
- (vi) Quad Avenue
- (vii) McComas Street
- (viii) Westport
- (ix) Stony Run

ERP: Revised Emergency Response Plan prepared pursuant to Paragraph 16 of the MCD.

SDUO: Any discharge of sewage through the City's separate storm sewer system, where the source of the sewage is unknown. Once the source of the SDUO is confirmed, if it originates from the Collection System, it is a Sanitary Sewer Overflow.

SSO: Any spill, release, or discharge of wastewater from any portion of the Collection System, except from NPDES permitted outfalls in accordance with the applicable permit.

SSO Structure: Any structure constructed to allow discharge from the Separate Sanitary Sewer System at a point prior to the headworks of either the Patapsco or Back River wastewater treatment plants.

ATTACHMENT E

**CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
200 Holliday St
Baltimore, Maryland 21202
RAW SEWAGE WATER POLLUTION OVERFLOW NOTICE
The City of Baltimore maintains and operates a separate sewer system**

Date of Occurrence: _____ **Occurrence Location:** _____ **ZIP Code:** _____

Weather Conditions: _____ **Temperature (F):** _____ **SSO ID:** _____ **Insp. ID:** _____

PERSON NOTIFIED WITHIN 24 HOURS OF OCCURRENCE

**MD Department of the Environment
Division of Sewage - Inspection Compliance**

MDE Person Notified:

1800 Washington Blvd
Baltimore, MD 21230

Date of Notification: Not Set
410-537-3510 (After Hours: 1-866-633-4686)

1. Was an active overflow observed? _____ Is overflow still active? _____
Is there evidence of overflow only? _____ Bypass needed? _____
Time of Discharge - Start Date/Time: _____ End Date/Time: _____
Duration of Discharge (minutes): _____ Estimated Flow (GPM): _____
Estimated Volume (GAL): _____ Overflow Type: _____

2. Is the discharge greater than 10,000 gallons? _____

3. Overflow Occured In a Sensitive Area? _____

4. Did the overflow reach a storm drain inlet or waterway? _____

Name of Watershed: _____ Receiving Waters: _____

5. Overflowing Structure: _____ Choke Type: _____

Overflow Feature ID: _____ Choke Feature ID: _____

6. Reason for Overflow: _____

Primary Reason: _____

Secondary Reason: _____

Tertiary Reason: _____

7. Description of Discharge: _____

8. Measures taken to minimize discharge/abate overflow: _____

9. Preventive measure taken to stop reoccurrence: _____

10. Additional Remarks: _____

Title of Preparer: Wastewater Maintenance Supervisor Name of Preparer: _____ WO#: _____ SR#: _____

311 CSR Creation Time: _____

Reviewed By: _____ Review Date: _____

Authorized Signature: _____ **Date:** _____