

CHARLES RIVER POLLUTION CONTROL DISTRICT

COLLECTION SYSTEM OPERATION & MAINTENANCE PLAN

October 2016



Serving the towns of Franklin, Medway, Millis, Bellingham, Norfolk, Sherborn, Dover, Wrentham,
Weston, Holliston, and Sharon

66 Village Street
Medway, MA 02053

Contents

Wastewater Treatment and Collection System Information	4
Wastewater Treatment Plant	4
Legal Authorities and Controls	4
Sewer Use Ordinance.....	4
Joint Sewer System Agreement	5
Geographic Information Systems (GIS)	5
Collection System Details.....	6
Age of Collection System	6
Diameter and Material of Pipe.....	7
Sanitary Sewer Overflow History	8
Preventative Maintenance and Monitoring Program	9
Goals	9
Staffing.....	9
Infiltration and Inflow Identification and Removal Program	11
Infiltration and Inflow Study	11
Manhole Inspection Program.....	14
CCTV Inspection Program	15
Inflow Identification	17
Cleaning	17
Recent I/I Work.....	18
Investigation and Inspection Data Management.....	20
Root Control.....	20
Fats, Oils and Grease (FOG) Program.....	20
Pump Station Maintenance Program	20
Capacity Management	21
Sanitary Sewer Overflow or Bypass Potential.....	21
I/I Related Effluent Violations Prevention	21
Public Information and Education Program	22
Public Call Management Program	22
Program Funding	24
Budget Process.....	24
I/I Capital Improvement Program Overview	24
Population Growth.....	24
Plan Updates	26
Plan Update Process.....	26
Monitoring, Measurement, and Program Modifications.....	26
Appendix A: Sewer Overflow Response Plan.....	28

List of Figures and Tables

Figure 1: Charles River Pollution Control District's Organizational Chart	10
Figure 2: Charles River Pollution Control District Subsystem Map	13
Table 1: CRPCD Typical Flows and Design Flows	4
Table 2: District's GIS Information	5
Table 3: Summary of District's Collection System	6
Table 4: District Interceptor Information.....	6
Table 5: Age of District Interceptors	7
Table 6: Length of Pipe Diameter and Material	7
Table 7: I/I Study Subareas.....	11
Table 8: Sample of District Manhole Inspection Program	15
Table 9: Example of District's CCTV Inspection Program.....	16
Table 10: Proposed Manhole Repair Quantities and Estimated Costs	18
Table 11: I/I CIP Fiscal Year Budgeted Plan.....	24

Wastewater Treatment and Collection System Information

Wastewater Treatment Plant

The Charles River Pollution Control District (District) owns and operates a 5.7 mgd wastewater treatment facility and receives wastewater from the towns of Franklin, Medway, Millis, and Bellingham. The collection system transports wastewater to the treatment facility located at 66 Village Street, Medway MA and which discharges into the Charles River. Table 1 shows the treatment facility's typical flows and design flows.

Table 1: CRPCD Typical Flows and Design Flows

Annual Average Daily Flow (mgd)	Average Daily Dry Weather Flow (mgd)	Treatment Plant Design Capacity (MGD)		
		Average	Max Daily	Max Peak Hour
4.48	4.24	5.70	10.1	20.0

In 1973, the Towns of Franklin and Medway entered into an agreement to construct a treatment facility for both communities. Since 1980, the District has operated the treatment facility that provides advance wastewater treatment. Since then, the Towns of Franklin and Medway have relinquished a portion of their allotted reserved capacity in the District's treatment facility, collection system and outfall sewer to allow the Towns of Millis, Bellingham, Norfolk, Sherborn and Dover to become customers of the District and discharge wastewater and/or septage to the District's facilities for treatment.

The last major upgrade of the wastewater treatment facility was completed in 2016 which encompassed plant-wide improvements to meet more stringent permit limits, improve safety, and increase the reliability of the treatment facility by extending the life of the equipment.

Franklin, Medway, Millis and Bellingham each own the wastewater collection system within their respective jurisdictions and maintain their own collection systems. The District is responsible for only District owned interceptors.

Legal Authorities and Controls

Sewer Use Ordinance

The District has established and implemented regulations regarding the use of the wastewater collection system. The District has a comprehensive sewer use ordinance, consistent with EPA's model ordinance, last updated in 2010. As regulations and requirements have changed, the District has updated the ordinance to address those issues. The ordinances are kept up-to-date and are available in hardcopy and in the future will be available electronically on the District's website.

The items addressed through our sewer use regulations include: sewer use and standards, pretreatment requirements, service connections, hauled waste/septage and permitting of flows into the system. The District intends to update the sewer use regulations to also include access to pipelines and structures. Each community member of the District has their own sewer use

ordinance which each town enforces and must also obey the District's sewer use regulations

Joint Sewer System Agreement

The District was formed in 1979 by the Towns of Franklin and Medway. The Towns of Millis and Bellingham entered into agreements in 1983 and 1984, respectively, and became customers of the District. The Towns of Norfolk, Sherborn, and Dover have also purchased reserved capacity at the District; however these towns are not connected into the sewer collection system as their waste is hauled to the plant as septage. The main items in the agreement are described below:

- The Towns of Franklin, Medway, Millis and Bellingham have ownership and are responsible for the operation and maintenance of their sewer collection system.
- The Towns are responsible for the control of infiltration and inflow in their sewer collection system.
- The District is responsible for inspections, cleaning, repairs and CCTV inspection of its own collection system.
- The District is responsible for determining the annual sewer service assessment for the Towns of Franklin, Medway, Millis and Bellingham. The sewer assessment includes: costs for sewer maintenance, wastewater treatment, and capital improvements for both the wastewater treatment plant and collection system.

To date, the District has not encountered legal issues regarding wastewater flow from the Towns of Franklin, Medway, Millis and Bellingham.

Geographic Information Systems (GIS)

The District uses a Geographic Information System (GIS) to manage the information on the collection system. The District receives support from CDM Smith's GIS specialist department. Table 2 shows the information that is included in the District's GIS.

Table 2: District's GIS Information

GIS Information	
Manholes Basic Map Information <ul style="list-style-type: none">• ID number or other unique identifier• Location, with reference to streets, property lines and manholes• Depth• GPS coordinates• Size• Date built• Rim elevation• Invert elevation• Material type• Manhole study information links• Manhole inspection dates and inspector• Plan or as built source	Pipes Basic Map Information <ul style="list-style-type: none">• ID number or other unique identifier• Location, with reference to streets, property lines and manholes• Size• Direction of flow• Length• Material type• Date built• Slope• Pipe invert elevations• Plan or as-built source• CCTV study information links• CCTV video• Pipe inspection dates and inspector

Pump Stations Basic Map Information <ul style="list-style-type: none"> • ID number • Location • Capacity • Additional information on drawings • Plan or as-built source 	Force Main Basic Map Information <ul style="list-style-type: none"> • ID number or other unique identifier • Location, with reference to streets • Direction of flow and pump station associated • Length • Material type • Date built • Capacity • Slope • Invert elevations • Plan or as-built source
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Collection System Details

The sewer system consists of over 238 miles of sewer pipes, including approximately 13 miles of District owned interceptors, and serves approximately 11,550 service connections. In addition to the sewer mains, the collection system contains 37 pump stations, including the District owned Route 495 pump station which is further discussed in section “Pump Station Maintenance Plan”

Table 3 provides information on the sewer system owned by the four sewer communities and the District. Table 4 shows the breakdown of the District owned interceptors along with their respective length.

Table 3: Summary of District’s Collection System

	Length of Pipe (feet)	Number of Manholes	Number of Pump Stations
District Owned Interceptors	66,125	251	1
Franklin Sewer System	657,925	3364	23
Medway Sewer System	279,790	1342	2
Millis Sewer System	144,062	640	4
Bellingham Sewer System	114,603	540	7
TOTAL	1,262,505	6,137	37

Table 4: District Interceptor Information

Interceptor	Length (linear feet)
Black Swamp (BSI)	5,709
Chicken Brook (CBI)	637
Charles River (CRI)	16,037
Mine Brook (MBI)	23,873
Shepard’s Brook (SBI)	19,869
TOTAL	66,125

Age of Collection System

A former WWTF serviced a large portion of the existing Franklin sewer system. Therefore, that

area includes the oldest sewers in the collection system, with some dating back to the 1910's. Since the District was built in the 1970's and put online in 1980, all sewers in Medway, Millis, and Bellingham, as well as the northern half of Franklin, were built in the 1970's or later. The sewer pipes range in size from 2 to 62 inches in diameter. The District's interceptors range in size from 8 inches to 62 inches in diameter. Information on the District's interceptors can be found in Table 5.

Table 5: Age of District Interceptors

Interceptor	Year Placed Online	Pipe Diameter (inches)	Length (linear feet)
Black Swamp (BSI)	1985	18	52
		24	5,657
Chicken Brook (CBI)	1980	24 (two parallel pipes)	251
		42	386
Charles River (CRI)	1980	48	5,268
		54	10,710
		62	59
Mine Brook (MBI)	1980	18	1,177
		24	7,880
		30	44
		36	2,811
		48	11,961
Shepard's Brook (SBI)	1988	8	5,177
		15	4,284
		18	6,822
		21	3,586

The District-owned interceptors are all gravity sewer except for 1,170 linear feet of force main in the 495 Interceptor after the 495 Pump Station which the District owns and operates.

Diameter and Material of Pipe

Table 6 details the pipe material for each pipe diameter and the amount of linear feet.

Table 6: Length of Pipe Diameter and Material

Pipe Diameter (inches)	Length (linear feet)	Material
8	5,177	Polyvinyl Chloride
15	4,284	Polyvinyl Chloride
18	6,822	Polyvinyl Chloride
18	1,230	Ductile Iron
21	3,586	Polyvinyl Chloride
24	251	Ductile Iron
24	7,110	Polyvinyl Chloride
24	6,427	Reinforced Concrete
30	44	Ductile Iron

36	2,811	Reinforced Concrete
42	386	Reinforced Concrete
48	17,229	Reinforced Concrete
54	997	Precast Concrete
54	9,712	Reinforced Concrete
62	59	Reinforced Concrete
TOTAL	66,125	

Sanitary Sewer Overflow History

The District has not experienced any sanitary sewer overflows (SSOs). To assure sewer capacity the District has developed programs to address capacity, inflow/infiltration, and condition of the collection system. These programs are described later under the “Preventative Maintenance and Monitoring Program” Section.

Preventative Maintenance and Monitoring Program

Goals

This manual combines preventive, predictive and corrective maintenance strategies with best management practices. These documents have been prepared to help the District effectively manage its wastewater collection system and achieve the following goals:

- Prevent public health hazards
- Protect the environment
- Comply with regulations
- Minimize disruptions in service
- Minimize complaints
- Provide quick response to any disruption in service that occurs
- Protect the District's large investment in the sewer collection system by maintaining maximum capacity and extending the useful life of the associated assets
- Prevent unnecessary damage to public/private property
- Efficiently use the funds available for the maintenance of the infrastructure and the operation of services
- Reduce expenditures for emergency maintenance and repair
- Convey wastewater to the District's wastewater treatment facility with minimum infiltration, inflow and exfiltration
- Provide adequate capacity to convey peak flow
- Provide immediate, responsive, and efficient service to all emergency calls
- Provide a safe work environment for employees, employers, and residents
- Perform all operations in a safe manner to prevent personal injury
- Utilize evolving technology to increase our effectiveness and efficiency
- Provide reliable service now and into the future

Staffing

The District has eleven full-time employees. District staff will be responsible for the District's collection system. Specifically, the District's Executive Director, Engineer, and Maintenance Department will be the main contributors. The District uses an engineering consultant who supports the District with its subcontract work and specifications for investigations and repairs. Figure 1 shows the organizational structure of the District.

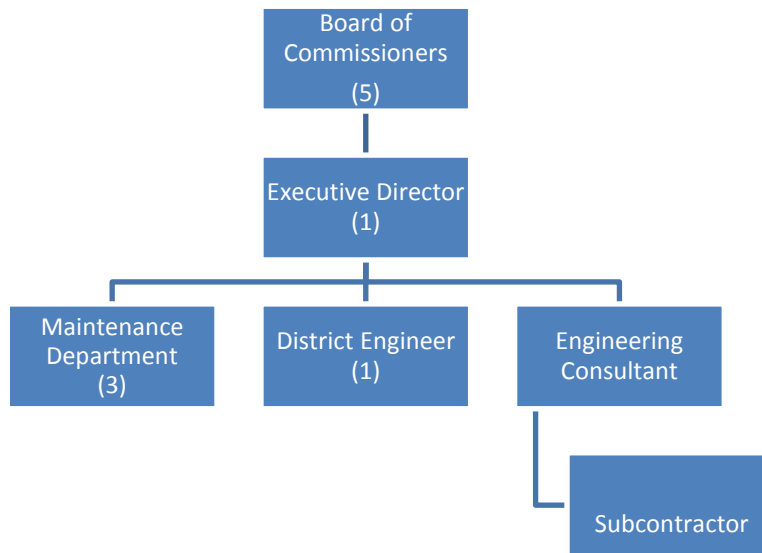


Figure 1: Charles River Pollution Control District's Organizational Chart

Board of Commissioners – The Board of Commissioners is the governing body of the District.

Executive Director – The Executive Director establishes policy, plans strategy, leads staff, delegate's responsibility, allocates resources, authorizes outside contractors to perform services, and may serve as public information officer. In addition, the Executive Director also manages field operations and maintenance activities, provides relevant information to agency, prepares and implements contingency plans and leads emergency response events.

Maintenance Department – The District has three staff personnel in the maintenance department who are able to work in the field and perform or assist a subcontractor if needed with any maintenance work on the collection system.

District Engineer – The District Engineer assists the Executive Director and Engineering Consultants including but not limited to reviewing specifications, reports, and overseeing field work. The District Engineer will oversee the GIS program with assistance from the engineering consultants. In addition, the District Engineer with assistance from the Executive Director will investigate and report SSOs.

Engineering Consultants - The Engineering Consultants prepare wastewater collection system planning documents and document new and rehabilitated assets. Ensure that new and rehabilitated assets meet the District's standards, work with field crews to handle emergencies when contractors are involved, and provide reports to the District.

Subcontractor - The subcontract upon direction from the District or Engineering Consultant may conduct preventive maintenance activities, can mobilize and respond to notification of stoppages and SSOs (e.g., mobilize sewer cleaning equipment, by-pass pumping equipment, and portable generators).

Infiltration and Inflow Identification and Removal Program

Infiltration and Inflow Study

The District's preventative maintenance program is designed to identify and correct areas of excess infiltration and/or inflow and any repairs needed to the system. The program includes, but is not limited to, the following activities:

- Identifying areas of excessive infiltration and inflow by performing a flow monitoring study
- Creating a prioritized list of each area for further investigation
- Determining the condition of the interceptor by performing manhole investigations and/or inspection of the interceptor (CCTV)
- Sampling areas along interceptors for debris for cleaning analysis
- Creating a schedule for repairs identified during the investigations/inspections
- Performing the repairs if deemed cost effective and monies are available

The first step in the program is to perform an infiltration and inflow study of the collection system. In the spring of 2013, the District contracted with CDM Smith to conduct a flow monitoring program in order to determine areas subject to excessive infiltration/inflow (I/I) in the District owned interceptors. The program provided the basis for recommending diagnostic investigations to develop an effective remediation program to reduce the levels of extraneous flows within the interceptors to acceptable limits. The District owned interceptors were divided into subsystems to be individually monitored. Thirteen subsystems were delineated by isolating segments of the interceptors. Table 7 shows the 13 subsystems and their respective lengths. As shown, there were two subsystems which had no District owned sewer lines.

Table 7: I/I Study Subareas

Subsystem	Interceptor Length (LF)
Black Swamp Interceptor (North)	274
Black Swamp Interceptor (South)	5,145
Charles River Interceptor (East)	9,582
Charles River Interceptor (West/South)	4,011
Chicken Brook Interceptor	0
Mine Brook Interceptor (Central)	17,229
Mine Brook Interceptor (North)	5,203
Mine Brook Interceptor (South)	7,154
Shepard's Brook Interceptor (Central)	6,178
Shepard's Brook Interceptor (North)	4,609
Shepherds Brook Interceptor (South)	7,202
Beaver Brook Interceptor	0
Route 140 (Bellingham)	0

Figure 2 shows a map of each subsystem. The Charles River Interceptor (East) and (West/South) were combined during the analysis of the study due to a problem with a flow meter.

The study found that the District's infrastructure is generally in good condition, with no areas identified over the MassDEP threshold of 4,000 gpd/idm. Based on the analysis, the subsystems were ranked from highest priority to lowest as listed below:

- Charles River Interceptor (both West/South and East)
- Mine Brook Interceptor (Central/South)
- Mine Brook Interceptor (North)
- Shepards Brook Interceptor North
- Shepards Brook Interceptor South
- Black Swamp Interceptor
- Shepards Brook Interceptor Central

The greatest emphasis was given to the first three subsystems.

The study recommended that the District have the subsystems investigated further. The investigation work would include inspecting each manhole in the subsystem followed by cleaning and performing a CCTV inspection of the interceptor. Based on the results from the inspections the District would then prioritize the repairs.

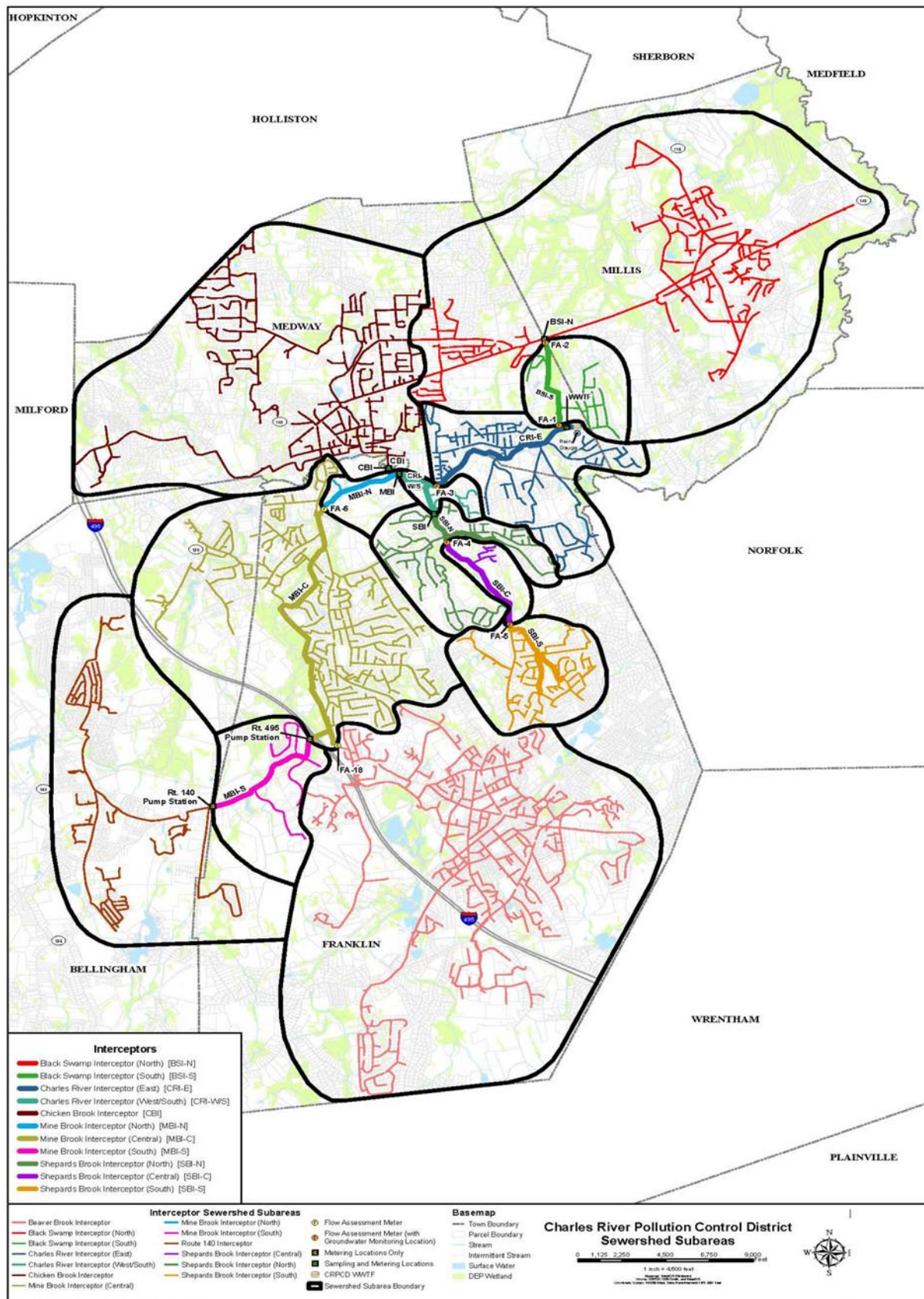


Figure 2: Charles River Pollution Control District Subsystem Map

Manhole Inspection Program

One of the recommendations from the I/I study was for the District to conduct manhole inspections. It was determined that the manhole inspection program should be completed prior to the CCTV inspection program in order to gather critical information on the condition of the interceptor. Information such as sediment levels, physical condition of the interceptor, and typical flow levels would help guide the direction of the CCTV inspection program.

The manhole inspections help keep our asset inventory up to date and are used not only to update collection system maps, but to determine structural condition. The manhole inspection program is completed by a subcontractor using NASSCO Manhole Assessment & Certification Program (MACP) standards. MACP standards result in a comprehensive assessment to determine the overall condition of the manhole by identifying what defects, if any, need to be corrected. NASSCO uses two MACP condition assessment inspection protocols:

- A Level 1 inspection gathers basic condition assessment information to evaluate the general condition of a manhole and to gather enough information to determine if a comprehensive Level 2 inspection is appropriate. A Level 1 inspection can be completed without manned entry into a manhole.
- A Level 2 inspection gathers detailed information to determine the condition of a manhole, fully document all existing defects, and provide specific information to specify corrective actions.

MACP uses the established defect coding system found in the Pipeline Assessment and Certification Program (PACP) to the extent possible. The following information is to be collected for each manhole during the inspection program:

- Identify the physical condition of all manhole aspects (cover, frame, chimney, cone, wall, bench, channel, pipe connection)
- Identify visible sources of I/I, either inflow from surface runoff or infiltration from groundwater
- Identify deterioration mechanisms such as erosion, abrasion, hydrogen sulfide induced corrosion, etc.
- Collect GPS coordinates for all manholes
- Measure sediment depth in the invert of each manhole
- Prepare sediment samples for selected manholes
- Identify manholes which are missing frame and cover bolts and covers with missing or deteriorated gaskets
- Take photos looking upstream and downstream into all incoming and outgoing pipelines

Based on the findings from the manhole inspection program recommendation are made for the rehabilitation of the manholes. Rehabilitation methods include manhole repair through chemical sealing injection and grouting, epoxy or cementitious lining of the bench, wall joint or entire manhole, chimney repair through grouting, and replacement of chimneys with new HPDE grade rings. In addition, an estimated I/I is quantified in order to help prioritize repairs.

Table 8 shown below is an example of the District manhole inspection program. The District is able to track each manhole using an unique ID and the following:

- If level 1 or level 2 inspection was conducted

- Defects (encrustations deposits, roots, infiltration weeper, etc.)
- Clock position of defects
- Sediment depth
- Frame and cover bolts/gasket notes
- Recommended repairs (manhole sealant, chimney repair, HDPE grade rings, etc.)

Table 8: Sample of District Manhole Inspection Program

MH ID	Map No.	Level 1 Inspection	Level 2 Inspection	Defects	Clock Position of Defect	Sediment Depth (in)	Frame and cover bolts/gaskets notes
CHARLES RIVER INTERCEPTOR							
Med-6532	1	✓	✓	DAE (encrustation deposits) at interior wall	5	0	-
				DAE (encrustation deposits) at interior wall	12		
				DAE (encrustation deposits) at interior wall	10		
Med-6531	1	✓		-	-	0	-
Med-6530	1	✓		-	-	0	-
Med-6528	1	✓		DAE (encrustation deposits) at interior wall at pipe connection	9 to 3	0	-
Med-6527	1	✓		IS (infiltration stain) at interior chimney	12 to 12	0	-
				DAE (encrustation deposits) at interior wall	10		
Med-6526	1	✓		IS (infiltration stain) at interior chimney	12 to 12	0	-
Med-6665	1	✓	✓	DNF (fine ingress deposits) at interior wall	12 to 12	0	-
Med-6239	1	✓	✓	-	-	0	-
Med-6240	1	✓		MMS (missing mortar small) at interior chimney	12 to 12	0	-
Med-6241	1	✓		-	-	0	-
Med-6242	1	✓	✓	DNF (fine ingress deposits) at bench	12 to 12	0	-
Med-6243	2	✓		-	-	0	4 bolts broken, broken gasket
Med-6244	2	✓		-	-	0	-
Med-6245	2	✓		SRI (surface wear/roughness) at interior wall	12 to 12	0	2 broken bolts, broken and dry rotted gasket
				CL (crack longitudinal) at interior wall	9		
Med-6246	2	✓	✓	DNF (fine ingress deposits) at bench	12 to 12	0	4 broken bolts, no gasket
Med-6247	2	✓	✓	DSF (fine settled deposits) at interior wall	12 to 12	0	4 missing bolts
Med-6248	2	✓		DAE (encrustation deposits) at interior wall	2	0	4 missing bolts, gasket broken and dry rotted
				MMM (missing mortar, medium) at interior chimney	6 to 6		
Med-6249	2	✓	✓	DAE (encrustation deposits) at interior wall	2	0	4 missing bolts, gasket broken and dry rotted
Med-6250	2	✓	✓	DAE (encrustation deposits) at interior wall	9 to 3	0	-
Med-6251	2	✓		ID (infiltration dripper) at interior wall	11 to 1	0	-
				ID (infiltration dripper) at interior wall	10		
				ID (infiltration dripper) at channel	8		
Med-6252	2	✓		IS (infiltration stain) at interior chimney	12 to 12	0	3 bolts missing and 1 bolt broken, no gasket
Med-6253	2	✓		DAE (encrustation deposits) at interior wall	12 to 2	0	no bolts and no gasket
Med-6171	2	✓		DAE (encrustation deposits) at interior wall	2 to 4	0	2 broken bolts, broken gasket and dry rotted
Med-6172	3	✓		RFB (fine roots) at interior chimney	12 to 3	0	4 bolts missing and broken gasket
Med-6173	3	✓		IR (infiltration runner) at interior service pipe connection	8	0	2 bolts missing, no gasket
Med-6174	3	✓		IS (infiltration stain) at interior wall	11 to 3	0	1 broken bolt, gasket dry rotted
				DAE (encrustation deposits) at channel	3		

The recommended manhole rehabilitation work should be completed in conjunction with the potential interceptor rehabilitation work. The manhole inspection program provides detailed information to both identify manhole defects and repairs and clarify the needs for the CCTV inspection program. The repairs can be performed in conjunction with one another if the type of pipelines repairs identified suggests greater efficiency in coordinating the two repair programs.

CCTV Inspection Program

The second type of inspection recommended by the I/I study was a Closed-Circuit Television Camera (CCTV) inspection. The purpose of the CCTV inspection program is to determine the physical condition of the interceptor and identify, locate, and quantify specific sources of I/I above the flow line. Based on the results of the manhole inspection program the amount of sediment found will decide if cleaning of the interceptor needs to be done prior to the CCTV inspection.

The interceptors are inspected using a closed-circuit television camera. The camera can identify trouble hot spots, such as cracked or broken pipe, offset joints, blockages, and any other defects above the flow line. The CCTV inspection program shall be completed using NASSCO's Pipe Assessment and Certification Program (PACP) standards. PACP allows for standardization of inspection data and provides condition ratings for each pipe segment, which is a vital step in determining cost effective approach in rehabilitating the interceptors.

Each defect found will be graded on a scale of 1 to 5 (with 5 being the worst) for O&M and structure/condition. An O&M defect is denoted with an "M" before the grade and a structural

defect is denoted with an “S” before the grade. If defects were observed to be leaking (infiltration) or if a “running” service was found, then flow estimates in gallons per minute (gpm) were quantified by a visual estimate.

Table 9 is an example of the District’s CCTV inspection program. The table summarizes the identified main line defects, service connection defects, and “running” services for all sewer reaches (A running service is defined as a service with clear flow observed but the source of the flow is unknown or could not be identified.). For each defect, the location in feet from the downstream manhole, the infiltration rate in gpm (if applicable), the defect observation and the grade are provided. The CCTV program allows the District to track:

- Pipe information (size, material, length, etc.)
- O&M and structural related defects
- Cracks in sewer pipe
- Leaking of pipe joint
- Sediment intrusion
- Concrete deterioration
- Service connection defects
- Root intrusion
- Evidence of I/I
- Manhole pave overs
- Other deficiencies that factor into condition assessment
- Grease

Table 9: Example of District’s CCTV Inspection Program

Pipe Information						Main Line Defects				Service Connection Defects				Running Services			
From MH	To MH	GIS ID	Dia. (in)	Material	Length	Location	Flow (gpm)	Observation	Grade	Location	Flow (gpm)	Observation	Grade	Location	Flow (gpm)	Observation	Grade
Flume #1	Fra-2359	4147	36"x62" & 48"	RC & PCC	249.2	0-249		Surface Aggregate Visible	S3								
						75		Infiltration Stain									
Fra-2359	Fra-7645	6482	54"	RC	467	0-467		Surface Aggregate Visible	S3	117		Tap Break-in Intruding	M2				
						82		Repair Patch									
Fra-7645	Fra-7646	6499	54"	RC	362	0-362		Surface Aggregate Visible	S3								
						4		Deposits Attached Encrustation	M2								
						240		Deposits Attached Encrustation	M2								
						281	2	Infiltration Gusher	M5								
Fra-7646	Fra-7647	6498	54"	RC	385	0-385		Surface Aggregate Visible	S3								
						66		Deposits Attached Encrustation	M2								
						209		Infiltration Stain									
						217		Deposits Attached Encrustation	M2								
						241		Crack Longitudinal	S2								
						247		Crack Longitudinal	S2								
						274		Alignment Right	M1								
						298		Deposits Attached Encrustation	M2								
						303		Deposits Attached Encrustation	M2								
						332		Deposits Attached Encrustation	M2								
						378		Deposits Attached Encrustation	M2								
						380		Alignment Right	M1								
Fra-7647	Med-6921	6497	54"	RC & PCC	213	0-213		Surface Aggregate Visible	S3								
						23		Deposits Attached Encrustation	M2								
						30		Deposits Attached Encrustation	M2								
						37		Crack Longitudinal	S2								
						65		Crack Longitudinal	S2								
						128		Crack Longitudinal	S2								
						142		Deposits Attached Encrustation	M2								
Med-6921	Med-7644	6495	54"	RC	277	0-277		Surface Aggregate Visible	S3								
						238		Deposits Attached Encrustation	M2								
						272		Deposits Attached Encrustation	M2								
Med-7644	Med-6176	6494	54"	RC	223	0-223		Surface Aggregate Visible	S3								
						87		Infiltration Stain									
						203		Deposits Attached Encrustation	M2								
						217		Deposits Attached Encrustation	M2								
Med-6176	Med-6199	5523	54"	RC	324	0-324		Surface Aggregate Visible	S3								
						28		Deposits Attached Encrustation	M2								
						249		Deposits Attached Encrustation	M2								
						312		Deposits Attached Encrustation	M2								
Med-6199	Med-6175	4376	54"	RC	170	0-170		Surface Aggregate Visible	S3								
						74		Deposits Attached Encrustation	M2								
						81		Deposits Attached Encrustation	M2								
Med-6175	Med-6174	4377	54"	RC	112	0-112		Surface Aggregate Visible	S3								
Med-6174	Med-6173	4378	54"	RC	363	0-363		Surface Aggregate Visible	S3								
						18		Deposits Attached Encrustation	M2								
						129		Deposits Attached Encrustation	M2								
						359		Deposits Attached Encrustation	M2								

Based on the results of the CCTV inspection the District may in addition perform a multi-sensor

inspection (MSI) which can be taken simultaneously with the CCTV inspection. A MSI collects the following data:

- Sonar data allows an understanding of grit build up or pipeline defects below the water level not visible by traditional CCTV inspection.
- Hydrogen sulfide monitoring can identify areas with high levels of hydrogen sulfide which is the main contributor to corrosion of pipelines.
- Laser scanning is used to supplement the visual observation data collected during CCTV inspection to gain an understanding of pipeline condition including pipe wall thickness, deposit thickness, or material loss. The data is used to assess pipeline conditions and possible repair approaches

After performing the manhole and CCTV inspection the District can then determine and properly prioritize the rehabilitation program for the collection system. Rehabilitation methods for the interceptors could include trenchless rehabilitation, polymeric lining (spray-on lining) and cured-in-place pipe (CIPP) via ultraviolet (UV) or stream/water curing.

Pipe condition information is used to determine short and long term maintenance strategies including increased cleaning, root treatment, sewer line repair, or replacement. The condition assessment helps establish the cleaning frequency and inform the District's capital planning. As more condition assessment information becomes available, the priority of capital projects may change.

Inflow Identification

Inflow is stormwater that enters a sewer system via directly connected building roof leaders (gutter drain spouts), foundation drains, yard drains, driveway catch basins, drains from springs and swampy areas, leaking manhole covers, and any cross connections between storm drains and sanitary sewers, and illegally connected building sump pumps.

During the manhole investigations and CCTV inspections, inflow will be investigated and identified. In addition, the District will be working on identifying additional sources of inflow in the interceptors.

The first step is to identify all of the direct connections in the interceptors. This will be done by using the GIS map and the CCTV video data. Once that has been done, the District will perform inspections of each site. If there are sources of inflow the District will work with the owner to redirect the water.

As part of the MassDEP regulations, the District will evaluate the District owned Collection system for a five year 24 hour storm event.

Cleaning

Cleaning of the interceptors will be assessed during the manhole investigation program. If minimal debris is found then cleaning does not need to be performed.

If minimal debris is found then it should not be a problem to move forward with the CCTV inspection because CCTV equipment for large diameter pipes is equipped to traverse over sediment and debris. The District also evaluates the need for cleaning based on historical flow data. Under the highest flow conditions, if the flow levels will exceed one-third of the pipe diameter then cleaning should be considered. Based on the results, gaining capacity from the

pipe cleaning is determined to be either critical or non-critical.

In addition, if the system exhibits frequent back-ups due to partial or full blockages then the District will re-evaluate its cleaning program.

Recent I/I Work

In addition to the I/I study conducted in 2013, the District has also perform a manhole investigation and CCTV inspection programs in the Charles River Interceptor Subsystem in 2014 and 2016, respectively.

Manhole Investigation Program

The manhole inspection program was performed on 35 manholes along the Charles River Interceptor and six manholes along the Shepards Brook interceptor. It was also determined that one manhole along the Black Swamp Interceptor needed to be inspected due to known infiltration.

All inspections included entry into the manholes for observation of both the manhole itself and the upstream and downstream interceptor pipelines. Level 1 inspections were completed for all 42 manholes and Level 2 inspections were completed for 13 of the 42 manholes. Below is a general summary of the findings

- Five manholes were identified with structural defects as follows:
 - Two manholes with missing mortar at the brick chimney
 - One manhole with a circumferential crack in the exterior brick chimney
 - One manhole with surface wear/roughness along the interior wall
 - One manhole with a longitudinal crack along the interior wall
- 30 manholes were identified with I/I-related defects:
 - 20 manholes with encrustation or settled deposits inside the manhole
 - Four manholes with infiltration staining
 - Seven manholes with visible infiltration
 - Nine manholes with root intrusion
- Nine manholes had no observed defects
- Only one manhole had measureable sediment in the invert (1-inch)
- 15 manholes had broken, deteriorated, or missing manhole cover gaskets
- 20 manholes had at least one broken or missing manhole cover bolt

Based on the results of the manhole inspection program, it was recommended that 32 manholes be rehabilitated, as shown in Table 10.

Table 10: Proposed Manhole Repair Quantities and Estimated Costs

Repair type	Estimated Unit Cost	Estimated Quantity	Total Estimated Cost
Cleaning and Sealant	\$900 each	27 each	\$24,300
Cleaning, Sealant and Cementitious Lining of Bench	\$900 each	4 each	\$3,600

Cleaning, Sealant and Cementitious Lining of Manhole	\$200 per vertical foot	126 vertical feet	\$25,200
Cleaning, Sealant and Epoxy Lining of Manhole	\$600 per vertical foot	15 vertical feet	\$9,000
Chimney Repair (Grouting)	\$700 each	6 each	\$4,200
HPDE Grade Rings	\$1,100 each	6 each	\$6,600
New Gasket and Bolts	\$250 each	42 each	\$10,500
TOTAL CONSTRUCTION COST (without engineering)			\$83,400

It was estimated that by performing these repairs about 25,000 gpd could be eliminated in average annual infiltration.

Closed Circuit Television (CCTV) Inspection

In March 2016, CCTV inspection was performed for the Charles River Interceptor subsystem, which included about 11,000 feet of the Charles River Interceptor and about 2,000 feet of the Shepards Brook Interceptor. In addition to the CCTV inspection data a multi-sensor inspection (MSI) was completed. As part of the MSI, additional data was collected to supplement the visual data captured under the CCTV inspection. (Due to budgetary constraints, only the CCTV inspection data was post-processed and reported under this program).

Below is a general summary of the findings from the CCTV inspection program. Note that a sewer reach may have multiple defects.

Charles River Interceptor (35 sewer reaches total)

- 26 sewer reaches were identified with O&M-related defects
 - three with visible infiltration (five defects totaling 4.1 gpm of infiltration)
 - eight with infiltration stain (nine defects total)
 - 25 with encrustation or settled deposits (103 defects total)
 - Four break-in sewer services
- 35 sewer reaches were identified with structural defects
 - 35 with varying degrees of surface roughness and surface aggregate visible
 - four with longitudinal crack(s) at crown of pipe (seven defects total)
- Six “running” sewer services

Shepards Brook Interceptor (7 sewer reaches total)

- No sewer reaches with identified O&M-related defects
- One sewer reach with structural defects (surface roughness increased)
- Two “running” sewer services

Given the minimal infiltration sources identified and varying degrees of concrete corrosion, it was recommended that the MSI data collected along the 35 sewer reaches in the Charles River Interceptor be post-processed and reviewed to determine the extent of concrete deterioration. No additional investigations or repairs are recommended on the Shepards Brook Interceptor.

A MSI typically includes CCTV for visual observations above the flow line (already completed), sonar for inspection under water, laser modeling, and H₂S gas monitoring. Sonar sensors accurately profile the pipe below the flow line and identify any changes in diameter, holes, or

protrusions. Laser modeling determines the precise size and shape of the pipe and provides a quantitative assessment of deformation, corrosion and alignment. H₂S gas monitoring determines portions of the interceptor which may be vulnerable to the adverse effects of H₂S.

The District will be proceeding with post-processing and reviewing the MSI data in FY 2017. After the data has been reviewed, the District, along with CDM Smith, will determine what repairs will be performed on the subarea. Once the repairs are complete then the District will move to the second highest priority subsystem.

Investigation and Inspection Data Management

All reports from CDM Smith for any cleanings, inspections, investigations and assessments are stored by the District in electronic and hard copy files. In addition, the reports, camera footage, inspection data, etc. are incorporated into the District's GIS.

Root Control

If there are any tree roots in the collection system, they will be identified during the manhole investigations and CCTV inspection programs. No large roots have been found to date.

Fats, Oils and Grease (FOG) Program

Grease and grease like products can significantly increase the likelihood of sewer overflows. Grease can also cause blockages or aggravate blockages due to roots or structural deficiencies. Restaurants, cafeterias, and other food service facilities, as well as industrial facilities, can discharge grease as part of their normal sanitary flows that can lead, in time, to blockages, backups and overflows. The discharge of fats, oil and grease (FOG) is regulated by each town. The Millis' Board of Health regulates their FOG program, and the Franklin and Medway Department of Public Works regulates their FOG program. The District's industrial pretreatment program regulates all industries which discharge process water into the sewer system.

Pump Station Maintenance Program

The District owns and operates one wastewater pump station with a capacity of 7.2 gallons per day and an average daily flow of approximately 500,000 gallons per day. The pump station is located at 111 Corporate Drive in Franklin, MA. The pump station is routinely checked by trained personnel through daily inspections and the SCADA system. During these inspections, operators review pump run hours, totalized flow, wet well levels and alarms. A back-up generator is also exercised monthly by the maintenance staff. On a semi-annual basis, the District removes grease build up in the wet wells and annually the flow meter is calibrated.

Inspection, maintenance and repair activities are recorded on maintenance tour logs and recorded into the computerized maintenance management system (CMMS). If a problem or maintenance issue is encountered, personnel will report it immediately to the Maintenance Supervisor or Executive Director. The CMMS automatically generates work orders for repairs and routine maintenance. Repairs are a higher priority than routine maintenance.

The District has a Supervisory Control and Data Acquisition (SCADA) system that monitors the pump station and sends alarms to the on call operator in the event of a malfunction or

emergency. The SCADA system continuously records and stores the following information:

- Number of pumps in operation
- Status of pumps (including operational alarms)
- Current pumping flow rate
- Historic flow rate (24 hour Flow Chart)
- Pump start / stop cycles
- Pump run times
- Power status (including power failure alarms)
- Wet well conditions (level, lead / lag pump levels, etc.)
- All other alarms

Manufacturer's Operation and Maintenance (O&M) manuals for equipment are located at the pump station and at the treatment facility.

Capacity Management

The District's collection system has to date not exceeded design capacity to transport wastewater flows from the member towns to the treatment facility. Based on historical flow data, under the highest flow conditions, flow levels do not exceed one-third of the pipe diameter.

Annually, after the flows from each Town are calculated the District will compare each Town's flows with the capacity of each interceptor. If an interceptor is nearing its capacity, then the District will look at steps to reduce the flow and/or increase the size of the pipe.

When a new industry or development has proposed connecting into the collection system, the District will review the interceptors' capacity to convey the wastewater.

As part of the MassDEP regulations, the District will investigate adopting a plan for mitigating impacts from any new connection or extension where proposed flow exceeds 15,000 gallons per day. Such mitigation shall require that four gallons of infiltration and/or inflow be removed for each gallon of new flow to be generated by the new sewer connection or extension.

Sanitary Sewer Overflow or Bypass Potential

The District has not had a sanitary sewer overflow (SSO) or bypass in its collection sewer nor does it see any potential for one of these events to occur. The District is not a combined sewer system and prohibits stormwater flows into the collection system. In addition, as mentioned above, the interceptors, even at the highest flow rates, are only filled to approximately one-third of the pipe diameter. Given this information, the District does not see any potential of an SSO or bypass event in the interceptors.

I/I Related Effluent Violations Prevention

Annually, the District will review its NPDES permit compliance and identify any violations that were attributed to I/I. If there are a number of instances of non-compliances due to I/I then the District will try to identify where in the system the I/I may have come from. The District will analyze the data from its flow metering stations throughout the collection system and work with

the Towns to identify the problem area.

Public Information and Education Program

The District plans to use the following means of communication to distribute information and educate the public:

- District's Website
- Local Media (TV and Newspaper)
- Town Hall Meetings
- District Meetings
- Public Hearings
- Site Visits
- Signs/Postings
- School Classroom Presentations
- Letters or Notices to Abutters or Stakeholders
- Brochures or Pamphlets in each Town's Sewer Bill

Types of information and education provided include:

- Sewer System Evaluation
- Sewer Use Ordinances
- Major Repairs and Rehabilitation Projects
- Types of Waste Treated
- Industrial Pretreatment Requirements
- Road Closures
- Wastewater Treatment Processes
- Customer Emergency Response
- Grease Handling Information
- Complaint Procedures
- Grease Disposal Pamphlet
- Service Connection Requirements
- Private Hauler Instructions
- Wastewater Collection and Treatment

Public Call Management Program

The District is responsible for responding to public calls about the collection system for the District owned interceptors. Response is performed by the District staff and includes both assessing the information and resolving the problem. The majority of the calls in the past are related to noise and odor.

The calls are entered into our log book and include the following detailed information:

- Receiver of call
- Time and date of request
- Form number (Work Order)

- Caller information (Name, address, call back phone number)
- Location of the problem
- Type of call (home back up, odor, manhole overflow, etc.)
- Specific request
- Personnel assigned to call
- Findings type, including cause of problem
- Closeout information
- Date closed

Once a call is assigned, District personnel will perform an investigation. If the problem cannot be immediately resolved, the District will generate a work order to take appropriate action for permanent correction of the problem. If the District is not responsible for correcting the problem, the Town DPW will be notified. Once an investigation has been completed, the staff enters closeout information into the log book. Appendix B depicts the log template.

Program Funding

Budget Process

The District prepares an annual budget which includes both O&M and capital expenses. The collection system investigation/inspection work is paid for out of the capital funds. Depending on which interceptor the work is in, the towns are assessed based on the reserved capacity they own in the given interceptor. Based on the I/I capital improvement plan, the District budgets an estimated amount to complete the work for the fiscal year.

Collection system expenses include:

- **Professional Services** includes planning and engineering studies for investigations, inspections, and repair or replacement projects.
- **Contractor Services** includes contractual work for cleaning sewer lines and manholes, CCTV, performing manhole and pipe repairs or replacements and improvements to the collection system map.

I/I Capital Improvement Program Overview

The District has developed a long-range I/I CIP program covering a 5-year period that is updated annually. Table 12 details the I/I CIP program which is funded through the District's annual budget. The District also has a capital reserve fund which can be used in the case of an emergency repair.

Table 11: I/I CIP Fiscal Year Budgeted Plan

Fiscal Year	I/I Work	Budgeted/Spent Monies
2013	Infiltration and Inflow Study	\$44,962
2014		\$91,938
2015	Manhole Investigation of the Charles River Interceptor (CRI) Subsystem	\$21,230
2016	CCTV CRI Subsystem	\$55,000
2017	Repair manhole and pipe defects in half of CRI subsystem	\$150,000
2018	Repair manhole and pipe defects in second half of CRI subsystem	\$150,000
2019	Investigate 40 manholes in the Mine Brook Interceptor (MBI) Central/South Subsystem	\$70,000
2020	CCTV MBI Central/South Subsystem	\$120,000
2021	Repair manhole and pipe defects in half of MBI subsystem	\$175,000

Population Growth

In 2012, the District and CDM Smith completed a 20 year Capital Improvement Plan (CIP) for the treatment facility. During the design of the CIP, CDM Smith contacted each town and inquired about their population growth. CDM Smith collected information from each Town and projected their flows to year 2035. Based on the projections, the Towns appear to within their

capacity at the treatment facility and collection system.

In each Town, when a new connection is proposed, the Town must receive approval from the Executive Director before the permit is approved. The Executive Director confirms that the Town has enough reserved capacity before approving connections.

Plan Updates

Plan Update Process

The District will complete annual reviews of our Preventive Maintenance program and this plan beginning in November 1, 2017. The review will consider the progress that has been made in developing and implementing our Preventive Maintenance Program, the results of our monitoring program and will incorporate any updates to this Plan including, but not limited to:

- Changes to organizational structure, information management, contacts, and system maps,
- Changes to information on the collection system, such as the size and age of pipes, to incorporate information on repairs completed during the year,
- Incorporation of successful cleaning, inspection and assessment program improvements during the past year,
- Changes to our Sewer Use Ordinance program,
- Updates to our pump station inspection and maintenance program,
- Updates as we evaluate our collection system capacity,
- Budget and capital planning updates,

As the sewer inspection history of any segment of pipe is retrievable electronically and the data is used to develop condition ratings, these aids in prioritizing future sewer rehabilitation projects, maintenance activities, and updating this plan. The latest version of Collection System O&M Manual will be made available on the District's website.

Monitoring, Measurement, and Program Modifications

The District maintains complaint and blockage records in a logbook, maintains our records of cleaning and other preventive maintenance activities, and records problems (e.g., excessive debris, observed manhole defects) identified through regular sewer maintenance activities.

The information available in the Reports, GIS, and the SSO reporting system, are used to help measure the effectiveness of our program by tracking various parameters related to service calls and our maintenance and inspection activities. We also measure our effectiveness by comparing SSO trends from previous years and identifying system components that continually contribute to system failures. Specifically, we currently will track the following parameters with which to measure the effectiveness of this Plan and its effectiveness in reducing SSOs and meeting the goals we set:

- Number of SSOs per year
- Volume of SSOs per year
- Number of dry weather SSOs per year
- Number of SSOs per year by cause (e.g., roots, grease, pipe failure, I/I, pump failure or other deficiency, etc.)
- Response time to SSOs and other service calls (time from call received to first responder arriving on site)
- Length of gravity sewers cleaned annually
- Actual versus scheduled cleaning dates for gravity sewers
- Length of gravity sewers CCTV inspected annually

- Record of pump station maintenance work orders completed annually
- Percent of system rehabilitated (repaired or upgraded) each year
- Improvements in capacity due to reductions in I/I
- Safety history/incidents

This information will be assessed and reported to the Board of Commissioners during our annual meeting as we keep District officials and coordinating departments up to date with our infrastructure work. Changes to this Collection System O&M Manual will address issues identified through this monitoring program and during our annual update and review.

Appendix A: Sewer Overflow Response Plan

Contents

RESPONSE INFORMATION	30
District Contacts.....	30
District Towns' Contact Information.....	30
Recording the Report of Possible Sanitary Sewer Overflow (SSO).....	33
Confirming Overflows	33
Reporting Overflows.....	33
INTRODUCTION	34
Goals	34
Overview.....	34
Specific Known Vulnerabilities	35
Pump Stations	35
Force Mains	35
OVERFLOW NOTIFICATION PROCEDURE	36
Overview	36
Receipt of Information Regarding an SSO	36
RESPONSE TO OVERFLOWS	37
Preliminary Assessment.....	37
EMERGENCY RESPONSE PROCEDURES	38
Sewer Blockage or Back up into Basement	39
Steps to be taken by Property Owner when Sewerage Back-up is due to Blockage in Private Lateral Connection.....	41
Overflowing Sewer Manhole Resulting from Surcharged Trunk Sewer	42
Cavities and Depressions in Streets and Lawns.....	44
Sewage Force Main Break	45
Sewer Main Break/Collapse	47
Air Release and Vacuum Relief Valve Failure.....	49
Wastewater Pump Station Alarms General Response Actions	50
Pumping Station Failure Caused by Secondary Power Failure	51
EMERGENCY SUPPORT	52
Spill Contractor:.....	52
Mutual Aid Agreements.....	53
OVERFLOW REPORTING	54

Overview	54
Reporting Details	55
Customer Follow-up	56
Guidance on Estimating Sewer Overflow Volumes	56
APPENDIX B: PUBLIC CALL LOG TEMPLATE	58
APPENDIX C: SANITARY SEWER OVERFLOW/BYPASS NOTIFICATION FORM	59
APPENDIX D: CCTV INSPECTION COMPANIES	60
APPENDIX E: BYPASS PUMPING COMPANIES	61

List of Tables and Figures

Table 1: Responsibilities Chart	32
Table 2: Table 495 Pump Station Details and Potential Impact Areas	35
Table 3: Sewer Blockage or Back up into Basement.....	40
Table 4: Overflowing Sewer Manhole Resulting from Surcharged Trunk Sewer.....	43
Table 5: Cavities and Depressions in Streets and Lawns	44
Table 6: Sewage Force Main Break	46
Table 7: Sewer Main Break/Collapse	48
Table 8: Air Release and Vacuum Relief Valve Failure.....	49
Table 9: Wastewater Pump Station Alarms General Response Actions.....	50
Table 10: Pumping Station Failure Caused by Secondary Power Failure	51
Table 11: SSO Notification Contacts.....	54

Response Information

District Contacts

Elizabeth Taglieri, Executive Director

Plant: 508-533-6762 ext. 39

Cell: 413-522-4768

Dan Pickering, Maintenance Supervisor

Plant: 508-533-6762 ext. 23

Cell: 508-615-8581

Gary Farquharson, Assistant Chief Operator

Plant: 508-533-6762 ext. 36

Cell: 508-416-0522

Kristen Mucciarone, District Engineer

Plant: 508-533-6762 ext. 21

Cell: 802-782-3325

District Towns' Contact Information

Medway

Fire Department	508-533-3211
Police Department	508-533-3212
DPS Director	508-533-3275
Power Co. (Eversource)	800-592-2000

Millis

Fire Department	508-376-2361
Police Department	508-376-5112
Public Works Director	508-376-5424
Power Co. (Eversource)	800-592-2000

Franklin

Fire Department	508-528-2323
Police Department	508-528-1212
Public Works Director	508-520-4910
Power Co. (National Grid)	800-465-1212

Bellingham

Fire Department	508-966-1112
Police Department	508-966-1515
Public Works Director	508-966-5816
Power Co. (National Grid)	800-465-1212

Milford Medical Center 508-473-1190

DEP Central Region 508-792-7650

MEMA 508-820-2000

In the event that the telephone and radio systems are down, please meet at the District located at 66 Village Street, Medway MA 02053.

Below is a map of the collection system. The bolded pipes are the District owned interceptors.

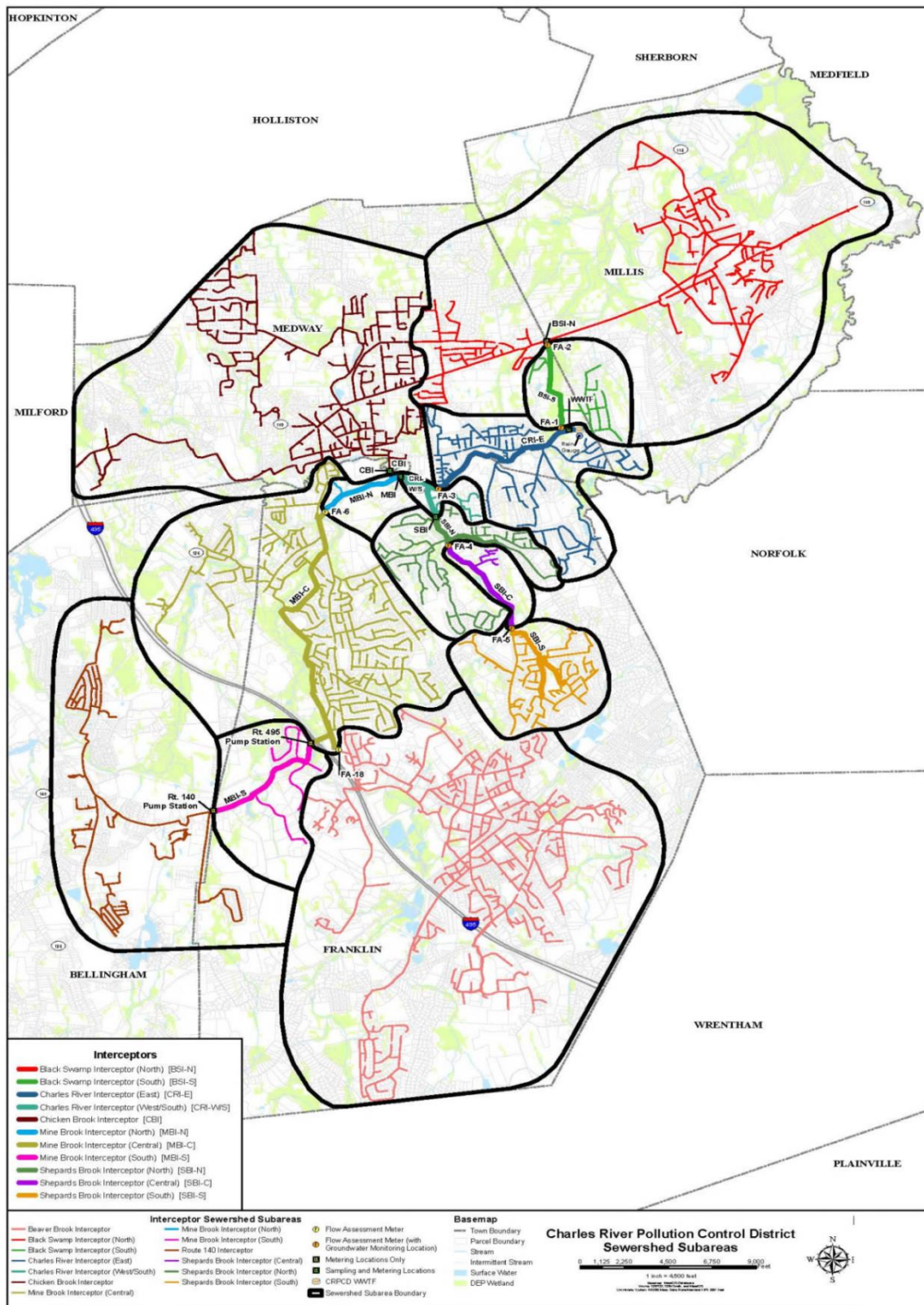


Figure 1: Charles River Pollution Control District Subsystem Map

The first response step when a Sanitary Sewer Overflow (SSO) occurs is to contact the Executive Director of the Charles River Pollution Control District (District). They are responsible for managing the response and making key decisions. Their responsibility is to assess the situation and initiate a series of response actions based on the type and severity of the event.

Table 1 below identifies the key personnel who will be responding in emergency situations.

Table 1: Responsibilities Chart

Name and title	Responsibilities during a SSO response	Contact numbers
Executive Director	<p>Responsible for overall management and decision making for the sewer collection system. Takes the lead for managing the response to a SSO, providing information to regulatory agencies, the public and news media.</p> <p>Responsible for determining the need to contact Fire department (for response to toxic spills and containment booms), local conservation department(s), and/or town officials.</p>	<p>Elizabeth Taglieri Plant: 508-533-6762 ext.39 Cell: (413) 522-4768</p>
Maintenance and Operation Personnel	In charge of operating the collection system, performing inspections, maintenance and relaying critical information, assessing facilities, and providing recommendations to the Executive Director. Responsible for organizing crews for response.	<p>Dan Pickering, Maintenance Supervisor Plant: 508-533-6762 ext. 23 Cell: 508-615-8581</p> <p>Gary Farquharson, Assistant Chief Operator Plant: 508-533-6762 ext. 36 Cell: 508-416-0522</p>
Administrative Clerk	Responsible for administrative functions in the office including receiving phone calls and keeping a log of events. Will provide a standard carefully pre-scripted message to those who call with general questions. Additional information will be released through the Executive Director	<p>Janice Healy Plant: 508-533-6762 ext. 32</p>

Recording the Report of Possible Sanitary Sewer Overflow (SSO)

Generally, telephone calls from the public reporting possible sewer overflows/ basement backups are received at the District.

For phone calls reporting overflows and backups, the Administrative Clerk or whomever answers the phone call will obtain all relevant information available regarding the overflow including:

- Time and date of the call;
- Specific location of the overflow;
- Description of problem (e.g., what is overflowing, extent of spill, if the cause is obvious, etc.);
- Caller's name and phone number;
- Observations of the caller (e.g., odor, duration, back or front of property); and
- Other relevant information that will enable the District to quickly locate, assess and stop the overflow.

See Appendix B for a template of the log.

Confirming Overflows

The Executive Director or Engineer will confirm that the location of the back-up is occurring within the District owned sewer system. Once verified an operator or maintenance staff member(s) will go to the suspected overflow to confirm and determine the extent of the problem.

If the overflow is located in one of the Town's sewer system, then the Executive Director or Engineer will contact the Town's Public Works Department.

Reporting Overflows

The Executive Director will complete a Sanitary Sewer Overflow (SSO)/Bypass Notification Form, in Appendix C, within 24 hours of the sewer overflow confirmation.

Introduction

The District owned collection system is an integral part of the sewer system; it collects wastewater from the Town's collection system and conveys it to the District's treatment facility located at 66 Village Street in Medway MA. If the capacity of the collection system is exceeded, or if blockages occur, overflows may result. Untreated wastewater overflows that occur upstream of the treatment plant are called Sanitary Sewer Overflows (SSOs). SSOs are a threat to public health and the environment because the SSO may discharge pollutants such as pathogens, floatable materials, toxics, and other pollutants, all of which may impact public health, drinking water supplies, water quality and/or aquatic ecosystems.

Goals

The goal of the Sewer Overflow Response Plan (SORP) is to document the District's plans for mitigating or preventing potential emergency overflows whenever possible, to prepare the District's personnel and responding departments to deal efficiently with the effects of such events, and to protect health, environment, and property.

Quick responses to an SSO will minimize the overflow impacts on public health, water quality, the environment, and customer service. This SORP is designed to ensure that appropriate personnel are immediately dispatched to all reported SSOs to stop the overflow as quickly as possible; to minimize the effects of the overflow on public health and the environment; to minimize the impact of the overflow on collection system operations; and to report the overflow to the appropriate regulatory agencies, and to the public when warranted. The objectives of this plan include controlling waste discharge and providing procedures for managing sanitary sewer overflows, preventing harm to public health and the environment, and satisfying regulatory and reporting requirements.

Additional objectives of the SORP are to: provide appropriate customer service, protect collection system personnel and the wastewater treatment plant, protect all parts of the collection system and protect private and public property beyond the collection and treatment facilities.

This plan will be updated annually to reflect any changes in staffing or notification requirements, including contact numbers. It should and must be revised as insight and experience dictate.

Overview

This section provides a general description of the District's collection system and critical facilities. Response personnel must be familiar with the collection system and its components to effectively execute the response procedures described in this plan. For further details on the collection system, see the Collection System Operations & Maintenance Manual.

The District owns and operates a 5.7 mgd wastewater treatment facility and receives wastewater from the towns of Franklin, Medway, Millis, and Bellingham. The collection system transports wastewater to the treatment facility and then discharges into the Charles River.

The sewer system consists of over 238 miles of sewer pipes, including approximately 13 miles of District owned interceptors, and serves approximately 11,550 service connections. In addition to the sewer mains, the collection system contains 37 pump stations, including the District owned Route 495 pump station. The District-owned interceptors are all gravity sewer except for 1,170 linear feet of force main in the I-495 Interceptor after the 495 Pump Station. The District owned interceptors are comprised of components ranging in age from 1980 to 1988. Materials include polyvinyl chloride, ductile iron and reinforced concrete.

The District's collection system contains several critical facilities. Depending on the specific critical facility, a sewer system failure could potentially impact wetlands, drinking water supplies, surface waters, basement or street flooding. Critical collection system facilities are described later in this section.

Specific Known Vulnerabilities

There are no known areas of vulnerability in the District owned sewer system. If any should arise, this plan will be updated to include them. Even during some of the highest flows in March 2010, there were no SSOs in the District owned collection system.

Pump Stations

The District has one pumping station located in Franklin, MA. Details and potential impact areas are included in Table 2.

Table 2: Table 495 Pump Station Details and Potential Impact Areas

Station Type	Max Flow (MGD)	Alarm system/ Emergency Power	Year Built	Potential Impact Area(s)
Wet Well and Dry Well	7.2	Monitoring via Main Plant Supervisory Control and Data Acquisition (SCADA) System and Alarms call out to operators On-site Emergency Generator and Fuel Oil Tank	1990	The sewer system upstream of the pump station can cause SSOs if the pumps do not operate correctly

Force Mains

The District owned collection system includes one force mains with a total length of 1,170 linear feet. The force main was constructed in 1988 and is Ductile Iron material.

Overflow Notification Procedure

Overview

When an SSO or other collection system emergency occurs, a number of individuals must be notified. Depending on the size and severity of the problem, different notifications are needed. While minimum notification procedures are in place for all overflows, more specific notification procedures are required for more severe overflows. For example, a small, contained overflow with no impact to a water body or other sensitive area will have fewer notification requirements than an overflow that has discharged into surface water.

Receipt of Information Regarding an SSO

The District is responsible for acting based on received phone calls or reports of possible sewage overflow from the District owned collection system, and providing immediate response to investigate and/or correct the problem. Please refer to Appendix C for the template of the log that should be used when a call is received.

The operation and/or maintenance staff member(s) will confirm the overflow and implement measures to stop the overflow as noted in the procedures later in the plan.

The Executive Director shall within 24 hours of the sewer overflow confirmation contact the Massachusetts Department of Environmental Protection (MassDEP) and the Environmental Protection Agency (EPA). The Sanitary Sewer Overflow (SSO)/Bypass Notification Form must be submitted within 5 days. See the section on Overflow Reporting.

If the overflow may affect beach or swimming areas, or public drinking water intakes, the Executive Director shall notify the MassDEP and EPA and the Massachusetts Board of Health and the Town's Board of Health by phone within two hours of becoming aware of the discharge.

If the overflow results in a fish kill, the Executive Director shall notify the MassDEP by phone within two hours of becoming aware of the results of the fish kill.

The Executive Director is responsible for reviewing, updating and signing the final Sewage Overflow Report, clean up information and any other paperwork.

Pump/lift station failures are monitored by the District's SCADA system and alarms are received by the operations department. The operator on duty shall immediately convey all information regarding alarms to the Assistant Chief Operator, Executive Director or Maintenance Supervisor to initiate the investigation.

Response to Overflows

Response procedures provide guidance for the evaluation, mitigation and correction of the conditions that are causing or contributing to an unpermitted discharge of untreated wastewater. The primary objectives of these emergency response procedures are to provide standard protocols, minimize risk, and protect public health and the environment.

The Executive Director, District Engineer, Assistant Chief Operator or Maintenance Supervisor can dispatch personnel to confirm and contain the overflow, and determine the cause.

While investigating emergencies the crew shall maintain contact with the Executive Director to keep them informed of the progress and any problem(s).

Preliminary Assessment

The District anticipates that the Towns of Medway, Franklin, Millis or Bellingham can provide additional personnel, material, supplies, and equipment. The District will confirm this.

In all cases, response crews report their findings, including possible damage to private and public property, to the Executive Director immediately upon making their investigation.

The Executive Director is responsible for informing the MassDEP and EPA of all SSOs within 24 hours of becoming aware of the release and filing the MassDEP Sanitary Sewer Overflow (SSO)/Bypass notification form. Refer to the Overflow Reporting Section for more information.

If hazardous substances are suspected in the overflow, personnel are to contact the Fire Department in Medway 508-533-3211 and/or Franklin 508-528-2323 or 911, immediately.

Emergency Response Procedures

The following specific response procedures are contained in the following pages:

- Sewer Blockage or Back up into Basement
- Overflowing Sewer Manhole Resulting from Surcharged Trunk Sewer (No backup into building)
- Cavities and Depressions in Streets and Lawns
- Sewage Force-Main Break
- Sewer Main Break/Collapse
- Air Release and Vacuum Relief Valve Failure
- Waste Water Pump Station Alarms General Response Actions
- Pumping Station Failure Caused by Secondary Power Failure During Power Outage

Sewer Blockage or Back up into Basement

EMERGENCY PROCEDURES:

- Refers to sewer maps for location and to determine critical facilities and sewer sub-area to provide to dispatch crew. If the area of the complaint is served by a pump station, check to confirm whether any alarms from the pump station have been received.
- Dispatch the crew immediately to the complainant address and notify complainant/property owner(s) when they are on site.
- If the flow is questionable (not reasonable for the given service area) go to the upstream manhole to visually compare flows.
- If the flow from both manholes is reasonable for the area, notify the property owners that the problem is in their service lateral and to contact a plumber or sewer service contractor to relieve the blockage as described under ‘Steps to be Taken By Property Owners When Sewage Back-Up is Due to Blockage In Private Lateral Connection’.
- If the downstream manhole is full and there is a potential for overflow, immediately begin the set up for pumping around the blockage (see “Overflowing Sewer Manhole” procedure)
 - Request additional manpower and equipment as needed (e.g. excavating crew, bypass pumping equipment, etc.)
 - Set up pump out equipment and hoses from the upstream manhole to the nearest flowing manhole below the blockage.
- Continue checking manholes downstream until a dry manhole is found indicating a blockage upstream.
 - See “Overflowing Sewer Manhole” procedure for pumping around the blockage while the line is repaired
 - Note, if no blockage is found and the problem is attributable to a pump station problem refer to Pump Station responses.
- If vactor and jetter are available, jet line and have vactor clear. If not, install the proper size sandtrap in the downstream invert of the manhole before clearing the blockage to capture the debris.
- Remove the debris from the manhole and observe it to try to determine the cause of the blockage.
- Use the necessary equipment to relieve the blockage, either by jet flushing or power rodding (if jet flushing is not sufficient to clear the blockage, request staff to bring power rodding equipment).
- Notify Executive Director and describe the blockage. The Executive Director will notify the proper authorities and agencies.
- Cordon off the area if ponding occurs on the street or easement (public or private).
- Collect as much of the sewage as possible, disinfect and notify surrounding homes, if needed.
- Use the District camera equipment or contract with a CCTV inspection company to schedule an inspection. Refer to Appendix D for a list of potential companies.
- If the blockage is in a public line, relieve the blockage, clean up the property owner’s basement as per policy on disinfecting. If blockage is determined to be in property

owner's lateral connection, direct property owner to clear the line.

- Make out a report indicating the time of the call, a description of the problem, repair work done, personnel present and equipment used.
- If sewage overflowed the collection system, file the MassDEP Sanitary Sewer Overflow (SSO)/Bypass notification form and notify MassDEP and EPA within 24 hours. Refer to the Overflow Reporting Section.

NOTES:

1. When available, use collected debris to try to determine the cause of the blockage. Confirm removal of all debris from the manhole.
2. Record the water damage to all items in the basement. Record all actions taken (from start to finish) in log/record book, including equipment and personnel that were utilized.

Table 3: Sewer Blockage or Back up into Basement

Minimum Emergency Equipment	Specialized Equipment
<ul style="list-style-type: none"> • Jet flushing unit if available (sand trap) • Rodding machine & associated cleaning/cutting attachments (sand trap) • Standard harness and lifeline if applicable • Air blower with hose • Power vacuum • Portable pumps • Portable generators • Safety cones/barricades • Gas meter for oxygen deficient, explosive or toxic gases • Confined space entry tripod and associated equipment 	<ul style="list-style-type: none"> • Closed Circuit Television camera unit • Truck with hoist • Vactor unit • Power saw (circular) • Pipe cutter (hydraulic) • Sand trap
Minimum Staffing Level 2 People	

Steps to be taken by Property Owner when Sewerage Back-up is due to Blockage in Private Lateral Connection

After the District has checked the District owned interceptor for blockage and has found that the public sewer is not blocked, they will notify the property owner. If the main sewer is clear then the property owner must hire a licensed plumber, drain layer, or sewer cleaner to free any blockage, which might exist in the private lateral. The property owner is responsible to pay for this activity.

Rodding Procedure Guideline for Property Owners to Clear Private Lateral Sewer Connections

If the blockage is found in the portion of the sewer house connection located within private property, the owner must hire a licensed contractor to perform the necessary repair work.

In cases where a property owner needs to free a blockage within their lateral, the plumber must use a 4" cutter at the end of the rod. If they can't break through the blockage, they will then start using smaller cutters back up to 4". If the plumber relieves the blockage, they must then rod the house connection to the main sewer line.

Warning:

If the property owner, licensed plumber, drain layer or sewer cleaner does not call the District or Town and request the public sewer line to be checked prior to rodding, the District will not assume liability if the problem is located in the public sewer line.

If there is a blockage, but no record of the house connection, the owner must prove where the blockage is located. This can be done by excavation or electronic locator in the presence of an inspector.

Overflowing Sewer Manhole Resulting from Surcharged Trunk Sewer
(no backup into building)

EMERGENCY PROCEDURES:

- Dispatch the crew immediately to the problem location.
 - Refer to sewer maps for location of sewers (private lands, flow patterns, manholes, etc.) and determine if the area is served by a pump station before responding to the call.
- Go to the location of the overflowing manhole to assess the immediate danger to public health or the environment.
- Determine the location of the blockage by inspecting the downstream manholes until a dry manhole is found. Immediately begin the set up for pumping around the blockage
 - Request additional manpower and equipment as needed (e.g. excavating crew, bypass pumping equipment, etc.) or to help with evaluating options for pumping around the blockage. See Appendix E for a list of companies.
 - Set up pump out equipment and hoses from the upstream manhole to the nearest flowing manhole below the blockage.
- Install the proper size sandtrap in the downstream invert of the manhole before clearing the blockage to capture the debris. Remove the debris from the manhole and assess it to try to determine the cause of the blockage.
- Use the necessary equipment to relieve the blockage, either by jet flushing or power rodding. If jet flushing is insufficient to clear the blockage, request Town of contractor to bring power rodding equipment.
- If it is imminent that the waste water will be released into wetlands, receiving waters or a drinking water supply watershed, contact the Town or contractor and notify supervisor, who will call in extra crew and coordinate emergency equipment. The Executive Director will also notify the proper authorities and agencies including the fire department to set up flotation booms across streams, brooks, etc. if necessary.
- Gather and remove sewage related debris and organic matter from the affected area.
- If the wastewater is in the streets/roads (public or private), use sand bags to contain the waste water to minimize any impact to public health or the environment.
- Sandbag nearby catch basin inlets or paved leak-offs to prevent the waste water from entering the drainage system and causing potential contamination to the receiving waters.
- Cordon off the area if ponding occurs.
- Collect as much of the sewage as possible, disinfect according to policy, notify surrounding homes (superintendent notifies appropriate officials, as needed).
- If the waste water jeopardizes a playground or park, cordon off the entire area. Close the park to the public until the issue has been remedied to the satisfaction of the local and state boards of health and the local park superintendent.
- Complete a report indicating the time of the call, description of the problem, repair work done, personnel present and equipment used.
- If sewage overflowed the collection system, file the MassDEP Sanitary Sewer Overflow (SSO)/Bypass notification form and notify MassDEP and EPA within 24 hours. Refer to the Overflow Reporting Section.

Table 4: Overflowing Sewer Manhole Resulting from Surcharged Trunk Sewer

Minimum Emergency Equipment	Specialized Equipment
<ul style="list-style-type: none"> • Jet flushing unit if available (sand trap) • Rodding machine & associated cleaning/cutting attachments (sand trap) • Standard disinfectants • Safety harness and lifeline if applicable • Air blower with hose • Power vacuum • Portable pumps • Portable generators • Safety cones/barricades • Caution Tape • Gas meter for oxygen deficient, explosive or toxic gases • Confined space entry tripod and associated equipment • Sand bags 	<ul style="list-style-type: none"> • CCTV camera unit • Truck with hoist • Vactor unit • Power saw (circular) • Pipe cutter (hydraulic) • Caution tape • Sand trap • Floatation booms if necessary
Minimum Staffing Level 2-3 People	

Cavities and Depressions in Streets and Lawns

EMERGENCY PROCEDURES:

- When a call is received from the public, confirm the following:
 1. That the problem area is in fact a cavity or depression and not a missing or low manhole cover, gate box cover or catch basin grate.
 2. The location of the reported cavity and the name and address of the party making the call.
- If the caller indicates the problem is severe, extensive or obviously associated with the sewer or water system, investigate and barricade the condition if it appears appropriate to do so. Lights and barricades should be used if the situation is dangerous. Notify the water company immediately to aid in the cause investigation.
- When checking a depression over a main sewer, it is important to check the main sewer at both the upstream and downstream manholes adjacent to the depression to determine if there is a restriction of flow. If there is a blockage, it may indicate a possible main sewer break.
- If the cavity is a result of a sewer failure, refer to procedures for sewer main collapse and repair as appropriate.
- If it has been determined that it is a cavity or depression caused by other utilities (storm drain, water main, etc.), the crew should notify the Town and request that they take over the repair.
- The crew leader should thoroughly document the nature and extent of the impacts including the use of photographs and video footage where possible.
- Make out a report indicating the time of the call, a description of the problem, the repair work done, personnel present and equipment used.
- If sewage overflowed the collection system, file the MassDEP Sanitary Sewer Overflow (SSO)/Bypass notification form and notify MassDEP and EPA within 24 hours. Refer to the Overflow Reporting Section.

Table 5: Cavities and Depressions in Streets and Lawns

Minimum Emergency Equipment	Specialized Equipment
<ul style="list-style-type: none">• Safety cones/barricades• Refer to emergency procedures for sewer break if confirmed	<ul style="list-style-type: none">• Caution tape
Minimum Staffing Level 2 People	

Sewage Force Main Break

EMERGENCY PROCEDURES:

- Dispatch a crew to the site to assess the situation, including determination of whom and what might be affected and the immediate danger to the environment.
- Refer to sewer maps for location of sewers (private lands flow patterns, manholes, etc.) and determine the pump station associated and which critical facilities are in the area.
- Set up traffic cones and barricades as needed.
- Initiate measures to contain the sewer overflow, protect any streets, public areas, catch basin inlets, etc. that might be subject to flooding, and collect wastewater that has been discharged so as to minimize impact to public health and the environment.
- Determine if it will be possible to pump around the break, from the pump station wetwell to the force main discharge manhole or other accessible manhole, and if so, prepare to pump around the break as described below:
 - Request additional manpower and equipment as needed (e.g. excavating crew, bypass pumping equipment, etc.)
 - Set up pump out equipment and hoses from the wetwell to the nearest sewer discharge point.
 - Draw down the wet well as much as possible to maintain the low level.
 - Lock-out and tag-out (LOTO) the pumps in the pumping station.
- If pumping around the break is not possible, utilize the vacuor truck or septage hauler to draw down the wet well as much as possible and maintain a low level.
- Call in additional crews as necessary to help contain the sewer overflow. Set up flotation booms across streams, sandbag storm drains, etc., as necessary.
 - Check the tributary area to determine if the discharge will affect any receiving waters.
 - If it is determined that the receiving water may be affected, the supervisor should notify the proper authorities or agency.
 - If the wastewater is in streets/roads (public or private), contain the waste water to the extent possible with sandbags.
 - Sandbag nearby catch basin inlets or paved leak-offs to prevent the wastewater from entering the drainage system and causing potential contamination to the receiving waters.
 - Cordon off the area if ponding occurs.
 - Collect as much of the sewage as possible, disinfect and notify surrounding homes.
 - If the wastewater jeopardizes a playground or park, cordon off the entire area. Close the park to the public until the issue has been remedied to the satisfaction of the local and state boards of health and the local park superintendent.
 - Gather and remove sewage related debris and organic matter from the affected area.
- Drain the force-main:
 - Close down the gate valve on the upstream side of the discharge check valve in the pumping station.
 - Open the check valve by hand and secure it in place.
 - Slowly bleed the force-main back into the wetwell by slowly opening the gate valve on the discharge side of the pump, but only to the point where the force-main stops leaking and there is enough room to make the repair. Constant communication must

- take place between the crew located at the break and the crew located at the pump station.
- Close the gate valve and return the check valve to its normal operating position and then fully open the gate valve.
 - Repair force main break.
 - After the repair is complete, remove LOTO and return the pumps to normal operating position.
 - Run the pump in the hand manual position to fill the force-main (Care must be taken during filling of force main – use only one pump during filling). Once completed, observe several pumping cycles before completely back-filling the excavation.
 - Upon confirmation of adequacy of the repair, backfill the excavation (if necessary) and restore surface conditions to match existing conditions.
 - While the crew is restoring the excavation, the crew leader should conduct a preliminary assessment of damage to private and public property. The crew leader should thoroughly document the nature and extent of the impacts including the use of photographs and video footage where possible.
 - Make out a report indicating the time of the call, a description of the problem, the repair work done, personnel present and equipment used.
 - If sewage overflowed the collection system, file the MassDEP Sanitary Sewer Overflow (SSO)/Bypass notification form and notify MassDEP and EPA within 24 hours. Refer to the Overflow Reporting Section.

Table 6: Sewage Force Main Break

Minimum Emergency Equipment	Specialized Equipment
<ul style="list-style-type: none"> ● Portable bypass pumping units ● Hoses ● Standard disinfectants ● Safety harness and lifeline if applicable ● Air blower with hose ● Power vacuum ● Portable generators ● Safety cones/barricades ● Gas meter for oxygen deficient, explosive or toxic gases ● Confined space entry tripod and associated equipment 	<ul style="list-style-type: none"> ● CCTV camera unit ● Truck with hoist ● Vactor unit or septage hauler ● Power saw (circular) ● Pipe cutter (hydraulic) ● Caution tape ● Sand trap ● Floation booms if necessary ● Self Contained Breathing Apparatus (SCBA)
Minimum Staffing Level 4-5 People	

Sewer Main Break/Collapse

EMERGENCY PROCEDURES:

- Dispatch crew to location of break/collapse immediately while referring to the sewer maps for location of sewers (private lands flow patterns, manholes, etc.) to determine which critical facilities are in the area.
- Crew sets up signs, barricades, and/or barrels for traffic control and public safety, rerouting traffic as necessary and deploying traffic control measures such as police or flag person as needed.
- If it is a main line break, the Executive Director shall notify the appropriate authorities and town officials immediately.
- Request additional manpower and equipment as needed based on initial damage assessment (e.g. excavating crew, equipment to pump around the break, etc.)
- Pumping around the break from the upstream manhole to the downstream manhole may be required. If necessary, set up bypass pumping equipment. If not necessary, prepare for repairs while the pipe is flowing.
- Call in additional crews to set up flotation booms across streams, install sandbags, etc., as necessary. Unless special conditions exist, **pumping around the failed sewer main is a priority** before containing the overflow.
- Gather and remove sewage related debris and organic matter from the affected area.
- If the wastewater is in the streets/roads (public or private), use sand bags to contain the wastewater to minimize any impact to public health or the environment.
- Sandbag nearby catch basin inlets or paved leak-offs to prevent the waste water from entering the drainage system and causing potential contamination to the receiving waters.
- Cordon off the area if ponding occurs.
- Collect as much of the sewage as possible, disinfect according to policy, notify surrounding homes (superintendent notifies appropriate officials, as needed).
- If the waste water jeopardizes a playground or park, cordon off the entire area. Close the park to the public until the issue has been remedied to the satisfaction of the local and state boards of health and the local park superintendent.
- Determine the location of the break/collapse and make any necessary repairs. Use repair procedures consistent with policy. If the break is on the pipe length, then a repair can be made with a wrap-around sleeve. If the break is at the bell, then a bell-joint clamp may be used.
- Upon confirmation of adequacy of the repair by Town or consulting engineer, backfill the excavation (if necessary) and restore surface conditions to match existing conditions.
- To restore the sewer line to full capacity, the crew should remove any debris that may have entered and accumulated in the sewer line downstream and upstream from the break/collapse. The crew should clean the sewer line as described below.
- Install the proper size sandtrap in the downstream invert of the downstream manhole to trap any debris which may have accumulated in the sewer line.
- Using a high velocity jet-flushing vehicle, begin flushing from the downstream manhole against the flow to the upstream manhole.
- Repeat this procedure for several upstream and downstream pipe reaches.
- The crew leader should thoroughly document the nature and extent of the impacts

including the use of photographs and video footage where possible.

- Make out a report indicating the time of the call, a description of the problem, the repair work done, personnel present and equipment used.
- If sewage overflowed the collection system, file the MassDEP Sanitary Sewer Overflow (SSO)/Bypass notification form and notify MassDEP and EPA within 24 hours. Refer to the Overflow Reporting Section.

Table 7: Sewer Main Break/Collapse

Minimum Emergency Equipment	Specialized Equipment
<ul style="list-style-type: none"> • Portable bypass pumping units • Hoses • Jet flushing unit if available (sand trap) • Standard disinfectants • Safety harness and lifeline if applicable • Air blower with hose • Power vacuum • Portable pumps • Portable generators • Safety cones/barricades • Gas meter for oxygen deficient, explosive or toxic gases • Confined space entry tripod and associated equipment 	<ul style="list-style-type: none"> • CCTV camera unit • Truck with hoist • Vactor unit • Power saw (circular) • Pipe cutter (hydraulic) • Sand trap • Caution tape • Flootation booms and sand bags as necessary • Self Contained Breathing Apparatus (SCBA)
Minimum Staffing Level 4 People	

Air Release and Vacuum Relief Valve Failure

EMERGENCY PROCEDURES:

- These valves require frequent inspection and maintenance. Their failure is often found during routine inspections. Both these types of valves may fail to operate reliably if grease is allowed to accumulate in the valve or on the operating mechanism.
- Inspection crew should inspect valves in accordance with the specific manufacturer's recommendations.
- Attach fittings at the top and the bottom to permit back flushing of all valves upon initial installation or retrofit upon failure.
- Isolate the valve by closing the shutoff valve attached to the force main.
- To clean the internal components of the valve(s), attach a back-flushing hose to a pressurized water source using a quick disconnect coupling.
- Place a blow off discharge hose in a container to collect the back-flush water from the blow off valve. This wastewater should not be discharged onto the street or into the pit.
- Open the shutoff valve and back-flush the valve through the blow off valve at the bottom.
- If you are using a potable (drinking) water source, provide the system with an anti-siphon device or back flow to prevent contamination of the potable water.
- Make out a report indicating the time of the call, description of the problem, repair work done, personnel present and equipment used.
- If sewage overflowed the collection system, file the MassDEP Sanitary Sewer Overflow (SSO)/Bypass notification form and notify MassDEP and EPA within 24 hours. Refer to the Overflow Reporting Section.

Table 8: Air Release and Vacuum Relief Valve Failure

Minimum Emergency Equipment	Specialized Equipment
<ul style="list-style-type: none">• Hose with quick disconnect fitting and anti-siphon device• Blow off discharge hose and waste container• Standard disinfectants• Safety harness and lifeline if applicable• Air blower with hose• Power vacuum• Portable pumps• Portable generators• Safety cones/barricades• Gas meter for oxygen deficient, explosive or toxic gases• Confined space entry tripod and associated equipment	<ul style="list-style-type: none">• CCTV camera unit• Truck with hoist• Vactor unit• Power saw (circular)• Pipe cutter (hydraulic)• Caution tape• Self-Contained Breathing Apparatus (SCBA)
Minimum Staffing Level 3 People	

Wastewater Pump Station Alarms General Response Actions

EMERGENCY PROCEDURES:

- Send an individual to the station indicating an alarm as soon as possible for a Critical Alarm. If serious trouble is found, call for additional assistance and keep an individual at the station until further instructions are received.
- Always check with the power company when an alarm goes on to see if there is a power outage in the area, although a power failure that has not been reported to the power company can occur at a pump station.
- Personnel called in to investigate pump station alarms shall respond to the station even if the alarm has cleared prior to their arrival. All alarm conditions are to be checked and logged. Use the following guidelines and follow confined space entry procedures if applicable:

Wetwell/Drywell Type Stations

1. Observe all safety precautions.
2. Check the atmosphere within drywell with gas meter prior to entering.
3. Upon entry, identify the storage capacity in the well. This will give some indication of the time available for response. If flooded, skip to pump-out steps under “Pumping Station Failure inside valve pit, pump or valve failure” procedure.
4. Take your time entering the drywell. Never enter a flooded drywell.
5. Note any unusual odors - i.e. burning electrical equipment or paint.
6. Listen and note any unusual noises.
7. Check for heat around pump motors and pump bearing housings. Note any which seem unusually hot.
8. Observe every piece of equipment in the station. Note anything that looks out of place.
9. Record all gauge readings including wet well level, hour meters, flow charts, on-off levels, psi gauges on pump, rpm (on VFD’s) and anything else that you feel is significant.
10. Using available information and the trouble shooting guide, systematically run through the system. Use a process of elimination to identify the cause of the failure. Check the level controls, check pump operation using manual position, check pump output by pressing on check valve counterweight as defined in the trouble-shooting guide. Once the cause of the problem is isolated, engage mechanical or electrical disciplines for repairs.
11. Emergency personnel should be absolutely certain that the cause of the pump station alarm or failure has been properly identified and corrected prior to leaving the station.
12. Reset any/all alarm feature indicator lights.

Table 9: Wastewater Pump Station Alarms General Response Actions

Minimum Emergency Equipment	Specialized Equipment
<ul style="list-style-type: none">• Gas meter for oxygen deficient, explosive or toxic gases• Self Contained Breathing Apparatus (SCBA)• Harness and lifeline	<ul style="list-style-type: none">• As applicable for trouble-shooting•
Minimum Staffing Level 2 People	

Pumping Station Failure Caused by Secondary Power Failure

EMERGENCY PROCEDURES:

- Dispatch pump station crew to the pumping station immediately. The crew needs to bring the auxiliary generator for that specific station as a backup, assuming that repair to the dedicated generator cannot be made immediately.
- Upon entry, identify the storage capacity in the well. This will give some indication of the time available for response. If flooded, skip to pump-out steps under “Pumping Station Failure inside valve pit, pump or valve failure” procedure.
- Dispatcher shall request the assistance of the power company in restoring power to the station if necessary. Determine the estimated time of arrival of the power company crew and then notify the pumping station operators.
- As they approach the pumping station, the pumping station crew should check the overhead power lines for fuses that might have blown or down power lines. If the crew notices a blown fuse or down power line, identify the location and pole number(s), and notify the dispatcher to relay this information to the power company.
- Lock out and tag out (LOTO) the main line, disconnect (if applicable).
- Check all components of the dedicated generator to determine failure cause. Use the manufacturer-prepared trouble-shooting guide to aid in diagnosis. If it cannot be repaired immediately, connect the portable generator to the auxiliary power connection located outside the building. Examine plug type and ensure consistency. Use adapters as necessary.
- Go through the specific procedures for starting the generator to supply power to the station.
- Obtain the services of a qualified generator repair facility to address the dedicated generator failure.
- Once fully repaired, disconnect the portable generator and reconnect the dedicated unit. Operate the dedicated unit through several pump cycles. Check unit for regular exercise.

Table 10: Pumping Station Failure Caused by Secondary Power Failure

Minimum Emergency Equipment	Specialized Equipment
<ul style="list-style-type: none">• Harness and lifeline• Flash light• Emergency lighting• Portable generator• Gas meter for oxygen deficient, explosive or toxic gases	<ul style="list-style-type: none">• Power testing equipment
Minimum Staffing Level 2-3 People	

Emergency Support

Addressing some problems may require resources beyond the District's forces. This is particularly true of main line breaks where there is a risk of a significant sewer overflow. In these situations, the District may enlist the aid of other parties.

The District is currently investigating the Water/Wastewater Agency Response Networks (WARN) program and other companies that can provide these types of services. Once these programs/companies have been determined the plan will be updated.

The District will investigate general services agreement with several companies for situations that require the prompt reconstruction of sewer lines.

These companies are capable of mobilizing construction equipment and personnel quickly to handle emergency assignments. The response time and the level of response will vary due to several factors, some are identified below:

- Location of the sewer repair in relation to the contractor's equipment yard
- Scope of the repair, size of sewer, depth of sewer and volume of flow
- The size, type and availability of equipment and number of workers
- The time of day, day of the week and the proximity to a holiday
- Weather conditions, clear, rain, snow, extreme cold or heat

Spill Contractor:

In the event of a spill that cannot be controlled by the District, an outside contractor will provide professional services for the removal and disposal of contaminated material. The District is in the process of selecting a spill contractor(s) which would be available for emergency response. The following is a list of spill contractors the District is considering:

- Environmental Restoration LLC
222 Weymouth Street
Rockland, MA 02370
781-878-2100
- Clear Harbor Environmental Services, Inc.
800-645-8265
- SAK Environmental
978-688-7804

Mutual Aid Agreements

Mutual Aid Agreements are being investigated by the District to supply equipment, materials, and personnel in an emergency situation. The following will be updated once the agreements are finalized.

XXX Public Works Department
Equipment, Materials, and Personnel
Dump trucks, flatbed trucks, backhoe
Portable pumps, auxiliary personnel

Contact: XXX
Telephone: XXX

XXX Fire Department
Equipment, Materials, and Personnel , ventilating fans

Contact: XXX
Telephone: XXX

Overflow Reporting

Overview

The Executive Director shall report an SSO by telephone and/or email to MassDEP, EPA, and other parties. Notification must be made as soon as possible, and no later than 24 hours after discovery of the event. The agency notifications should include all responsible officials whose duties include management of resources which may be affected by the SSO discharge. A written submission shall also be provided within 5 days from the time the SSO was made aware to them by completing the MassDEP Sanitary Sewer Overflow (SSO)/Bypass notification form (See Appendix C for form and instructions).

The Notification form should be fully completed, and shall include a clear description of the overflow, or bypass and its causes, including the best approximation of the dates and times, and if the situation has not been corrected, the amount of time the overflow/bypass is expected to continue, and a description of the measures to be implemented to stop the discharge. The Form or attachments must also include steps taken or planned to reduce, eliminate, and prevent recurrence.

Include with your Notification Form a copy of a map indicating the overflow or bypass location. Please use 8-1/2" by 11" paper at an appropriate scale between 1:5000 to 1:25000. Specifying the geographic location will help DEP determine the public health and water quality impacts associated with overflows and bypasses.

Fax the Notification Form to:

- Bureau of Resource Protection, Massachusetts Department of Environmental Protection, Central Regional Office, 8 New Bond Street, Worcester, MA 01606, Fax: 508-792-7621 and
- US EPA Water Technical Unit (OES 04-4), 5 Post Office Square - Suite 100, Boston, MA 02109-3912, Fax 617-918-0870.

See Table 11: SSO Notification Contacts Table 11 for the list of notification contacts.

Table 11: SSO Notification Contacts

Agency:	Contact	Requirements
MassDEP	During business hours: Central Region: (508) 792-7650 24-hour Emergency Line: 1-888-304-1133	Report all SSO events to regional office Report SSO's to emergency line during non-business hours

EPA	EPA New England: (617) 918-1870	Report all SSO events
Local Board of Health	Bellingham BOH: 508-657-2860 Franklin BOH: 508-520-4905 Medway BOH: 508-533-3206 Millis BOH: 508-376-7042	Report all SSO events to local BOH(s) where impacts may occur
Department of Conservation and Recreation	State House Ranger Base 617-722-1188	Where DCR beaches or parks affected
Drinking Water Resource Managers	Bellingham: Donald DiMartino, 508-966-5813 Franklin: Robert Cantoreggi, 508-553-5500 Medway: Barry Smith, 508-533-3208 Millis: James McKay, 508-376-5424	Where Drinking Water Resources may be affected

Reporting Details

- The dispatcher provides details on the time, location, description, and map locations of overflows
- The start time of the sewer overflow is determined by one of the following methods:
 - Date and time information received and/or reported to have begun and later substantiated by a sewer investigator or response crew;
 - Visual observation;
 - Pump station and lift station flow trends for the SCADA System.
- The stop time of the sewer overflow is determined by one of the following methods:
 - When the blockage is cleared or flow is controlled or contained; or
 - The arrival time of the sewer investigator or response crew, if the overflow stopped between the time it was reported and the time of arrival.
- An estimation of the rate of sewer overflow is made by one of the following criteria:
 - Direct observations of the overflow; or measurement of actual overflow from the sewer main.
 - When the rate of overflow is known gallons per minute (GPM), the duration of the overflow is multiplied by the overflow rate; or when the rate of overflow is not known, the surrounding area is investigated for evidence of ponding or other indications of overflow volume.
- Visual observations should be recorded for any unusual observations
- Photographs and videotapes are taken at the event and response when possible.
- The nature and extent of any damage or impacts to public/private property are assessed.
- Repair crews provide a report indicating the time of the call, a description of the problem, the repair work done, personnel present and equipment used

The Executive Director will keep all reports which are evaluated to determine patterns and trends and to provide input to the asset management program.

Customer Follow-up

The Executive Director follows up in person or by telephone with the citizen(s) reporting the overflow. The cause of the overflow and its resolution will be disclosed.

Guidance on Estimating Sewer Overflow Volumes

A variety of approaches exist for the estimation of the volume of a sanitary sewer overflow. Other methods are also possible. The person preparing the estimate should use the method most appropriate to the SSO using their judgment.

Method 1 “Visual Estimate”

The volume of very small spills can be estimated by imagining the amount of water that would spill from a 5-gallon bucket or 50 gallon barrel. If the spill is larger than the amount of liquid from a 50 gallon barrel, try to visualize how many barrels the standing water would fill and then multiply by the number of barrel volumes by 50. This method can be useful for contained spills that are not more than a couple of hundred gallons.

Method 2 “Measured Volume”

The volume of some small spills can be estimated using this method if it is not raining. The shape dimensions and depth of the spilled wastewater are needed to use this method. The shape dimensions are used to calculate the area of the spill and the depth calculates the volume.

1. Sketch the shape of the contained area of sewage
2. Measure or pace off the dimensions and add the dimensions to your sketch
3. Measure the depth in several locations and then average the depth for the spill. (If the shape and depth vary, break your sketch into sections and calculate the volume of each by repeating the steps below)
4. Convert the dimensions to feet (if they are not in feet to begin with)
5. Calculate the area using the following formulas (depending on the shape of the spill):
 - a. Rectangle $\text{Area} = \text{length} \times \text{width}$
 - b. Circle $\text{Area} = \text{diameter} \times \text{diameter} \times 0.785$
 - c. Triangle $\text{Area} = \text{base} \times \text{height} \times 0.5$
6. To get the volume in cubic feet, multiply the area times the average of the depths you measured
7. Multiply the volume by 7.5 to convert to gallons

Method 3 “Duration and Flow Rate”

Calculating the volume of spills where it is difficult or impossible to measure the area and depth requires a different approach. In this method separate estimates are made of the duration (the elapsed time from the start of the overflow to the time the spill is stopped) of the spill and the flow rate.

Start time can be difficult to establish. Here are two approaches to estimating start time:

For very large overflows, changes in flow on a downstream flow meter can be used to establish the start time. Typically, the daily flow peaks are “cut off” or flattened by the loss of flow. This can be identified by comparing hourly flow data on the downstream flow meter.

Conditions at a spill site may change with time. Initially, there will be limited deposits of grease and toilet paper. After a few days to a week, the grease forms a light colored residue. After a few weeks to a month the grease turns dark. In the latter two cases the quantity of toilet paper and other materials of sewage origin increase in amount. These changes with time can be used to estimate the start time in the absence of other information.

Sometimes it is simply not possible to estimate the start time and the date that the overflow was first observed should be used on the form.

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

Flow Rate:

One way to estimate flow rate is to look at changes in flow rates in the downstream flow meters to estimate how much of the flow rate was lost during the spill (this generally only works for large SSOs).

A second way to estimate flow rate is to base it on up-stream connections: Once the location of the spill is known, the number of upstream connections can be determined from records or your computerized system. Multiply the number of connections by 200 to 250 gallons per day per connection or 8-10 gallons per hour for each connection (or other flow rates that are consistent with your data for your connections).

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

Appendix B: Public Call Log Template

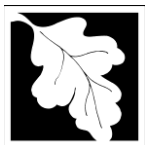
Work Order Number	Receiver of Call	Time and Date	Call Information			Location of the problem
			Name	Address	Phone Number	

Work Order Number	Type of Call (Back Up, Odor, Overflow, etc.)	Specific request	Personnel assigned to Call	Findings and Cause of Problem	Closeout Information	Date Closed

Appendix C: Sanitary Sewer Overflow/Bypass Notification Form

The MassDEP Sanitary Sewer Overflow (SSO)/Bypass Notification Form can be found at the following URL:

<http://www.mass.gov/eea/agencies/massdep/service/approvals/sanitary-sewer-overflow-bypass-backup-notification.html>



Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wastewater Management Program

**Sanitary Sewer Overflow(SSO)/Bypass
Notification Form**

Instructions

Who must notify DEP about an overflow or bypass, and when?

Any owner or operator of the following facilities:

- Municipal, state, federal, regional, industrial or other private wastewater collection system;
- Wastewater utility;
- Wastewater treatment works;
- Facility with a groundwater discharge permit;
- Facility with a surface water discharge permit.

This requirement includes any owner or operator of a satellite municipal collection system or other collection system that is part of a larger POTW not under the same ownership and control.

The following situations require notification to DEP and submittal of the SSO Report Form:

- An un-permitted overflow or bypass;
- Backup of wastewater into public or private property when the event is caused by a condition of the system owned and operated by the sewer authority
- In a combined sewer system, an overflow or bypass during dry weather conditions or at a location not covered by a NPDES permit, or from a portion of the system that has a separate sanitary sewer.

Backups of wastewater into a property which are not caused by conditions in the system owned and operated by the sewer system are not required to be reported. These incidents normally occur due to blockages in service connections to a property or blockages in the internal plumbing system.

What are the procedures for reporting?

Step One:

Immediate Telephone and/or email notification to MassDEP, EPA, and other parties:

Notification to MassDEP and other regulatory authorities is a critical element of the SSO response plan. Notification must be made as soon as possible, and no later than 24 hours after discovery of the event. The agency notifications should include all responsible officials whose duties include management of resources which may be affected by the SSO discharge. A list of agencies, contact staff, phone numbers, and emails should be kept by the Sewer Authority and posted for easy access to responsible staff. A list of some relevant agencies follows:

Agency:	Contact	Requirements
MassDEP	During business hours: Northeast Region: (978) 694-3215 Central Region: (508) 792-7650 Southeast Region: (508) 946-2750	Report all SSO events to relevant regional office Report SSO's to emergency line during non-business hours



Sanitary Sewer Overflow(SSO)/Bypass Notification Form

Instructions

	Western Region: (413) 784-1100 24-hour Emergency Line: 1-888-304-1133 If you are not sure which Massachusetts DEP Regional Office oversees your facility, go to http://www.mass.gov/eea/agencies/massdep/about/contacts/ .	
EPA	EPA New England: (617) 918-1870	Report all SSO events
Local Board of Health	List of local BOH contact information available at http://www.mhoa.com/boh-roster/	Report all SSO events to local BOH(s) where impacts may occur
Department of Conservation and Recreation	State House Ranger Base 617-722-1188	Where DCR beaches or parks affected
MA Division of Marine Fisheries	Boston/Northeast: 617-727-3336 x 165 Southeast: 508-563-1779 x 122	Where shellfish resources may be affected
Drinking Water Resource Managers	List of Drinking Water Supply contacts available at http://www.mass.gov/eea/docs/dep/about/organization/pwscont.pdf	Where Drinking Water Resources may be affected

Hazardous Material Releases: If you believe an overflow, bypass, or any other discharge may have resulted in an oil or hazardous material release, report it to DEP at any time, 24 hours a day, at this toll free number: 1-888-304-1133.

MassDEP may require, on a case-by-case basis, more extensive reporting of the SSO event where determined necessary to protect users of resources affected by SSO discharges.

Step Two:

Submit a written report to DEP within five (5) calendar days of the time you become aware of the overflow, bypass or backup. DEP requires the use of the MassDEP Sanitary Sewer Overflow (SSO)/Bypass notification form, unless an alternative reporting form is authorized by MassDEP in writing.

The Notification form should be fully completed, and shall include a clear description of the overflow, or bypass and its causes, including the best approximation of the dates and times, and if the situation has not been corrected, the amount of time the overflow/bypass is expected to continue, and a description of the measures to be implemented to stop the discharge. The Form or attachments must also include steps taken or planned to reduce, eliminate, and prevent recurrence.

If you have a discharge permit, check the Monitoring and Reporting Section of your permit to determine if your *Notification Form* should be sent to the attention of DEP's regional Bureau of Waste Prevention



Sanitary Sewer Overflow(SSO)/Bypass Notification Form

Instructions

(industrial facilities) or the regional Bureau of Resource Protection (nonindustrial facilities). All municipal facilities shall submit their reports to the Bureau of Resource Protection.

Fax the *Notification Form* to the attention of the Bureau of Resource Protection in your DEP regional office:

- Massachusetts Department of Environmental Protection, Northeast Regional Office, 205B Lowell Street, Wilmington, MA 01887. Fax: 978-694-3499.
- Massachusetts Department of Environmental Protection, Central Regional Office, 8 New Bond Street, Worcester, MA 01606. Fax: 508-792-7621.
- Massachusetts Department of Environmental Protection, Southeast Regional Office, 20 Riverside Drive, Lakeville, MA 02347. Fax: 508-947-6557.
- Massachusetts Department of Environmental Protection, Western Regional Office, 436 Dwight Street, Springfield, MA 01103. Fax: 413-784-1149.
- U.S. Environmental Protection Agency, Water Technical Unit (OES 04-4), 5 Post Office Square – Suite 100, Boston, MA 02109-3912 Fax: 617-918-0870

What should I do if I'm not sure of the information I am providing?

For required items such as time of occurrence, causes of incident, volume of overflow, etc., PROVIDE YOUR BEST ESTIMATE OR ASSESSMENT AT THE TIME OF THIS REPORT. You can submit any additions or corrections later.

What is the best way to report the exact location of the overflow, or bypass?

Include with your *Notification Form* a copy of a map indicating its location. Please use 8 ½ " by 11" paper at an appropriate scale between 1:5000 to 1:25000. Specifying the geographic location will help DEP determine the public health and water quality impacts associated with overflows and bypasses.

Why do I need to report backups into buildings?

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

Are there some overflows or Bypass that are not subject to these reporting requirements?

DO NOT use the *Sanitary Sewer Overflow(SSO)/Bypass Notification Form* in the following situations:

- The overflow is from a properly permitted Combined Sewer Overflow structure. Follow the reporting requirements in your NPDES Permit.
- You are reporting an overflow or bypass of sewage for a collection system or treatment works that is not under your ownership and control. However, please assist DEP by immediately reporting to the appropriate DEP Regional Office by phone or fax any overflows or bypass incidences for facilities other than your own which involve a discharge of wastewater to the environment.

What are the state regulations that apply to this notification? Where can I get copies?

These regulations include, but are not limited to:

- Surface Water Discharge Regulations, 314 CMR 3.00



Sanitary Sewer Overflow(SSO)/Bypass Notification Form

Instructions

- Groundwater Discharge Regulations, 314 CMR 5.00
- Sewer Connection Regulations, 314 CMR 7.00
- Operation and Maintenance Regulations, 314 CMR 12.00

Official copies of the regulations may be purchased at:

State Bookstore
State House, Room 116
Boston, MA 02133
617-727-2834

State Bookstore
436 Dwight Street
Springfield, MA 01103
413-784-1376



Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Watershed Permitting Program
**Sanitary Sewer Overflow (SSO)/Bypass
Notification Form**

FOR DEP USE ONLY

Tax Identification Number

A. Reporting Facility

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



See DEP Regional Office telephone and fax numbers at the end of this form.

1. Facility Information

Reporting Sewer Authority

Permit #

2. Authorized Representative Transmitting Form:

First Name

Last Name

Telephone No.

Title

E-mail Address

B. Phone Notifications:

1. MassDEP staff contacted:

first name

last name

Date/Time contacted:

Date

Time

☐ am

☐ pm

2. EPA staff contacted:

first name

last name

Date/Time EPA contacted:

Date

Time

☐ am

☐ pm

3. Board of Health contacted:

First Name

Last Name

Date/Time contacted:

Date

Time

☐ am

☐ pm

4. Others notified (select all that apply);

☐ Conservation Commission

☐ Harbormaster

☐ Shellfish Warden

☐ Division of Marine Fisheries

☐ Downstream Drinking Water Supplier

☐ Watershed Association

☐ Beach Resource Manager

☐ Other:

(specify)

C. SSO Information

1. SSO Discovered:

Date

Time

☐ am

☐ pm

By:

2. SSO Stopped:

Date

Time

☐ am

☐ pm

3. SSO Discharge from:

☐ Sanitary Sewer Manhole

☐ Pump Station

☐ Backup into Property

☐ Other:

(specify)

4. SSO Discharge to:

☐ Ground Surface (no release to surface water)

☐ Direct to Receiving Water

(surface water)

☐ Catch basin to Receiving Water

(surface water)

☐ Backup into Property Basement



Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Watershed Permitting Program
**Sanitary Sewer Overflow (SSO)/Bypass
Notification Form**

FOR DEP USE ONLY

Tax Identification Number _____

C. SSO Information (cont.)

Location: _____
(Description of discharge site or closest address)

5. Estimated SSO Volume at time of this Report: _____

Method of Estimating Volume: _____

6. Cause of SSO Event:

☐ Rain Event ☐ Pump Station Failure ☐ Insufficient Capacity in System

☐ Treatment Unit failure

☐ Sewer System Blockage: ☐ Pipe Collapse ☐ Root Intrusion ☐ Grease Blockage

☐ Other: _____
(Specify)

7. Corrective Actions Taken:

Impact Area cleaned and/or disinfected: ☐ Yes ☐ No

Corrective Actions Completed: ☐ Yes ☐ No

D. Comments/Attachments/Follow-up

I wish to provide (select all that apply):

☐ Attachment ☐ Additional comments below: ☐ No additional comments or attachments

Additional comments and planned actions:



Sanitary Sewer Overflow (SSO)/Bypass Notification Form

Tax Identification Number

E. Certification Statement

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature of Authorized Representative

Date Signed

Please keep a copy of this report for your records. When submitting additional information, include the MassDEP Incident Number from this report.

MassDEP Regional Office and EPA Telephone and Fax Numbers:

Northeast Region	Phone: 978-694-3215	Fax: 978-694-3499
Southeast Region	Phone: 508-946-2750	Fax: 508-947-6557
Central Region	Phone: 508-792-7650	Fax: 508-792-7621
Western Region	Phone: 413-784-1100	Fax: 413-784-1149
EPA Contact	Phone: 617-918-1870	Fax: 617-918-0870
DEP 24-hour emergency	Phone: 888-304-1133	

Appendix D: CCTV Inspection Companies

Below is a list of CCTV Inspection Companies:

- BMC Corp
Pinehurst, MA
781-273-0398
- McVac Environmental Inc
New Haven, CT
888-549-2606
- BSI Companies
Boston, MA
844-471-1737
- National Water Main Cleaning Co.
Canton, MA
781-828-0863
- Truax Corporation
Plainville, MA
508-316-0979
- RedZone
Pittsburgh, PA
412-476-8980

Appendix E: Bypass Pumping Companies

Below is a list of Bypass Pumping Companies:

- Xylem, Inc.
Woburn, MA
781-935-6516
- D'Allessandro Corp
Avon, MA
508-559-6400
- Baker Corp
Oxford, MA
508-987-0034
- Rain For Rent
North Oxford, MA
508-987-0042
- Sunbelt Rentals
Marlborough, MA
508-481-1541