



City of Alameda Sewer System Management Plan

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None

Abbreviations and Definitions

ACDEH	Alameda County Department of Environmental Health
AMC	Alameda Municipal Code
AMIP	Asset Management Implementation Plan
AO	Administrative Order for Compliance
BMP	Best Management Practices. Refers to the procedures employed in commercial kitchens to minimize the quantity of fats, oils, and grease that are discharged to the sanitary sewer system. Examples include scraping food scraps into the garbage can and dry wiping dishes and utensils prior to washing.
CAD	Computer-Aided Drafting
Cal OES	California Office of Emergency Services
CCTV	Closed-Circuit Television. Refers to the process and equipment that are used to internally inspect the condition of gravity sewers.
CDFW	California Department of Fish and Wildlife
CIP	Capital Improvements Plan
City	City of Alameda
CIWQS	California Integrated Water Quality System. Refers to the SWRCB online electronic reporting system that is used to report SSOs, certify completion of the SSMP, and provide information on the sanitary sewer system.
CMMS	Computerized Maintenance Management System
CWEA	California Water Environment Association
Design Storm	A 7-hour, 5-year return frequency rainfall event, as defined for the East Bay I/I Study conducted during the 1980s, which determines the peak flow rate that the City's sewer system must have capacity to convey. The design storm event is assumed to occur under saturated soil conditions and concurrently with the diurnal peak base wastewater flow.
EBMUD	East Bay Municipal Utility District
EPA	U.S. Environmental Protection Agency
First Responder	Refers to the City employee who provides the City's initial response to a sewer system event.
FOG	Fats, Oils and Grease
Force Main	Refers to a pressure sewer used to convey wastewater from a pump station to the point of discharge.
FSE or FHF	Food Service Establishment or Food Handling Facilities. Refers to commercial or industrial facilities where food is handled, prepared, and/or served that discharge to the sanitary sewer system.
FY	Fiscal Year

GIS	Geographic Information System. Refers to the system that is used to store, analyze, and manage geospatial data associated with the City’s sewer system assets.
GPS	Global Positioning System
HOA	Homeowner Association
I/I	Infiltration and Inflow. Refers to storm water or groundwater that enter the sanitary sewer system through defects in pipes and manholes (infiltration) or direct drainage connections (inflow).
Lower Lateral	Refers to the portion of the sewer service lateral located in the public right-of-way, extending from the property line to the public sewer.
LRO	Legally Responsible Official. Refers to the individual who has the authority to certify reports and other actions that are submitted through CIWQS.
MH	Manhole or Maintenance Hole. Refers to an engineered structure that is intended to provide access to a sanitary sewer for maintenance and inspection.
MRP	Refers to the Monitoring and Reporting Program associated with SWRCB Order No. 2006-0003 Statewide General Waste Discharge Requirements for Sanitary Sewer Systems
MWWTP	EBMUD Main Wastewater Treatment Plant
NASSCO	National Association of Sewer Service Companies
OERP	Overflow Emergency Response Plan
OES	California State Office of Emergency Services
O&M	Operations and Maintenance
NPDES	National Pollutant Discharge Elimination System
PACP	Pipeline Assessment Certification Program
PLSD	Private Lateral Sewage Discharge
PSL	Private Sewer Lateral. Refers to the upper portion of the sewer service lateral that connects a building drain to the Lower Lateral.
PM	Preventive Maintenance
RWQCB	Regional Water Quality Control Board, San Francisco Bay Region
SECAP	System Evaluation and Capacity Assurance Plan
SO	Stipulated Order for Preliminary Relief
SSMP	Sewer System Management Plan
SSO	Sanitary Sewer Overflow. Refers to any overflow, spill, release, discharge or diversion of untreated or partially treated wastewater from a sanitary sewer system.
SWRCB	State Water Resources Control Board
VCP	Vitrified Clay Pipe
WDR	Refers to SWRCB Order No. 2006-0003 Statewide General Waste Discharge Requirements for Sanitary Sewer Systems
Work Order	Refers to a document (paper or electronic) that is used to assign work and to record the results of the work.
WWF	Wet Weather Facility

Introduction

The “Statewide General Waste Discharge Requirements for Sanitary Sewer Systems” (WDR), adopted by the State Water Resources Control Board (SWRCB) in 2006, requires that every public agency in California with more than one mile of sanitary sewers prepare a Sewer System Management Plan (SSMP) that defines the management, operation, and maintenance practices needed to prevent and mitigate the impact of sanitary sewer overflows (SSOs). This introductory chapter describes the sewage discharge prohibitions and provisions as stated in the WDR and provides an overview and historical perspective on the City of Alameda’s sanitary sewer system. A copy of the WDR is included in **Appendix A** of this SSMP. Pursuant to California Water Code Section 13267(b), the City must also comply with the SSO “Monitoring and Reporting Program” (MRP), as amended in 2013, and all future revisions, included by reference in the WDR. A copy of the MRP is included in **Appendix B** of this SSMP.

The City has complied with all the mandatory elements of the WDR. The City’s first SSMP was completed and certified by the City Council in July 2009. This document constitutes the five-year update to the SSMP and reflects the most current information on the City’s sewer system management, operation, and maintenance programs. A copy of the WDR, MRP, and the certified SSMP is available to all personnel involved in management, operation, and maintenance of the City’s sanitary sewer system and to the public upon request.

WDR Prohibitions

To meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder, the City of Alameda is required to comply with the following prohibitions:

- Any SSO that results in a discharge of untreated or partially treated wastewater to waters of the United States is prohibited, and
- Any SSO that results in a discharge of untreated or partially treated wastewater that creates a nuisance as defined in California Water Code Section 13050(m) is prohibited.

WDR Provisions

As stated in the WDR, the City agrees to meet the following provisions:

1. City must comply with all conditions in the WDR. Any noncompliance with the WDR constitutes a violation of the California Water Code and is grounds for enforcement action.
2. Nothing in the WDR shall be:
 - (i) Interpreted or applied in a manner inconsistent with the Federal Clean Water Act, or supersede a more specific or more stringent state or federal requirement in an existing permit, regulation, or administrative/judicial order or Consent Decree;
 - (ii) Interpreted or applied to authorize a SSO that is illegal under either the Clean Water Act, an applicable Basin Plan prohibition or water quality standard, or the California Water Code;
 - (iii) Interpreted or applied to prohibit a Regional Water Board from issuing an individual National Pollutant Discharge Elimination System permit or waste discharge requirements, superseding this WDR, for a sanitary sewer system, authorized under the Clean Water Act or California Water Code; or

- (iv) Interpreted or applied to supersede any more specific or more stringent waste discharge requirements or enforcement order issued by a Regional Water Board.
3. The City shall take all feasible steps to eliminate SSOs. In the event that an SSO does occur, the City shall take all feasible steps to contain and mitigate the impacts of an SSO.
 4. In the event of an SSO, the City shall take all feasible steps to prevent untreated or partially treated wastewater from discharging from storm drains into flood control channels or waters of the United States by blocking the storm drainage system and by removing the wastewater from the storm drains.
 5. The City shall report SSOs in accordance with Section G of the WDR.
 6. The City understands that in any enforcement action, the State and/or Regional Water Boards will consider the appropriate factors under the duly adopted State Water Board Enforcement Policy, and, consistent with this policy, must consider the City's efforts to contain, control, and mitigate SSOs when considering the California Water Code 13327 factors. In assessing these factors, the State and/or Regional Water Boards will also consider additional factors listed in Provision 6 of the WDR.
 7. When an SSO occurs, the City shall take all feasible steps and necessary remedial actions to 1) control or limit the volume of untreated or partially treated wastewater discharged, 2) terminate the discharge, and 3) recover as much of the wastewater discharged as possible for proper disposal, including any wash down water.

The City shall implement all remedial actions to the extent they may be applicable to the discharge and not inconsistent with an emergency response plan, including the following:

- (i) Interception and rerouting of untreated or partially treated wastewater flows around the wastewater line failure.
 - (ii) Vacuum truck recovery of sanitary sewer overflows and washdown water.
 - (iii) Cleanup of SSO-related debris at the overflow site.
 - (iv) System modifications to prevent another SSO at the same location.
 - (v) Adequate sampling to determine the nature and impact of the release.
 - (vi) Adequate public notification to protect the public from exposure to the SSO.
8. The City shall properly manage, operate, and maintain all parts of the sanitary sewer it owns and operates, and shall ensure that the system operators (including employees, contractors, or other agents) are adequately trained and possess adequate knowledge, skills, and abilities.
 9. The City shall allocate adequate resources for the operation, maintenance, and repair of its sanitary sewer system, by establishing a proper rate structure, accounting mechanisms, and auditing procedures to ensure an adequate measure of revenues and expenditures. These procedures must be in compliance with applicable laws and regulations and comply with generally accepted accounting practices.
 10. The City shall provide adequate capacity to convey base flows and peak flows, including flows related to wet weather events. Capacity shall meet or exceed the design criteria as defined in the City's System Evaluation and Capacity Assurance Plan for all parts of the sanitary sewer system owned or operated by the City.

11. The City shall develop and implement a written SSMP and make it available to the State and/or Regional Water Board upon request. A copy of this document must be publically available at the City's office and/or available on the internet. This SSMP must be approved by the City's governing board at a public meeting.
12. In accordance with the California Business and Professions Code sections 6735, 7835, and 7835.1, all engineering and geologic evaluations and judgments shall be performed by or under the direction of registered professionals competent and proficient in the fields pertinent to the required activities. Specific elements of the SSMP that require professional evaluation and judgments shall be prepared by or under the direction of appropriately qualified professionals, and shall bear the professional(s)' signature and stamp.
13. The elements of the SSMP include:
 - (i) Goal
 - (ii) Organization
 - (iii) Legal Authority
 - (iv) Operations and Maintenance Program
 - (v) Design and Performance Provisions
 - (vi) Overflow Emergency Response Plan
 - (vii) FOG Control Program
 - (viii) System Evaluation and Capacity Assurance Plan
 - (ix) Monitoring, Measurement, and Program Modifications
 - (x) SSMP Program Audits
 - (xi) Communication Program
14. The SSMP must be updated every five (5) years, and must include any significant program changes. Re-certification by the City Council is required when significant updates to the SSMP are made. To complete the re-certification process, the City shall enter the data in the Online SSO Database and mail the form to the State Water Board, as described in Section D.14 of the WDR.

Sewer System Overview and Historical Perspective

The City's collection system includes approximately 142 miles of City-owned sanitary sewers (136 miles of gravity pipes and 6 miles of force mains), approximately 3,000 manholes and other sewer structures, and 42 sewage pump stations. Approximately 128 miles of the total system pipeline length and 33 pump stations are located on the main part of the Alameda island and Harbor Bay Isle, and approximately 14 miles of pipeline and 9 pump stations are located in the City-owned portion of Alameda Point, the former Alameda Naval Air Station. A large portion of Alameda Point was formally transferred to City ownership in 2013, including the collection system and building laterals. The remainder (including an additional 3 miles of sewers) will be transferred at a later date after cleanup operations are completed; however, the City maintains the entire Alameda Point collection system under a contract with the U.S. Navy.

The original sewers in Alameda were primarily terra cotta pipe and were installed between 1890 and 1920. The sewers constructed after 1920 can be divided into three major groups based on the date of construction: those built prior to 1950; between 1950 and 1970; and 1970 to the present.

There are over 10 miles of pipelines and seven pump stations located in Alameda that are part of the East Bay Municipal Utility District (EBMUD) wastewater interceptor system, as well as over 14 miles of

privately-owned sanitary sewers that are the responsibility of individual Homeowner Associations (HOAs). Most of these private sewers are located on Harbor Bay Isle or in the Bayport development located east of Alameda Point between Willie Stargell Avenue and Ralph Appezato Memorial Parkway. The U.S. government owns and is responsible for the sanitary sewer system serving the Coast Guard Housing area located north of Bayport.

In Alameda, the property owner is responsible for maintenance and repair of the entire service lateral from the building drain to the connection to the City's sewer main. However, the City takes responsibility for replacement of the lower portion of the lateral (within the public right-of-way) when the public sewer main to which it is connected is rehabilitated or replaced, or if the lower lateral fails, whichever occurs first.

Wastewater generated in the City's collection system is conveyed to the EBMUD interceptor system, and is treated at EBMUD's Main Wastewater Treatment Plant (MWWTP) located near the eastern terminus of the San Francisco-Oakland Bay Bridge. EBMUD also receives flows from six other "Satellite" collection system agencies: the cities of Albany, Berkeley, Emeryville, Oakland, and Piedmont, and the Stege Sanitary District.

During the 1980s, EBMUD and the seven Satellite agencies conducted studies to address the problem of overflows and bypasses of untreated wastewater that occurred during large wet weather events due to excessive infiltration and inflow (I/I) into the collection systems. These studies resulted in a long-term program of construction of collection system relief sewers and sewer rehabilitation (called the East Bay I/I Correction Program), and construction by EBMUD of improvements at the MWWTP as well as three new remote Wet Weather Facilities (WWFs) designed to store, provide primary-level treatment, and discharge flows that exceeded the capacity of its interceptor system during wet weather.

Over a period of 20 years, separated into multiple phases, the City installed relief lines, as well as removed and replaced sewer mains, manholes and lower laterals in targeted areas identified as being cost-effective for rehabilitation to reduce I/I. In addition the City has carried out cyclic sewer rehabilitation projects on lines identified by the Maintenance Division as significantly deficient. Through the I/I Correction and Cyclic Sewer Rehabilitation programs, the City has rehabilitated or replaced about 27 miles of its gravity sewers and associated lower laterals (over 20 percent of the system) since 1987. Since 1988, the City has also implemented a private sewer lateral (PSL) certification program requiring the testing and/or repair or replacement of private (upper) sewer laterals at the time of property transfer. To date, over 6,000 private laterals have been certified for compliance under the program.

In 2009, the U.S Environmental Protection Agency (EPA), State Water Resources Control Board (SWRCB), and the San Francisco Bay Regional Water Quality Control Board (RWQCB) prohibited future discharges from the WWFs, and entered into a legal settlement with EBMUD to establish programs focused on reducing wet weather flows. Shortly thereafter, the EPA issued Findings of Violation and Orders for Compliance, also called Administrative Orders (AOs), to each of the seven EBMUD Satellite agencies requiring the development of specific plans and programs to reduce SSOs and control wet weather I/I into the collection systems. The AOs were subsequently replaced in 2011 by a Stipulated Order for Preliminary Relief (SO) with the EPA, SWRCB, and RWQCB. As required by the SO, the City has prepared various plans and reports related to the management, operation, and maintenance of its sewer system, including an Asset Management Implementation Plan (AMIP), Inflow Identification and Elimination Plan, Subbasin Flow Monitoring and I/I Assessment Plan and Report, Pump Station Prioritization and Renovation Plans, as well as annual progress reports. The programs and practices described in those plans and reports have been incorporated into the relevant sections of this SSMP.

The seven Satellites and EBMUD have recently entered into a Consent Decree with EPA, the SWRCB, and the RWQCB (Case Nos. C09-00186-RS and C09-05684-RS). The Consent Decree establishes requirements for achieving the elimination of WWF discharges over the next 22 years. This SSMP incorporates the sewer system programs and practices that will be required as part of the Consent Decree.

About this Document

The structure of this document follows the nomenclature used in the WDR, and the chapter numbers correspond to the eleven SSMP elements. The SSMP provides a description of how the City complies with the various provisions of the WDR and provides references to supporting documents included in appendices. Some supporting materials may not be physically included in the SSMP, such as the City of Alameda Municipal Code (available on the internet), and detailed sewer main and manhole geographic information system (GIS) data. In these cases, the SSMP provides a reference indicating the type, owner, and location of these supporting materials.

The SSMP is intended to be the document that guides the daily activities of City staff in the management, operation and maintenance of the sanitary sewer system. Additional details of these programs and specific activities related to compliance with the City's SO and Consent Decree are also contained in the City's AMIP, included as **Appendix C**.

Chapter 1 Goal of SSMP

The goal of the SSMP is to provide a plan and schedule to properly manage, operate, and maintain all parts of the City's sanitary sewer system to prevent SSOs and mitigate any SSOs that do occur. The purpose of the WDR is to prevent SSOs. The City has prepared and implemented this SSMP to support this purpose. The City will monitor the effectiveness of this SSMP to determine if deficiencies exist and will take appropriate steps to correct them.

1.1 Regulatory Requirements for the Goal Element

The WDR includes the following goal for the SSMP:

The goal of the SSMP is to provide a plan and schedule to properly manage, operate, and maintain all parts of the sanitary sewer system to prevent SSOs and mitigate any SSOs that do occur. This will help reduce and prevent SSOs, as well as mitigate any SSOs that do occur.

1.2 SSMP Goals

The City's specific SSMP goals are:

- Continue to professionally manage, operate and maintain all parts of the wastewater collection system.
- Cost-effectively minimize infiltration and inflow into the system and provide adequate capacity to convey peak flows.
- Minimize the frequency of SSOs
- Mitigate the impact of SSOs.
- Protect water quality and the environment.

Chapter 2 Organization

This chapter identifies the City's authorized representatives and describes the organization of City staff, their chain of communication, and roles in implementation of the SSMP.

2.1 Regulatory Requirements for the Organization Element

The requirements for the Organization element of the SSMP are summarized below. The SSMP must identify:

- (a) *The name of the responsible or authorized representative;*
- (b) *The names and telephone numbers for management, administrative, and maintenance positions responsible for implementing specific measures in the SSMP program. Include lines of authority as shown in an organization chart or similar document with a narrative explanation; and*
- (c) *The chain of communication for reporting SSOs, from receipt of a complaint or other information, including the person responsible for reporting SSOs to the State and Regional Water Board and other agencies if applicable (such as County Health Officer, County Environmental Health Agency, Regional Water Board, and/or State Office of Emergency Services (OES)).*

2.2 Authorized Representative

The City's duly authorized representatives, also referred to as Legally Responsible Officials (LROs), as defined in Section J of the WDR, are the Public Works Maintenance Superintendent, Public Works Director, Public Works Deputy Director, and Public Works Coordinator.

2.3 Positions Responsible for SSMP Implementation

Figure 2-1 is an organization chart summarizing positions and lines of authority for staff responsible for SSMP implementation. **Table 2-1** summarizes the roles and responsibilities relevant to the sanitary sewer system infrastructure of the key positions shown on the organization chart. The positions with overall responsibility for implementing the specific elements and measures of the SSMP are identified in **Table 2-2**. The names and telephone numbers for management, administrative, and maintenance positions are included in **Appendix 2-A**.

Figure 2-1: SSMP Organization Lines of Authority

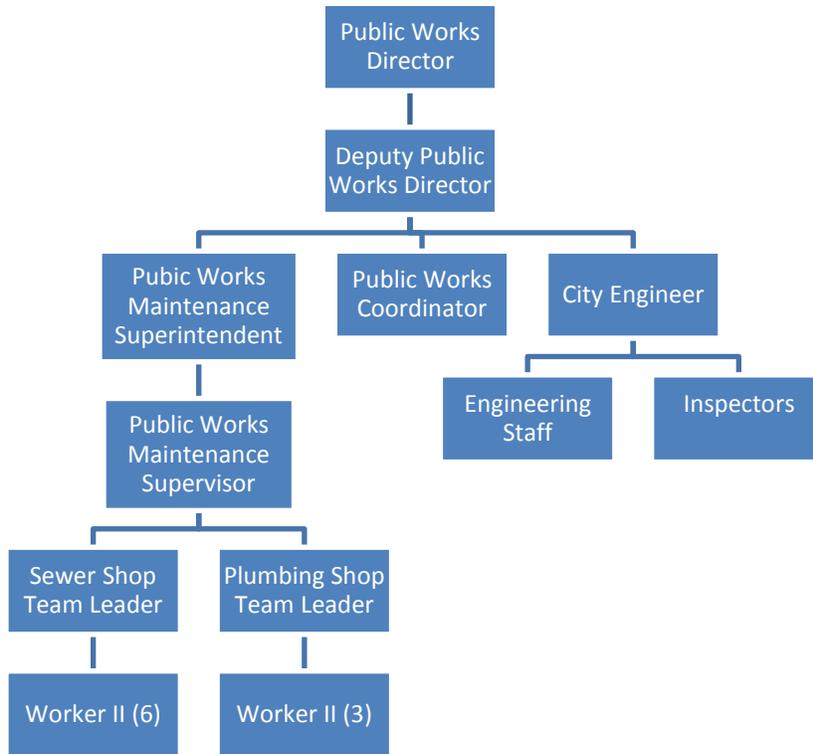


Table 2-1: Narrative Explanation of Responsibilities of SSMP Organization Positions

Position	Narrative Explanation
City Council	Provides policy direction, approves SSMP, and appropriates funds to implement SSMP activities.
City Manager	Implements City Council policy.
Public Works Director	Supervises Public Works engineering, operations, and administrative staff. Regulatory agency liaison and LRO.
Deputy Public Works Director	Responsible for sewer program operations and capital budgets. LRO with backup responsibility for certifying City's reporting to CIWQS.
Public Works Coordinator	Responsible for regulatory reporting and permitting; coordination with EBMUD and other EBMUD Satellites; tracking compliance and issuing notices and citations for violations related to inflow elimination and private sewer lateral compliance programs. Oversees contractor cleaning and CCTV inspection. Responsible for condition assessment and inflow elimination programs. LRO with backup responsibility for certifying City's reporting to CIWQS.
City Engineer	Oversees sewer rehabilitation and I/I correction programs. Supervises engineering staff.
Assistant & Associate Civil Engineers	Perform sewer rehabilitation design; manage sewer and pump station rehabilitation design and construction projects.
Engineering Inspectors	Inspect sewer and pump station rehabilitation construction and coordinate with sewer inspection contractors.
Public Works Maintenance Superintendent	Oversees sewer system O&M program and manages sewer system O&M staff. LRO responsible for certifying City's reporting to CIWQS.
Public Works Maintenance Supervisor	Supervises sewer and pump station field personnel; assigns and tracks completion of work. Supports planning, scheduling, dispatch, and tracking of sewer and pump station maintenance activities. Responsible for reporting to CIWQS.
Sewer and Plumbing Shop Team Leaders	Lead sewer and pump station field crews.
Sewer and Plumbing Shop Workers	Perform sewer system and pump station emergency response, cleaning, inspection, and repair work.

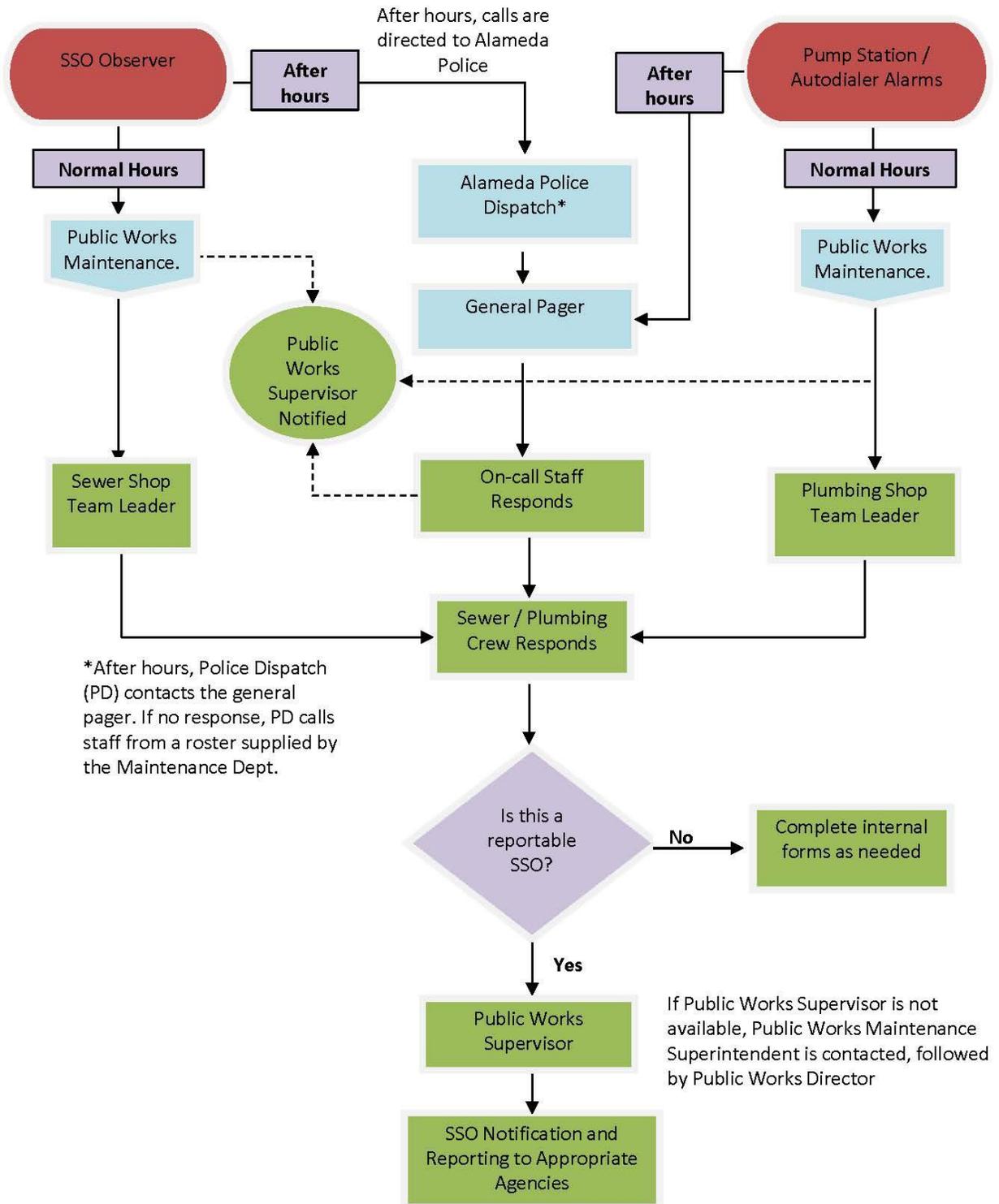
Table 2-2: Positions Responsible for SSMP Implementation

SSMP Element	SSMP Element/Measure	Responsible Position
1	Goal	Public Works Director
2	Organization	Public Works Director
3	Legal Authority	Public Works Director
4	Operations and Maintenance Program – Mapping	Public Works Coordinator
4	Operations and Maintenance Program – Hot Spot and Routine Maintenance	Public Works Maintenance Superintendent
4	Operations and Maintenance Program – Condition Assessment Program	Public Works Coordinator
4	Operations and Maintenance Program –Rehabilitation and Replacement Program	City Engineer
4	Operations and Maintenance Program – CIP Program Funding	Deputy Director of Public Works
4	Operations and Maintenance Program – Field Crew Training; O&M Contractor Training	Public Works Maintenance Superintendent
4	Operations and Maintenance Program – Equipment and Replacement Parts Inventory	Public Works Maintenance Superintendent
5	Design and Performance Provisions	City Engineer
6	Overflow Emergency Response Plan	Public Works Maintenance Superintendent
7	Fats, Oils, and Grease Control Program	Public Works Maintenance Superintendent
8	System Evaluation and Capacity Assurance Plan	Public Works Coordinator
9	Monitoring, Measurement, and Program Modifications	Public Works Coordinator
10	SSMP Program Audits	Public Works Coordinator
11	Communication Program	Public Works Coordinator

2.4 Chain of Communication for Reporting Sewer Overflows

The City's chain of communications for reporting sewer overflows is shown in **Figure 2-2**. Refer to Chapter 6, Overflow Emergency Response Plan, for additional information on SSO notification and reporting.

Figure 2-2: Chain of Communications for Reporting SSOs



Chapter 3 Legal Authority

This section of the SSMP discusses the City's legal authority to comply with the SSMP requirements, as provided in its Municipal Code and agreements with other agencies.

3.1 Regulatory Requirements for the Legal Authority Element

The WDR requirements for the Legal Authority element of the SSMP are summarized below:

The City must demonstrate, through sanitary system use ordinances, service agreements, or other legally binding procedures, that it possesses the necessary legal authority to:

- (a) Prevent illicit discharges into its wastewater collection system (examples may include infiltration and inflow (I/I), storm water, chemical dumping, unauthorized debris and cut roots, etc.);*
- (b) Require that sewers and connections be properly designed and constructed;*
- (c) Ensure access for maintenance, inspection, or repairs for portions of the lateral owned or maintained by the Public Agency;*
- (d) Limit the discharge of fats, oils, and grease and other debris that may cause blockages; and*
- (e) Enforce any violation of its sewer ordinances.*

3.2 Summary of Legal Authorities

The Alameda, California, Code of Ordinances (Alameda Municipal Code or AMC) and the California Plumbing Code, which has been adopted by the City, provide the City with the required legal authorities. The City's legal authorities are also provided by EBMUD Ordinances and Regulations. The City's current legal authorities are summarized in **Table 3-1**. Each of the documents providing the City of Alameda with required legal authorities can be accessed via the internet at the following websites:

- Alameda Municipal Code: <https://library.municode.com/index.aspx?clientId=16753&stateId=5&stateName=California>
- California Plumbing Code: <http://www.iapmo.org/Pages/californiaplumbingcode.aspx>
- EBMUD Ordinance 311A-03: http://ebmud.com/sites/default/files/pdfs/ord_no_311a03_2.pdf

Table 3-1: Summary of City of Alameda's Legal Authorities

Requirement	Legal Authority Reference*
ILLCIT DISCHARGES	
Prevent illicit discharges into the wastewater collection system	AMC 18-1.1; EBMUD Ordinance No. 311A-03
Limit the discharge of fats, oils, and grease and other debris that may cause blockages	AMC 18-1.1
Control infiltration and inflow (I/I) from private service laterals	AMC 18-5.1
PROPER DESIGN AND CONSTRUCTION	
Require that sewers and connection be properly designed and constructed	AMC 18-2.1, 18-3.6
Require proper installation, testing, and inspection of new and rehabilitated sewers	AMC 18-2.2, 18-2.4
ACCESS TO LATERALS	
Clearly define City responsibility and policies	AMC 18-6.1f
Ensure access for maintenance, inspection, or repairs for portions of the service lateral owned or maintained by the City	N/A
FOG SOURCE CONTROL	
Requirements to install grease removal devices (such as traps or interceptors)	EBMUD Ordinance No. 311A-03
Maintenance requirements, BMP requirements, record keeping and reporting requirements for grease removal devices	EBMUD Ordinance No. 311A-03
Authority to inspect grease producing facilities	EBMUD Ordinance No. 311A-03
ENFORCEMENT	
Enforce any violations of its sewer ordinances	AMC 18-5.2, 18-5.4, 18-6.7

* AMC refers to Alameda Municipal Code, Chapter XVIII (Sewer and Water), Article I (Sewers)

Chapter 4 Operations and Maintenance Program

This section of the SSMP provides an overview of the City's sewer system operations and maintenance (O&M) program. The elements of the City's sewer system O&M Program include maintenance of gravity sewers, operational inspection and maintenance of pump stations, and sewer, manhole, and pump station inspection, rehabilitation and replacement. The details of the City's O&M programs are described in this section. Additional details on specific aspects of the O&M Program as required by the Consent Decree are provided in the Asset Management Implementation Plan, included in **Appendix C**.

4.1 Regulatory Requirements for Operations and Maintenance Program

The summarized requirements for the Operations and Maintenance Program are:

1. *Maintain an up-to-date map of the sanitary sewer system, showing all gravity line segments and manholes, pumping facilities, pressure pipes and valves, and applicable storm water conveyance facilities;*
2. *Describe routine preventive operation and maintenance activities by staff and contractors, including a system for scheduling regular maintenance and cleaning of the sanitary sewer system with more frequent cleaning and maintenance targeted at known problem areas. The preventative maintenance (PM) program should have a system to document scheduled and conducted activities, such as work orders;*
3. *Develop a rehabilitation and replacement plan to identify and prioritize system deficiencies and implement short-term and long-term rehabilitation actions to address each deficiency. The program should include regular visual and TV inspections of manholes and sewer pipes, and a system for ranking the condition of sewer pipes and scheduling rehabilitation. Rehabilitation and replacement should focus on sewer pipes that are at risk of collapse or prone to more frequent blockages due to pipe defects. Finally, the rehabilitation and replacement plan should include a capital improvement plan that addresses proper management and protection of the infrastructure assets. The plan shall include a time schedule for implementing the short-term and long-term plans plus a schedule for developing the funds needed for the capital improvement plan;*
4. *Provide training on a regular basis for staff in sanitary sewer system operations and maintenance, and require contractors to be appropriately trained; and*
5. *Provide equipment and replacement part inventories, including identification of critical replacement parts.*

4.2 Sanitary Sewer System Mapping

The City maintains a set of sanitary sewer collection system block book maps that contain information about the sewer, manhole, and pump station locations, pipe sizes, rim and flow line elevations, and references to construction drawings. These block book maps are used by sewer field crews to locate sewer facilities and note any corrections needed. The City has also digitized the sewer system maps into Computer Aided Drafting (CAD) format. The City converted the collection system CAD map to Geographical Information System (GIS) format in 2009. Since that time, updates have been made to the GIS map and database to correct errors and incorporate sewer projects constructed by the City or new sewers constructed by developers. GIS attribute data for pipes include diameter, length, invert elevations, material (if documented), type (gravity or force main), owner (City, private, or EBMUD), year of construction or rehabilitation (if documented), plan reference, grid or non-grid system (see discussion of

sewer system cleaning in Section 4.3.1), and basin ID. The GIS mapping is used for hydraulic modeling and sewer inspection planning and documentation.

Mapping for Alameda Point, previously in CAD format, was also recently converted to GIS, and manhole and node IDs were assigned. These maps show pipe sizes, types, and pump stations, but lack information on rim and invert elevations and references to record drawings. It is anticipated that the majority of the sewers in Alameda Point will be replaced as development occurs in the area, and sewer mapping will be updated at that time.

The City is working on developing a formalized process to update sewer maps and develop a consolidated set of maps that can be used by both the sewer crews and for computerized applications that require GIS-based mapping.

The City also maintains a set of storm drain maps similar to the sewer block book maps. The maps show the location of storm sewers and catch basins, pipe diameters and materials, manhole rim and flow line elevations, and flow directions.

4.3 Operation and Maintenance Activities

4.3.1 Sewer Preventive Maintenance

The City employs a preventive maintenance approach to maintaining the sewer system designed to minimize the occurrence of repeat blockages and/or SSOs from gravity sewer line segments with a known history of problems, or to prevent problems from occurring in high traffic business areas. It consists of cleaning problematic or critical gravity sewer line segments on an aggressive preventive maintenance frequency of (at least once per year), and all other sewer line segments as part of a routine maintenance program on a 5- or 10-year frequency schedule.

Aggressive (“Hot Spot”) Preventive Maintenance

Sewers with previous repeat SSOs (two or more SSOs at the same location in a single year due to the same cause) and/or identified by maintenance staff as having recurring maintenance issues (e.g., roots, grease, or debris accumulation) are defined as “hot spots.” The hot spot is identified if, after cleaning operations, roots, grease, or debris are found to be the cause of a blockage or SSO, and the same problem is reported two or more times in a year. In these cases, the sewer segments both upstream and downstream of the blockage location are put on the hot spot list. Other sewers may also be included as hot spots based on the decision of the Maintenance Superintendent. The aggressive preventive maintenance program also includes sewer lines located in the busy commercial areas along Park and Webster Streets in order to minimize the potential for sewer blockages. The gravity sewer line segments that are currently maintained on an aggressive preventive maintenance frequency are shown on the map in **Appendix 4-A**.

Hot spots are cleaned on a schedule at least once per year, with some on 9-month schedules. The hot spot locations currently include approximately 6.7 miles of pipes located in the business districts along Webster Street and Park Street, and in several other areas of the system. The primary maintenance issue in the business districts is grease. Historically, many of the City’s hot spots were related to issues in lower laterals. The City has historically taken responsibility for unplugging lower lateral blockages as a courtesy to homeowners, but has now changed its policy to shift responsibility to the property owner. Therefore, the City has updated the hot spot list based on changes in maintenance protocols for lower laterals.

Hot spot locations are maintained in GIS on a Hot Spot Location Map, which is updated annually. Hot spots are added based on the criteria above, or may be removed based on the Maintenance Superintendent’s recommendation if the hot spot has not caused or contributed to an SSO for two consecutive years or if the pipe reach has been replaced.

Starting in FY14/15, the City plans to add the hot spots to its Comcate work order system in order to automatically generate work orders when each pipe is scheduled for cleaning, as well as record the cleaning results. Hot spot cleaning results will be recorded in accordance with the codes shown in Table 4-2. The initial frequency of cleaning for new hot spots will be 6 months. The City will adjust hot spot cleaning frequencies based on cleaning findings, as shown in **Table 4-1**.

Table 4-1: Cleaning Schedule Changes Based on Cleaning Results

Clear	Light	Moderate	Heavy
Decrease frequency to next lower frequency after 2 consecutive CL results (e.g. 6 mos. to 12 mos.) and CCTV inspection data showing no remaining defects that would cause a blockage or an SSO.	Continue current maintenance frequency.	Increase current maintenance frequency to next higher frequency (e.g. 6 mos. to 3 mos.)	Increase current maintenance frequency to next higher frequency (e.g. 6 mos. to 3 mos.)

System-Wide Routine Maintenance

Sewer pipelines not assigned an aggressive preventive maintenance frequency are cleaned as part of a system-wide (routine) preventive maintenance program. Since 2012, the City has elected to perform routine cleaning activities in conjunction with its CCTV inspection program. This work is conducted by contractor.

The gravity sewer mains in the City's collection system are classified into two basic types: "grid" and "non-grid". The sewers in the grid system are characterized by having multiple pathways for flow should a temporary pipe blockage and flow backup occur. This allows the flow to be bypassed to another, non-obstructed sewer main and be conveyed downstream in another direction, thereby preventing a sanitary sewer overflow. Over 60 percent of the gravity sewers in the main Alameda collection system are part of the grid system. Each pipe is flagged as "grid" or "non-grid" in the City's GIS based on the configuration of the surrounding system. The map included in **Appendix 4-B** shows the locations of the grid and non-grid sewer mains in the system.

In accordance with Consent Decree requirements, the City plans to complete cleaning of all pipes in the system (except for the Alameda Point system) by or before June 30, 2019. Thereafter, the City will clean all non-grid sewer mains at least once every five years and all grid sewer mains at least once every ten years. Mains that are greater than 15 inches in diameter may be cleaned based on condition assessment, which shall, at a minimum, take into consideration any information concerning the accumulation of fats, oil and grease, sediment, and debris derived from CCTV inspection or cleaning history.

Sewer cleaning crews will record their observations regarding the nature and extent of the material removed during the sewer cleaning using the codes shown in **Table 4-2**.

Note that the Consent Decree does not require a routine cleaning program for the Alameda Point sewers. The sewers in Alameda Point will be replaced over time as part of the planned redevelopment of the former Naval Air Station site. As sewers are replaced, the City will evaluate the need for and frequency of a routine sewer cleaning program. However, any sewers in Alameda Point that experience repeat blockages or SSOs or otherwise meet the criteria noted above for the hot-spot cleaning program will be included in that program.

Table 4-2: Categorization of Sewer Cleaning Results

	Clear	Light	Moderate	Heavy
Debris	Code: CL <ul style="list-style-type: none"> No observable debris 	Code: DL <ul style="list-style-type: none"> Minor amount of debris 15 minutes or less to clean 1 pass 	Code: DM <ul style="list-style-type: none"> Less than 5 gallons of debris per line segment 15-30 minutes to clean 2-3 passes 	Code: DH <ul style="list-style-type: none"> More than 5 gallons of debris per line segment More than 30 minutes to clean More than 4 passes Operator concern for future stoppage
Grease	Code: CL <ul style="list-style-type: none"> No observable grease 	Code: GL <ul style="list-style-type: none"> Minor amounts of grease 15 minutes or less to clean 1 pass 	Code: GM <ul style="list-style-type: none"> Small "chunks" No "logs" 15-30 minutes to clean 2-3 passes 	Code: GH <ul style="list-style-type: none"> Big "chunks" or "logs" More than 30 minutes to clean More than 4 passes Operator concern for future stoppage
Roots	Code: CL <ul style="list-style-type: none"> No observable roots 	Code: RL <ul style="list-style-type: none"> Minor amounts of roots 15 minutes or less to clean 1 pass 	Code: RM <ul style="list-style-type: none"> Thin stringy roots No "clumps" 15-30 minutes to clean 2-3 passes 	Code: RH <ul style="list-style-type: none"> Thick roots Large "clumps" More than 30 minutes to clean More than 4 passes Operator concern for future stoppage
Other: Pipe wall fragments Soil/dirt/ rock	Code: CL <ul style="list-style-type: none"> No observable materials 	Code: OL <ul style="list-style-type: none"> Specify material (if possible) Minor amounts of material 	Code: OM <ul style="list-style-type: none"> Specify material Less than 5 gallons of material per line segment 	Code: OH <ul style="list-style-type: none"> Specify material More than 5 gallons of material per line segment Operator concern for future stoppage

This table was adapted from *Best Practices Manual: Hydroflush Cleaning of Small Diameter Sewers*, California Collection System Collaborative Benchmarking Group, February 2001.

Root Control

The City uses chemical root control as needed to control roots. The City initially identified 3.3 miles of sewer pipelines for chemical root treatment. These were primarily areas with root problems from sewer laterals rather than sewer mains. Pipes were initially identified as potential candidates for chemical root control based on lower lateral service requests, sewer mains in backyard/sideyard easements and under sidewalks, and shallow sewer mains in areas with trees. Based on video inspection of these areas, it was determined that roots in sewer mains were not an issue, but roots in lower laterals could pose a risk in backyard, sideyard, and sidewalk mains. Therefore, these lines (and the associated lower laterals) are targeted for chemical root treatment.

Root foaming was applied for the 3.3 miles of pipes initially identified for chemical root control. Sewers that have undergone chemical root treatment will be CCTV inspected periodically by City crews. The amount of root foaming will be adjusted as needed in future years based on CCTV information or any recurrence of blockages in pipes that are not otherwise replaced by CIP projects.

4.3.2 Pump Station Maintenance

All pump stations in the City are monitored 24 hours/7 days per week using SCADA technology. Each of the City's pump stations is inspected and cleaned once per month on a regular basis. Degreasing the pump stations and exercising standby generators is performed once a month. The City Maintenance Division performs the pump station cleaning and inspection in accordance with a written procedure. A weekly schedule of pump station inspections is automatically generated by the City's Comcate work order system. A check-box form is used to record the cleaning and inspection activities, which are also noted in a log book at each station. Any issue identified during the inspection requiring repair or other maintenance action is recorded in Comcate. Small issues are addressed immediately (the same day). **Appendix 4-C** includes a copy of the pump station inspection and maintenance procedures and form.

4.3.3 Non-Routine Maintenance

Non-routine maintenance activities include investigation and response to any reports or complaints regarding a sewer overflow or backup; missing, shifted, or noisy manhole covers; pump station malfunction; unexpected sewer odor, etc. Sewer complaints received by the Public Works Department are entered into Comcate and investigated, and appropriate actions are taken to resolve the source of the problem.

4.4 Rehabilitation and Replacement Plan

The City's rehabilitation and replacement program is driven by its I/I correction program and the ongoing gravity sewer condition assessment effort based on CCTV inspections, manhole inspections, smoke testing, and maintenance and service requests. The sewer rehabilitation program is also coordinated with the City's street resurfacing program.

The City initiated its sewer condition assessment program in 2009, and is currently planning to have inspected all gravity sewers (and associated manholes) in the main system (other than Alameda Point) that are more than 10 years old by the end of 2015. The City has adopted the National Association of Sewer Service Companies (NASSCO) Pipeline Assessment Certification Program (PACP) standards for inspection and condition assessment of sewer pipelines. CCTV data is stored in the City's Granite XP CCTV database. The information gathered during the condition assessment is used to identify acute defects in need of near-term repair and to prioritize gravity sewers for rehabilitation and replacement.

The City schedules sewers for rehabilitation in its 5-year CIP, called its “cyclic sewer replacement program.” The City is developing a “pipe rating model” that will be used to prioritize sewer rehabilitation based on relative risk scores, calculated based on the likelihood and consequences of pipe failure. Likelihood of failure factors will include pipe structural condition based on CCTV inspection; pipe age and material (where inspection data is not available); relative peak I/I rates; soil conditions (e.g., location in fill areas); and history of SSOs or recurring maintenance problems. Consequence of failure factors will include the relative size of the sewer (and indicator of the number of customers impacted by a failure or size of a potential SSO); proximity to water bodies; and location in busy streets, commercial areas, or adjacent to community or public safety facilities such as hospitals and fire stations. The results of the pipe rating model will be used to define annual sewer rehabilitation projects to meet Consent Decree requirements.

The City’s current sewer rehabilitation CIP targets an average of three miles of sewer replacement annually. The City reviews this plan annually and makes adjustments based on additional information from maintenance and paving programs. Adjustments will also be made as needed based on results from EBMUD’s Regional Technical Support Program (RTSP), which is focused on identifying specific sources of inflow and rapid infiltration that contribute to peak wet weather flows within the Satellite collection systems.

In addition to planned CIP projects, the City also conducts sewer and manhole point repairs that are identified as critical issues (“acute defects”) based on information from maintenance and inspection activities. The City has an annual budget of \$250,000 for such repairs, which are done by contractor.

The funds that support the Capital Improvement Program come from the City’s Sewer Fund. The sewer fund is an enterprise fund and sewer fees are established to meet projected needs.

4.5 Training Program

4.5.1 City Staff

The City uses a combination of in-house classes; on-the-job training; and conferences, seminars, and other training opportunities to train its wastewater collection system staff. The Maintenance Division holds a monthly tailgate meeting.. These meetings may include a combination of videos and discussion. Training includes trench safety, personal protective equipment, hazardous materials handling, operation of sewer cleaning truck and other equipment, and Class B driver’s license for combination sewer cleaning.

The following personnel in the City’s Maintenance Division have Class II CWEA Certification:

- Sanitary Sewer Pump Station Team Leader
- Public Works Supervisor, Sewers

Also two sewer field personnel have received training for NASSCO PACP certification, and a total of six Public Works staff will have PACP certification as of November 2014.

4.5.2 Staff Contracted for City Projects

The City construction specifications require that all contractors and subcontractors be experienced with sanitary sewer work and that they fully comply with all laws, regulations, and standards governing sewer work, sanitation, and public health.

The City plans to add specific contract language requiring contractors working in the wastewater collection system to provide training for their employees regarding the potential to cause SSOs and

the importance of preventing non-stormwater discharges into the local waterways, as well as develop and submit a Spill Response Plan for review and approval.

4.6 Equipment and Parts Inventory

Equipment, tools, and material for the collection system are maintained at the Maintenance Division Sewer Shop located at 1616 Fortmann Way and the Pump Storage House at 950 West Ranger Avenue, and are accessible to the crews. The City keeps two emergency bypass pumps and a portable generator at the Pump Storage House. Spare parts are available for every pump station, and critical pump stations have spare pumps and motors on the shelf. Lists of the equipment, tools, materials, and spare parts that are kept at the Sewer Shop are included in **Appendix 4-D**. The City Maintenance Division updates the inventory lists on a regular basis.

The City is standardizing its equipment for sewer pump stations in order to achieve more efficient and reliable equipment operations, faster repair time on incidents that could result in SSOs through the use of common parts, and a reduction in on-going training costs. Standardization will also minimize spare and critical replacement parts inventory and costs. **Appendix 4-E** includes a list of specified standardized equipment for sewer pump stations.

4.7 Outreach Program

The City participates in the Bay Area Clean Water Agencies region-wide outreach program to inform sewer cleaning and plumbing contractors of the potential for their work to cause SSOs. The BACWA SSO prevention flyer is available at the City of Alameda's Planning and Building Department's Permit Counter. The flyer briefly describes SSOs, the impact of SSOs, and how to prevent SSOs.

Information about the City's Private Sewer Lateral certification program is posted on the City's website, as well as available from the City Planning and Building Department's Permit Counter. All necessary steps to obtain a Sewer Lateral Certificate, including testing procedure, inspection by the City, identification of any health and safety violations, etc., are explained on the website. Effective January 1, 2015, the City is planning to join the EBMUD Regional PSL Program; at that time, website information will be updated to provide links to the EBMUD PSL Program website.

Chapter 5 Design and Performance Provisions

This element of the SSMP presents the City's Design and Construction Standards for sewer systems.

5.1 Regulatory Requirements for Design and Performance Provisions

The summarized requirements for the Design and Performance Provisions element of the SSMP, which includes Design and Construction Standards, are:

The Enrollee must have design and construction standards and specifications for the installation of new sewer systems and for the rehabilitation and repair of existing sewer systems.

The Enrollee must also have procedures and standards for inspecting and testing the installation of new sewers, pump stations, and other appurtenances; and for rehabilitation and repair projects.

5.2 Standard Specifications for Sewer System Facilities

The City's standards pertaining to the design, construction, inspection, and testing of gravity sewer systems, sewer force mains, and other facilities to be operated and maintained by the City consist of the *Sanitary Sewer Design Standards and Specifications Update* included in **Appendix 5-A**, the *California Plumbing Code*, the *California Department of Transportation Standard Specifications*, and project-specific specifications for cyclic sewer replacement and pump station upgrade projects. The City also maintains a book of Standard Plans, available in digital format, which contains construction details of sewer system structures and pipe installation. The City's sewer design standards are required for both new installation and replacement facilities.

The City has three full-time construction inspectors, who report to the Construction Inspection and Survey Supervisor within the Public Works Department. All new sewer construction and rehabilitation work is inspected to make sure that it meets the City's design and construction standards. All sewers constructed by contractors are cleaned, tested, and video inspected before acceptance. Sewer laterals on private property are tested in accordance with the Uniform Plumbing code and City of Alameda ordinances in the presence of a City Building Inspector from the City's Planning and Building Department.

Chapter 6 Overflow Emergency Response Plan

The purpose of the Overflow Emergency Response Plan (OERP) is to support an orderly and effective response to sanitary sewer overflows (SSOs). The OERP provides guidelines for City personnel to follow in responding to, cleaning up, and reporting SSOs that may occur within the City's service area.

6.1 Regulatory Requirements for OERP Element of SSMP

The WDR includes the following requirements for the development of an Overflow Emergency Response Plan that identifies measures to protect public health and the environment. At a minimum, this plan must include the following:

- (a) Proper notification procedures so that the primary responders and regulatory agencies are informed of all SSOs in a timely manner;*
- (b) A program to ensure appropriate response to all overflows;*
- (c) Procedures to ensure prompt notification to appropriate regulatory agencies and other potentially affected entities (e.g. health agencies, regional water boards, water suppliers, etc.) of all SSOs that potentially affect public health or reach the waters of the State in accordance with the Monitoring and Reporting Program (MRP). All SSOs shall be reported in accordance with this MRP, the California Water Code, other State Law, and other applicable Regional Water Board Waste Discharge Requirements or National Pollutant Discharge Elimination System (NPDES) permit requirements. The Sewer System Management Plan should identify the officials who will receive immediate notification;*
- (d) Procedures to ensure that appropriate staff and contractor personnel are aware of and follow the Emergency Response Plan and are appropriately trained;*
- (e) Procedures to address emergency operations, such as traffic and crowd control and other necessary response activities; and*
- (f) A program to ensure that all reasonable steps are taken to contain untreated wastewater and prevent discharge of untreated wastewater to waters of the United States and minimize or correct any adverse impact on the environment resulting from the SSOs, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the discharge.*

6.2 Overflow Emergency Response Plan Document

The City's OERP is contained in a separate document included as **Appendix 6-A**. The OERP contains detailed sections on spill detection and notification, SSO response procedures, recovery and cleanup, documentation and reporting, equipment, and SSO response training. The OERP appendices include SSO standard operating procedures, contact information, forms used for documentation, spill volume estimation methods, and the Water Quality Monitoring Program Plan to be used when water quality sampling is needed.

Table 6-1 summarizes the contents of each section of the OERP document.

Table 6-1: Summary of OERP Contents

OERP Section	Contents
Section 1 - Introduction	Regulatory requirements, SSO response goals
Section 2 – Spill Detection and Notification	Notification procedures for public observation, city staff observation, and pump station alarms, both during and after working hours
Section 3 – SSO Response Procedures	First responder priorities, safety, initial response, restoring flow, containment measures, water quality sampling and testing
Section 4 – Recovery and Clean-Up	Estimating spill volume, recovery of spilled sewage, clean-up and disinfection, public notification, failure analysis investigation
Section 5 – SSO Documentation and Reporting	SSO categories, internal reporting procedures, external reporting procedures, internal SSO documentation, external record keeping requirements, post-SSO event debriefing
Section 6 - Equipment	Specialized equipment to support SSO response
Section 7 – SSO Response Training	Initial and annual refresher training, SSO response drills, record keeping training
Appendices	SSO Standard Operating Procedures Contact Information SSO Report Form Private Property Incident Form Collection System Failure Analysis Form Methods for Estimating Spill Volume Manhole Overflow Flowrate Guide Sample Warning Signs Water Quality Monitoring Program Plan

Chapter 7 FOG Control Program

This section presents the City's Fats, Oils, and Grease (FOG) Control Program. This FOG Control Program is managed, staffed, and administered by the East Bay Municipal Utility District (EBMUD), with the exception of enforcement, which is the City's responsibility.

7.1 Regulatory Requirements for FOG Control Element of SSMP

The WDR requirements for the FOG Control element of the SSMP are:

The collection system agency shall evaluate its service area to determine whether a FOG control program is needed. If the collection system agency determines that a FOG program is not needed, the collection system agency must provide justification for why it is not needed. If FOG is found to be a problem, the collection system agency must prepare and implement a FOG source control program to reduce the amount of these substances discharged to the sanitary sewer system. The FOG source control program shall include the following as appropriate:

- (a) An implementation plan and schedule for a public education outreach program that promotes proper disposal of FOG;*
- (b) A plan and schedule for the disposal of FOG generated within the sanitary sewer system service area. This may include a list of acceptable disposal facilities and/or additional facilities needed to adequately dispose of FOG generated within a sanitary sewer system service area;*
- (c) The legal authority to prohibit discharges to the system and identify measures to prevent SSOs and blockages caused by FOG;*
- (d) Requirements to install grease removal devices (such as traps or interceptors), design standards for the grease removal devices, maintenance requirements, BMP requirements, record keeping and reporting requirements;*
- (e) Authority to inspect grease producing facilities, enforcement authorities, and determination of whether the Agency has sufficient staff to inspect and enforce the FOG ordinance;*
- (f) An identification of sewer system sections subject to FOG blockages and the establishment of a cleaning maintenance schedule for each section; and*
- (g) Development and implementation of source control measures, for all sources of FOG discharged to the sewer system, for each sewer system section identified in (f) above.*

7.2 Nature and Extent of FOG Problem

Data on SSOs and causes were analyzed to define the nature and extent of FOG problems in the City's sewer system. The City has reported 28 SSOs during the past five years (as of June 2014), 18 of which were associated with sewer mainlines. Four of the 18 mainline SSOs were caused by FOG, or an average of about one FOG-related SSO per year.

The City's preventive maintenance efforts combined with the EBMUD FOG Source Control Program appear to be effective in minimizing the problems associated with commercial FOG sources.

7.3 FOG Source Control Program

The City will continue to contract with EBMUD for FOG Source Control Program services. EBMUD's services include targeted FOG hot spot investigations (as reported by the City), food

service establishment (FSE) and grease interceptor inspections, and public outreach and education. EBMUD also maintains a FOG control database to manage information about FSEs, inspections, FOG hotspots, and enforcement status. A quarterly report is prepared for each agency. The EBMUD Regional FOG Control Program is described in **Appendix 7-A**. An example quarterly report for Alameda is included in **Appendix 7-B**.

The City's building plan check records for FSEs are provided to EBMUD on a regular basis so that EBMUD has a record of all such establishments within the City. FSEs must have grease interceptors per the California Plumbing Code.

7.4 Public Outreach Program

EBMUD prepares materials to be used as the basis for a focused public education/outreach program. EBMUD and the City provide public education/outreach materials at public events and to commercial and residential sources that are tributary to sewers that experience FOG-related stoppages and SSOs. EBMUD's FOG brochure is included in **Appendix 7-C**.

7.5 Acceptable FOG Disposal Facilities

A list of grease haulers approved by EBMUD is included as **Appendix 7-D**. There is adequate disposal capacity for FOG from commercial sources within the City's service area.

7.6 FOG Preventive Maintenance

The City's preventive maintenance program is focused on the problematic sewer line segments. Historically, FOG hot spots were located in the business districts with restaurant establishments, namely Park Street, Webster Street, and the Town Centre Shopping Center. The City uses the results from sewer cleaning operations to revise sewer cleaning frequencies as required to address FOG issues. City staff provides the EBMUD FOG Source Control Program staff with timely notice when gravity sewers experience FOG-related blockages or SSOs. **Appendix 7-E** contains a copy of the form used to report grease SSOs and blockages to EBMUD for investigation.

7.7 Legal Authorities

The City's legal authorities to control the discharge of FOG to its sanitary sewer system are described in Chapter 3, Legal Authority. The Public Works Department is responsible for enforcement of FOG violations.

Chapter 8 System Evaluation and Capacity Assurance Plan

This section of the SSMP presents the City's approach to ensuring that its sanitary sewer system has adequate hydraulic capacity through a System Evaluation and Capacity Assurance Plan (SECAP).

8.1 Regulatory Requirements for the SECAP Element

The WDR requirements for the SECAP element of the SSMP are:

The collection system agency shall prepare and implement a capital improvement plan (CIP) that will provide hydraulic capacity of key sewer system elements for dry weather peak flow conditions, as well as the appropriate design storm or wet weather event. At a minimum, the plan must include:

- (a) **Evaluation:** *Actions needed to evaluate those portions of the sanitary sewer system that are experiencing or contributing to an SSO discharge caused by hydraulic deficiency. The evaluation must provide estimates of peak flows (including flows from SSOs that escape from the system) associated with conditions similar to those causing overflow events, estimates of the capacity of key system components, hydraulic deficiencies (including components of the system with limiting capacity) and the major sources that contribute to the peak flows associated with overflow events;*
- (b) **Design Criteria:** *Where design criteria do not exist or are deficient, undertake the evaluation identified in (a) above to establish appropriate design criteria; and*
- (c) **Capacity Enhancement Measures:** *The steps needed to establish a short- and long-term CIP to address identified hydraulic deficiencies, including prioritization, alternatives analysis, and schedules. The CIP may include increases in pipe size, I/I reduction programs, increases and redundancy in pumping capacity, and storage facilities. The capital improvement plan shall include an implementation schedule and shall identify sources of funding.*
- (d) **Schedule:** *The District shall develop a schedule of completion dates for all portions of the capital improvement program developed in (a) - (c) above. This schedule shall be reviewed and updated consistent with the SSMP review and update requirements in Section D. 14.*

8.2 Evaluation and Design Criteria

In May 2010, the City completed a *Sanitary Sewer System Hydraulic Analysis* study that included development of a dynamic hydraulic model of the collection system and use of the model to identify potential capacity deficiencies in the system. The model includes almost all pipes in the system except for Alameda Point; and 26 of the system pump stations. The Hydraulic Analysis report is incorporated into this SSMP by reference. **Appendix 8-A** contains the Executive Summary section of the report describing the modeled sewer system; design flow, hydraulic, and capacity analysis criteria used for the analysis; and capacity analysis results and proposed enhancement measures.

The capacity analysis was based on use of assessor parcel data, projections of future development and redevelopment, and standard unit flow factors to estimate dry weather base wastewater flows for existing and future conditions, and I/I rates determined based on calibration to flows in the Alameda Interceptor predicted by EBMUD's hydraulic model. The design storm used in the analysis is the 5-year return period event developed as part of the 1980s East Bay I/I Study.

For gravity sewers, capacity deficiencies were identified when the model predicted more than one foot of surcharge to within 6 feet of manhole rims during design storm peak wet weather flow conditions, or any surcharge under peak dry weather flow conditions. Required capacity improvements, as needed under existing and/or future conditions, were determined for each deficiency.

In general, pump stations were considered capacity deficient if predicted peak dry or peak wet weather flow exceeded firm capacity (capacity with largest pump not in service). However, a number of pump

stations in the system have high-level bypass pipes that allow flows to be routed around the pump station when water levels reach a high stage, thereby protecting against overflows. Therefore, pump station deficiency “scores” were developed to consider multiple factors, including both firm and total capacity, existence of a high-level bypass, and extent of model-predicted upstream surcharge under dry and wet weather conditions. Development of pump station capacity projects was coordinated with the City’s Pump Station Prioritization and Renovation Plans.

Note that overflow events (SSOs) in the City’s sewer system have generally been associated with maintenance or construction related issues (e.g., blockages due to roots, debris, or construction material or defects) rather than wet weather. As a result of the 1980s I/I and wet weather studies conducted by EBMUD and the Satellites, the City constructed a number of relief trunk sewers, completed sewer rehabilitation to reduce I/I the system and removed any wet weather bypasses that existed at the time. These efforts over the past 25 years have eliminated capacity-related overflows in the system. As indicated by the Hydraulic Analysis results, virtually no existing pipe capacity restrictions remain in the system; and the City is upgrading pump stations where needed to provide adequate capacity for design peak wet weather flows.

The City will update its hydraulic model as part of an overall Sewer Master Plan to be completed in 2015. The model will be updated to incorporate new sewers and developments constructed since 2010 and additional flow data collected by EBMUD and the City since the original model was developed. The model will also be expanded to include the proposed future sewer system in Alameda Point. Model results indicating peak I/I rates from different areas of the system will be used as inputs to the pipe rating model, described previously in Section 4.4.

8.3 Capacity Enhancement Measures and Schedule

The City has addressed all capacity deficiencies under existing flow conditions identified in the Hydraulic Analysis study. All other identified capacity deficiencies were related to projected future development, and improvements will be constructed as needed when the development occurs.

Several pump stations were identified as needing capacity upgrades as part of the Hydraulic Analysis study. Under the Pump Station Prioritization and Renovation Plans, pump stations with inadequate capacity for peak wet weather flows, or simplex stations without high-level bypasses, were identified as highest priority for improvements. The City completed a major upgrade (including increasing capacity) of its largest pump station, BFI, as well as upgrades to eleven other stations during the first two phases of the pump station renovation program. Upgrades to the remaining high priority stations will be completed in the next two phases of the program in FY2014/15 and 15/16.

Note also that as part of the work conducted under the City’s EPA Stipulated Order, the City has conducted smoke testing in areas with high peak I/I flows to identify potential sources of direct inflow into the sewer system from both private property and the public portions of the system. The City has conducted follow-up notification and enforcement for all inflow sources identified on private property, and investigating and correcting any such sources in the public system. In the future, additional inflow sources may be identified through EBMUD’s Regional Technical Support Program, discussed in Section 4.4. The City’s on-going sewer rehabilitation program and Private Sewer Lateral (PSL) compliance program will also serve to further reduce I/I in the system to ensure that the system continues to have adequate capacity to convey peak wet weather flows.

Chapter 9 Monitoring, Measurement, and Program Modifications

This section of the SSMP presents the City's approach to Monitoring, Measurement, and Program Modifications.

9.1 Regulatory Requirements for the Monitoring, Measurement, and Program Modifications Element

The requirements for the Monitoring, Measurement, and Program Modifications element of the SSMP are to:

- (a) *Maintain relevant information that can be used to establish and prioritize appropriate SSMP activities;*
- (b) *Monitor the implementation and, where appropriate, measure the effectiveness of each element of the SSMP;*
- (c) *Assess the success of the preventative maintenance program;*
- (d) *Update program elements, as appropriate, based on monitoring or performance evaluations; and*
- (e) *Identify and illustrate SSO trends, including: frequency, location, and volume.*

9.2 Information Used to Monitor and Measure SSMP Performance

The City utilizes data captured in its GIS, Comcate work order system, Granite XP CCTV database, Accela permit system, and the State Water Resources Control Board's California Integrated Water Quality System (CIWQS) SSO database, as well as other in-house spreadsheet tools, to monitor and measure the performance of the SSMP and SSMP implementation. This information is used to accomplish the following:

- Establish and prioritize appropriate SSMP activities
- Monitor the implementation and effectiveness of the SSMP
- Assess the success of the preventive maintenance program
- Identify and illustrate SSO trends including frequency, volume, and location

The City's Maintenance Division tracks a number of parameters related to the performance of the sanitary sewer system, including the number, location, and volume of SSOs, sewer stoppages, and sewer main and lateral repairs. This information, as well as information on amount of sewer cleaning, inspection, and rehabilitation completed, is also documented in annual reports to the EPA as required under its Stipulated Order and Consent Decree. The annual report is also the means for the City to communicate the performance of the SSMP and SSMP implementation on an annual basis.

The information that is tracked and documented in annual reports, as well as the results of CCTV inspections displayed on GIS maps, helps in assessing effectiveness of preventive maintenance activities and in prioritizing sewers for annual cyclic sewer rehabilitation projects. Locations where problems, backups and breakages occur become candidates for maintenance and repair programs.

The City also performs a failure cause analysis of all individual sewer overflow events and identifies corrective actions to prevent future SSOs at locations where SSOs occurred in the previous year, as well as corrective actions to SSMP program elements that are appropriate based on this review. The indicators that the City uses to measure the performance of its wastewater collection system and the effectiveness of

its SSMP are listed in **Table 9-1**. The City will update the data and analysis of performance measures at the time of each evaluation and may use other performance measures as well in its evaluation.

Table 9-1: Performance Metrics for Monitoring and Measurement

	Performance Measure	Source
System Statistics	Total miles of gravity sewer	GIS
	Total miles of pressure sewer	GIS
	Total number of manholes	GIS
	Total number of sewage pumping stations	GIS
Measures Based on SSO Number	Total number and percentage of SSOs by Category	CIWQS
	Number of SSOs by cause	CIWQS
	Number of SSOs per 100 miles of sewer per year	CIWQS
	Number of locations with repeat SSOs	CIWQS
	Number of locations where SSOs occurred in pipes previously rehabilitated	CIWQS and GIS
Measures Based on SSO Volume	Total volume of SSOs	CIWQS
	Number and percentage of SSOs by Volume	CIWQS
	Volume of SSOs per 100 miles per Year	CIWQS
	Total SSO volume recovered and percentage of overall total SSO volume	CIWQS
	Total volume reaching storm drainage channel and not recovered or reaching surface waters and percentage of overall total SSO volume	CIWQS
SSO Response Time	Average response time during business hours	CIWQS
	Average response time outside of business hours	CIWQS
Maintenance	Number of blockages in the past year by cause	Comcate
	Amount of "hot spot" cleaning performed (LF)	Spreadsheet
	Amount of routine cleaning performed (LF)	Granite XP
	Amount of chemical root control performed (LF)	Spreadsheet
Condition Assessment, Rehabilitation, and I/I Control	Number of manholes inspected	Spreadsheet
	Amount of CCTV inspection performed (LF)	Granite XP
	Amount of mainlines (LF) and number of manholes and lower laterals rehabilitated	Contract Documents
	Number of inflow sources detected and corrected	Spreadsheet
	Number of private laterals repaired or replaced and certified	Accela

In addition to the parameters listed in the table, performance measures related to the FOG control program (e.g., number of reported FOG hotspots, inspections completed, etc.) are reported by EBMUD in its quarterly summary reports for Alameda (see Appendix 7-B).

The Maintenance Division also establishes and tracks performance indicators for sewer maintenance and operations, which are documented in the City's Annual Budget and Forecast. These indicators include the following:

- Emergency requests received and responded to within 24 hours
- Pump stations maintained
- Priority and hot spot cleaning
- Annual sewer line root foaming
- Sewer line videoing
- Repair of reported sink holes within 72 hours

9.3 Annual Reporting

Since 2011 under its Stipulated Order, the City has submitted Annual Reports to the EPA, SWRCB, and RWQCB documenting its compliance with the requirements of the SO and its performance during each calendar year, and identifying any planned changes to programs for the following year. The Annual Reports include metrics and narrative reports on the following programs that are relevant to the Monitoring, Measurement, and Program Modifications element of the SSMP:

- Sanitary Sewer Overflows
- Sewer Cleaning and Inspection Program
- Sewer Pipe Repair and Rehabilitation Program.
- Inflow Identification and Reduction Program
- Private Sewer Lateral Repair and Replacement Program
- Asset Management Implementation Program (AMIP)

Starting in FY 2014/15, the City will provide similar annual reports (on a fiscal year basis) under its Consent Decree with the above regulatory agencies.

9.4 SSMP Updates

The City will update its SSMP at least every five years. The SSMP Program Audit, conducted every two years (and more frequently if deemed necessary) will be one of many indicators used to determine if any major updates are required prior to a 5-year update. Any major changes to the SSMP require approval by the City Council. The City may make minor changes, such as changes to the organizational chart, without City Council approval.

In accordance with the requirements of the Amended MRP, the City must maintain a record of all changes made to the SSMP since its last certification, indicating when a subsection(s) was changed and/or updated and who authorized the change or update. These records must be attached to the SSMP. An SSMP Change Log is included in **Appendix 9-A**.

Chapter 10 SSMP Program Audits

This section of the SSMP presents the process the City will follow to audit its SSMP and related programs.

10.1 Regulatory Requirements for the SSMP Program Audits Element

As part of the SSMP, the City shall conduct periodic internal audits, appropriate to the size of the system and the number of SSOs. At a minimum, these audits must occur every two years and a report must be prepared and kept on file. This audit shall focus on evaluating the effectiveness of the SSMP and the City's compliance with the SSMP requirements identified in this subsection (D.13 of the WDR), including identification of any deficiencies in the SSMP and steps to correct them.

10.2 Plan for SSMP Program Audits

The City will audit its SSMP and SSMP implementation every two years. The audit will evaluate the effectiveness of the SSMP and will review whether the SSMP meets the current requirements of the WDR, whether the SSMP reflects the City's current practices, and whether the City is following the SSMP.

A team of Public Works staff will conduct the audit. As designated by the Public Works Director, the Public Works Coordinator will be responsible for ensuring the City conducts SSMP Program Audits on schedule. The scope of the audit will cover each of the sections of the SSMP. The results of the audit will be included in an SSMP Program Audit Report. The SSMP Program Audit Report will focus on the effectiveness of the SSMP program, compliance with the WDR requirements, and identification of any deficiencies in the SSMP or SSMP implementation. The SSMP Program Audit Report will identify revisions that may be needed for a more effective program. The City will maintain copies of the SSMP Program Audit reports for a period of 5 years.

The City conducted its last annual SSMP audit (as previously required by the RWQCB) in March 2012, and its latest biennial SSMP audit in June 2014. A copy of the June 2014 Audit Report is included as **Appendix 10-A**. Deficiencies and recommendations identified in the Audit Report have been incorporated into this updated SSMP. Subsequent audits will be completed every two years (or at a higher frequency if deemed necessary).

Chapter 11 Communication Program

This section of the SSMP outlines the process involved in communicating with interested members of the public regarding the development, implementation, and performance of this plan. This Communication Program also addresses communication between Alameda and its neighboring and satellite sewer systems.

11.1 Regulatory Requirements for the Communication Program Element

The City shall:

- a. *Communicate on a regular basis with the public on the development, implementation, and performance of its SSMP. The communication system shall provide the public the opportunity to provide input to the Agency as the program is developed and implemented.*
- b. *Create a plan of communication with systems that are tributary and/or satellite to the Agency's sanitary sewer system.*

11.2 Communication with Public

The SSMP is available for public review, if requested, at the Maintenance Service Center and Public Works Department office. The City will post information about the SSMP and a link to this document on the City of Alameda website.

The City's Public Works Department webpage currently includes information about the private sewer lateral compliance program and pump station reliability projects. Information about sewer system related activities (e.g., private lateral compliance program, construction projects) can also be found in local publications and websites (e.g., Alameda Patch). Public meetings are held prior to initiation of each phase of the pump station projects to allow residents who live near the pump stations to review the plans and offer comments. The Private Sewer Lateral webpage includes links to a number of documents describing requirements, guidelines, and procedures for lateral testing and repair.

Information about the City's SSO performance is also available to the public through the State CIWQS public reports website.

11.3 Communication with Tributary Systems

The City has regular communication with systems that are tributary and/or neighboring to the City's sanitary sewer system. The City has several opportunities to regularly communicate with the other EBMUD satellite agencies at Technical Advisory Board (TAB) and East Bay Collection System Advisory Committee (EBCSAC) meetings, and at Bay Area Clean Water Agencies (BAWCA) meetings. The TAB was established as part of the 1980s I/I studies to coordinate on approaches to deal with wet weather issues. TAB members include EBMUD and the seven EBMUD Satellites. The City is also a member of the EBCSAC, comprised of the seven EBMUD Satellites; this committee is focused specifically on the EPA Stipulated Order and other regulatory issues currently facing the Satellites. In addition, the City has the opportunity to communicate with other neighboring agencies in the Bay Area at monthly BACWA Collection System Committee meetings.

The City conducts monthly meetings with the Alameda West Lagoon (Southshore) Homeowners Association (HOA) regarding lagoon issues, and communicates with other HOAs as needed. The City maintains a contact list of all HOAs in the City, which includes those with lagoons that could potentially be impacted by SSOs, and those that own and operate private sewer systems.

Communication with the U.S. Navy regarding Alameda Point takes place when issues arise.