



City of Alameda

Sewer System Management Plan

City Council Adoptions:

July 21, 2009 Resolution 14364

October 21, 2014 Resolution 14976

WDID 2SSO10087

NPDES NO. CA0038474

December 2017

Table of Contents

Introduction	1
WDR Prohibitions.....	Error! Bookmark not defined.
WDR Provisions.....	Error! Bookmark not defined.
Sewer System Overview and Historical Perspective	1
About this Document.....	5
Chapter 1 Goal of SSMP	2-1
1.1 Regulatory Requirements for the Goal Element.....	2-1
1.2 SSMP Goals.....	2-1
Chapter 2 Organization	2-1
2.1 Regulatory Requirements for the Organization Element	2-1
2.2 Authorized Representative	2-1
2.3 Positions Responsible for SSMP Implementation	2-1
2.4 Chain of Communication for Reporting Sewer Overflows	2-4
Chapter 3 Legal Authority	3-1
3.1 Regulatory Requirements for the Legal Authority Element.....	3-1
3.2 Summary of Legal Authorities.....	3-1
Chapter 4 Operations and Maintenance Program	4-3
4.1 Regulatory Requirements for Operations and Maintenance Program	4-3
4.2 Sanitary Sewer System Mapping.....	4-3
4.3 Operation and Maintenance Activities.....	4-4
4.3.1 Sewer Preventive Maintenance	4-4
4.3.2 Pump Station Maintenance.....	4-6
4.3.3 Non-Routine Maintenance	4-7
4.4 Rehabilitation and Replacement Plan.....	4-7
4.5 Training Program.....	4-11
4.5.1 City Staff.....	4-11
4.5.2 Staff Contracted for City Projects.....	Error! Bookmark not defined.
4.6 Equipment and Parts Inventory.....	4-11
4.7 Outreach Program	Error! Bookmark not defined.
Chapter 5 Design and Performance Provisions	5-12
5.1 Regulatory Requirements for Design and Performance Provisions.....	5-12
5.2 Standard Specifications for Sewer System Facilities	5-12
Chapter 6 Overflow Emergency Response Plan	6-13
6.1 Regulatory Requirements for OERP Element of SSMP	6-13
6.2 Overflow Emergency Response Plan Document	6-13
Chapter 7 FOG Control Program	7-1
7.1 Regulatory Requirements for FOG Control Element of SSMP	7-1
7.2 Nature and Extent of FOG Problem.....	7-1
7.3 FOG Source Control Program	7-2
7.4 Public Outreach Program	7-2
7.5 Acceptable FOG Disposal Facilities.....	7-2
7.6 FOG Preventive Maintenance.....	7-2
7.7 Legal Authorities.....	7-2

Chapter 8 System Evaluation and Capacity Assurance Plan	8-1
8.1 Regulatory Requirements for the SECAP Element	8-1
8.2 Evaluation and Design Criteria	8-1
8.3 Capacity Enhancement Measures and Schedule.....	8-3
Chapter 9 Monitoring, Measurement, and Program Modifications	9-1
9.1 Regulatory Requirements for the Monitoring, Measurement, and Program Modifications Element	9-1
9.2 Information Used to Monitor and Measure SSMP Performance	9-1
9.3 Annual Reporting.....	9-3
9.4 SSMP Updates	9-3
Chapter 10 SSMP Program Audits	10-1
10.1 Regulatory Requirements for the SSMP Program Audits Element.....	10-1
10.2 Plan for SSMP Program Audits.....	10-1
Chapter 11 Communication Program	11-2
11.1 Regulatory Requirements for the Communication Program Element	11-2
11.2 Communication with Public.....	11-2
11.3 Communication with Tributary Systems.....	11-3

List of Tables

Table 2-1: Narrative Explanation of Responsibilities of SSMP Organization Positions	2-3
Table 2-2: Positions Responsible for SSMP Implementation.....	2-4
Table 3-1: Summary of City of Alameda’s Legal Authorities	3-2
Table 4-1: Cleaning Schedule Changes Based on Cleaning Results	Error! Bookmark not defined.
Table 4-2: Categorization of Sewer Cleaning Results	Error! Bookmark not defined.
Table 6-1: Summary of OERP Contents.....	6-14
Table 9-1: Performance Metrics for Monitoring and Measurement	9-2

List of Figures

Figure 2-1: SSMP Organization Lines of Authority	2-2
Figure 2-2: Chain of Communications for Reporting SSOs	2-5

Appendices (separate volume)

Appendix A

City Council Resolutions Adopting Sewer System Management Plan

Appendix B

City of Alameda Asset Management Implementation Plan, (Updated August 2014)

Chapter 2 Appendices

Appendix 2-A Key Staff Contact Information

Chapter 3 Appendices

None

Chapter 4 Appendices

Appendix 4-A Map of Sewers in Hot Spot Cleaning Program

Appendix 4-B Map of Grid and Non-Grid Systems

Appendix 4-C Pump Station Maintenance Procedures

Appendix 4-D Sewer Equipment and Materials Inventory Lists

Appendix 4-E Pump Station Standardized Equipment List

Chapter 5 Appendices

Appendix 5-A Sanitary Sewer Design Standards and Specifications Update

Chapter 6 Appendices

Appendix 6-A Overflow Emergency Response Plan

Chapter 7 Appendices

Appendix 7-A EBMUD Regional FOG Program

Appendix 7-B Example FOG Control Program Quarterly Summary Report

Appendix 7-C EBMUD FOG Brochure

Appendix 7-D EBMUD Approved Grease Haulers

Appendix 7-E Grease SSO and Blockage Reporting Form

Chapter 8 Appendices

None

Chapter 9 Appendices

Appendix 9-A SSMP Change Log

Chapter 10 Appendices

Appendix 10-A 2014 SSMP Audit Report

Chapter 11 Appendices

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). 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. The WDR and MRP can be viewed here: http://www.waterboards.ca.gov/water_issues/programs/sso/.

The State Water Board issued the City Waste Discharge Identification - 2SSO10087, a unique identifier assigned to each Enrollee for regulatory record and data management purposes.

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, updated and then recertified in October 2014. A copy of the Council Resolutions are in **Appendix A**. This version document 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.

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 3,129 manholes and other sewer structures, and 45 sewage pump stations. Approximately 126 miles of the total system pipeline length and 35 pump stations are located on the main part of the Alameda island and Harbor Bay Isle, and approximately 14 miles of pipeline and 10 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. The system statistics are summarized below:

Table 1-1 Sewer Mains by Age

Age of Sewer	Miles of Gravity Pipeline	
	Alameda Island and Harbor Bay Isle	Alameda Point
2000-Present	24.7	--
1980-1999	36.9	--
1960-1979	14.6	--
1940-1959	7.1	--
1920-1939	5.2	--
1900-1919	34	--
Before 1900	0	--
Unknown Age	0.1	14

Table 1-2 Sewer Mains by Material

Sewer Main Material	Miles of Gravity Pipeline	
	Alameda Island and Harbor Bay Isle	Alameda Point
Vitrified Clay	54.8	8.9
Cast Iron	0.5	1.3
TRUSS	3.2	0
Corrugated Metal	0	0.1
Reinforced Concrete Pipe	1.2	0
Asbestos Concrete Pipe	0.08	0.4
Plastic/Steel Composite	0.1	0.4
High Density Polyethylene	9.6	0.2
Polyvinyl Chloride	44.2	0
Cured in Place	0.6	0
Ductile Iron Pipe	0.03	0
Unknown	7.9	2

Table 1-3 Sewer Mains by Diameter

Sewer Main Diameter	Miles of Gravity Pipeline	
	Alameda Island and Harbor Bay Isle	Alameda Point
4"	0.7	0.2
6"	38.7	22.6
8"	55.0	4.8
10"	10.5	2.5
12"	5.4	2.9
14"	1.0	0.2
15"	4.9	0.6
16"	0.5	0
18"	2.2	0.3
20"	0.2	0.05
21"	2.0	0.03
24"	0.3	0
27"	0.1	0
30"	0.5	0
Unknown	0.5	0.2

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 other recent new developments located on the main island. The U.S. government owns and is responsible for the sanitary sewer system serving the Coast Guard Housing within the City limits.

In Alameda, the property owner owns the entire service lateral from the building drain to the connection to the City's sewer main; however, the City takes responsibility for maintenance and replacement of the lower portion of the lateral. Lower laterals are rehabilitated when the public sewer main to which it is connected to is rehabilitated, 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.

The Regional Water Board first issued an NPDES permit to EBMUD in 1976 for the wet weather discharges from EBMUD's interceptors. This permit required EBMUD to eliminate the discharge of untreated overflows from its interceptors and to protect water quality in San Francisco Bay. The Regional Water Board issued similar permits in 1976 to members of the East Bay Communities, including the City of Alameda's NPDES NO. CA0038474. The Regional Water Board has

reissued the NPDES permits every 5 years with the most recent renewal in 2014. The City's permit can be located here: <https://alamedaca.gov/public-works/public-works-key-documents>.

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. On January 1, 2015, the City joined the regional Private Sewer Lateral program implemented by EBMUD, per Consent Decree requirement.

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 entered into a Consent Decree with EPA, the SWRCB, and the RWQCB (Case Nos. C09-00186-RS and C09-05684-RS) with the San Francisco Bay Keeper and Our Children's Earth Foundation as Intervenor-Plaintiffs in September 2014. 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. The Consent Decree can be located here: <https://alamedaca.gov/public-works/public-works-key-documents>.

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 B**.

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 and Public Works Deputy Director.

2.3 Positions Responsible for SSMP Implementation

Figure 2-1: SSMP Organization Lines of Authority, summarizing positions and lines of authority for staff responsible for SSMP implementation.

Table 2-1: Narrative Explanation of Responsibilities of SSMP Organization Positions summarizes the roles and responsibilities of key positions shown on the organization chart.

Table 2-2 contains a staff contact for each specific elements of the SSMP. 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

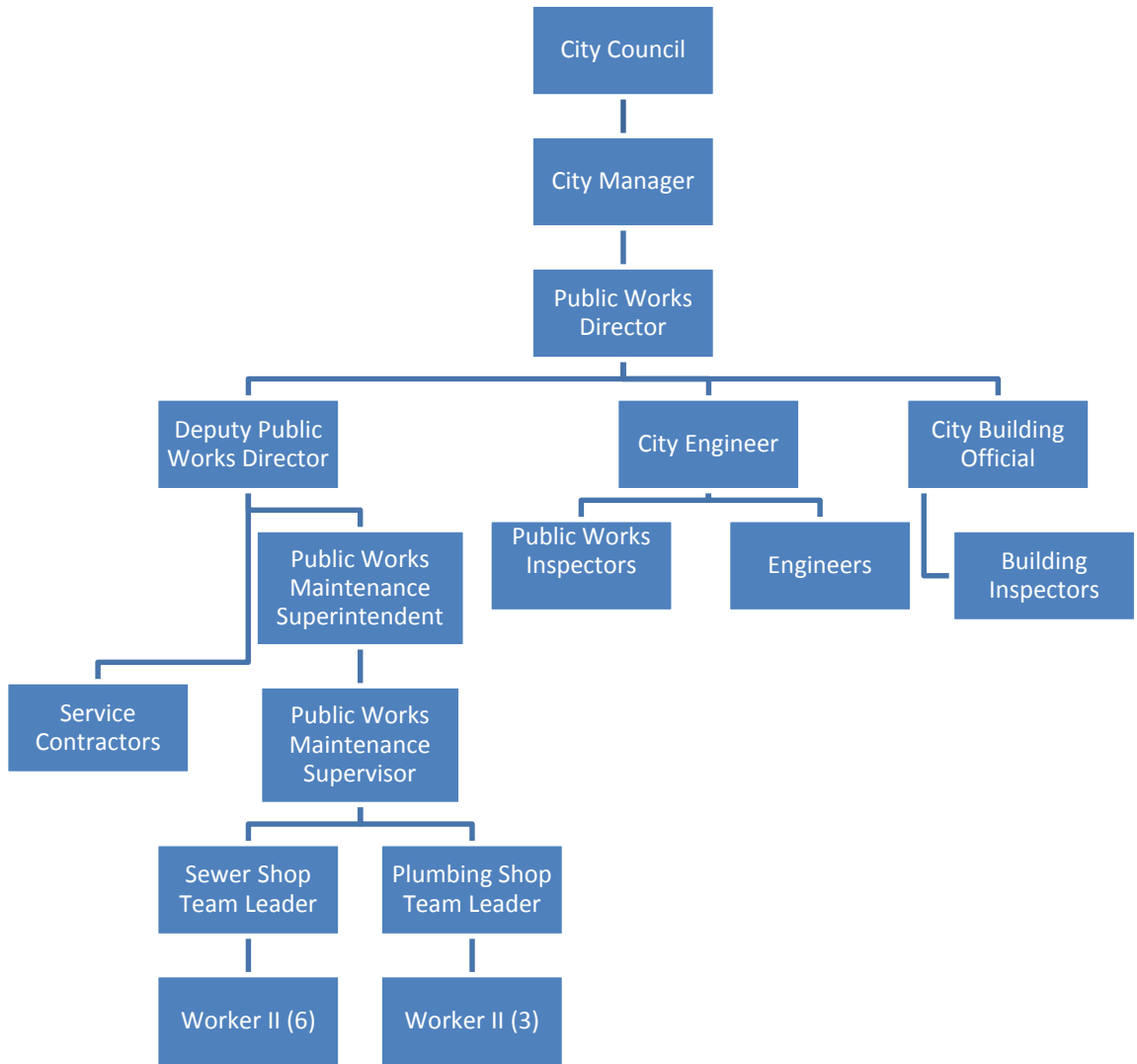


Table 2-1: Narrative Explanation of Responsibilities of SSMP Organization Positions

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.
Public Works 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. Data Submitter responsibilities.
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.
City Building Official	Responsible for enforcing the Building Code and CA Plumbing Code
Building Inspectors	Inspect for Building and Plumbing Code compliance, including the electrical service for newly renovated pump stations

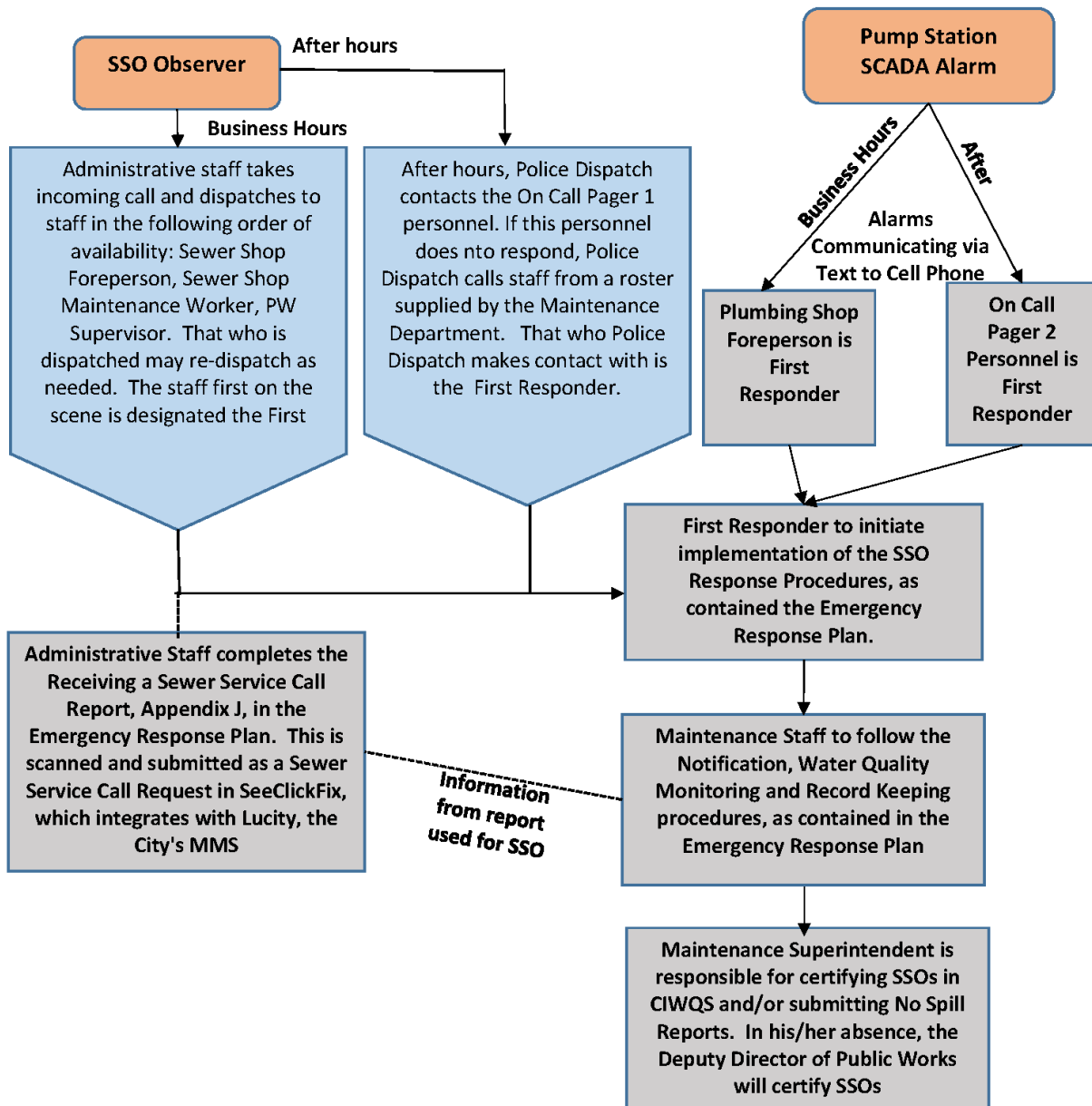
Table 2-2: Positions Responsible for SSMP Implementation

SSMP Element	SSMP Element/Measure	Responsible Position	Name and Phone
	Introduction	Deputy Public Works Director	Erin Smith (Acting) 510-747-7938
1	Goal	Deputy Public Works Director	Erin Smith (Acting) 510-747-7938
2	Organization	Deputy Public Works Director	Erin Smith (Acting) 510-747-7938
3	Legal Authority	Deputy Public Works Director	Erin Smith (Acting) 510-747-7938
4	Operations and Maintenance Program – Mapping	Deputy Public Works Director	Erin Smith (Acting) 510-747-7938
4	Operations and Maintenance Program – Hot Spot and Routine Maintenance	Public Works Maintenance Superintendent	Max Arbios 510-747-7922
4	Operations and Maintenance Program – Condition Assessment Program	Deputy Public Works Director	Erin Smith (Acting) 510-747-7938
4	Operations and Maintenance Program – Rehabilitation and Replacement Program	Deputy Public Works Director	Erin Smith (Acting) 510-747-7938
4	Operations and Maintenance Program – CIP Program Funding	Deputy Public Works Director	Erin Smith (Acting) 510-747-7938
4	Operations and Maintenance Program – Field Crew Training; O&M Contractor Training	Public Works Maintenance Superintendent	Max Arbios 510-747-7922
4	Operations and Maintenance Program – Equipment and Replacement Parts Inventory	Public Works Maintenance Superintendent	Max Arbios 510-747-7922
5	Design and Performance Provisions	City Engineer	Laurie Kozisek (Acting) 510-747-7900
6	Overflow Emergency Response Plan	Public Works Maintenance Superintendent	Max Arbios 510-747-7922
7	Fats, Oils, and Grease Control Program	Public Works Maintenance Superintendent	Max Arbios 510-747-7922
8	System Evaluation and Capacity Assurance Plan	City Engineer	Laurie Kozisek (Acting) 510-747-7900
9	Monitoring, Measurement, and Program Modifications	Deputy Public Works Director	Erin Smith (Acting) 510-747-7938
10	SSMP Program Audits and Change Logs	Deputy Public Works Director	Erin Smith (Acting) 510-747-7938
11	Communication Program	Deputy Public Works Director	Erin Smith (Acting) 510-747-7938

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 City's NPDES Permit, Consent Decree and 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 was adopted by the City, provide the City with the required legal authorities. EBMUD Ordinances and Regulations are also applicable as they are owner of the regional interceptor and treatment facilities. The City's current legal authorities are summarized in **Table 3-1** and 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 Wastewater Ordinance:
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 Wastewater Ordinance
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
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 18-5
Ensure access for maintenance, inspection, or repairs for portions of the service lateral owned or maintained by the City	City is Enforcing Agency, per California Plumbing Code
FOG SOURCE CONTROL	
Requirements to install grease removal devices (such as traps or interceptors)	EBMUD Wastewater Control Ordinance and California Plumbing Code Chapter 10
Maintenance requirements, BMP requirements, record keeping and reporting requirements for grease removal devices	EBMUD Wastewater Control Ordinance
Authority to inspect grease producing facilities	EBMUD Wastewater Control Ordinance and California Plumbing Code Chapter 10
ENFORCEMENT	
Enforce any violations of its sewer ordinances	AMC 1.5, 18-5

* 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 B**.

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 maps that contain information about the sewer, manhole, and pump station locations, pipe sizes, rim and flow line elevations, and references to construction drawings. The sewer map books are periodically published from the data contained in the City's Geographical Information System (GIS). The GIS (spatial and attribute data) is updated, as field edits are identified and/or following capital improvement projects. The

GIS mapping is used for hydraulic modeling and is integrated (ESRI SDE) with the City's maintenance management system, Lucity.

The City also maintains storm drain GIS data and map books similar sewer. The maps show the location of storm sewers and catch basins, pipe diameters and materials, manhole rim and flow line elevations, and flow directions. These systems can be overlaid in the GIS.

Sewer and storm map books are used by sewer field crews to locate facilities and note any corrections needed. Field crews also have the GIS and Lucity available on Surface Tablets that can be used in the field.

4.3 Operation and Maintenance Activities

4.3.1 Sewer Preventive Maintenance

The City implements a preventive maintenance program where all sewer mains are cleaned on a schedule ranging from a 90 day to 10 year return frequency. A line's cleaning interval is based on its maintenance history, results of TV inspection, proximity to environmentally sensitive areas as well as other factors. This approach is intended to minimize the occurrence of repeat blockages and/or SSOs from sewer line segments. Line segments that are on a 90-day return frequency are part of the "hot spot" cleaning program. All other sewer line segments are on a condition based return frequency with no return frequency to exceed 5 years for non-grid sewers and 10 years for grid sewers.

"Hot Spot" Program

Sewers with previous repeat SSOs and/or identified by maintenance staff as having recurring maintenance issues (e.g., roots, grease, or debris accumulation) are defined as "hot spots." Hot spots are cleaned on a 90 day schedule. 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 Public Works Supervisor. The majority of locations part of the hotspot program are areas of known grease. A pipe segment can be removed from the hot spot list if repair or replacement work resolved the maintenance issues or if the maintenance issue is not present for three consecutive 90 day cleanings.

Pipe segments on the hot spot list are managed in Lucity. An attribute of each pipe segment is Yes/No for the Hot Spot program. Those marked Yes are included on a work order for cleaning scheduled to generate every 90 days. Staff can add or remove lines from the hot spot list by checking or un-checking this Yes/No attribute.

The gravity sewer line segments currently part of the hot spot program total about 1.1 miles and are shown on the map in **Appendix 4-A**.

System-Wide Routine Cleaning

Sewer pipelines not assigned an aggressive preventive maintenance frequency are cleaned as part of a system-wide (routine) preventive maintenance program. 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.

The Consent Decree requires the City 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.

In 2016, the City finished cleaning and filming all accessible pipes, excluding Alameda Point, to have the necessary condition data to develop the City's Sewer Master Plan, which contains a 20 Year Sewer Rehabilitation program. This cleaning and inspection work was performed by a contractor with QA/QC performed by City staff. The date of last cleaning and inspection is stored in Lucity for each pipe segment with an assigned return frequency, which will generate a work order when the next cleaning or inspection activity is due.

In 2018, the City will start transitioning the routine sewer cleaning and filming activities to be performed by in house staff. Sewer cleaning crews will record their observations regarding the nature and extent of the material removed during sewer cleaning and will set the return frequency accordingly.

Although the Consent Decree does not require a routine cleaning program for the Alameda Point sewers, in 2017 the City cleaned and filmed all accessible sewers and will base the return frequencies on the same criteria as that used in the rest of the City, including the hot spot program. The sewers in Alameda Point will be replaced over time as part of the planned redevelopment of the former Naval Air Station site.

System-Wide Routine Inspection

The City initiated its sewer condition assessment program in 2009 and completed the inspection of accessible gravity sewers (and associated manholes), excluding Alameda Point, in advance of the City Sewer Master Plan, November 2015, so the condition data could be used as the basis of planning for the rehabilitation program. In the summer of 2017, the City completed condition assessment of the Alameda Point sewer system. The City implements 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 with the date of the last inspection and schedule for the next maintained in Lucity. The return frequency for the next inspection is condition based with no return frequency exceeding 20 years.

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.

Force Main Inspection

The City has about 6 miles of force mains ranging in size from 4 to 16 inches and in length from approximately 25 to over 7,000 feet, constructed of various types of pipe materials. The condition of the force mains is largely unknown; however, in 2015, the City started to replace force mains when pump stations are renovated. Since that time, 8 force mains (approximately 600 ft) were replaced with C900 restrained joints force mains. In addition, following a failure in the Park/Otis force main prompted a redesign of the force main and abandonment of the old pipe, 3,248 feet of 8" asbestos concrete pipe, and the installation of a new force main 400 feet in length with C900 restrained joint. The City is currently working to develop and implement a force main condition assessment program for those force mains not scheduled for replacement in the near future. The force mains will be prioritized and assessment methods tailored to each pipe based on age, material, size (or flow), location, and length, and whether or not the associated pump station has a high level gravity pipeline bypass. Based on the results of the assessments, potential improvements to address identified force main condition deficiencies should be incorporated into the sewer system CIP.

Root Control

The City uses chemical root control on pipes identified to have root intrusion via CCTV inspection. Pipes treated are kept on a two-year treatment schedule until the pipe is replaced or otherwise repaired in a manner that prevents future root intrusion. Pipe segments that are on the root foaming list are managed in Lucity. An attribute of pipe segments is Yes/No for the Root Control program. Those marked Yes have a Date Last Treated and Date Next Due for root foaming. Once a year, the PW Supervisor or Deputy Director will query those pipes due for root control and prepare a work request for the root foaming contractor.

4.3.2 Pump Station Preventive 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. Lucity issues a monthly work order with the checklist, as shown in **Figure 5-1**.

Figure 4-1: Monthly Pump Station PM Checklist

Line Number	Checklist
1	Inspect Grounds
2	Wash Down Wetwell Walls
3	Test Level Controls
4	Check Motor Amps - Note Readings
5	Exercise Pumps
6	Exercise Valves, ISO's and Checks
7	Check Inflow Manhole
8	Check Discharge Manhole
9	Infrared Temp Motors - Note Readings
10	Test Back Floats
11	Test Sump Pump
12	Station Lighting
13	On/Off Settings High/Low Level Settings

Any issue identified during the inspection requiring repair or other maintenance action is recorded in Lucy with applicable follow up work orders generated. Small issues are addressed immediately (the same day).

Standby generators are also inspected monthly and run per manufacturer specifications.

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 SeeClickFix, if report taken by administrative staff, or directly in Lucy if report taken by sewer staff. SeeClickFix integrates with Lucy. The reports are investigated, and appropriate actions are taken to resolve the source of the problem.

4.4 Rehabilitation Plan

The City’s sewer system Capital Improvement Program (CIP) includes three primary components: sewer rehabilitation; capacity improvements; and pump station renovation, as described in the City’s Sewer Master Plan, November 2015: <https://alamedaca.gov/public-works/public-works-key-documents>.

The Sewer Master Plan utilized information collected through its maintenance, inspection, and monitoring activities to perform an assessment of system condition and capacity; and utilized the results of those assessments to identify and prioritize sewer system capital improvement needs.

The basic tool used to develop the Rehabilitation Plan was a “Pipe Rating Model,” which assigns a risk score to each gravity pipe in the system and provides a means of helping to prioritize pipes for rehabilitation and replacement. For purposes of grouping pipes into potential sewer rehabilitation projects, other factors including pavement condition, pipe material, location (proximity), and City staff input were also considered.

The sewer rehabilitation program was developed based on the following three primary criteria:

- Meet the minimum annual sewer rehabilitation footage requirements of the Consent Decree.
- Maintain consistency with the City’s annual capital improvement budget based on the financial plan and sewer service charge schedule that has been adopted by the City Council.
- Prioritize mini-basins for rehabilitation based on risk scores as calculated by the Pipe Rating Model and other factors such as pipe material, pavement condition, and proximity

By the end of the 20 year program, summarized below, the City will have rehabilitated or replaced over 75 percent of its gravity sewer system. The City may elect to modify the CIP schedule, as needed, to accommodate budget constraints and/or changes in project priorities as additional inspection data or other information is collected over time. Such information may include the need for coordination with street paving or other infrastructure or utility projects; the need to address new or recurring maintenance problems in the system; or the need to address specific sources of I/I identified by EBMUD as part of the Regional Technical Support Program.

Table 4-1 Sewer Rehabilitation Plan

Project Year	Fiscal Year	Length of Pipes (mi)	Estimated Capital Cost (\$Million)*	Status
1	FY 15/16	3.33	6.97	Complete
2	FY 16/17	2.78	5.41	Complete
3	FY 17/18	2.73	5.29	Construction Contract award in September 2017
4	FY 18/19	2.80	5.40	In design as of July 2017
5	FY 19/20	2.89	5.41	
6	FY 20/21	2.84	5.54	
7	FY 21/22	2.95	5.52	
8	FY 22/23	2.71	5.37	
9	FY 23/24	2.81	5.38	
10	FY 24/25	2.41	5.47	
11	FY 25/26	2.52	5.56	
12	FY 26/27	2.47	5.48	
13	FY 27/28	2.72	5.50	
14	FY 28/29	2.61	5.54	
15	FY 29/30	2.70	5.43	
16	FY 30/31	2.72	5.39	
17	FY 31/32	2.51	5.37	
18	FY 32/33	2.90	5.48	
19	FY 33/34	2.56	5.49	
20	FY 34/35	2.60	5.51	

*Estimates represent current (FY2015/16) costs.

Figure 4-2 Pump Station Renovation Plan

Group 2	Estimated Costs - 2015 Dollars		
Adelphian	\$346,215	Construct 15/16	Complete
Verdemar	\$265,737		
Harbor Bay Parkway II	\$408,068		
Willow-Whitehall	\$634,587		
Cola Ballena	--		
Marina Village	--		
Haile	\$169,719		
Bay Fairway	\$219,487		
Contingency	\$306,572		
SUBTOTAL	\$2,350,385		
Group 3			
Sheffield-Cumberland	\$750,000	Construct 16/17 - 17/18	In Construction
Seaview I	\$350,000		
Seaview 2	\$350,000		
Eastshore Myers	\$750,000		
Bayview	\$350,000		
Sand Beach	\$350,000		
Triumph-Independence	\$350,000		
Lift Station 6	\$35,000		
Grand Station	\$35,000		
SUBTOTAL	\$3,320,000		
"Group 4"			
Harbor Bay Parkway I (conversion; some design already done)	\$800,000	Construct 17/18-18/19	In Design
Cola Ballena (conversion; some design already done)	\$800,000		
Marina Village (some design already done)	\$900,000		
Catalina (conversion)	\$800,000		
Grand/Otis (conversion)	\$800,000		
Park/Otis (conversion)	\$800,000		
SUBTOTAL	\$4,900,000		
"Group 5"			
Eighth Taylor (relocate; some design already done)	\$540,000	Construct 18/19 to 19/20	
Tideway (conversion)	\$670,000		
Eighth & Portola (new build)	\$800,000		
Willow Station (take offline; redo gravity line)	\$500,000		
Dublin (accessibility issues)	\$150,000		
SUBTOTAL	\$2,660,000		
GRAND TOTAL	\$13,230,385		

Encinal Boat Ramp - the design is complete; should be constructed when Parks Depart. constructs upgrades

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 approximately \$380,000 for pipeline repairs, which are primarily 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's training activities fall into two categories, safety and job skills. The two are closely related insofar as safety is of prime consideration in performance of any job activity. Safety training is conducted by City staff or outside consultants in the areas listed below. One or more topics are covered during monthly training sessions.

- Chemical Hygiene
- CPR / First Aid
- Driver Training
- Electrical lockout/tagout
- Emergency Response
- Fire Prevention/Fire Extinguishers
- Hearing Protection
- Forklift
- Hazard Communication
- Heat Stress
- Respiratory Protection
- Wastewater Pathogens
- Confined Space

Job skills training involves an annual SSO Emergency Response Plan training, including methods to collect the information required for notification and reporting of SSOs under Order 2006-003-DWQ and volume estimation. Causey Consulting conducted the last SSO response and volume estimation training in February 2017. Annual training also includes water quality monitoring. Specialized off-site training for specific job skills include National Association of Sewer Service Companies (NASCO) Pipeline Assessment Certification Program (PACP) training and CWEA conferences and other events. Each employee has a file which documents training received.

Sewer staff was trained during the initial implementation of Lucity and have access to the Deputy Director for additional training, as needed.

4.6 Equipment and Parts Inventory

Equipment, tools, and material for the collection system are maintained at the Maintenance Service Center 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-C**. The Public Works Supervisor is responsible for maintaining the equipment and parts inventory.

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-D** includes a list of specified standardized equipment for sewer pump stations.

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 are contained in the Regional Standards for Sanitary Sewer System Installation, Rehabilitation and Repair, June 20, 2016, 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 Regional Standards were developed per Consent Decree requirement and submitted to the Environmental Protection Agency. These standards can be accessed here: <https://alamedaca.gov/public-works/public-works-key-documents>. 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 and air tested before acceptance.

The City participates in the Regional Private Sewer Lateral Program, implemented by EBMUD. The program requires that private laterals be repaired or replaced as necessary, and pass an air or water verification test per the testing standards contained here: <http://www.eastbaypsl.com/eastbaypsl/doc/PSLContractorGuidelines.pdf>

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 overflow 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, the Water Quality Monitoring Program Plan to be used when water quality sampling is needed, and other pertinent materials.

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 – Overflow 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 Response Flow Chart Emergency Contact List SSO Report Form Private Property Incident Form Collection System Failure Analysis Form Duration and Flowrate Method for Estimating SSO Volume Sample Warning Signs SSO Response Equipment Water Quality Monitoring Program Plan Door Hanger SSO Incident File Checklist Form Receiving a Sewer Service Call Report City Claim Form

Chapter 7 FOG Control Program

This section presents the City's Fats, Oils, and Grease (FOG) Control Program. The City pays an annual fee to have the East Bay Municipal Utility District (EBMUD) manage, staff, and administer the FOG Control Program. The legal authority to prohibit FOG discharges to the system 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 23 SSOs during the past five years (as of July 2017), 6 of which 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; however, FOG discharges do cause increased maintenance in sewer mainlines and at

City pump stations. City staff intends to pursue Council approval of a FOG ordinance, similar to other East Bay jurisdictions, with better definition around prohibited FOG discharges, Food Service Establishment requirements for the installation and maintenance of grease control devices, and enforcement.

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; however staff intends to pursue Council approval of a FOG Ordinance, as described in Section 8.2. EBMUD currently issue two Notice of Violations, as applicable, for non-compliance identified during FSE inspections. Enforcement action beyond the two notices is City responsibility.

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. A model of the future Alameda Point sewer system was developed separately, as discussed later in this section. In 2015, the City updated the dynamic hydraulic model 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. Data from flow monitoring programs conducted by the City and by EBMUD during the 2009/10 and 2010/11 wet weather seasons were used to estimate the amount of I/I for various areas of the system and to confirm, through model calibration, that the hydraulic model reasonably simulates the actual performance of the system during both dry and

wet weather conditions. The model was also expanded to include the proposed future sewer system in Alameda Point, as described below.

The capacity of the system was assessed with respect to a design storm condition, defined as a design rainfall event falling under saturated soil conditions with the timing of the storm such that the peak I/I flows occur at about the same time as the peak diurnal base wastewater flow in most areas. The design rainfall is a 7-hour historical storm (known as the “EBMUD design event”), which was defined for the 1980s I/I studies and has been used since that time by the Satellites and EBMUD for wet weather evaluations. The storm has an approximate *rainfall* return period of 5 years, but based on the assumed timing of the storm under design event conditions, it is generally thought to create a return period of peak wastewater *flow* that is greater (less frequent) than the return period of the rainfall event.

The hydraulic model was run with the design event to identify areas of the sewer system that would not have adequate capacity to convey the peak wet weather flows generated by that event. Capacity was considered inadequate whenever the model predicted that the peak flows would result in surcharge (flow above the crown of sewer pipes) to within five to six feet of manhole rims.

The modeling indicated that overall, the Alameda system has adequate capacity to convey peak wet weather flows. Only two potential capacity deficiencies were identified, both located within and/or downstream of the Harbor Bay Business Park area. Proposed sewer capacity improvements (pipe upsizing along Harbor Bay Parkway and Beach Road) were developed for these areas. The project along Harbor Bay Parkway is required to address a predicted existing capacity deficiency; the Beach Road project would only be required in the future when additional development in the Harbor Bay Business Park occurs. The City has experienced no capacity related overflows at either of these locations to date. The Hydraulic Analysis report recommends that the City monitor these locations before constructing improvements to confirm the capacity issues under peak wet weather flows.

The modeling also provided updated estimates of peak wet weather flows to the modeled system pump stations, which were compared to the existing and planned station firm capacities (firm capacity is the capacity of the pump station with the largest pump out of service). A number of the system pump stations have already been planned for capacity upgrades as part of the City’s Pump Station Renovation program. The results indicated that all of the pump stations (except those with only a single pump) have adequate existing or planned firm capacity to handle estimated peak wet weather flows. However, all of the pump stations with only one pump have high level gravity bypass pipes that can prevent overflows if the pump is out of service or pump capacity is exceeded.

Note that climate change and predicted sea level rise may result in increased rainfall and higher groundwater levels in the system in the future. However, as the City continues to rehabilitate and replace sanitary sewers, and property owners replace their private service laterals, these changes are not expected to result in any further capacity issues in the Alameda sewer system.

Model results indicating peak I/I rates from different areas of the system were used as inputs to the pipe rating model, described previously in Section 4.4.

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.

A complete overview of the 2015 Hydraulic Analysis is contained in the City Sewer Master Plan, November 2015: <https://alamedaca.gov/public-works/public-works-key-documents>.

8.3 Alameda Point

The sewer system serving Alameda Point is hydraulically separate from the system serving the rest of the City. The flows from Alameda Point discharge to EBMUD's Pump Station R, located on the north side of the site, from where they are pumped directly to the inlet of the Alameda siphons.

As part of the preparation of the City's *Master Infrastructure Plan (MIP)* for Alameda Point, a hydraulic model of the future trunk sewer system was developed by RMC in order to estimate system flows and confirm the sizing of the backbone sewer infrastructure proposed in the MIP. The flow estimates were based on the ultimate development of approximately 1,400 residential units and 5.5 million square feet of commercial floor space. The sewer improvements would be constructed in phases, with completely new sewer infrastructure constructed initially in the "Development Area" of the site, and incremental rehabilitation and replacement of the infrastructure in the "Reuse Area". Based on the model analysis, the proposed backbone sewer network as developed in the MIP was found to be adequate to convey the wastewater flows anticipated to be generated in Alameda Point.

8.4 Capacity Enhancement Measures and Schedule

The City addressed all capacity deficiencies identified in the 2010 Hydraulic Analysis study for existing flow conditions. 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 2010 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, Bay Farm Island, as well as upgrades to 19 other stations during the first three phases of the pump station renovation program. Upgrades to the remaining high priority stations will be completed in FY2018/19.

The City also conducted smoke testing, from 2011-2014, 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 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 (RTSP). The RTSP is a required program, per the Consent Decree, whose goal is to identify and characterize sources of Inflow and Rapid Infiltration that afford opportunities to increase the rate of I&I reduction in EBMUD's satellite collection systems and thereby support the elimination of EBMUD's Wet Weather Facilities. EBMUD provides each Satellite formal notice of identified sources of I&I identified through the RTSP. The City must eliminate High Priority Sources within twenty-four months of the annual December 31st formal notification from EBMUD. For non-High Priority locations, the City shall incorporate these into their Capital Improvement Program within 24 months of notification.

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, Lucity, 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 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 helps in assessing effectiveness of preventive maintenance activities and in identifying any re-prioritization needed to the sewer rehabilitation projects. Locations where problems, backups and breakages occur that are not

scheduled for replacement in the near future, are moved up and prioritized for replacement and/or repair.

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
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
	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 or surface water and not recovered	CIWQS
SSO Response Time	Average response time during business hours	CIWQS
	Average response time outside of business hours	CIWQS
Maintenance	Amount of “hot spot” cleaning performed (LF)	Lucity
	Amount of routine cleaning performed (LF)	Lucity
	Amount of chemical root control performed (LF)	Lucity
	Amount of CCTV inspection performed (LF)	Lucity/Granite XP
Rehabilitation	Length mainline rehabilitated (LF)	Contract Documents

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). EBMUD also implements a regional Private Sewer Lateral program driven by property sales, remodel and change in water meter size. The number of laterals repaired, replaced or tested as is that passed compliance is reported in EBMUD's Consent Decree annual report to the regulators.

Appendix 9-A contains the measurements of performance metrics over the last five years.

9.3 Annual Reporting

Starting in FY 2014/15, the City is required to submit an annual report by September 30th, per Consent Decree requirement, to the EPA, SWRCB, and RWQCB documenting its compliance with the requirements of the Consent Decree in the preceding fiscal 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:

- A list of all Deliverables submitted to Plaintiffs and a description of the Work performed pursuant to all Deliverables
- A description of any known noncompliance
- Any recommended changes to the required work in the Consent Decree
- A Sanitary Sewer Overflow report that includes the location of SSOs; the start and end date and time of each SSO; the SSO volume including gross volume, amount recovered, and amount not recovered; the destination of each SSO; the probable cause(s) of the SSOs; the location(s) of repeat SSOs; a list of any SSOs at locations where the sewer main had been rehabilitated in the previous ten (10) Fiscal Years; and a description of measures taken to help prevent these SSOs in the future.
- The number of feet of sewer mains rehabilitated and the cumulative total feet of sewer main rehabilitated since the Consent Decree effective date. The number of lower lateral and manholes repaired or replaced when the sewer mains are rehabilitated and the number of abandoned laterals identified and disconnected.
- The budget spent on sewer main rehabilitation.
- The rehabilitation work to be completed in the next Fiscal Year.
- Inspection and condition assessment activities completed for sewer mains and manholes
- Inflow and rapid infiltration sources identified by EBMUD and addressed by the City.

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-B**.

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 and/or an outside consultant will conduct the audit. As designated by the Public Works Director, the Public Work Deputy Director 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 in February of 2017. A copy of the February 2017 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 SSMP is also posted on the Public Works Key Documents webpage: <https://alamedaca.gov/public-works/public-works-key-documents>. Performance of the SSMP is communicated in Element 9 and the SSMP Audits contained in **Appendix 10-A**. The City (WDID 2SSO10087) reports SSOs electronically to CIWQS. The electronic SSO data, as well as information regarding regulatory actions, is available at: http://www.waterboards.ca.gov/water_issues/programs/ciwqs/publicreports.shtml

The City's Public Works Department Key Documents section also contains a copy of the following:

- Sewer Collection System NPDES Permit
- Sewer Consent Decree
- Sewer Rate Study - February 2016
- Sewer System Management Plan - August 2014
- Sewer System Management Plan Appendices - August 2014
- Sanitary Sewer Overflow Emergency Response Plan
- Sewer Master Plan Final - November 2015

In addition, there is a dedicated webpage for the City's Private Sewer Lateral Program: <https://alamedaca.gov/community-development/building/private-sewer-lateral>

And a webpage for sewer and stormwater fees: <https://alamedaca.gov/public-works/sewer-and-storm-water-fees>

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.



City of Alameda Sewer System Management Plan Appendices

December 2017

Table of Contents

Appendix A

City Council Resolutions Adopting Sewer System Management Plan

Appendix B

City of Alameda Asset Management Implementation Plan, February 2013

Chapter 2 Appendices

Appendix 2-A Key Staff Contact Information

Chapter 3 Appendices

None

Chapter 4 Appendices

Appendix 4-A Map of Sewers in Hot Spot Cleaning Program

Appendix 4-B Map of Grid and Non-Grid Systems

Appendix 4-C Sewer Equipment and Materials Inventory Lists

Appendix 4-D Pump Station Standardized Equipment List

Chapter 5 Appendices

None

Chapter 6 Appendices

Appendix 6-A Overflow Emergency Response Plan (bound seperately)

Chapter 7 Appendices

Appendix 7-A EBMUD Regional FOG Program Scope of Services

Appendix 7-B Example FOG Control Program Quarterly Summary Report

Appendix 7-C EBMUD FOG Brochure

Appendix 7-D EBMUD Approved Grease Haulers

Appendix 7-E Grease SSO and Blockage Reporting Form

Chapter 8 Appendices

None

Chapter 9 Appendices

Appendix 9-A SSMP Change Log

Chapter 10 Appendices

Appendix 10-A 2014 SSMP Audit Report

Chapter 11 Appendices

None

Appendix A

City Council Resolutions Adopting Sewer System Management Plan

CITY OF ALAMEDA RESOLUTION NO. 14364

APPROVING THE DEVELOPMENT PLAN AND THE TIME SCHEDULE
FOR THE SEWER SYSTEM MANAGEMENT PLAN AS ADOPTED BY THE
STATE WATER RESOURCES CONTROL BOARD

Approved as to Form



City Attorney

WHEREAS, pursuant to Section 13267 of the California Water Code, municipalities that own and operate sanitary sewer collection system are required to prepare a Sewer System Management Plan (SSMP); and

WHEREAS, on May 2, 2006, the State Water Resources Control Board (SWRCB), adopted new statewide Sanitary Sewer Overflow Waste Discharge Requirements (SSO WDR); and

WHEREAS, pursuant to the statewide SSO WDR, agencies that own and operate sanitary sewer system must develop a SSMP and complete the SSMP elements in accordance with the SWRCB milestone schedule; and

WHEREAS, the City of Alameda has developed and completed an SSMP, based on the Regional Water Quality Control Board (RWQCB) guidelines; and

WHEREAS, the City of Alameda Public Works Department's staff is responsible for maintaining and reporting of the SSMP elements to the SWRCB and RWQCB; and

WHEREAS, the SSMP is also a part of the City of Alameda Sewer Master Plan, funded by the City Sewer Funds.

NOW, THEREFORE, BE IT RESOLVED that the City Council of the City of Alameda hereby accepts the completed SSMP as adopted by the SWRCB.

* * * * *

I, the undersigned, hereby certify that the foregoing Resolution was duly and regularly adopted and passed by the Council of the City of Alameda during the Regular Meeting of the City Council on the 21st day of July, 2009, by the following vote to wit:


AYES: Councilmembers deHaan, Gilmore, Matarrese,
and Mayor Johnson - 4.

NOES: None.

ABSENT: Councilmember Tam - 1.

ABSTENTIONS: None.

IN WITNESS, WHEREOF, I have hereunto set my hand and affixed the official seal of said City this 22nd day of July, 2009.



Lara Weisiger, City Clerk
City of Alameda

CITY OF ALAMEDA RESOLUTION NO.14976

RESOLUTION APPROVING THE CITY OF ALAMEDA
SEWER SYSTEM MANAGEMENT PLAN, AUGUST 2014

WHEREAS, on May 2, 2006 the State Water Resources Control Board (State Water Board) adopted Statewide General Waste Discharge Requirements (WDR) for all public agencies that own or operate a sanitary sewer system within the State of California; and

WHEREAS, the WDR requires agencies to develop and implement a Sewer System Management Plan (SSMP); and

WHEREAS, the State Water Board's Executive Director issued a revised Monitoring and Reporting Program that became effective on September 9, 2013; and

WHEREAS, the SSMP must be certified by City Council at least once every five years and must include program updates; and

WHEREAS, this City Council adopted Resolution No. 14364 on July 21, 2009 approving the City's SSMP; and

WHEREAS, the SSMP was updated in accordance with the WDR and a revised Monitoring and Reporting Program; and

WHEREAS, the updated SSMP is consistent with the City's work requirements in the Final Consent Decree for Consolidated Case Nos. C 09-00186-RS and C 09-05684-RS; and

WHEREAS, the updated SSMP must be presented to the City Council at a public meeting and formally adopted to assure that the public has the opportunity to comment on the collection systems policies and procedures.

NOW, THEREFORE, the City Council of the City of Alameda, DOES HEREBY RESOLVE that the Sewer System Management Plan, August 2014 is approved.

* * * * *

I, the undersigned, hereby certify that the foregoing Resolution was duly and regularly adopted and passed by the Council of the City of Alameda in a regular meeting assembled on the 21st day of October, 2014, by the following vote to wit:

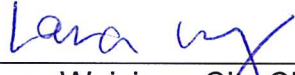
AYES: Councilmembers Chen, Daysog, Ezzy Ashcraft, Tam and Mayor Gilmore – 5.

NOES: None.

ABSENT: None.

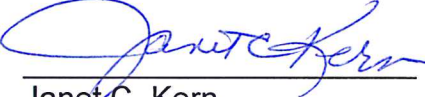
ABSTENTIONS: None.

IN WITNESS, WHEREOF, I have hereunto set my hand and affixed the seal of said City this 22nd day of October, 2014.



Lara Weisiger, City Clerk
City of Alameda

APPROVED AS TO FORM:



Janet C. Kern
City Attorney

Appendix B

City of Alameda Asset Management Implementation Plan, Updated 2014

Stipulated Order for Preliminary Relief
Case No. C 09-05684 RS

Final Consent Decree
Case Nos. C 09-00186-RS and C 09-05684-RS

Asset Management Implementation Plan

Prepared by the City of Alameda

February 1, 2013

Updated August 2014



Table of Contents

1	Introduction	1
1.1	Background	1
1.2	Wastewater Collection System	1
1.3	Stipulated Order and Consent Decree Requirements.....	2
1.4	Organization and Contents of the AMIP	3
1.5	Basis of AMIP Development	3
2	Asset Management Program Overview.....	4
2.1	Asset Management Goals and Objectives	4
2.2	Staff Organization and Responsibilities	5
2.3	Information Systems	6
2.4	Plan Updates and Reporting	6
3	Sewer Inspection and Condition Assessment	7
3.1	Overall Program Description	7
3.2	Sewer Inspection Methods.....	7
3.3	Basis of Sewer Pipe Condition Assessment Program	7
3.4	Evaluation and Documentation of CCTV Inspection Findings	8
3.5	CCTV Inspection Schedule	8
3.6	Manhole Inspection	9
4	Sewer Maintenance.....	10
4.1	Overall Program Description	10
4.2	Routine Cleaning.....	10
4.3	Hot Spot Cleaning	12
4.4	Root Control	12
4.5	QA/QC Program.....	13
4.6	Staffing.....	13
5	Sewer Repair and Replacement.....	13
5.1	Overall Program Description	13
5.2	Basis of Sewer Rehabilitation Program.....	14
5.3	Infiltration/Inflow Control Measures.....	14
5.3.1	Inflow Identification and Elimination	14
5.3.2	Infiltration Identification and Reduction	15
5.3.3	I/I Prevention	15
5.4	Schedule for Sewer Repair, Rehabilitation and Replacement	16
5.5	Emergency Repair and Replacement	16
5.6	10-Year Capital Improvement Plan and Financial Plan	16

List of Tables

Table 1: Asset Management Program Performance Measures.....	5
Table 2: Defects Requiring Corrective Action	9
Table 3: Categorization of Sewer Cleaning Results	11
Table 4: Cleaning Schedule Changes Based on Cleaning Results	12

Appendices

Appendix A - Map of Grid and Non-Grid Systems

Appendix B - Sewer Hot Spot List and Map

Appendix C - FY 2014/15 Sewer Rehabilitation/Replacement Plan

Appendix D - 10-Year Financial Plan (to be updated in 2015)

List of Abbreviations and Definitions

AMIP	Asset Management Implementation Plan
AO	Findings of Violation and Order for Compliance (Administrative Order)
CCTV	Closed-Circuit Television
City	City of Alameda
CY	Calendar Year (January 1 to December 31)
EBMUD	East Bay Municipal Utility District
EPA	U.S. Environmental Protection Agency
FOG	Fats, Oils, and Grease
FY	Fiscal Year (July 1 to June 30)
Grid System	Portion of the sewer system characterized by pipes that have multiple pathways for flow should a temporary blockage or flow backup occur
GWDR	General Waste Discharge Requirements for Sanitary Sewer Systems
I/I or I&I	Infiltration and Inflow
Infiltration	Water other than wastewater that enters a sewer system through the ground through defects pipes, service laterals, or manholes
Inflow	Water other than wastewater that enters a sewer system through direct connections from roof leaders, area drains, foundation drains, or cross-connections between the storm and sanitary sewer systems, or through manhole covers.
Lower Lateral	The portion of the sewer lateral extending from the cleanout at the property line to the connection to the public sewer main
MH	Manhole or Maintenance Hole
NASSCO	National Association of Sewer Service Companies
NPDES	National Pollutant Discharge Elimination System
O&M	Operations and Maintenance
PACP	Pipeline Assessment Certification Program
PSL	Private Sewer Lateral
QA/QC	Quality Assurance/Quality Control
Rapid Infiltration	Infiltration that enters the sewer system very quickly during storm events
Rehabilitation	“Node-to-node” (e.g., manhole to manhole) lining or replacement of an entire pipe segment
Repair	Replacement of a short segment of a sewer main or lateral; also called “point repair” or “spot repair”
RTSP	EBMUD Regional Technical Support Program
RWQCB	Regional Water Quality Control Board, San Francisco Bay Region
SO	Stipulated Order for Preliminary Relief
SSO	Sanitary Sewer Overflow
SWRCB	State Water Resources Control Board
Upper Lateral	The portion of the sewer lateral extending from the building drain to the cleanout at the property line
WWF	EBMUD Wet Weather Facility

1 Introduction

This Asset Management Implementation Plan (AMIP) was originally submitted by the City of Alameda (City) in compliance with the requirements of the Stipulated Order for Preliminary Relief (Case C 09-05684 RS) with the U.S. Environmental Protection Agency (EPA), the California State Water Resources Control Board (SWRCB), and the California Regional Water Quality Control Board, San Francisco Bay Regional (RWQCB) (“Plaintiffs”), and San Francisco Baykeeper (“Intervenor-Plaintiff”), as approved by the United States District Court, Northern District of California, on September 6, 2011. This AMIP has been updated to reflect the requirements of the Consent Decree with the above parties (Case Nos. C09-00186-RS and C09-05684-RS) as approved in September 2014.

1.1 Background

The City owns and operates a wastewater collection system that collects and conveys wastewater generated within the City to the East Bay Municipal Utility District (EBMUD) wastewater system. 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.

EBMUD’s wastewater facilities include interceptor pipelines and pump stations that convey flow from the Satellite collection systems to its Main Wastewater Treatment Plant. During large storm events, some of the flow is diverted to three remote Wet Weather Facilities (WWFs). In 2009, the EPA, SWRCB, and 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 sanitary sewer overflows (SSOs) and control wet weather infiltration/inflow (I/I or 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.

In 2014, the seven Satellites and EBMUD entered into a Consent Decree with the Plaintiffs and Intervenor-Plaintiff. The Consent Decree replaces the 2011 SO, and requires that the AMIP be revised as necessary to reflect the Work requirements of the Consent Decree.

1.2 Wastewater Collection System

The City’s collection system includes approximately 136 miles of City-owned gravity sanitary sewers, 42 sewage pump stations, approximately 6 miles of pressure force mains, and approximately 20,000 service laterals. 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 (Bay Farm Island), 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. The remainder of Alameda Point (including an additional 3 miles of sewers) will be transferred to City ownership at a later date; however, the City maintains the entire Alameda Point collection system under a contract with the U.S. Navy.

There are over 10 miles of pipelines and seven pump stations in Alameda that are part of the EBMUD wastewater interceptor system. EBMUD is responsible for operation and maintenance of these facilities. There are also approximately 16 miles of privately-owned sewers that are the responsibility of individual homeowners’ associations. The U.S government owns and is responsible for the sanitary sewer system serving the Coast Guard housing area east of Alameda Point.

In Alameda, the maintenance and repair of the service laterals are the responsibility of individual property owners; however, the City’s practice is to repair or replace the lower portion of the laterals (located within the public right-of-way) from the property line cleanout to the connection to the City’s sewer main

whenever the public sewer main is rehabilitated or replaced, or if the lower lateral fails, whichever occurs first.

The City has rehabilitated or replaced over 20 percent of its gravity sewers and associated lower laterals over the past 30 years. Since 1988, the City has had a private sewer lateral (PSL) certification program requiring the testing and/or repair or replacement of the upper portion of sewer laterals at the time of property sale. Effective January 1, 2015, the City will join the EBMUD Regional Private Sewer Lateral Program.

1.3 Stipulated Order and Consent Decree Requirements

This AMIP addresses the requirements of Section VI, Paragraph 22 of the SO and the specific requirements of Section VIII of the Consent Decree (“Work – City of Alameda”) that relate to the SO requirements.

Sub-paragraph 22.B of the SO specifies the minimum requirements of the AMIP, as follows:

1. ***Routine inspection of the Collection System according to a specified schedule, and that includes the following:***
 - a) *Inspection methods to be used, including direct visual inspection and CCTV inspection, and whether CCTV equipment is owned, purchased, leased, or a combination;*
 - b) *An inspection schedule, and protocol for determining the regular time interval on which repeat inspections will be performed; and*
 - c) *A system for timely evaluation of inspection findings and documentation of the assessed condition.*
2. ***Collection System maintenance protocols, including:***
 - a) *A schedule for routine cleaning of the City of Alameda’s Collection System using standardized responses developed by the City to typical local problems that cause blockages such as debris, grease and roots. The City shall develop its routine cleaning schedule after evaluating the cleaning needs of the Collection System;*
 - b) *A list of locations where pipe blockages and SSOs have frequently occurred (hot spots), a hot spot cleaning schedule, and procedures for adjusting the hot spot cleaning schedule based on changing conditions;*
 - c) *Preventive measures to address blockage of sewer pipes by roots, including a description of root control methods; locations where root control methods may be used within the Collection System; and a schedule for application of root control methods;*
 - d) *A plan for staffing the sewer system cleaning and root control programs, indicating whether staffing duties will be carried out by agency staff, by staff from other agencies, or by private contractor(s). To the extent that any sewer cleaning or root control duties conducted under this program will be carried out by private contractor(s), the City of Alameda shall retain on file and make available for inspection for a period of three years after the completion of work a description of each contractor and a copy of each contract, or a description of the procurement process;*
 - e) *A Quality Assurance and Quality Control Program (“QA/QC Program”) to ensure proper sewer cleaning. The QA/QC Program shall include a plan for inspecting the cleaning quality, which specifies a minimum percentage of cleaned pipes to be inspected at regular intervals and a schedule for inspections, the procedures for conducting the inspections, the time interval for any necessary re-cleaning, and criteria for increasing and decreasing the frequency of inspection.*

3. **Condition based repair and replacement of sewer pipe plan.** *This plan shall include elimination of known improper flow connections, according to a schedule informed by the inspection results, and address both short-term (repairs of Acute Defects to occur within one year of completion of inspection and assessment) and long term repair, rehabilitation and replacement of sewer pipes. The plan shall include the following:*
 - a) *A schedule and 10-year financial plan for repair, rehabilitation, and replacement of sewer pipes. This schedule shall identify pipe reaches presently planned as priorities for rehabilitation or replacement over the next three years, with the understanding that the identified priorities are likely to be further developed and revised through the inspection and assessment process, and as a result of changed conditions. The City shall develop its schedule for repair, rehabilitation and replacement of sewer pipes using standardized responses developed by the City to observed defects, taking into account available peak flow rate data;*
 - b) *Measures to control inflow and infiltration as needed to reduced flows in the Collection System and reduce the frequency of SSOs; and*
 - c) *The budget allocated for emergency repair and replacement of sewer pipe, the length of sewer pipe which underwent emergency repair and replacement during the previous year, and the cost thereof.*

1.4 Organization and Contents of the AMIP

The AMIP includes four subsequent sections, as follows:

Section 2 – Asset Management Program Overview describes the overall goals and objectives of the AMIP; staff organization and responsibilities for implementation of the plan; information systems that will be used by the City in implementing the plan; and processes that will be used to update the AMIP to reflect new information and changed conditions.

Section 3 – Sewer Inspection and Condition Assessment addresses the requirements for “Routine inspection of the Collection System” in accordance with sub-paragraph 22.B.1 of the SO and Section VIII.B.43.b of the Consent Decree.

Section 4 – Sewer Maintenance addresses the requirements for “Collection System maintenance protocols” in accordance with sub-paragraph 22.B.2 of the SO and Section VIII.C.50-51 of the Consent Decree.

Section 5 – Sewer Repair and Replacement addresses the requirements for “Condition based repair and replacement of sewer pipe plan” in accordance with sub-paragraph 22.B.3 of the SO and Sections VIII.B.43.a, 46, and 47, and Section VIII.C.49 of the Consent Decree.

1.5 Basis of AMIP Development

The AMIP builds upon City programs that are already in place for inspection, maintenance, and rehabilitation of the collection system; and plans that have been already been prepared and implemented under the Statewide Waste Discharge Requirements for Sanitary Sewer Systems and the City’s previous AO and SO, including the following:

- Sewer System Management Plan (Updated August 2014)
- Sewer System Cleaning and Root Control Program (Rev. 2, April 2011)
- Inflow Identification and Elimination Plan (July 2010)
- Subbasin Flow Monitoring and Infiltration/Inflow Assessment Plan (July 2010)
- Subbasin Flow Monitoring and Infiltration/Inflow Assessment (December 2012)

- Pump Station Prioritization Plan (July 2010)
- Pump Station Renovation Plan (July 2012)
- Sanitary Sewer System Hydraulic Analysis (May 2010)
- Sewer Rate Study (May 2010; update to be completed November 2014)

In particular, the AMIP is considered to be a part of the City's overall Sewer System Management Plan (SSMP), in that it provides additional detail on sewer maintenance, inspection, and rehabilitation activities. The SSMP addresses additional aspects of the City's management of its sewer system, including its legal authority; fats, oils, and grease (FOG) control program; design and performance standards; capacity evaluation and assurance planning; and overflow emergency response procedures.

2 Asset Management Program Overview

2.1 Asset Management Goals and Objectives

The overall goals of the City's sewer system asset management program are to:

- Protect public health and the environment
- Maintain customer satisfaction
- Manage the system and deliver service cost-effectively
- Comply with all applicable regulations, including National Pollutant Discharge Elimination System (NDPES) permits and California General Waste Discharge Requirements for Sanitary Sewer Systems (GWDR)

To achieve these goals, the specific objectives of the sewer system asset management program are to:

- Minimize sewer blockages, backups, and SSOs
- Minimize neighborhood disruption due to construction and maintenance activities
- Reduce wet weather discharges to San Francisco Bay by reducing I/I in the collection system
- Optimize the costs of maintenance and repair/rehabilitation programs

The programs described in this AMIP are designed to meet these goals and objectives, and include:

- Effective sewer system maintenance that includes routine (proactive) and preventive maintenance activities, including sewer cleaning and root control;
- System inspection and condition assessment to identify and help prioritize sewer maintenance, repair, rehabilitation, and replacement needs; and
- Sewer rehabilitation and I/I control programs to address structural and maintenance problems, maintain the long-term operational reliability of the system, improve neighborhood infrastructure, and help reduce wet weather flows.

Numeric targets associated with the above programs are summarized in **Table 1**. The City will use these targets as a means of measuring its performance in meeting its asset management goals and objectives.

Other related programs and activities that also address the City's overall asset management goals are described in other documents, including the City's Sewer System Management Plan, Pump Station Prioritization Plan, Pump Station Renovation Plan, and Sanitary Sewer System Hydraulic Analysis Report.

Table 1: Asset Management Program Performance Measures

Program	Activity	Target
Sewer Maintenance	System-Wide Cleaning	Clean entire system (except Alameda Pont) by June 30, 2019. Thereafter, clean non-grid pipes at least once every 5 years and grid pipes at least once every 10 years.
	Cleaning QA/QC	Conduct random CCTV inspection following cleaning for at least 2% of pipes cleaned by City crews and contractors (note: routine cleaning by contractors will be done in conjunction with CCTV inspection).
Sewer Inspection and Condition Assessment	CCTV Inspection	Inspect all sewers that are more than 10 years old (except Alameda Point) by the end of 2015. Thereafter, set sewer inspection frequency based on previous CCTV results, maintenance history, or potential risk, no longer than every 20 years.
	CCTV Inspection QA/QC	Conduct detailed review of video and observation coding for at least 2% of pipes inspected by City crews and contractors.
	Manhole Inspection	Inspect all manholes on sewers scheduled for CCTV inspection.
Sewer Rehabilitation and I/I Control	Sewer Rehabilitation and Replacement	Rehabilitate approximately 3 miles of sewer per year on a cumulative basis
	Private Property Inflow Correction	Initiate notification of properties with inflow sources within 90 days of identification

2.2 Staff Organization and Responsibilities

The City's sewer system asset management program is implemented by the City's Public Works Department under the leadership of the Director of Public Works. The Maintenance Division, under the direction of the Public Works Coordinator and the Public Works Maintenance Superintendent, is responsible for hot spot sewer cleaning and associated cleaning QA/QC, root control, maintenance-related sewer and manhole inspections, as well as other related maintenance activities such as SSO response and reporting, sewer blockage and complaint response, and emergency spot repairs. Chemical root control and select spot repairs are performed by contractors.

The Engineering Division, under the direction of the City Engineer and Public Works Coordinator, is responsible for routine cleaning conducted in conjunction with CCTV inspection, sewer and manhole inspections, condition assessment, inflow elimination, and sewer rehabilitation, including budgeting for sewer system capital improvements. Engineering design of sewer rehabilitation projects is performed by

City engineering staff or by consultants under the direction of City staff. Public Works Department inspectors provide inspection of sewer rehabilitation and replacement projects.

The Engineering Division also oversees the Private Sewer Lateral (PSL) program and coordinates with other City departments and agencies (e.g., Building, Finance, Information Technology, and EBMUD) as needed for implementation and enforcement of that program.

The Maintenance and Engineering Divisions coordinate on an on-going basis, including maintaining an engineering referral list for problems identified through maintenance activities such as CCTV inspection, service requests, maintenance flushing logs, lift station logs, sinkhole mitigation, and capital improvement program data. The two divisions are jointly responsible for preparing and updating this AMIP as well as other related documents, including the SSMP.

2.3 Information Systems

The City uses various information systems to support asset management activities. These systems include:

- **ESRI ArcMap Geographic Information System (GIS).** The GIS is used to generate sewer system maps and store system inventory data, including sewer attribute information such as pipe diameter, length, and material. The GIS is also used to define areas for cleaning and sewer inspection.
- **AutoCAD.** AutoCAD is used to create sewer mapping and design drawings.
- **Accela.** Accela is used to track building permits and plumbing permits for lateral testing, repair, and replacement. Two new permit designations (SLT and SLR) have been created for the PSL compliance program. (Note: Effective January 1, 2015, Alameda will join the Regional PSL Program and responsibility for tracking PSL compliance will be transferred to EBMUD.)
- **Comcate.** Comcate is used to generate work orders to respond to service requests from customers, as well as for normal pump station maintenance and hot spot cleaning.
- **Granite XP.** Granite XP records and stores data from cleaning and CCTV inspections conducted by City maintenance staff and contractors.
- **Other databases and spreadsheets.** The City uses MS Excel to track and record routine cleaning, manhole inspections, and results of other field activities.
- **InfoWorks CS sewer system hydraulic model.** The model is used to identify potential capacity deficiencies and determine the required sizes of sewer replacement and capacity improvement projects. The City owns a “viewer” version of the model which allows City staff to access and view model data and results.

2.4 Plan Updates and Reporting

The City intends to employ continuous improvement and adaptive management in implementing its asset management program. This means that system performance will be evaluated and assessed on an on-going basis, and plans and programs will be modified and updated based on actual performance and new information from sewer inspection and other field investigations. Performance measures will include the activity targets identified in Table 1; SSO and future flow trends will also be considered. The City will report on its progress in implementing its asset management program to the EPA, as required under the Consent Decree, and will include any proposed revisions to maintenance, inspection, and rehabilitation schedules and accompanying changes to the financial plan.

3 Sewer Inspection and Condition Assessment

3.1 Overall Program Description

The City conducts CCTV inspection of sewers under its on-going citywide program of video inspection and condition assessment (now in its seventh phase). Approximately 41 miles (over 30 percent of the system, not including Alameda Point) have been inspected since 2009. The data collected have been used to develop condition ratings for the inspected pipes and prioritize sewers for repair and replacement.

The City also performs CCTV inspections to investigate sewer main SSOs, troubleshoot problem areas, and conduct cleaning QA/QC.

3.2 Sewer Inspection Methods

The City uses both CCTV inspection and direct visual inspection of manholes to document the condition of gravity sewer facilities. Both of these activities may be performed by City staff or by contractors, depending on the availability of resources and the goals and requirements of specific activities or projects.

The City owns and operates a CUES CCTV inspection truck equipped with camera and equipment capable of inspecting sewer mains up to 15 inches in diameter (which comprise over 90 percent of the gravity system). The system uses Granite XP software to capture the CCTV observations recorded by the operator. City CCTV operators have been trained and certified under the National Association of Sewer Service Companies (NASSCO) Pipeline Assessment Certification Program (PACP). The City also has two push cameras which are used to inspect lower laterals and other small diameter sewers that cannot be accessed by the CCTV truck.

Contractors are required to use NASSCO PACP standards and deliver the data in a PACP compliant format. Data provided by contractors are merged and stored in the City's Granite XP database.

3.3 Basis of Sewer Pipe Condition Assessment Program

Over the past five years, the City has used a number of factors to identify and prioritize areas for sewer inspection, including:

- Relative age of sewer pipes
- Historical results of sewer surcharge monitoring.
- Backyard mains located within City easements on private properties
- Pipes located in the vicinity of water bodies
- Pipes located in areas susceptible to high groundwater table
- Pipes in landfill areas with Bay Mud sub-base
- Pipes with service call records to the City Maintenance Division
- Pipes with reports of grease build up
- Representative samples of sewers in various areas of the system
- Pipes located in streets scheduled for paving

By the end of 2015, the City plans to complete inspection and condition assessment of the remaining sewers in the system that have not yet been inspected under previous condition assessments during the past five years, or have not be rehabilitated or replaced during the past 10 years. This work will include approximately 60 percent of the system. This work will be conducted in conjunction with routine cleaning program activities (refer to Section 4 of this AMIP). Prioritization of areas for inspection will consider paving schedules, higher than average I/I rates (as identified in the City's Subbasin Flow Monitoring and I/I Assessment Report, submitted in December 2012), or other factors such as areas along

the perimeter of the island that were constructed on fill and are more prone to settlement and structural issues.

3.4 Evaluation and Documentation of CCTV Inspection Findings

As was done for all previous condition assessment work since 2009, CCTV inspection findings will be documented using the NASSCO PACP scoring system, which assigns a “grade” to each observed defect based on its type and severity. The PACP “quick rating” is used to generate an initial evaluation of pipe condition. Based on the PACP ratings, pipes with Grade 4 or 5 structural or maintenance defects will be reviewed in detail by City Engineering and/or Maintenance staff.

The City will track the results and decisions made based on the review. At a minimum, all inspected pipes with maintenance and structural defects with grades as indicated in the **Table 2** will undergo detailed review of the video record to determine the appropriate follow-up action. Based on the review, the required corrective action and/or schedule for next inspection will be determined and documented. Defect scoring will be used to prioritize sewer rehabilitation as part of the cyclic sewer program.

CCTV inspection data will also undergo QA/QC review by Engineering Division staff or quality review consultants to verify the quality of the video recording and accuracy of the recorded observations. At least 2 percent of CCTV inspections conducted for condition assessment by City crews or contractors will undergo detailed quality review.

3.5 CCTV Inspection Schedule

Following the baseline inspection program described above, the schedule for subsequent CCTV inspections will be based on pipe-specific condition assessment results, at a frequency not to exceed 20 years. Pipes with any Grade 5 or Grade 4 structural defects that are not otherwise addressed by corrective action per Table 2 will be re-inspected in 5 or 10 years, respectively; pipes with Grade 3 defects will be re-inspected in 15 years; and pipes with only Grade 1 or 2 defects or no defects will be reinspected in 20 years. However, the City may modify these default inspection frequencies for pipes that are considered more critical (higher risk), such as sewers located adjacent to waterways or in areas with known soil stability issues.

Table 2: Defects Requiring Corrective Action

Condition	Corrective Action
Grade 4 or 5 Maintenance Defect	Address issue within 60 to 90 days
Grade 5 Structural Defect – Imminent Failure Likely	Repair or Rehabilitate Sewer within 1 year
Grade 5 Structural Defect – Imminent Failure Unlikely	If sewer main is scheduled for rehabilitation within next 5 years – no action; otherwise Reinspect Sewer in 5 years
Grade 4 Structural Defect	If sewer main is scheduled for rehabilitation within next 10 years–no action; otherwise Reinspect or Repair within 10 years

Notes:

- 1) Corrective action for maintenance defects may include cleaning, root cutting, repair, rehabilitation, or continued monitoring, depending on the nature of the defect(s). An assessment of the required corrective action will be made through review of the inspection video and the maintenance history of the sewer segment by Maintenance and/or Engineering staff.
- 2) Decision to repair or rehabilitate sewers with Grade 4 or 5 structural defects will be based on the severity and type of defect; if re-inspection indicates that the sewer condition has not worsened since the previous inspection, then the corrective action could be deferred or subsequent inspection scheduled in accordance with the timeframes indicated in the table.

3.6 Manhole Inspection

The City initiated inspection of manholes in 2011, focusing initially on manholes identified as being located in areas prone to flooding, as listed in the City’s July 2010 Inflow Identification and Elimination Plan. The manhole inspection observations were recorded in an Excel spreadsheet that notes the condition of each component of the manhole (lid, frame, cone, barrel, base) based on a damage rating ranging from 1 to 5 (1 indicating no damage and 5 indicating need for immediate repair). The City plans to continue manhole inspections in conjunction with CCTV inspection work.

4 Sewer Maintenance

The City's protocols for maintenance of the sanitary sewer system were initially established in the Sewer System Cleaning and Root Control Program that was submitted to EPA in July 2010 and subsequently revised in October 2010 and April 2011 in response to EPA comments. Elements of that plan are incorporated into this section of the AMIP.

4.1 Overall Program Description

The City's sewer cleaning program includes hydro-flushing, jetting, and (on occasion) bucket cleaning. Sewer cleaning is performed by City crews and also by contractors for special projects or in conjunction with closed-circuit television (CCTV) inspection of sewers. Sewer cleaning is performed for hot spot locations at frequencies of one year or less, and as part of routine cleaning of other gravity sewers.

4.2 Routine Cleaning

All sewers that are not part of the hot spot cleaning program (described below) are included in the routine cleaning program. Routine cleaning will initially be conducted in conjunction with the CCTV inspection for those sewers included in the CCTV program (see description in Section 3). All other pipes (primarily those that are less than 10 years old) will undergo their first cleaning prior to June 30, 2019, as required by the Consent Decree.

The sewers in the City's collection system are classified into two basic types: "grid" and "non-grid". The pipes 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 pipe and be conveyed downstream in another direction, thereby preventing an SSO. Over 60 percent of the sewers in Alameda are part of the grid system. Each pipe is flagged as "grid" or "non-grid" in GIS based on the configuration of the surrounding system. A map showing the grid and non-grid pipes is included in **Appendix A**.

In accordance with the Consent Decree, after the initial round of routine cleaning, the City will clean the pipes that are not part of the grid system (excluding the sewers in Alameda Point) every 5 years and the grid system pipes every 10 years.

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 3**. Pipes with heavy material would be scheduled for re-cleaning in 2 years or moved to the hot spot cleaning program, if warranted.

Note that for any pipe that experiences an SSO, the City's standard practice is to perform a failure analysis to identify the cause, and based on the results of the failure analysis, the sewer may undergo a localized repair or referred to Engineering for rehabilitation if a structural solution is indicated, or else placed on a more frequent cleaning schedule.

Table 3: 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
<p>This table was adapted from <i>Best Practices Manual: Hydroflush Cleaning of Small Diameter Sewers</i>, California Collection System Collaborative Benchmarking Group, February 2001.</p>				

4.3 Hot Spot Cleaning

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 defined as a “root blockage” or “FOG blockage” if, after cleaning operations, roots or grease are found to be the cause of a blockage or SSO, and the same problem is reported two or more times in a year. Other sewers may also be included as hot spots based on the decision of the Maintenance Superintendent.

Hot spots are divided into three groups, with two of the groups cleaned annually and one group cleaned every 90 days. The hot spot locations currently include 6.7 miles of pipes located along and in the areas around Webster Street and Park Street, and in several other areas of the system. The City’s current hot spot list and map are included in **Appendix B**. Historically, many 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. Note that some of the hot spots are not necessarily locations where blockage or SSOs have actually occurred, but areas where aggressive preventive maintenance is considered warranted in order to avoid such occurrences (e.g., along busy commercial streets).

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.

Hot spot cleaning results will be recorded in accordance with the codes shown in Table 3. 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** below.

Table 4: 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.)

4.4 Root Control

The City uses hydroflushing, rodding, chemical root control, or a combination of these methods to control roots in the sewer system. Sewer mains are identified as potential candidates for chemical root control based on the number of lower lateral service requests caused by roots, observation of roots in the pipe through CCTV, if the main is in a backyard/sideyard easement, and/or if the main is shallow and in an area with trees. Root problems historically have been in sewer laterals rather than sewer mains. If there is root intrusion in a sewer lateral that causes a failure or break in the lower lateral, the City will repair or replace the lower lateral accordingly.

Sewer mains that are root foamed are re-treated every two years until root intrusion is no longer a problem or the pipe is replaced.

4.5 QA/QC Program

The City uses CCTV inspection as the primary method for ensuring the quality of pipeline cleaning, and applies a pipe cleanliness rating where 95 percent indicates adequate cleanliness. As part of its initial routine cleaning program in 2011, about 50 percent of the sewers that were cleaned by City crews also underwent CCTV inspection, typically within 30 days after cleaning. In the future, a random 2 percent sample of all cleaning conducted by City crews will undergo CCTV inspection after cleaning, and inadequately cleaned pipes will be re-cleaned within 30 days. Cleaning QA/QC results will be documented, and feedback and training as needed will be provided to maintenance staff.

As described in the previous section on routine inspection, the City also coordinates routine sewer cleaning and CCTV inspection by contractor, thereby using the CCTV inspection results to confirm the quality of cleaning. The City's cleaning and CCTV specifications require the contractor to submit CCTV data and video on a periodic basis for quality review by the City. Inadequate cleaning will be identified, and the contractor will be required to re-clean the sewer within 30 days.

4.6 Staffing

With the exception of chemical root control application and cleaning in association with CCTV inspection for sewer condition assessment, sewer maintenance activities are carried out by staff of the City's Public Works Department Maintenance Division. The Department currently employs 11 field staff (including one currently vacant position) and 1 supervisor for the operation and maintenance of the sanitary sewer system, including pump stations. This level of staff is adequate for performing the hot spot sewer cleaning, CCTV inspection for cleaning QA/QC, pump station maintenance, operations support, and a portion of routine cleaning, manhole inspections, and CCTV inspection for sewer condition assessment as needed.

The majority of routine cleaning for the initial cycle of system-wide cleaning will be performed by contractors in conjunction with CCTV inspection. The City has incorporated the requirements of this AMIP with respect to cleaning QA/QC and recording of cleaning and inspection results into its cleaning and inspection contract specifications.

5 Sewer Repair and Replacement

5.1 Overall Program Description

The City has had an on-going program for repair, rehabilitation, and replacement of its sewer system since the 1980s and, to date, has rehabilitated or replaced over 20 percent of its gravity sewer mains. The program has included rehabilitation and replacement of sewers in subbasins identified in its 1986 Sewer System Evaluation Survey (SSES) as being cost-effective for rehabilitation to reduce I/I. These areas were subsequently included in the I/I Correction Program mandated under Cease and Desist Orders issued by the RWQCB to the EBMUD Satellites in 1986 and revised in 1993. The City also conducts sewer rehabilitation to address maintenance issues, including sewers with historical blockages or SSOs, as well as pipes identified as having significant structural problems. Under its rehabilitation program, the City also rehabilitates or replaces the lower portion of sewer laterals whenever the associated mainline sewer is rehabilitated or replaced, replaces all manholes unless they are in good condition or have been replaced under previous rehabilitation projects.

It should be noted that in the context of this AMIP, the term sewer "rehabilitation" refers to "node-to-node" (e.g., manhole-to-manhole) lining or replacement of an entire pipe segment, and the term "repair" refers to a point repair (typically excavation and replacement of a 2 to 10-foot segment of pipe), generally performed to address a localized emergency condition, such as a sink hole.

5.2 Basis of Sewer Rehabilitation Program

The City schedules sewers for rehabilitation in its 5-year CIP, called its “cyclic sewer replacement program.” Sewers are identified for rehabilitation and projects are defined based on several factors, including history of recurring maintenance problems, coordination with street paving, and condition assessment results. As noted above, previous projects conducted under its 1993 I/I Correction Program Compliance Plan had been targeted toward I/I reduction, as determined by the 1986 SSES. The City has completed its Subbasin Flow Monitoring and I/I Assessment (submitted to EPA on December 1, 2012), which describes its future approach for targeting high priority areas for sewer rehabilitation. As noted in that plan, the City will include relative peak I/I rates as a key criterion in prioritizing areas for rehabilitation. As also noted in that report, EBMUD’s analysis indicates that flows from Alameda have minimal impact on discharges from its WWFs; therefore, Alameda’s sewer rehabilitation plan will be focused on improving the physical condition of its own collection system to preserve its structural integrity and minimize maintenance problems and SSOs, and reducing I/I as part of the overall regional goal of reducing wet weather flows.

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, cost of repair, and/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 3 miles of sewer replacement annually, or about 2 percent of the system per year. The City will review this plan annually and make adjustments based on additional information from maintenance, paving programs, CCTV inspection, and results from EBMUD’s Regional Technical Support Program (targeted at finding sources of inflow and rapid infiltration). The updated plans will be included in the City’s annual reporting under the Consent Decree. The City also replaces lower laterals in conjunction with sewer main replacement.

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 \$300,000 for such repairs, which are done by contractor.

5.3 Infiltration/Inflow Control Measures

5.3.1 Inflow Identification and Elimination

The City’s Inflow Identification and Elimination Program initially called for a 10-year program of smoke testing of the entire collection system to identify potential sources of direct inflow into the system, and inspection and repair, if needed, of approximately 465 manholes and other sewer structures located in areas prone to flooding. The program included documenting the results of these investigations and follow-up actions as needed, including enforcement for inflow sources located on private property.

The City decided to accelerate the smoke testing work by completing 6 of the original 10 phases of the program in 2011, 2012, and 2013 (total of about 80 miles of the system). Effective in 2014, the program was discontinued, as the Consent Decree now requires EBMUD to conduct inflow identification efforts as

part of its Regional Technical Support Program (RTSP). Under the Consent Decree, the City will be responsible for follow-up and enforcement for identified private inflow or “rapid infiltration” sources identified through the RTSP, and for repair of sources within the public portion of the system.

The City developed for its smoke testing program, and intends to use for the RTSP, a database to track follow-up actions for inflow or “rapid infiltration” sources on private property. Within 90 days of receiving notice from EBMUD of both High Priority and Non High Priority sources on private property, the City will issue a notice of non-compliance to the property owner with any associated materials to support the finding of non-compliance. For High Priority sources, if the City has not received verification that the illicit connection has been corrected within 6 months, a second notice of non-compliance will be sent to the property owner with an additional 6 months for correction and notification of future assessment of fines. If the City has not received verification that the illicit connection has been corrected within one year from the date of the first notice, the City will issue a final notice of non-compliance stating the City’s intent to pursue the passage of a City Council resolution for the work to be done by the City with the expenses assessed upon the property owner. For Non High Priority sources, the degree of enforcement will be determined based on the severity of the case.

For High Priority sources found in the public portion of the system, the City will either perform the repair through the emergency/spot repair budget and/or integrate the information into the City’s pipe rating model to re-prioritize sewer main rehabilitation.

The City is also conducting inspection of manholes identified as potential for inflow in areas prone to flooding. Based on these results, a capital improvement project will be budgeted to address manholes that the City determines are in need of repair or rehabilitation.

5.3.2 Infiltration Identification and Reduction

Areas and sources of infiltration may be identified through flow monitoring, smoke testing, and sewer, manhole, and lateral inspections. Infiltration reduction in the public portion of the system will be implemented through the sewer rehabilitation program described in this section of the AMIP. The City’s Private Sewer Lateral (PSL) compliance program (and starting in 2015, the Regional PSL Program) will be the primary vehicle for addressing infiltration from defective upper laterals.

5.3.3 I/I Prevention

Application of appropriate standards for design and construction of new sewer facilities and for sewer rehabilitation and replacement, and enforcement of the applicable provisions of the Alameda Municipal Code, are the primary methods for preventing I/I in the City’s collection system. The City’s Public Works Department maintains a book of Standard Subdivision Improvements Specifications and Design Criteria, which contains design standards for sewers. The City sewer design standards are required for both new installation and replacement facilities. The City has four full time construction inspectors, who report to the Construction Inspection and Survey Supervisor within the Public Works Department. All sewer construction and rehabilitation work is inspected to make sure that it meets the City’s design standards. All sewers constructed by contractors are cleaned, tested and video inspected before acceptance. Sewer laterals on private property are tested in accordance with Uniform Plumbing Code and City of Alameda Ordinance in the presence of a City Building Inspector from the City’s Planning and Building Department.

Under the Consent Decree, the City will also participate, together with the other Satellites and EBMUD, in the development of Regional Standards for sewer installation, rehabilitation, and repair.

5.4 Schedule for Sewer Repair, Rehabilitation and Replacement

The City's planned sewer rehabilitation and replacement projects for FY 2014/15 are shown in **Appendix C**. Subsequent years' projects will be based on the results of the pipe rating model, expected to be completed by early summer 2015. Upon completion, Appendix C will be updated with prioritized capital projects addressing the remaining portion of the system not already rehabilitated from its original installation. Note that the rehabilitation plan may continually be adjusted based on results of additional condition assessment or other relevant information. The City will report adjustments to the rehabilitation plan and schedule in its Annual Reports under the Consent Decree.

5.5 Emergency Repair and Replacement

As noted above, the City has an annual contract of \$300,000 for point repairs. The number and cost of emergency repairs will be reported in the City's Annual Reports under the Consent Decree.

5.6 10-Year Capital Improvement Plan and Financial Plan

The City's CIP includes repair, rehabilitation, and replacement of sewer pipelines, lower laterals, and manholes, as discussed in this AMIP, as well as upgrades to sewer pump stations. The City funds its sewer program through a combination of debt financing and revenues from sewer fees. The City is in the process of completing a rate study and preparing an updated financial plan. The study will be completed in late 2014, and rate adjustments will commence in FY 2015/16. At that time, the updated 10-year financial plan will be included in **Appendix D**.

Chapter 2 Appendices

Appendix 2-A Key Staff Contact Information

Position	Name	Phone Number
Public Works Director	Erin Smith	(510) 747-7938
Deputy Public Works Director	Vacant	
Public Works Coordinator	Liz Acord	(510) 747-7957
City Engineer	Vacant	
Assistant Engineer	Shilpa Patel	(510) 747-7945
Assistant Engineer	Philip Lee	(510) 747-7942
Senior Construction Inspector	Greg Stoia	(510) 747-7953
Public Works Maintenance Superintendent	Vacant	
Public Works Supervisor	Emanuel Rios	(510) 747-7922
Sewer Shop Team Leader	Vacant	(510) 747-7900
Plumbing Shop Team Leader	Victor Erdei	(510) 747-7900

Chapter 3 Appendices

None

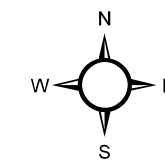
Chapter 4 Appendices

Chapter 4 Appendices

Appendix 4-A Map of Sewers in Hot Spot Cleaning Program

City of Alameda 90 Day Cleaning Frequency "Hot Spot" Program July 2017

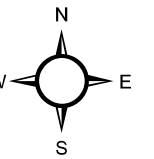
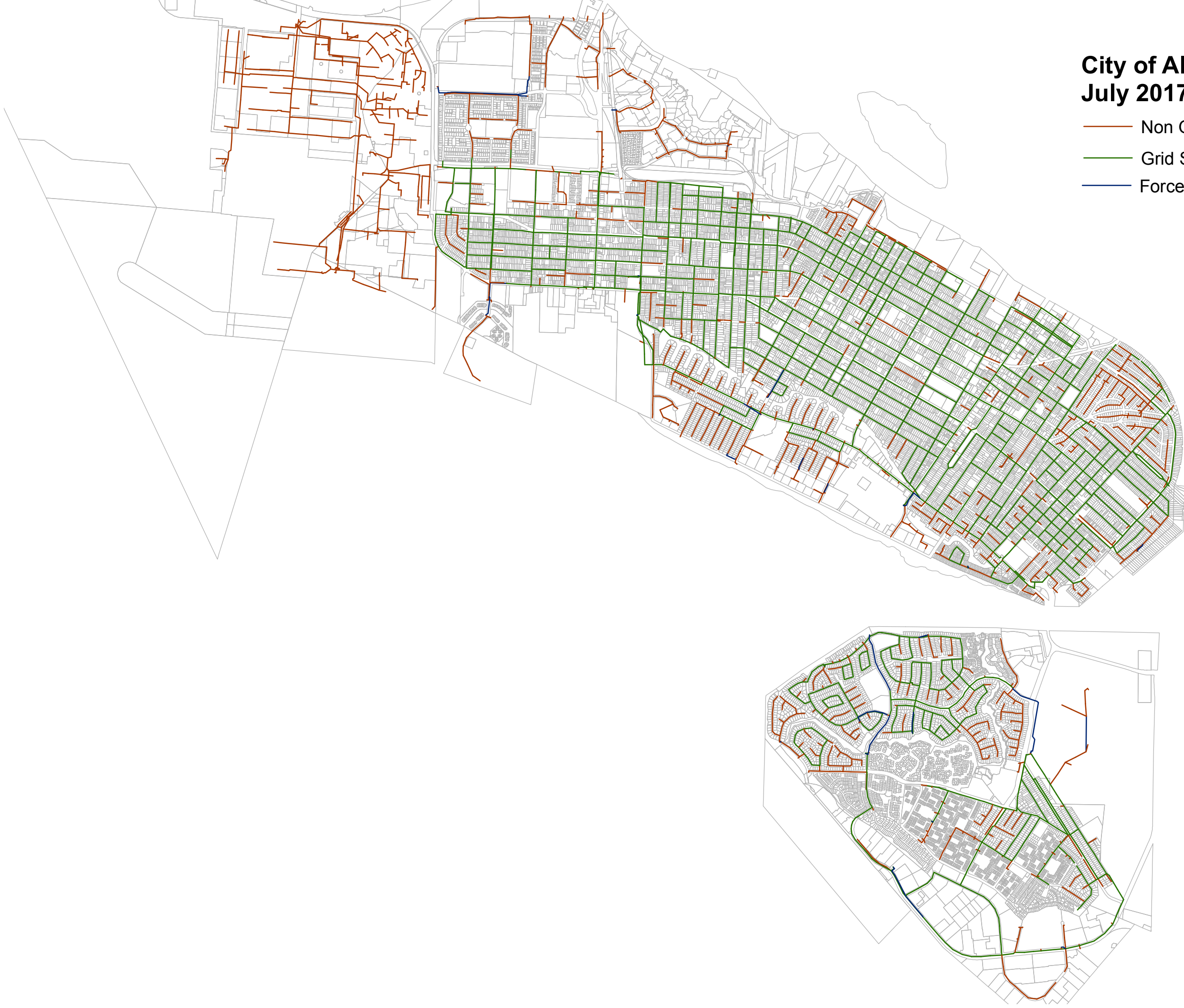
- Sewer Mains in Hot Spot Program (5,997 feet)
- Sewer Mains



Appendix 4-B Map of Grid and Non-Grid Systems

City of Alameda Grid System July 2017

- Non Grid System Main (approx. 56.5 miles)
- Grid System Main (approx. 82.6 miles)
- Force Main



Appendix 4-C Sewer Equipment and Materials Inventory Lists

Sewer Collection System Equipment

Description	Use
Tractor / Backhoe	Sewer Repairs
Tractor / Backhoe (Standby)	Sewer Repairs
Vac-Con Jetter / Vacuum	Sewer Cleaning / Repairs
Vactor Jetter / Vacuum	Sewer and Storm Drain Cleaning
Dump Truck	Sewer Cleaning / Repairs
Dump Truck (Standby)	Sewer Cleaning / Repairs
Flat-Bed Truck F-350	Sewer Cleaning / Repairs
Utility Truck F-450	Sewer Cleaning / Repairs
Utility Truck C-30	Sewer Cleaning / Repairs
Compressor / Jack Hammer	Sewer Repairs
Concrete Saw	Sewer Repairs
Walk Behind Concrete Saw	Sewer Repairs
Trench Shoring Jacks	Sewer Repair
Trench Shoring Jack Pump	Sewer Repair
Vibra Plate	Sewer Repairs (asphalt)
Wakers (2 ea)	Sewer Repairs (compaction)
Emergency Bypass Pump (with level control unit)	Sewer Cleaning / Repairs
Emergency Bypass Pump (with level control unit and transducer)	Sewer Cleaning / Repairs
Emergency Bypass Pump	Sewer Cleaning / Repairs
Emergency Lighting	Sewer Cleaning / Repairs
Gas Generators (4 ea)	Power for tools at Job Site
Sewer Snakes (4 ea)	Sewer Cleaning
CCTV lateral camers (2 ea)	Sewer Cleaning / Repairs
Pipe Locater	Sewer Cleaning / Repairs
Tripod and related equip	Confined Space Entry
Blowers (2 ea)	Confined Space Entry
Gas Detector (4 ea, Certified Annually)	Confined Space Entry
25-ft Pole Camera	Sewer Inspection
CCTV Mainline Camera/Mobile Van	Sewer/Storm Inspections
Standby Generator (2ea)	
Portable Generator (1 ea)	

Sewer Collection System Materials Inventory

Item Description	Quantity
4" PVC Sewer Pipe and Coupling (Hard Coupling and Rubber Coupling)	400' Pipe, 10 hard & 10 rubber couplings
6" PVC sewer Pipe and Coupling (Hard Coupling and Rubber Coupling)	200' Pipe, 10 hard & 10 rubber couplings
8" PVC Sewer Pipe and Coupling (Hard Coupling and Rubber Coupling)	100' Pipe, 5 hard & 5 rubber couplings
4" PVC WYEs (4"X4), 22 degree ells, 45 degree ells	5 of each
6" PVC WYEs (4"X4), 22 degree ells, 45 degree ells	5 of each
8" PVC WYEs (4"X4), 22 degree ells, 45 degree ells	2 of each
Manhole Covers	2 ea
Cleanout boxes and covers	5 ea

Appendix 4-D Pump Station Standardized Equipment List

- Flygt N-Series Submersible and Dry-Pit Submersible Pumps (> 2 HP)
- Barnes Submersible Grinder Pumps (low flow and low head - 2 HP or less)
- Cummins Power Generation (stationary standby emergency generators)
- Eaton Insight motor monitor
- Unitronics Pump Controller with pump vision and motor vision
- MOSCAD (Motorola SCADA)
- PMC, VL2000 Series Submersible Hydrostatic (Pressure) Level Transmitter
- MJK 7030 Float Type Level Switches Floats

Chapter 5 Appendices

None

Chapter 6 Appendices

Appendix 6-A Overflow Emergency Response Plan

Bound Separately

Chapter 7 Appendices

Appendix 7-A EBMUD Regional FOG Program Scope of Services

EAST BAY REGIONAL FATS, OILS AND GREASE (FOG) CONTROL PROGRAM SCOPE OF SERVICES

Background

The wastewater collection system agencies in the East Bay Municipal Utility District (EBMUD)'s wastewater service area are the cities of Alameda, Albany, Berkeley, Emeryville, Oakland, Piedmont, and Stege Sanitary District (agencies). The State Water Resources Control Board Order No. 2006-0003-DWQ statewide requirements include implementation of Fats, Oils, and Grease (FOG) programs unless agencies demonstrate that they do not have FOG related sanitary sewer overflows (SSOs) in their community sewers. The agencies and EBMUD have developed a regional FOG control program, as part of the TAB programs, to reduce FOG related SSOs, and wish to continue working collaboratively on development and implementation of FOG control.

EBMUD has the experience, qualifications, staff and expertise to perform agreed-upon services effectively and efficiently. It is mutually beneficial for EBMUD to provide services to the agencies related to FOG control. Regional implementation of FOG control activities coordinated and supported by EBMUD is an efficient use of resources, including economies of scale and trained staff with a broad knowledge base of the activities that support a regional effort and that provide a systematic approach to managing wastewater discharges from food service establishments (FSEs). It is also mutually beneficial to maintain consistency in development and implementation of FOG control requirements throughout EBMUD's wastewater service area.

Scope of Services

The purpose of this Scope of Services is to continue ongoing FOG control activities to help reduce FOG related SSOs in the agencies' community sewer system. This Scope of Services clarifies the roles and responsibilities of EBMUD and the agencies in this collaborative effort and identifies the tasks to be conducted by each party.

The agencies authorize EBMUD to implement a regional FOG control program as described in this Scope of Services. To facilitate implementation of FOG control activities outlined in the scope of services, agencies will continue to provide EBMUD with the following information:

- a) Completed grease SSO and blockage reporting forms for areas in which the agency wants EBMUD to conduct hotspot investigations;
- b) Electronic and/or hard copies of community sewer maps that include manhole identification numbers and their locations, sewer pipes size, and flow direction.
- c) Residential addresses, including apartment numbers, for hotspot areas in which the agency wishes FOG information to be delivered.

Each agency is responsible for the costs of implementing the FOG control program in its service area as established in Exhibit A: FOG Control Program Budget.

Termination

Any of the Parties may terminate its obligations under this Scope of Services by giving all other parties at least ninety (90) days written notice.

EBMUD's Scope of Services

EBMUD is the technical service provider for the agencies' FOG program requirements. EBMUD also leads inter-agency coordination for the regional FOG control program to maximize consistency and efficiency. EBMUD is responsible for the following activities:

1. FOG HOTSPOT INVESTIGATIONS

(a) EBMUD will initiate an investigation after receiving a completed grease SSO and blockage reporting form from agency. The investigation will:

- 1) Identify the sewer drainage basin contributing to the location of the blockage, SSO, or increased sewer maintenance (FOG hotspot area).
- 2) Determine if the FOG hotspot area is in a residential, commercial, or combined residential/commercial drainage basin.
- 3) Identify commercial FSEs that discharge in the sewer drainage basin.
- 4) If FSEs are identified in the sewer drainage basin, the following field activities may be performed to identify FSEs that caused or contributed to the SSO, blockage, or increased sewer maintenance:
 - Field inspection of the FSEs
 - Dye testing
 - Gravity interceptor inspection
 - Sewer lateral camera inspection
 - Mainline camera inspection
 - Sampling at FSEs

(b) EBMUD will maintain an electronic listing and perform a follow-up inspection to confirm that the required grease control device (GCD) has been installed and is properly maintained. Grease control devices include gravity grease interceptors and additional approved devices, such as automatic grease removal devices. The Parties shall develop a communications program for identifying and updating the GCD listing with EBMUD.

(c) EBMUD may perform follow-up sewer lateral and/or main line camera inspections, upon request by agencies.

2. GRAVITY GREASE INTERCEPTOR INSPECTIONS

(a) EBMUD will perform periodic gravity grease interceptor inspections for FSEs in hotspots as well as for FSEs that are not in hotspots.

3. RESIDENTIAL HOTSPOT RESPONSE

(a) EBMUD will provide targeted outreach in identified residential FOG hotspots, within the limits of the funding provided in this Scope of Services (Exhibit A). Residential outreach information will be distributed based on the residential addresses, including apartment numbers, in identified hot spot areas based on agency's requests.

4. ENFORCEMENT SUPPORT

- (a) EBMUD will send notifications to FSEs based on agency-specific requirements. These notifications may include requirement letters, notices of non-compliance and other follow-up documents.
- (b) EBMUD will support agencies in any enforcement actions and proceedings taken by agencies (e.g. if agency initiates hearing, EBMUD will present findings of hotspot investigation).
- (c) EBMUD shall maintain a list of approved grease haulers and shall continue to provide a disposal facility for grease.

5. REPORTING

- (a) EBMUD will submit to agencies quarterly FOG hotspot investigation summary reports. These reports include:
 - i. A summary of all FOG hotspots that were investigated during the quarter describing the activities performed and the FOG hotspot status at the end of the quarter.
 - ii. The number of inspections performed, FSEs identified to cause or contribute FOG related blockages/SSOs, GCDs confirmed to have been installed, and a summary of residential outreach materials distributed during the quarter.
 - iii. A summary by satellite agency detailing the level of effort for agency during the previous quarter. This report shall also include the full listing of all FOG hot spot investigation reports submitted by all agencies, their current status and those still remaining to be investigated.

6. FOG CONTROL DATABASE

- (a) EBMUD will develop and maintain a FOG control database that includes:
 - i. FOG Hotspots identified by the agencies
 - ii. FSEs identified in each FOG hotspot and grease control device/ gravity grease interceptor information for each FSE in the FOG hotspots
 - iii. FSE, gravity grease interceptor, lateral camera and main line camera inspections performed at FSEs and FOG hotspots
 - iv. Requirement and agency enforcement information for FSEs provided to EBMUD

7. RESIDENTIAL AND COMMERCIAL OUTREACH

EBMUD will maintain commercial and residential outreach and public education program activities, which may include bill inserts, billboards, outreach events, website development, and periodic direct communication with FSEs. These activities are not included in the budget (Exhibit A).

8. COMPENSATION

The agencies will compensate EBMUD for the work conducted under Scope of Services items 1 – 6 of this Scope of Services. Exhibit A details the budget for FY2014.

9. SCOPE OF SERVICES EVALUATION

EBMUD and Satellites agree to reevaluate the Scope of Services contained herein annually not later than February of each year.

Appendix 7-B Example FOG Control Program Quarterly Summary Report

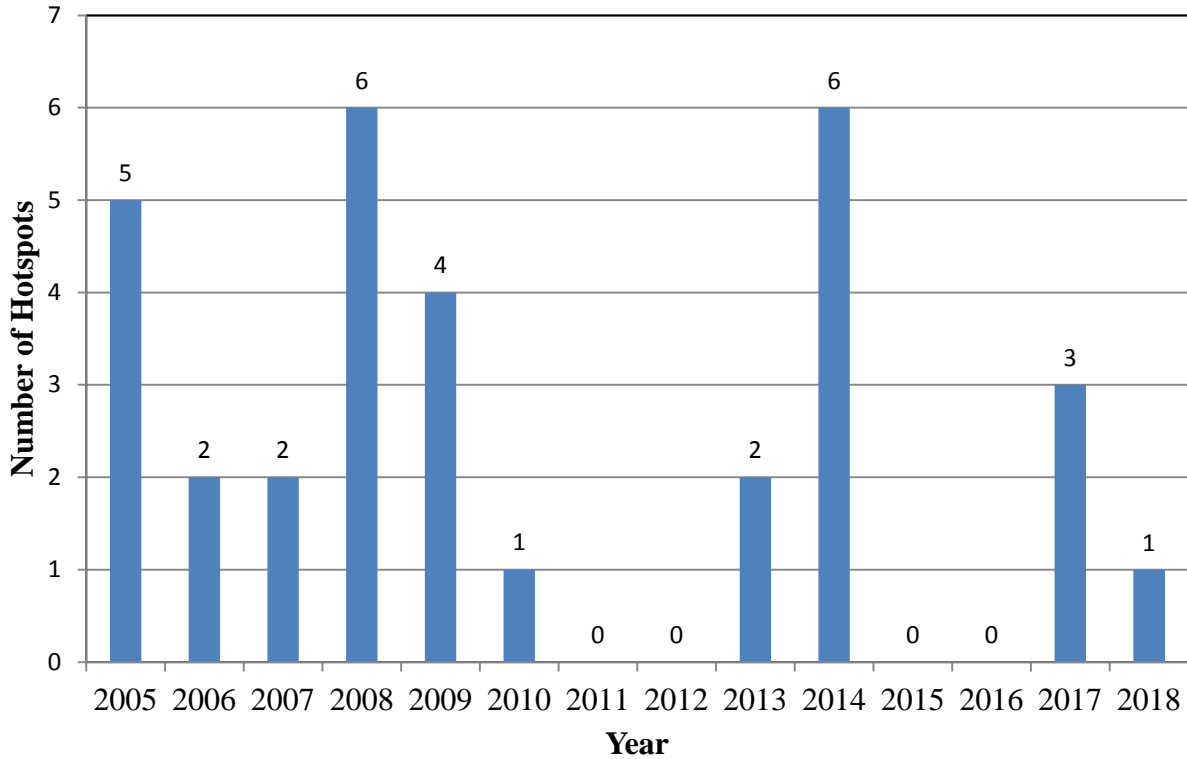
**FORM 3
FOG CONTROL PROGRAM QUARTERLY SUMMARY
QUARTER 1 (JULY – SEPTEMBER 2017)
CITY OF ALAMEDA**

Hotspot Investigation Summary

1 hotspot was reported this quarter. Chart 1 demonstrates hotspot trends by year for the City of Alameda.

Chart 1

**Alameda Hotspot Trends by Year
1 hotspot reported during 1st quarter (July - September 2017)**



Food Service Establishments

At the time of this report, a total of 359 food service establishments are present in the City of Alameda.

Inspection Completed for Current and Previous Quaters

	Quarterly Inspection Totals
This Quarter (July - September 2017)	2
Previous Quarter (April – June 2017)	2

Inspections

Hotspot Number	Facility Name	Facility Address	Inspection Date	Inspection Type
	Why Cook Too	1750 North Loop	07/10/2017	Grease Interceptor Inspection
Ala - 32	Pacific Light House	1051 Pacific Marina	07/24/2017	FSE Inspection

Hot Spot Inspection Summary

- Why Cook Too was inspected on 07/10/2017. During the inspection a service invoice dated 4/27/2017 from Pioneer Liquid Transportation Inc was provided. No issues were identified.
- Alameda, 32, Pacific Light House was inspected on 07/24/2017. Inspection notes show that no issues were identified. The FSE has a 2000 gal grease interceptor which is pumped every 3 months by Sequential according to contact. Last pump out 6/7/17.

Grease Control Devices Summary

1) GCD Installation Requirements:

No update this quarter.

2) GCD Maintenance Requirements:

No update this quarter.

Outreach Summary

Commercial

No update this quarter.

Residential

Letters to Customers:

Hotspot Number	Households Reached
Alameda 33	22

Appendix 7-C EBMUD FOG Brochure

Fats, Oils, and Grease are naturally produced during cooking and baking.

Common sources of FOG include:

- Meat fats
- Lard
- Shortening
- Butter
- Margarine
- Fatty/greasy food scraps
- Baked goods and pastries
- Cream-based sauces
- Cooking oil
- Oily salad dressing

Do Not Put Any of These Items Down the Drain

Call EBMUD's Environmental Services Hotline at 510-287-1651 or visit www.ebmud.com/cleanbay where you can:

- Request a free grease scraper
- Find the closest grease disposal location
- Get additional information



rev. 7/10

Avoid a Clog



Keep Grease Out of Your Drain

EBMUD Pollution Prevention

Helping to Protect the Environment



 EAST BAY MUNICIPAL UTILITY DISTRICT

When **fats, oils and grease (FOG)** are put down your drain they can cause many problems further down the sewer pipe. Liquified grease and fat from animal products will solidify and clog pipes much like a clog in a human artery. Liquid oils can also coat pipes and contribute to blockages. Blockages may cause a sewage backup into your home, resulting in expensive clean up costs and repairs to your sewer pipes, home and belongings. Blockages may also trigger an overflow or backup of sewage into streets or waterways creating a public health risk and threatening the environment.



You Can Help! Please Do Not Dispose of Any Cooking Oils or Grease Down the Drain

By following the guidelines below you may avoid sewer overflows, backups, and costly repairs:

- ✓ Pour all cooled cooking fats, oils and grease that will harden (bacon grease, meat drippings) into a waxed food container such as a milk carton or container with a lid and dispose of it in the garbage or your kitchen scrap recycling.
- ✓ Mix small amounts of liquid grease into your kitchen scrap recycling (where available) or place in a lidded container with an absorbent material such as cat litter, and dispose of in the garbage.
- ✓ Wipe down greasy pots, pans or dishes with a paper towel or newspaper before washing. Dispose of paper in the garbage or your kitchen scrap recycling (where available).
- ✓ Using your EBMUD scraper, scrape greasy food scraps from pots, pans, and dishes into the garbage or kitchen scrap recycling (where available), not a garbage disposal.
- ✓ Do not wash grease down the drain or garbage disposal.
- ✓ For cooking oil (liquid oil/vegetable oil) please see drop-off locations at www.ebmud.com/cleanbay

Appendix 7-D EBMUD Approved Grease Haulers

Name	Phone Number
A-1 Septic Tank Service	(510) 697-8083
A-1 Septic Tank Service	(800) 730-4471
All Valley Environmental, Inc.	(559) 498-8378
Able Septic	(408) 377-9990
Ameriguard Maintenance Services	(800) 347-7876 ext 14
Bay Pumping	(831) 320 5229
Burr Plumbing & Pumping	(408) 287-2877
Evergreen Recycling, Inc.	(650) 952-5000
Magnum Fire Protection	(510) 742-0775
Miller & Gibson (prev Able Septic Tank Service)	(408) 377-9990
Miller & Gibson (prev Able Septic Tank Service)	(408) 398-4990
ModestoTallow/Florin Tallow Co.	(209) 522-7224
ModestoTallow/Florin Tallow Co.	(800) 564-7204
One More Time	(800) 624-5504
Pioneer Liquid Transport	(800) 804-7327
Sacramento Rendering Co.	(800) 339-6493
Salinas Tallow	(800) 621-9000
San Jose Tallow	(408) 452-8777

Appendix 7-E Grease SSO and Blockage Reporting Form



**FORM 1
GREASE SSO AND BLOCKAGE REPORTING FORM**

EVENT NUMBER: _____ (EBMUD use)

COLLECTION SYSTEM INFORMATION

Date of Incident: _____ Date of Report: _____

Blockage SSO Increased Maintenance

Contact Info

Agency Name: _____ Agency Contact: _____

Agency Contact Phone Number: _____

Site Info

Name: _____

Reporting Address: _____ Nearest Cross Street: _____

Hotspot Address (if different): _____

City: _____ Zip Code: _____

Upstream Structure Reference: _____ Downstream Structure Reference: _____

1. Does this location have a history of grease blockages? Yes No
If yes,

2. Date of last incident? _____

3. Is it a known residential only area? Yes No

If yes, is it mostly multi-family or single family? Multi-family Single Family Both

Additional info attached: Line History Work report CCTV footage Other _____

City Main Line Privately owned service lateral Lower lateral (agency responsibility)

Additional info available: _____

Send notifications to:

EBMUD	EBMUD Contact Name: Nadia Borisova
P.O. 24055, MS 702	Phone number: (510) 287-1065
Oakland, CA 94607-4240	Fax number: (510) 287-0621
	e-mail: nborisov@ebmud.com

EBMUD RESPONSE INFORMATION

Date received by EBMUD: _____ Received by: _____

Initial Review Response: Investigation Field Inspection

Response Details

(Please attach additional detail sheets, if necessary)

Report submitted by: _____ Date: _____

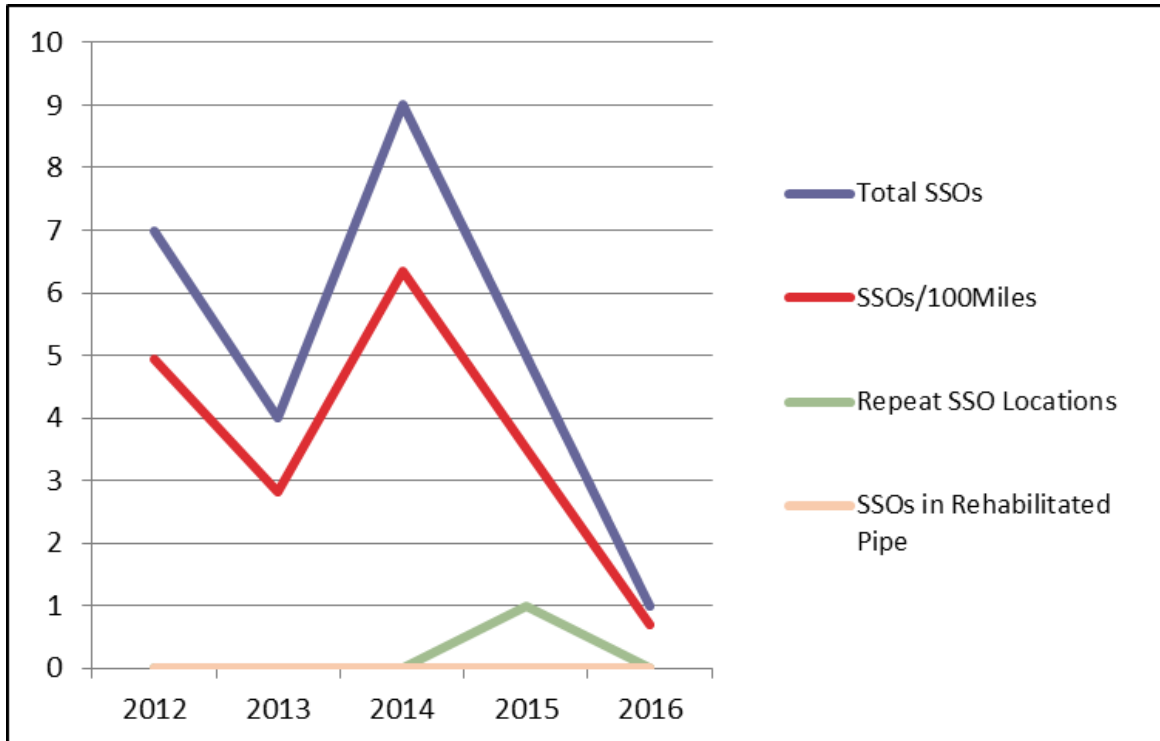
Chapter 8 Appendices

None

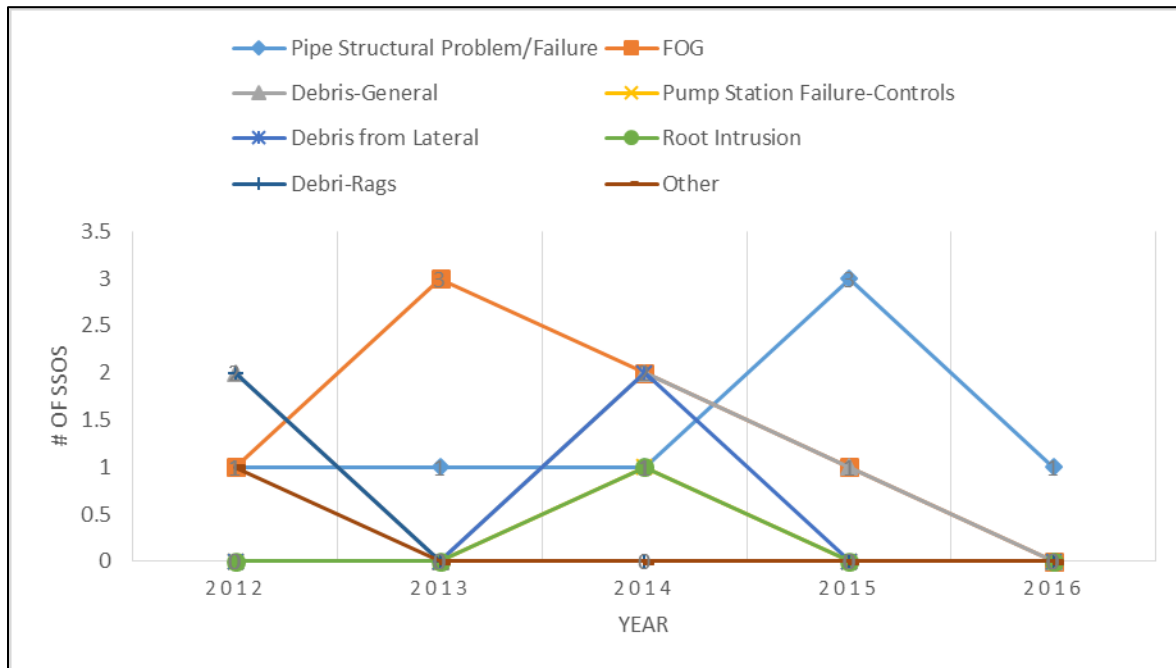
Chapter 9 Appendices

Appendix 9-A Performance Metrics

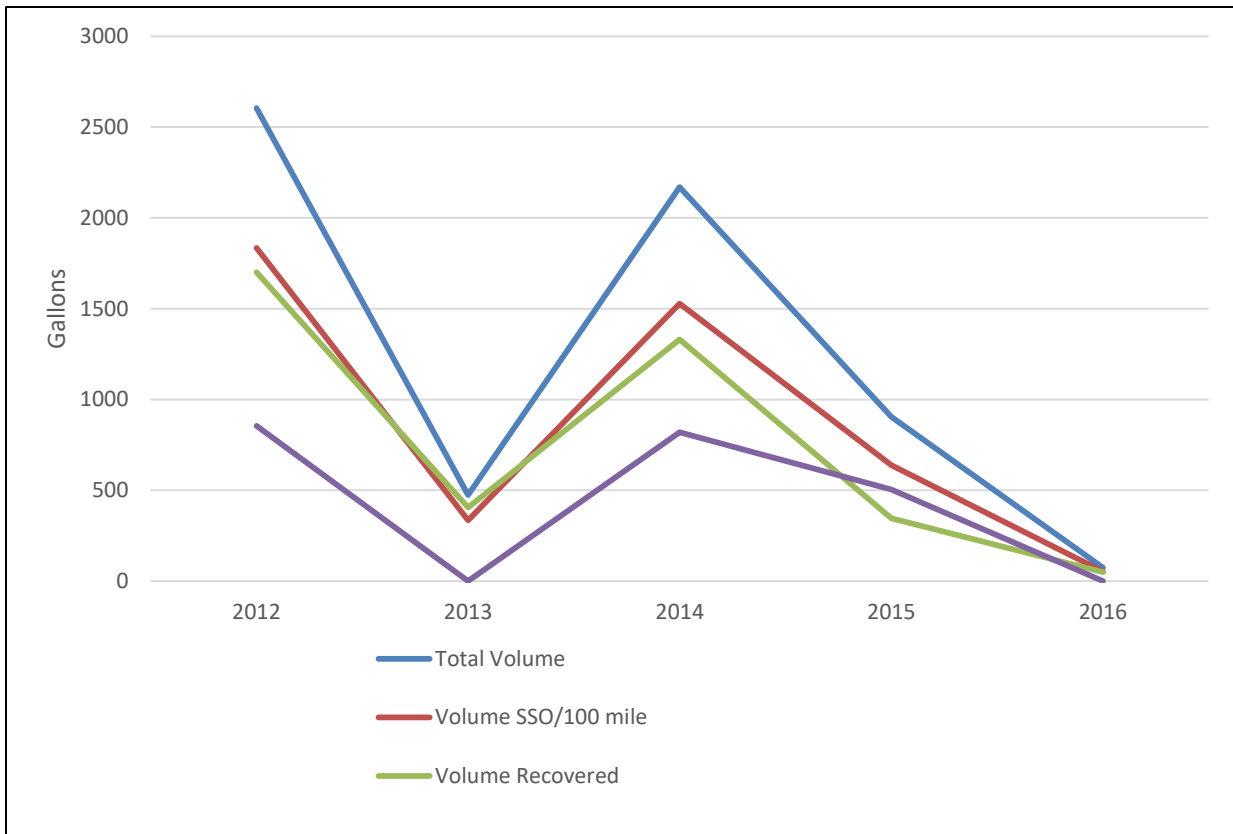
Measures Based on Sanitary Sewer Overflow Number



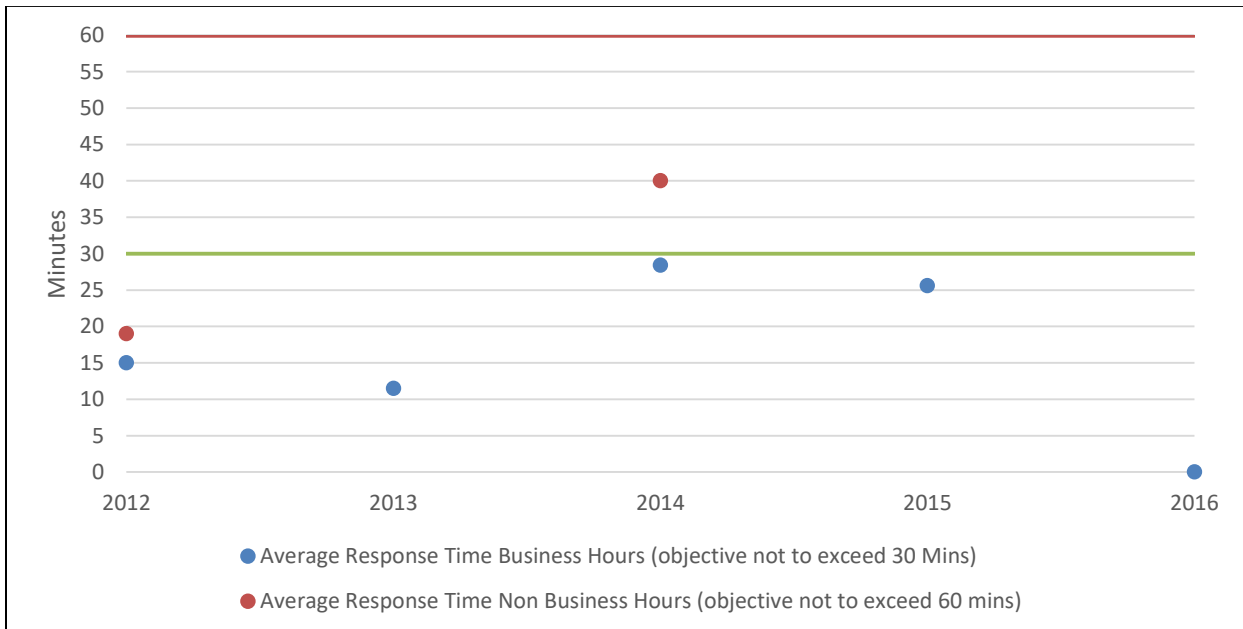
Sanitary Sewer Overflows by Cause



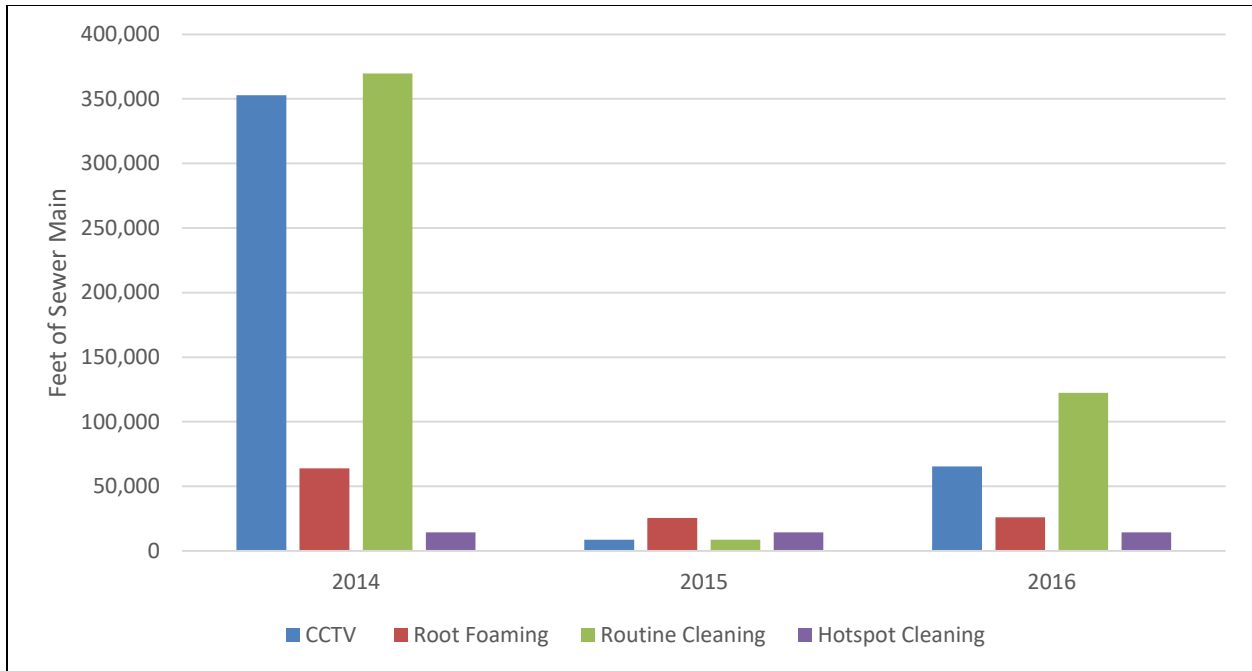
Measures Based on Sanitary Sewer Overflow Volume



Sanitary Sewer Overflow Response Time



Maintenance



Data for 2012 and 2013 was not captured in a maintenance management system and is therefore not readily retrievable. In 2014, the City cleaned and filmed a significant amount of sewer main to get caught up and to have condition data available for the development of Sewer Mast Plan. Commencing in late 2017, early 2018, maintenance activities will begin to be performed by City staff and will therefore start to show more consistency in annual rates.

Rehabilitation

Appendix 9-B SSMP Change Log

SSMP Element	Description of Change or Update	Authorized by	Date
Introduction	<ul style="list-style-type: none"> Removed WDR language and added link to the Water Board website. Added City's WDID and reference to the City's NPDES permit. Updated and added system statistic summary tables. 	Erin Smith	12/4/17
2-Organization	<ul style="list-style-type: none"> Updated Organization Lines of Authority to reflect current staffing and reporting structures. Updated City staff contact information Updated Chain of Communications for Reporting SSOs to reflect current practices Updated Appendix- Key Staff Contacts with current staff information 	Erin Smith	12/4/17 4/5/21

SSMP Element	Description of Change or Update	Authorized by	Date
3-Legal Authority	<ul style="list-style-type: none"> • Included website links for referenced legal authorities. • Updated Summary of City of Alameda's Legal Authorities, as applicable. 	Erin Smith	12/4/17
4-Operations and Maintenance Program	<ul style="list-style-type: none"> • Updated sewer mapping section to reflect current practices and systems. • Updated cleaning, filming, root control and pump station activities to reflect the City's use of Lucity. • Added section on force main inspection • Added current description of main rehabilitation and pump station renovation activities and included a new summary tables. • Added additional information on staff training program 	Erin Smith	12/4/17
5- Design and Performance Provisions	<ul style="list-style-type: none"> • Added recent development and adoption of the Regional Standards for Sanitary Sewer System Installation, Rehabilitation and Repair, June 20, 2016 • Added City's participation in a Regional Private Sewer Lateral Program, implemented by EBMUD. 	Erin Smith	12/4/17
6-Overflow Emergency Response Plan	<ul style="list-style-type: none"> • Updated summary table to reflect the July 2017 OERP. • Updated Contact List 	Erin Smith	12/4/17 4/5/21
7-FOG Control	<ul style="list-style-type: none"> • Updated legal authorities to reflect current practice with EBMUD and to include a statement of the City's intent to update its FOG control ordinance 	Erin Smith	12/4/17
8-System Evaluation and Capacity	<ul style="list-style-type: none"> • Section updated to include information from the City's Sewer Master Plan and 2015 update to its hydraulic model and capacity assessment. • Include reference to Alameda Point's hydraulic model • Include mention of the City's participation in the Regional Technical Support Program, as required by the Consent Decree. 	Erin Smith	12/4/17
9-Monitoring, Measurement and Program Modifications	<ul style="list-style-type: none"> • Updated list of Performance Measures to reflect those that can be tracked and are useful in regards to assessing performing and optimizing operations. • Included list of information annually reported to EPA and the Water Board through the City' Consent Decree annual report. 	Erin Smith	12/4/17
11- Communications	<ul style="list-style-type: none"> • Included list of sewer related documents now available to the public on the City's website. 	Erin Smith	12/4/17

Chapter 10 Appendices

Appendix 10-A SSMP Audit Reports

**City of Alameda
Biennial Sewer System Management Plan Audit Report**

Date: June 5, 2014

Audit Team:

- Bob Haun, Public Works Director
- Jesse Barajas, Public Works Maintenance Superintendent
- Max Arbios, Public Works Supervisor
- Flavio Barrantes, Construction Inspection Supervisor
- Shilpa Patel, Assistant Engineer
- Gisa Ju & Nishant Parulekar, RMC Water & Environment (consultants)

The purpose of the Sewer System Management Plan (SSMP) Audit is to evaluate the effectiveness of the City of Alameda's SSMP and to identify whether updates are needed. This document was designed to meet the requirements of State Water Resources Control Board Order No. 2006-0003-DWQ as revised by Order No. WQ 2013-0058-EXEC. Documentation of SSMP audits are kept on file at the City of Alameda Public Works Department, and an indication is made in the California Integrated Water Quality System (CIWQS) database that the audit was completed.

Directions: Please indicate **YES** or **NO** for each question. To answer the following questions, refer to the text of the SSMP Element, any referenced material in the text, all corresponding attachments, and any data collected to assist in assessing SSMP effectiveness. For any **NO** responses describe the updates or changes needed and the timeline to completion in "Description of Scheduled Updates/Changes to the SSMP" on the last page of this form.

ELEMENT 1. GOALS

1. Are the goals stated in the SSMP still appropriate and accurate? **YES / NO**

ELEMENT 2. ORGANIZATION

2. Is the SSMP up-to-date with organization and staffing contact information? **YES / NO**

Section needs to be updated with more description of the roles and responsibilities of each position for SSMP implementation. Chain of communication and contact information for notification and reporting SSOs needs to be updated.

ELEMENT 3. LEGAL AUTHORITY

3. Does the SSMP reference up-to-date information about legal authority? **YES / NO**

Section needs to be updated to incorporate revised sewer lateral testing provisions adopted by Ordinance No. 3048 in June 2012.

4. Does the City have sufficient legal authority to control sewer use and maintenance? **YES / NO**

ELEMENT 4. OPERATIONS AND MAINTENANCE PROGRAM**4.a Map of the Sanitary Sewer System**

5. Does the SSMP reference up-to-date information about maps? **YES / NO**

Section needs to be updated to discuss latest GIS mapping

6. Are collection system maps complete, up-to-date, and sufficiently detailed? **YES / NO**

However, City needs to develop a formalized process to continue to keep the maps up-to-date and develop a consolidated set of maps that can be used by both field crews and for computerized applications requiring GIS mapping.

4.b Preventative Maintenance Program

7. Does the SSMP contain up-to-date information about preventive operations and maintenance activities? **YES / NO**

8. Are the City's preventive maintenance activities sufficient and effective in reducing and preventing SSOs and blockages? **YES / NO**

Since 2010, the City's has averaged 5.5 SSOs per year, or 3.8 per 100 miles.

4.c Rehabilitation and Replacement Plan

9. Does the SSMP contain up-to-date information about the rehabilitation and replacement program? **YES / NO**

10. Does the SSMP contain up-to-date information about Closed Circuit Television (CCTV) inspections? **YES / NO**

11. Are scheduled inspections and the condition assessment system effective in identifying, prioritizing, and addressing deficiencies? **YES / NO**

12. Does the Capital Improvement Plan (CIP) address prioritized projects for collection system assets? **YES / NO**

4.d Training

13. Does the SSMP contain up-to-date information about existing training programs? **YES / NO**

14. Do supervisors believe their staff are sufficiently trained? **YES / NO**

Staff need training in the new monitoring and reporting requirements, and annual refresher training in overflow response procedures.

15. Are staff satisfied with the training opportunities and support offered to them? **YES / NO**

4.e Equipment and Replacement Part Inventories

16. Does the SSMP reference up-to-date information about equipment and replacement part inventories? **YES / NO**

ELEMENT 5. DESIGN AND PERFORMANCE PROVISIONS

17. Does the SSMP contain up-to-date information about design and construction standards? **YES / NO**

ELEMENT 6. SSO & BACKUP RESPONSE PLAN

18. Does the SSMP contain an up-to-date version of SSO Response Plan? **YES / NO**
OERP needs to be updated to reflect the new monitoring and reporting program requirements.

19. Is the Response Plan effective in handling SSOs? (if **YES**, indicate specific information under the “Evaluation of the Effectiveness of the SSMP” section below) **YES / NO**

ELEMENT 7. FATS, OILS, AND GREASE (FOG) CONTROL PROGRAM

20. Does the SSMP reference or contain up-to-date information about the City’s FOG control program? **YES / NO**

21. Is the current FOG program effective in documenting and controlling FOG sources? **YES / NO**

City is averaging only about one FOG-related SSO per year.

22. Are all public outreach materials for the FOG program current? **YES / NO**

ELEMENT 8. SYSTEM EVALUATION AND CAPACITY ASSURANCE PLAN

23. Does the SSMP reference or contain up-to-date information about the City’s capacity assessment activities and documentation? **YES / NO**

Section needs to be updated to document the 2010 Sewer System Hydraulic Model Analysis and results.

24. Is the City sufficiently addressing hydraulic deficiencies? **YES / NO**

The Hydraulic Analysis indicated very few capacity deficiencies in the gravity sewer system. The City is upgrading pump stations to address pump station capacity deficiencies.

ELEMENT 9. MONITORING, MEASUREMENT, AND PROGRAM MODIFICATIONS

25. Does the SSMP reference up-to-date information about the City’s data collection and organization (e.g. use of CMMS, performance indicators, etc.)? **YES / NO**

The SSMP should indicate specific performance measures that can be used to quantitatively evaluate the City’s SSMP and SSO performance.

26. Is the City’s data collection and organization sufficient to evaluate the effectiveness of the SSMP? **YES / NO**

ELEMENT 10. SSMP PROGRAM AUDITS

27. Will this SSMP Audit be completed by every two years starting in 2014? **YES / NO**

ELEMENT 11. COMMUNICATION PROGRAM

28. Is the City's website up-to-date, including information related to providing an opportunity for public input on the SSMP? **YES / NO**
Website needs to updated to include information about the SSMP and a copy of the latest version of the document.

Evaluation of the Effectiveness of the SSMP

The City's sewer system programs as embodied in the SSMP have been effective in maintaining a low level of SSOs. Since 2010, the number of SSOs has averaged 5.5 per year, or 3.8 per 100 miles, which is below average for San Francisco Bay Area agencies; and percent of SSO volume recovered has averaged 86% over that period, with only 10% of volume discharged to surface water.

The City has effective programs in place for controlling FOG (through participation in EBMUD's Regional FOG Control Program), and has targeted sewer mains in easements and sidewalks (which are most prone to root intrusion from laterals) for chemical root control. The City's CCTV inspection and rehabilitation program over the past five years have targeted sewers with recurring maintenance problems, potential structural deficiencies (based on age and pavement condition), higher than average I/I rates, and proximity to water bodies. The City is on track to rehabilitate or replace an average of 2.6 miles of sewers per year, which is an annual rate of approximately 2% of the system (not including Alameda Point, where sewers will be replaced as the redevelopment occurs).

The City is making greater use of GIS and computerized data management systems (e.g., Granite XP for capturing cleaning and CCTV data) in order to monitor performance and provide effective information to prioritize maintenance and rehabilitation activities.

The City has also conducted smoke testing to identify sources of direct inflow to the sewer system, and is strengthening its private sewer lateral compliance program to continue to address I/I and minimize potential private sewer lateral blockages and overflows.

Over the past three years, the City has been implementing a major pump station upgrade program to improve pump station reliability; and has standardized its pump station equipment to allow for more efficient and reliable equipment operations, faster repair time on incidents that could result in SSOs, and reduction in training requirements.

Description of Scheduled Updates/Changes to the SSMP

See comments under each SSMP element for description of needed changes and updates to the SSMP. The SSMP is scheduled to be updated in June 2014 and brought to City Council for adoption in July 2014 or at the time the Consent Decree is lodged. The 2014 SSMP will be a major revision to the previous document, will be re-organized in numbered sections

corresponding to the SSMP elements, and will include additional detail, as well as an introduction that lists the WDR prohibitions and provisions and provides an overview and historical perspective of the City of Alameda sewer system. The SSMP will incorporate programs that are required under the City's current Stipulated Order and anticipated Consent Decree with the U.S. EPA and State and Regional Water Boards.

**City of Alameda CA
Sanitary Sewer Management Plan
Audit and Gap Analysis
Prepared by Causey Consulting
January 31, 2017**

<u>SSMP Regulatory Requirements from WDR and MRP</u> <u>WDR Section D13 and 2013 MRP Revisions</u>	<u>Compliance Status</u> <u>Compliant/Partially Compliant/Non-Compliant</u>	<u>Comments/Recommendations</u>
Title Page	<u>N/A</u>	Recommend that the original adoption date and resolution number, WDID, NPDES Permit Number and date that the document is readopted be added to this page of the SSMP.
Introduction/Executive Summary	Compliant	Update to current; suggest removing WDR and MRP and simply hyperlink to SSO Office; add WDID description and City number for use by reader; add references to the NPDES permit for the collection system; add document available on City website; revise 11. for new MRP requirements; add three tables with pipeline information for gravity sewers by age, material and pipe diameter plus table for pump stations and force mains; add history of regulatory inspections; add additional information on customer classifications; add table of City, extraterritorial and federal government assets (see sample); discuss more thoroughly lateral responsibilities including reporting responsibilities for lower and upper lateral overflow reporting; add BayKeeper & Our Children's Earth to the list of groups involved in the negotiations with EPA et al.
Section 1 - Goals		
The goal of the Sewer System Management Plan (SSMP) is to provide a plan and schedule to properly manage, operate, and maintain all parts of the sanitary sewer system. This will help reduce and prevent SSOs, as well as mitigate any SSOs that do occur.	Compliant	These goals should again be reviewed based upon operational and effectiveness results to date?
Section 2 - Organization		
a. The name of the responsible or authorized representative as described in Section J of this Order.	Partially Compliant	Table 2-1 and Figure 2-1 must identify all City employee classifications and service contractors working in the narratives and the org chart as required in the WDR and MRP. Table 2-1 add all LROs and data submitter designations in this table; Table 2-2 add contact information for all responsible positions and also add the responsibilities for Introduction and SSMP Change Log to this table; also suggest that two additional appendices be included for Audit Reports and Council Adoption Documents of SSMP.
b. The names and telephone numbers for management, administrative, and maintenance positions responsible for implementing specific measures in the SSMP program. The SSMP must identify lines of authority through an organization chart or similar document with a narrative explanation; and	Partially Compliant	See 2a above.
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)).	Partially Compliant	Specific classifications not listed in Figure 2-2 as required; add actual notifications by SSO category to the flow chart; add documentation requirements for dispatch and administration staff as well as use of script for caller information; add See Click Fix to the flow chart; internal forms box needs to be revised for separate functional areas of the chain of communications and where the documentation is to be filed.
Section 3 - Legal Authority		No reference to the legal responsibilities under the NPDES and Consent Decree those be at least be referenced at the end of the table.
a. Prevent illicit discharges into its sanitary sewer system (examples may include I/I, stormwater, chemical dumping, unauthorized debris and cut roots, etc.);	Compliant	None
b. Require that sewers and connections be properly designed and constructed;	Compliant	None
c. Ensure access for maintenance, inspection, or repairs for portions of the lateral owned or maintained by the Public Agency;	Non-compliant	Appears that references to City responsibility and policies are contained in Chapter 18.5.2 and 18.5.3 not 18.6; Access requirements needs to be added to the AMC or find sections of the code currently providing authority for access - N/A not appropriate
d. Limit the discharge of fats, oils, and grease and other debris that may cause blockages, and enforce any violation of its sewer ordinances.	Partially Compliant	Must add references to the City Uniform Plumbing Code Chapter XIII not simply EBMUD ordinance as they are not responsible for enforcement of FSE violations..
e. Enforce violations of its sewer ordinances.	Partially Compliant	Appears other sections of the AMC provide additional enforcement authority like 1.5 and should be added to the table.
Section 4 - Operations and Maintenance Program		

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	<u>Compliant/Partially Compliant/Non-Compliant</u>	
a) 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 stormwater conveyance facilities;	Compliant	Requires updating to current for Alameda Point and description of formalized process for map updating along with proper documentation especially in light of the extensive replacement not occurring from the consent decree. Recommend discussing status of maps available in the field for cleaning and emergency response.
b) 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 Preventive Maintenance (PM) program should have a system to document scheduled and conducted activities, such as work orders;	Partially Compliant	This section needs to be completely rewritten to conform to actual practices. Add tables for historical performance results for hot spots, regular cleaning, CCTV results and other performance metrics included in Chapter 9; discuss condition based CCTV and include a table of return frequencies based upon previous condition assessment; how are large diameter pipelines cleaned? by contractor?; Section 4.3.2 does not discuss the maintenance and assessment of force mains and the City has a large inventory of these facilities; discuss future plans for general cleaning and condition assessment of pipelines in the City - what is the future policy and procedure as no general maintenance is now being done. Should City staff be responsible for these operations and maintenance in the future eliminating most construction work currently conducted? See Operations Review Report for further information; revise the City lateral policy for maintenance and replacement as well as SSO reporting as public laterals; consider development of a customer satisfaction survey procedure following all collection system customer complaints; see additional considerations in the Operations Review.
c) 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- and long-term plans plus a schedule for developing the funds needed for the capital improvement plan;	Partially Compliant	Section 4.4 requires updating to current and describing in more detail what has been accomplished recently. Should include a table of CIP projects for the short and long term improvements along with funding for these improvements in the CIP table - this table would also include any capacity related improvements from Chapter 8.
d) Provide training on a regular basis for staff in sanitary sewer system operations and maintenance, and require contractors to be appropriately trained;	None Compliant	Section requires updating for status of revisions to project contract language; Section should specifically identify training on the WDR, MRP, SSMP, OERP, WQMP for new employees and refresher training for all employees involved in collections and emergency response - regulators are looking specifically for this language. Training should also include discussion of field exercises on volume control and evaluation of SSO start times - big issue for compliance; consider development of a training matrix by position classification for both new employee and refresher training. Staff has indicated that training time does not appear to be available given other priorities for the department - confined space entry and other OSHA required training must be conducted regularly and proper documentation must be completed for actual events in the field; consider development of a comprehensive training matrix for all City classifications involved in the operation, maintenance and emergency response activities; train the PD to provide documentation and typical script responses from caller complaints; assure proper documentation for all training activities; provide additional Lucity software training for those who interact with the system; assure that annual confined space entry training as required by OSHA is conducted and documented along with proper documentation of entry activities; consider use of equipment and product supplier training for specialized equipment and products used in the collection system.
e) Provide equipment and replacement part inventories, including identification of critical replacement parts.	Compliant	Add position responsible for updating the equipment and parts inventory
Section 4.7 Outreach program	Not required	Does this really belong in Section on training? If it remains update for inclusion in the EBMUD PSL Program. Delete as independent section, as it is not required.
Section 5 - Design and Construction Standards		
a) Design and construction standards and specifications for the installation of new sanitary sewer systems, lift stations and other appurtenances; and for the rehabilitation and repair of existing sanitary sewer systems; and	Compliant	Consider hyperlinking the design standards.
b) Procedures and standards for inspecting and testing the installation of new sewers, pumps, and other appurtenances and for rehabilitation and repair projects.	Compliant	Add City Building Inspector to the Organization Chart in Chapter 2 and a narrative description in Table 2-1.
Causey Consulting Confidential		
Final SSMP AUDIT REPORT		12/4/2017

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<u>WDR Section D13 and 2013 MRP Revisions</u>	<u>Compliant/Partially Compliant/Non-Compliant</u>	
Section 6 - Overflow Emergency Response Plan		All reporting forms require updating for recent changes and the addition of OES and basic information that is not currently on the forms.
a) Proper notification procedures so that the primary responders and regulatory agencies are informed of all SSOs in a timely manner;	Partially Compliant	Revise full document to remove references to Comcate which is no longer used. Service request form not used, needs to be added and updated for more information and for use by Police Department also. Figure 2-1 needs to be updated and to use consistent names and classification descriptions in the flow chart. Add box for the call to either the services center or the police department - add phone numbers. How are after hours directed to the PD by voicemail on the City phone system? How does the auto dialer know to call the pager? Need to expand narrative to explain and include the on call staff listing and what happens if no response - call contractor?
b) A program to ensure an appropriate response to all overflows;	Compliant	Add requirement for first responder to take photos or video and to create a timeline of the event from arrival to end of event. Section 3.5 assumes done by a single person or does the call out involve a full crew? Especially after hours? Is the responder required to capture the blockage materials when clearing the problem? If so need to add statements about insertion of traps etc. Clarification of lateral and private sewer responsibilities and response should be initiated and trained on with field staff.
c) Procedures to ensure prompt notification to appropriate regulatory agencies and other	Compliant	See separate spreadsheet for comments on the OERP.
d) Procedures to ensure that appropriate staff and contractor personnel are aware of and follow the Emergency Response Plan and are appropriately trained;	Partially Compliant	See separate spreadsheet for comments on the OERP. Need more defined employee training program for new employees and annual refresher training.
e) Procedures to address emergency operations, such as traffic and crowd control and other necessary response activities; and	Compliant	See separate spreadsheet for comments on the OERP.
f) A program to ensure that all reasonable steps are taken to contain and prevent the	Compliant	See separate spreadsheet for comments on the OERP.
g) Water Quality Monitoring Program Plan	Partially Compliant	Section 3.6 needs to add information on the agency specific WQMP which is included in the appendix I - also appears that more sampling is being stated than is necessary - this should be reviewed. Is there a list of the properly trained Sewer Shop Team Member - implies that other than sewer shop personnel can be a first responder - is this true? No statement about monitoring must start within 48 hours of the event. OERP states in Section 3.6 that EBRPD is responsible for testing overflows to Crown Beach yet there are no procedures in place to deal with this possible event - staff indicates that no discussions have been held with EBRPD and they are not sure what would happen in an event - this issue must be addressed in advance and proper procedures and responsibilities agreed to if this is not to be an Alameda function.
h) Technical Report for SSOs > 50,000 gallons	Non Compliant	Not included in the OERP narrative but very briefly included in Appendix I; Suggest that the Technical Report outline from the MRP replace the current language in Appendix I and added to the front end narrative.
Section 7 - Fats, Oils and Grease Program		This Chapter should be updated with current FSE information. Update Appendix 7B. Add historical information on enforcement activities conducted. Section 7.2 and Appendix 7B need to be confirmed as to number of FSEs - 28 vs. 278?
a) An implementation plan and schedule for a public education outreach program that promotes proper disposal of FOG;	Compliant	Needs to include the hyperlink or web address for the EBMUD FOG information and program. Are materials related to FOG available at public counters in the City ?
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;	Compliant	Is Appendix 7D current? Should be updated.
c) The legal authority to prohibit discharges to the system and identify measures to prevent SSOs and blockages caused by FOG;	Partially Compliant	Narrative needs expansion to further describe how City enforces on FOG - historical information? See 3d above.
d) Requirements to install grease removal devices (such as traps or interceptors), design standards for the removal devices, maintenance requirements, BMP requirements, record keeping and reporting requirements;	Non compliant	No information provided on this subject - is the City Building Department responsible for evaluating need for FOG devices? How is this requirement handled by the City?
e) Authority to inspect grease producing facilities, enforcement authorities, and whether the Enrollee has sufficient staff to inspect and enforce the FOG ordinance;	Partially Compliant	The City should have provisions in its AMC that deals with this and then refer to the agreement with EBMUD for this service - add this to Table 3-1.

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	<u>Compliant/Partially Compliant/Non-Compliant</u>	
f) An identification of sanitary sewer system sections subject to FOG blockages and establishment of a cleaning maintenance schedule for each section; and	Partially Compliant	Section 7.6 should discuss and reference Chapter 4 and the Appendix 4-A Hot Spot Cleaning Program Map which appears to be compliant with the requirements.
g) Development and implementation of source control measures for all sources of FOG discharged to the sanitary sewer system for each section identified in (f) above.	Non Compliant	Nothing provided to address this requirement - suggest expanding Section 7.6 to address this deficiency.
Section 8 - Capacity Assurance		
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;	Compliant	Section 8.2 requires updating and reference to the new sewer master plan.
b. Design Criteria: Where design criteria do not exist or are deficient, undertake the evaluation identified in (a) above to establish appropriate design criteria	Compliant	None.
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 CIP shall include an implementation schedule and shall identify sources of funding.	Compliant	Update Section 8.3 for pump station rehabilitation since the SSMP was prepared. Should this section discuss the consent decree requirements related to I/I and capacity as no references now exist? The RTSP is referenced and should be discussed further as part of this section.
d. Schedule: The Enrollee 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 Sewer System Management Plan (SSMP) review and update requirements as described in Section D. 14.	Non Compliant	A separate schedule for the pump station and pipeline capacity improvements outlined in the Prioritization Plan needs to be included for the next 5 to 10 years along with the funding of these improvements. Adding an appendix to either Chapter 4 or Chapter 8 with the annual Capital Improvements in Appendix?
Section 9 - Monitoring, Measurement and Modification		
a. Maintain relevant information that can be used to establish and prioritize appropriate Sewer System Management Plan (SSMP) activities;	Non Compliant	While Table 8-1 provides numerous performance metrics, it does not appear that these are being appropriately tracked. In addition, suggesting that some metrics are only available in CIWQS like response times does not provide for an average available for effectiveness evaluation. We recommend that the current list be reduced to a set on management metrics that can be included in tables and graphs to be able to quickly understand progress of the program - these tables and graphs should be maintained by the Maintenance Department and they should consider posting this information for the the staff and submitted annually to the City Council so they understand the sanitary sewer program effectiveness. Many agency provide this information in a two or three page annual report that is brief and easily read and understood by the public, regulators and elected officials.
b. Monitor the implementation and, where appropriate, measure the effectiveness of each element of the SSMP;	Non Compliant	It does not appear that the performance metrics are used or developed, and therefore no evaluation of program implementation and effectiveness is available or provided in any of the documents provided by the City for this evaluation. Information is included in the Consent Decree Annual Reports, but not in the form or with the historical view stated in Table 9-1. Remove references to the Comcate system as it is no longer utilized by the City. SSMP states in Section 9.2 that the performance indicators are documented in the Annual Budget and Forecast - we were not able to locate these indicators in the budget.

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<u>WDR Section D13 and 2013 MRP Revisions</u>	<u>Compliant/Partially Compliant/Non-Compliant</u>	
c. Assess the success of the preventive maintenance program;	Non Compliant	Only one audit report has been produced and all changes required were included in the readopted August 2014 SSMP revision. Audit Reports must be completed and appended to the SSMP every two years from the original adoption date by the City Council - readoption by City Council required every five years from original adoption date or when substantial changes are made in the SSMP.
d. Update program elements, as appropriate, based on monitoring or performance evaluations; and	Non Compliant	While the SSMP was readopted in 2014, it is not possible to tell what changes to the program elements were made as the City has not to this current date updated the SSMP Change Log as required by Section M the MRP Section. The 2014 Audit report did provide a level of changes and modifications that were required; however, the actual changes to the SSMP were not included in the SSMP Change Log as required following the September 2013 MRP requirement.
e. Identify and illustrate SSO trends, including: frequency, location, and volume.	Non Compliant	No tables or graphs of performance results are available or included in the Consent Decree Annual Reports. Create performance result graphs and charts in a separate appendix to the SSMP that is updated annually and used to inform effectiveness with time - compare SSO performance results to State and regional results for SSOs and volumes. Consider making these graphs and charts available for the future performance evaluation by the field staff.
Section 10 - Audit		
As part of the Sewer System Management Plan (SSMP), the Enrollee 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 Enrollee's compliance with the SSMP requirements identified in this subsection (D.13), including identification of any deficiencies in the SSMP and steps to correct them.	Partially Compliant	Only audit provided was from 6/5/2014 - SSMP states that an Audit report was completed in March 2012 but was not provided nor included in the appendix 10-A. 2014 Audit Report is not signed or certified by anyone at the City as required by the WDR and MRP. The 2014 Audit Report did provide an evaluation of effectiveness of the implementation of the program.
Section 11 - Communications		
The Enrollee shall communicate on a regular basis with the public on the development, implementation, and performance of its Sewer System Management Plan (SSMP). The communication system shall provide the public the opportunity to provide input to the Enrollee as the program is developed and implemented.	Compliant	Private Sewer Lateral Webpage included in Community Development - no reference link from sewer webpage. City should consider the development of an annual sewer report to the City Council at the end of the fiscal year comparing performance results and financial information as well as interesting collection information like FOG issues, capital plans, comparison of SSO rates to state and region, etc - this should be limited to 2 or 3 pages only. In Section 11.2, add the City WDID number and a link to the CIWQS website for the public and elected officials.
The Enrollee shall also create a plan of communication with systems that are tributary and/or satellite to the Enrollee's sanitary sewer system.	Compliant	Assure that all meetings are documented with agendas, summary notes and attendees and filed for at least five years.
Appendix A - SSMP Change Log		
	Non Compliant	The Change Log is blank and has not been updated with any changes since the August 2014 SSMP readoption even though contact information and other responsibilities of the staff have changed since August 2014.
Appendix B - SSMP Adoption Documents		
	Non Compliant	None appended with the SSMP; Original adoption resolution provided but nothing provided for the 2014 Council recertification which occurred in October 2014.
Appendix C - SSMP Audit Reports		
	Partially Compliant	Only one has been completed in June 2014 and is currently appended to the SSMP in Appendix 10-A. SSMP states that one was completed in March 2012 but was not available for review or attached to the SSMP.

Chapter 11 Appendices

None