City of Berkeley
Sewer System Management Plan

Preparation Supported by:

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Document Version Control

This Sewer System Management Plan (SSMP) is a living document that is anticipated change over time. This version control sheet is intended to support the City's efforts to keep the copies of the SSMP that have been assigned to City Staff current. Please contact Tiffany Pham at (510) 981-6427 prior to making copies for use by others, initiating changes, or for information regarding the current version of this document.

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Title Page	April 16, 2009	August 7, 2014	May 31, 2019
Introduction	April 16, 2009	March 31, 2014	May 31, 2019
1. Goals	April 16, 2009	March 31, 2014	March 31, 2014
2. Organization	April 16, 2009	August 7, 2014	May 31, 2019
3. Legal Authority	April 16, 2009	March 31, 2014	March 31, 2014
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6. Overflow Emergency Response Plan	April 16, 2009	August 7, 2014	May 31, 2019
7. FOG Control Plan	April 16, 2009	August 7, 2014	May 31, 2019
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Abbreviations and Definitions

ACDEH	Alameda County Department of Environmental Health
AMIP	Asset Management Implementation Plan
AO	Administrative Order for Compliance
BMC	City of Berkeley Municipal Code
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.
CalOES	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 Berkeley
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
CY	Calendar Year
Design Storm	A 7-hour 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 City's system that is used to store, analyze, and manage geospatial data associated with the City's sanitary sewer system assets.
GPS	Global Positioning System
GRD	Grease Removal Device. Refers to grease traps or grease interceptors that are installed to remove FOG from the wastewater flow at food service establishments.
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).
LBNL	Lawrence Berkeley National Laboratory
Lower Lateral	Refers to the portion of the sewer service lateral located in the public right-of-way, extending from the City Cleanout near 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 portion of the sewer service lateral that connects a building drain to the City's Lower Lateral or Yard Sewer Main.
PM	Preventive Maintenance
RWQCB	Regional Water Quality Control Board, San Francisco Bay Region
SECAP	System Evaluation and Capacity Assurance Plan
Sewer Main or Main Sewer	A sanitary sewer line directly controlled by the City of Berkeley and located in the public right-of-way or City easement that collects flow from more than one sewer lateral.
MWWTP	EBMUD Main Wastewater Treatment Plant

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
UCB	University of California, Berkeley Campus
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
Yard Sewer Main	A Sewer Main that is subject to the City's control and maintenance but that is not located in a public right-of-way.

Introduction

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

The City has complied with all the mandatory elements of the WDR. The City's first SSMP was completed in April 2009 and certified by the City Council in May 2009. The SSMP was updated and re-certified by the City Council in April 2014. This document constitutes the five-year update to the SSMP and reflects the most current information on the City's sewer system management, operation, and maintenance programs. A copy of the WDR, MRP, and the certified SSMP is available to all personnel involved in management, operation, and maintenance of the City's sanitary sewer system and to the public upon request.

WDR Prohibitions

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

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

WDR Provisions

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

1. City must comply with all conditions in the WDR. Any noncompliance with the WDR constitutes a violation of the California Water Code and is grounds for enforcement action.
2. Nothing in the WDR shall be:

   (i) Interpreted or applied in a manner inconsistent with the Federal Clean Water Act, or supersede a more specific or more stringent state or federal requirement in an existing permit, regulation, or administrative/judicial order or Consent Decree;

   (ii) Interpreted or applied to authorize a SSO that is illegal under either the Clean Water Act, an applicable Basin Plan prohibition or water quality standard, or the California Water Code;

   (iii) Interpreted or applied to prohibit a Regional Water Board from issuing an individual National Pollutant Discharge Elimination System permit or waste discharge

requirements, superseding this WDR, for a sanitary sewer system, authorized under the Clean Water Act or California Water Code; or

(iv) Interpreted or applied to supersede any more specific or more stringent waste discharge requirements or enforcement order issued by a Regional Water Board.

3. The City shall take all feasible steps to eliminate SSOs. In the event that an SSO does occur, the City shall take all feasible steps to contain and mitigate the impacts of an SSO.

4. In the event of an SSO, the City shall take all feasible steps to prevent untreated or partially treated wastewater from discharging from storm drains into flood control channels or waters of the United States by blocking the storm drainage system and by removing the wastewater from the storm drains.

5. The City shall report SSOs in accordance with Section G of the WDR.

6. The City understands that in any enforcement action, the State and/or Regional Water Boards will consider the appropriate factors under the duly adopted State Water Board Enforcement Policy, and, consistent with this policy, must consider the City's efforts to contain, control, and mitigate SSOs when considering the California Water Code 13327 factors. In assessing these factors, the State and/or Regional Water Boards will also consider additional factors listed in Provision 6 of the WDR.

7. When an SSO occurs, the City shall take all feasible steps and necessary remedial actions to 1) control or limit the volume of untreated or partially treated wastewater discharged, 2) terminate the discharge, and 3) recover as much of the wastewater discharged as possible for proper disposal, including any wash down water.

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

   (i) Interception and rerouting of untreated or partially treated wastewater flows around the wastewater line failure.

   (ii) Vacuum truck recovery of sanitary sewer overflows and washdown water.

   (iii) Cleanup of SSO-related debris at the overflow site.

   (iv) System modifications to prevent another SSO at the same location.

   (v) Adequate sampling to determine the nature and impact of the release.

   (vi) Adequate public notification to protect the public from exposure to the SSO.

8. The City shall properly manage, operate, and maintain all parts of the sanitary sewer it owns and operates, and shall ensure that the system operators (including employees, contractors, or other agents) are adequately trained and possess adequate knowledge, skills, and abilities.

9. The City shall allocate adequate resources for the operation, maintenance, and repair of its sanitary sewer system, by establishing a proper rate structure, accounting mechanisms, and auditing procedures to ensure an adequate measure of revenues and expenditures. These procedures must be in compliance with applicable laws and regulations and comply with generally accepted accounting practices.

10. The City shall provide adequate capacity to convey base flows and peak flows, including flows related to wet weather events. Capacity shall meet or exceed the design criteria as defined in the City's System Evaluation and Capacity Assurance Plan for all parts of the sanitary sewer system owned or operated by the City.

11. The City shall develop and implement a written SSMP and make it available to the State and/or Regional Water Board upon request. A copy of this document must be publically available at the City's office and/or available on the internet. This SSMP must be approved by the City's governing board at a public meeting.

12. In accordance with the California Business and Professions Code sections 6735, 7835, and 7835.1, all engineering and geologic evaluations and judgments shall be performed by or under the direction of registered professionals competent and proficient in the fields pertinent to the required activities. Specific elements of the SSMP that require professional evaluation and judgments shall be prepared by or under the direction of appropriately qualified professionals, and shall bear the professional(s)' signature and stamp.

13. The elements of the SSMP include:

    (i) Goal

    (ii) Organization

    (iii) Legal Authority

    (iv) Operations and Maintenance Program

    (v) Design and Performance Provisions

    (vi) Overflow Emergency Response Plan

    (vii) FOG Control Program

    (viii) System Evaluation and Capacity Assurance Plan

    (ix) Monitoring, Measurement, and Program Modifications

    (x) SSMP Program Audits

    (xi) Communication Program

14. The SSMP must be updated every five (5) years, and must include any significant program changes. Re-certification by the City of Berkeley City Council is required when significant updates to the SSMP are made. To complete the re-certification process, the City shall enter the data in the Online SSO Database and mail the form to the State Water Board, as described in Section D.14 of the WDR.

Sewer System Overview and Historical Perspective

The City's collection system includes approximately 254 miles of City-owned sanitary sewers, 7,200 manholes and other sewer structures, seven sewage pump stations, and approximately 31,600 service laterals. The City is responsible for maintenance and repair of the lower portion of the service laterals (located within the public right-of-way) from the property line cleanout to the connection to the City's sewer main. The collection system serving the University of California at Berkeley (UCB) campus, located within the City, is owned and maintained by the University but discharges to the City's sewer system, as do the sewer systems serving the Lawrence Berkeley National Laboratory (LBNL) and Golden

Gate Fields. The City's system also receives wastewater from small adjacent areas of the City of Albany, City of Oakland, and the Stege Sanitary District (Kensington).

Wastewater generated in the City's collection system is conveyed to the East Bay Municipal Utility District (EBMUD) wastewater 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 Alameda, Albany, Emeryville, Oakland, and Piedmont, and the Stege Sanitary District.

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

Through the I/I Correction Program, the City has rehabilitated or replaced over 227 miles of its gravity sewers and associated lower laterals over the past 30 years. Since 2006, the City has also implemented a private sewer lateral (PSL) certification program requiring the inspection and/or repair or replacement of private (upper) sewer laterals at the time of property transfer or major building remodel. To date, approximately 36 percent of private laterals have been certified for compliance under the program.

In 2009, the U.S Environmental Protection Agency (EPA), State Water Resources Control Board (SWRCB), and the San Francisco Bay Regional Water Quality Control Board (RWQCB) prohibited future discharges from the WWFs, and entered into a legal settlement with EBMUD to establish programs focused on reducing wet weather flows. Shortly thereafter, the EPA issued Findings of Violation and Orders for Compliance, also called Administrative Orders (AOs), to each of the seven EBMUD Satellite agencies requiring the development of specific plans and programs to reduce SSOs and control wet weather I/I into the collection systems. The AOs were subsequently replaced in 2011 by a Stipulated Order for Preliminary Relief (SO) with the EPA, SWRCB, and RWQCB. As required by the SO, the City 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, as well as annual progress reports.

In September 2014, the seven Satellites and EBMUD entered into a Consent Decree with EPA, the SWRCB, and the RWQCB, which established requirements for achieving the elimination of WWF discharges over the next 20 to 25 years. This SSMP also incorporates sewer system programs and practices that are required as part of the final Consent Decree.

About this Document

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. 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 Berkeley 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.

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:

1. To properly manage, operate, and maintain all portions of the City's wastewater collection system.
2. To provide adequate capacity to convey the peak wastewater flows. Adequate capacity, for the purposes of this SSMP, is defined as the capacity to convey the peak wastewater flows that are associated with the design storm event.
3. To minimize the frequency of SSOs.
4. To mitigate the impacts that are associated with any SSO that may occur.
5. To meet all applicable regulatory notification and reporting requirements.

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 duly authorized representative, also referred to as Legally Responsible Official (LRO), as defined in Section J of the WDR, is the Public Works Maintenance Superintendent. The Senior Public Works Supervisor, Public Works Supervisors (Sewers), and Environmental Compliance Specialist are also authorized as LROs for certifying SSO reports to CIWQS.

2.3 Positions Responsible for SSMP Implementation

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

Figure 2-1: SSMP Organization Lines of Authority

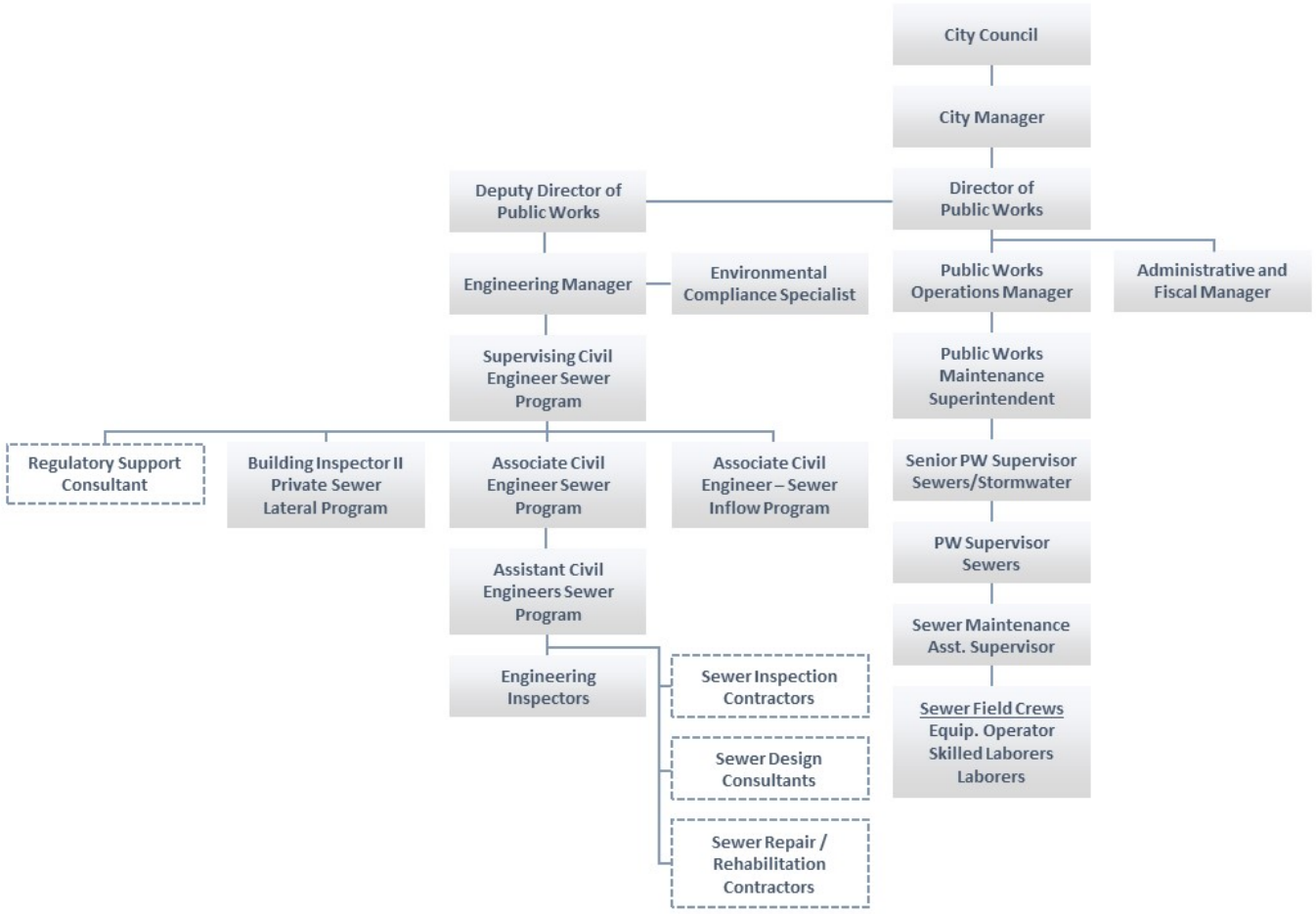


Table 2-1: Narrative Explanation of Responsibilities of SSMP Organization Positions

Position	Narrative Explanation
City Council	Provides policy direction, approves SSMP, and appropriates funds to implement SSMP activities
City Manager	Implements City Council policy
Director of Public Works	Supervises Public Works engineering, operations, and administrative staff. Regulatory agency liaison. Overall responsibility for capital and operating budgets.
Deputy Director of Public Works	Supervises Public Works engineering and administrative staff. Regulatory agency liaison.
Public Works Operations Manager	Oversees the O&M aspects of the SSMP. Supervises operations and maintenance staff.
Administrative and Fiscal Manager	Responsible for establishing sewer operating and capital budgets.
Manager of Engineering	Oversees programs related to the sewer rehabilitation and I/I correction programs, including sewer condition assessment, rehabilitation, inflow, and private sewer lateral compliance programs. Supervises engineering staff.
Supervising Civil Engineer	Supervises engineering staff working on the sewer program. Oversees preparation of plans and reports required by regulatory orders; serves as technical advisor to Director of Public Works on regulatory issues.
Associate Civil Engineer – Sewer CIP Program	Oversees sewer rehabilitation design and construction projects and GIS updates; coordinates with O&M staff on referrals for sewer repairs and map updates.
Associate Civil Engineer – Sewer Inflow Program	Manages smoke testing contractor, compiles and tracks smoke testing results and related enforcement activities, sends out notices and citations for violations
Assistant Civil Engineers – Sewer CIP Program	Manage sewer rehabilitation design and construction projects and contractor CCTV and manhole inspection. Perform GIS updates.
Engineering Inspectors	Inspect sewer rehabilitation construction.
Building Inspector II – Private Sewer Lateral Program	Manages the PSL compliance program, including issuing sewer lateral certificates, tracking compliance, and issuing notices and citations for violations.
Public Works Maintenance Superintendent	LRO. Oversees sewer system O&M program and supervises sewer system O&M staff. Responsible for City's reporting to CIWQS.
Senior Public Works Supervisor	Responsible for training and tracking performance of sewer O&M staff, maintaining and reporting O&M metrics. Authorized representative for reporting to CIWQS.
Public Works Supervisors	Supervise sewer field personnel; assign and track completion of work. Support planning, scheduling, dispatch, and tracking of sewer maintenance activities. Authorized representative for reporting to CIWQS.
Sewer Maintenance Assistant Supervisors	Assist in leading and supervising sewer field personnel.
Sewer Field Personnel	Perform sewer system emergency response, cleaning, inspection, and repair work.
Environmental Compliance Specialist	Provides data management support for tracking and reporting sewer maintenance activities; supports CMMS implementation. Authorized representative for reporting to CIWQS.

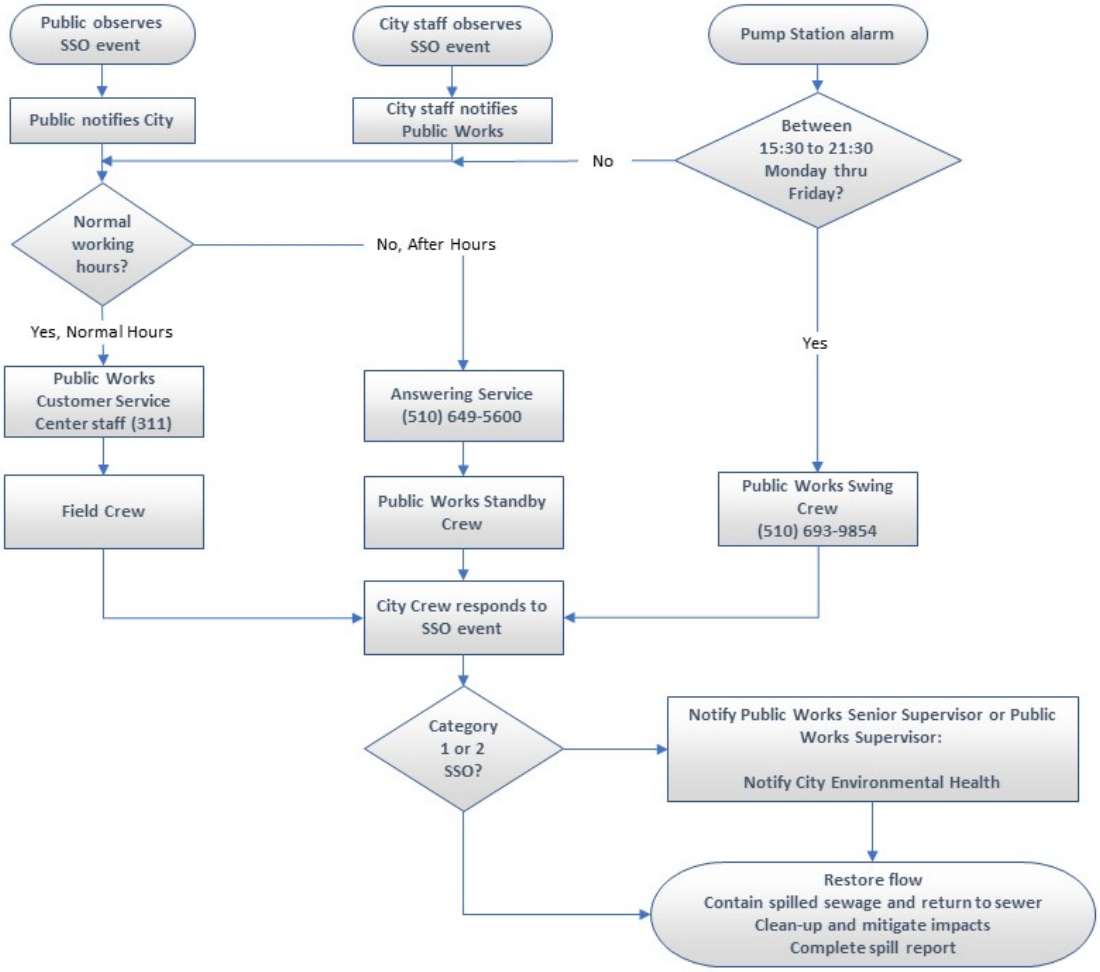
Table 2-2: Positions Responsible for SSMP Implementation

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

2.4 Chain of Communication for Reporting Sewer Overflows

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

Figure 2-2: Chain of Communications for Reporting SSOs



Chapter 3 Legal Authority

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

3.1 Regulatory Requirements for the Legal Authority Element

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

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

(a) Prevent illicit discharges into its wastewater collection system (examples may include infiltration and inflow (I/I), storm water, chemical dumping, unauthorized debris and cut roots, etc.);

(b) Require that sewers and connections be properly designed and constructed;

(c) Ensure access for maintenance, inspection, or repairs for portions of the lateral owned or maintained by the Public Agency;

(d) Limit the discharge of fats, oils, and grease and other debris that may cause blockages; and

(e) Enforce any violation of its sewer ordinances.

3.2 Summary of Legal Authorities

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

- Berkeley Municipal Code: http://codepublishing.com/ca/berkeley/
- California Plumbing Code: http://www.iapmo.org/Pages/californiaplumbingcode.aspx
- EBMUD Ordinance 311A-03: http://ebmud.com/sites/default/files/pdfs/ord_no_311a03_2.pdf

3.3 Agreements with Other Agencies

As noted previously, other public agency sewer systems discharging to the City's system include the University of California Berkeley (UCB), Lawrence Berkeley National Laboratory (LBNL), and small portions of the City of Albany, City of Oakland, and Stege Sanitary District. The City communicates with these agencies on a regular basis, as described in Section 11.3. The City plans to develop more formal agreements with these agencies in the future in order to better define their specific responsibilities with respect to sewer discharge into the City of Berkeley sewer system and, in applicable cases, each agency's responsibilities for jointly-used facilities.

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

Requirement	Legal Authority Reference
ILLICIT DISCHARGES	
Prevent illicit discharges into the wastewater collection system	BMC 17.16.020, EBMUD Ordinance No. 311A-03
Limit the discharge of fats, oils, and grease and other debris that may cause blockages	BMC 17.16.020
Control infiltration and inflow (I/I) from private service laterals	BMC 17.24.050,060,070
PROPER DESIGN AND CONSTRUCTION	
Require that sewers and connection be properly designed and constructed	BMC 17.16.050
Require proper installation, testing, and inspection of new and rehabilitated sewers	BMC 17.16.050, 17.24.120
ACCESS TO LATERALS	
Clearly define City responsibility and policies	BMC 17.24.020
Ensure access for maintenance, inspection, or repairs for portions of the service lateral owned or maintained by the City	BMC 17.24.040
FOG SOURCE CONTROL	
Requirements to install grease removal devices (such as traps or interceptors)	EBMUD Ordinance No. 311A-03
Design standards for the grease removal devices	BMC 19.34.010
Maintenance requirements, BMP requirements, record keeping and reporting requirements for grease removal devices	EBMUD Ordinance No. 311A-03
Authority to inspect grease producing facilities	EBMUD Ordinance No. 311A-03
ENFORCEMENT	
Enforce any violations of its sewer ordinances	BMC 1.20

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 and manhole inspection, rehabilitation and replacement. The details of the City's O&M programs are described in this section.

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 has a geographic information system (GIS) that includes the information for its wastewater collection system assets. The GIS information is available to appropriate City staff.

The field crews use GIS sectional maps called sector maps. The sector maps contain individual segments as well as manhole structures and are updated as needed. Corrections that are identified by the field crews are entered on a single map set and referred to sewer engineering for GIS updating.

4.3 Operation and Maintenance Activities

4.3.1 Overview of Sewer Maintenance Program

The objectives for the City's sewer maintenance program are:

1. Clean each of the gravity sewer line segments on a preventive maintenance frequency that will minimize the occurrence of repeat blockages and/or overflows;
2. If determined necessary, modify preventive maintenance frequency following a blockage/SSO event or after a closed-circuit television (CCTV) inspection identifies a maintenance defect where the loss of flow area, based on pipe diameter, is greater than 20 percent;
3. The initial round of cleaning and inspections of the entire sewer system, which began in 2010, has been completed. The City will now clean or inspect each gravity sewer line segment at a future frequency determined by conditions that were observed and recorded during cleaning and inspection, with at least 60 miles of sewer cleaned or inspected per fiscal year.

Appendix 4-A contains the Sanitary Sewer Maintenance section of the Public Works Streets and Utilities Division Field Manual, which includes procedures for sewer maintenance activities conducted by the Division.

4.3.2 Sewer Preventive Maintenance

The City employs a preventive maintenance approach to maintaining the sewer system designed to minimize the occurrence of repeat blockages and/or SSOs from gravity sewer line segments with a known history of problems. It consists of cleaning problematic gravity sewer line segments on an aggressive preventive maintenance frequency of every 1, 2, 3, 6, 12, 18, 24 or 36 months and all other sewer line segments at a frequency determined by observed conditions. Sewer preventive maintenance activities will be scheduled and recorded in the City's Accela computerized maintenance management system (CMMS). The City's standard operating procedure for sewer cleaning is included in Appendix 4-A.

Aggressive ("Hot Spot") Preventive Maintenance

The City's current sewer preventive maintenance program includes aggressive ("hot spot") preventive maintenance for all sewers that have experienced a blockage and/or SSO event since CY 2007, and where the underlying cause of the event has not been corrected through source control, chemical root control, repair, or rehabilitation/replacement. The gravity sewer line segments that are currently maintained on an aggressive preventive maintenance frequency are listed in **Appendix 4-B**.

Guidelines for managing aggressive preventive maintenance are as follows:

- Any gravity sewer line segment that experiences a blockage and/or SSO event will be cleaned during the City's response to the service call, and will be added to the hot spot program at an appropriate frequency (the default frequency will be 6 months, unless otherwise indicated by results of the investigation on the primary cause).
- A line segment may also be added to the hot spot program based on the results of CCTV inspection identifying an area where the loss of flow area, based on pipe diameter constriction, is greater than 20 percent.
- Field crew observations regarding the nature and extent of the materials removed from the gravity sewer line segment will be noted on the work orders associated with subsequent cleaning activities, and that information will be used to establish future cleaning frequencies and methods, following the process outlined in Appendix 4-A.

- The maintenance frequency for gravity sewer line segments may be reduced if the line has been rehabilitated; spot repaired; had a FOG case closure; or had a clear CCTV inspection one year after the last cleaning event. A reduction in maintenance frequency also requires approval of the Senior Public Works Supervisor or the Public Works Superintendent.

System-Wide Routine Maintenance

Sewer pipelines not assigned an aggressive preventive maintenance frequency will be cleaned as part of a system-wide preventive maintenance program. The City's gravity sewer system has been divided into 286 cleaning sectors for planning and scheduling system-wide preventive maintenance. These cleaning sectors were defined by field crews, based on being geographically related gravity sewer line segments with similar risk of blockage or SSOs, and based on their size and material. The sewer cleaning sectors have total lengths ranging from 440 feet to over 15,900 feet (over 3 miles). The cleaning sector for each pipe is identified in GIS. The cleaning sectors and their respective pipe length and scheduled or completed service date are listed in **Appendix 4-C**.

The cleaning sectors were developed using the following priorities:

- Age of pipe,
- Size of pipe, 6 inch diameter having the highest priority with priority decreasing by pipe size,
- Material, vitrified clay pipe (VCP) was the highest priority,
- Areas where FOG was problematic, i.e. in business areas, and
- Areas where roots are problematic.
- Pipe segments with a history of SSOs (hot spots)

The City performed spatial analysis of these factors to determine where high priority concerns overlapped. The City then divided geographically related line segments with similar risks into cleaning sectors that could be accomplished by a crew in a 1 to 4 day period.

System-wide preventive maintenance will be scheduled each month using the CMMS and will follow the completion of aggressive preventive maintenance activities (e.g., in the latter part of each month).

Root Control

The City employs both mechanical and chemical root control methods. Both the system-wide and hot spot cleaning programs address areas with root intrusion, particularly sewers located in easements. Chemical root control is used to maximize the remaining life of the sewers by minimizing damage to the pipe related to continuing root growth and frequent mechanical root cleaning activities

Pump Stations

The City conducts a weekly operational inspection of its pump stations including the wet well cleaning. The mechanical and electrical equipment preventive maintenance is scheduled annually. Lift station maintenance procedures are included in the Sanitary Sewer Maintenance Field Manual in Appendix 4-A. A copy of the City's lift station maintenance work order form is included in **Appendix 4-D.**

4.3.3 Non-Routine Maintenance

Non-routine maintenance activities include investigation and response to any complaints regarding a manhole overflow, missing or shifted manhole covers, manhole covers that are excessively noisy, residential plumbing troubles, pump station malfunction, unexpected sewer odor, etc. Sewer

complaints received by the Public Works Department are entered into the CMMS and investigated, and appropriate actions are taken to resolve the source of the problem.

4.4 Rehabilitation and Replacement Plan

The City's rehabilitation and replacement program is driven by its I/I correction program and the ongoing gravity sewer condition assessment effort based on CCTV inspections, manhole inspections, smoke testing, and maintenance and service requests. The City initiated its sewer condition assessment program in 2011, and by 2020 plans to have inspected all gravity sewers in the system (and associated manholes) that are more than 10 years old or otherwise not scheduled for rehabilitation or replacement in the next 10 years. The City's manhole inspection form is included in **Appendix 4-E.** The City has adopted the National Association of Sewer Service Companies (NASSCO) Pipeline Assessment Certification Program (PACP) standards for inspection and condition assessment of sewer pipelines. The information gathered during the condition assessment will be used to identify acute defects in need of near-term repair, pipes with maintenance issues requiring attention, and to prioritize gravity sewers for rehabilitation and replacement. CCTV data is stored in the City's POSM CCTV database.

The City has an annual sewer rehabilitation and replacement program to rehabilitate or replace the portions of its wastewater collection system where conditions warrant. Sewer rehabilitation and replacement work includes sewer mainlines, manholes, and associated lower laterals. Since 1986, the City had rehabilitated over 80 percent of the sewers in its collection system. The City plans to complete rehabilitation of the remaining portions of the system at an average rate of approximately 4.2 miles per year for the next 12 years. Thereafter, the pipe segments that will be scheduled for rehabilitation or replacement in the City's 5-year sewer Capital Improvement Program will be based on the results of sewer inspections and condition assessment.

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

4.5 Training Program

4.5.1 City Staff

The City uses a combination of in-house classes; on-the-job training; and conferences, seminars, and other training opportunities to train its wastewater collection system staff.

In most cases, equipment and operations training is initially provided by the vendor or manufacturer of the equipment. Ongoing technical training is provided through on-the-job training and rotation among the different maintenance crews and equipment. The City also relies on regional and statewide training available through seminars and conferences. The City has also provided training classes for California Water Environment Association (CWEA) collection system certification and NASSCO PACP certification. Training resources available through conferences, seminars, and educational institutions are shown in **Table 4-1**.

4.5.2 Staff Contracted for City Projects

The City's contract language requires contractors working in the wastewater collection system to provide training for their employees regarding the potential to cause SSOs and the importance of preventing non-stormwater discharges into the local waterways, as well as develop and submit a Spill Response Plan for review and approval.

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

Table 4-1: Training Resources

Sponsor	Event/Material	Timeframe	Reference
Bay Area Clean Water Agencies	Collection System Committee	Monthly	http://www.bacwa.org
California Water Environment Association	State Conference	April	www.cwea.org
	Northern Regional Training Conference	September	
	San Francisco Bay Section Collection System Committee	Quarterly	
California State University, Sacramento	Videos, manuals, home study courses		www.owp.csus.edu

4.6 Equipment and Parts Inventory

Appendix 4-F includes lists of the major equipment that the City uses in the operation and maintenance of its sewer system, and **Appendix4-G** is a list of critical sewer system replacement parts**.**

4.7 Outreach Program

The City participates in the Bay Area Clean Water Agencies region-wide outreach program to inform sewer cleaning and plumbing contractors of the potential for their work to cause SSOs. In addition, FOG control leaflets and pamphlets are distributed at various City fairs and, starting in 2014, will be available on City sewer trucks.

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, and inspection of gravity sewer systems, sewer force mains, and other facilities to be operated and maintained by the City consist of the *Standards for Sanitary Sewers* included in **Appendix 5-A**, the *California Plumbing Code*, the *City of Berkeley Specifications for Sanitary Sewer Rehabilitation* and associated Appendices, Details, and Detail Specifications, Regional Standards for Sanitary Sewer Installation, Rehabilitation and Repair, and the Standard Specifications for Public Works Construction by Public Works Standards, Inc., also known as the *Greenbook*.

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 Goals for SSO Response

The City's goals with respect to responding to SSOs are:

- Respond quickly to minimize the volume of the SSO;
- Eliminate the cause of the SSO;
- Contain the spilled wastewater to the extent feasible;
- Minimize public contact with the spilled wastewater;
- Mitigate the impact of the SSO; and
- Meet the regulatory reporting requirements.

6.3 Definitions

Sanitary Sewer System: Any system of pipes, pump stations, sewer lines, or other conveyances, upstream of a wastewater treatment plant headworks used to collect and convey wastewater to the publicly owned treatment facility.

Sanitary Sewer Overflow (SSO): Any overflow, spill, release, discharge or diversion of untreated or partially treated wastewater from a sanitary sewer system. Temporary storage and conveyance facilities (such as vaults, temporary piping, construction trenches, wet wells, impoundment, tanks, etc) are considered to be part of the sanitary sewer system, and discharges into these temporary storage facilities are not considered to be SSOs.

Table 6-1 summarizes the SSO categories and definitions.

Table 6-1: Spill Category Definitions

CATEGORIES	CATEGORY DEFINITIONS
CATEGORY 1	Discharges of untreated or partially treated wastewater of **any volume** resulting from an enrollee's sanitary sewer system failure or flow condition that: • Reach surface water and/or reach a drainage channel tributary to a surface water, or • Reach a municipal separate storm sewer system and are not fully captured and returned to the sanitary sewer system or not otherwise captured and disposed of properly. Any volume of wastewater not recovered from the municipal separate storm sewer system is considered to have reached surface water unless the storm drain system discharges to a dedicated storm water or ground water infiltration basin (e.g., infiltration pit, percolation pond).
CATEGORY 2	Discharges of untreated or partially treated wastewater of **1,000 gallons or greater** resulting from an enrollee's sanitary sewer system failure or flow condition that **do not** reach surface water, a drainage channel, or a municipal separate storm sewer system unless the entire SSO discharged to the storm drain system is fully recovered and disposed of properly.
CATEGORY 3	All other discharges of untreated or partially treated wastewater resulting from an enrollee's sanitary sewer system failure or flow condition.
PRIVATE LATERAL SEWAGE DISCHARGE (PLSD)	Discharges of untreated or partially treated wastewater resulting from blockages or other problems **within a privately owned sewer lateral** connected to the enrollee's sanitary sewer system or from other private sewer assets. PLSDs that the enrollee becomes aware of may be voluntarily reported to the CIWQS Online SSO Database.

6.4 Response to Notification of Spill

The processes that are employed to notify the City of the occurrence of an SSO include observation by the public, receipt of an alarm, or observation by City staff during the normal course of their work.

The City of Berkeley has adopted service call/overflow response procedures requiring immediate response to minimize or eliminate an overflow. The City provides all necessary spill response supplies, which are available for use at any time.

When a notification of an SSO is received, it should be clearly communicated who will respond, the estimated time of arrival, and what areas will need to be accessed. The information provided by the caller should be verified before dispatching a field crew. This includes verifying the address and nearest cross street and making sure it is part of the City's collection system. If not, provide the caller with the phone number of the responsible agency and follow up by calling the agency and providing the details of the call. Contact information for neighboring agencies is included in **Appendix 6-A.**

6.4.1 Public Observation

Public observation is the most common way that the City is notified of blockages and spills. Contact information for reporting sewer spills and backups is in the phone book and on the City's website: www.ci.berkeley.ca.us. The City's telephone number for reporting sewer problems is (510) 981-6620 (8 am to 5 pm) or 311 Sewer calls that are received during normal working hours are routed through the City's 311 call center.

Normal Work Hours

The City's regular working hours are Monday through Friday from 7:30 a.m. to 5:00 p.m., except holidays. When a report of a sewer spill or backup is made during normal work hours, the Public Works Customer Service Call Center receives the call, takes the information from the caller, and communicates it to the field crew. The information regarding the service call is documented in a log book.

After Hours

Service calls are forwarded to the Answering Service who receives the call, takes the information from the caller, and communicates it to the City's Swing Shift (until 9:30 p.m.) or the Public Works Standby Crew. The Answering Service confirms receipt of the service call with the pertinent information received from the caller in a daily log that is sent to Public Works Customer Service.

6.4.2 City Staff Observation

City staff conducts periodic inspections of its sewer system facilities as part of their routine activities. Any problems noted with the sewer system facilities are reported to appropriate City staff who, in turn, respond to emergency situations. Work orders are issued to correct non-emergency conditions.

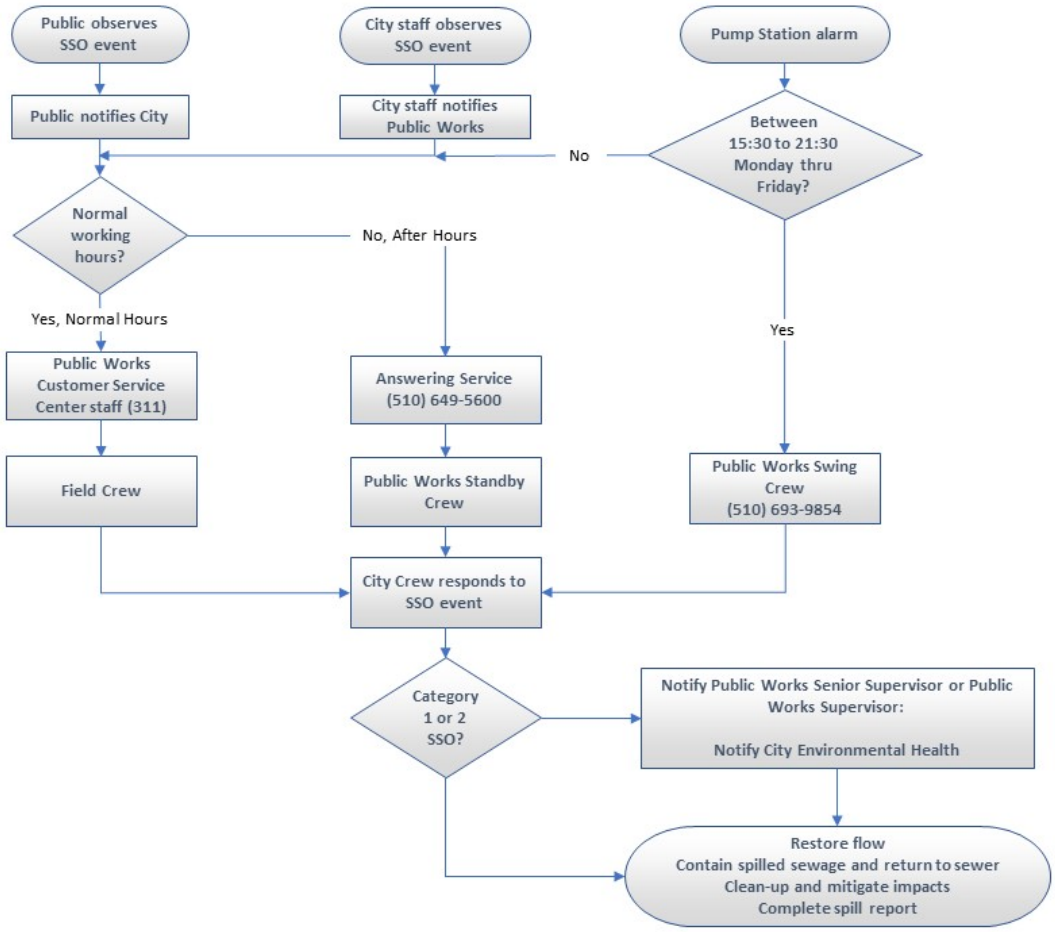
6.4.3 Alarms

Pump station alarms are transmitted via autodialer to the City's Emergency Communication Center. The information is communicated to field crews or standby personnel for response as described above

6.5 SSO Response Procedures

Sewer service calls are considered high priority events that demand a prompt response. The notification and response procedure flow chart is shown in **Figure 6-1.**

Figure 6-1: Notification and Response Flow Chart



6.5.1 Customer Relations Practices

As representatives of the City, field staff will occasionally have to deal with an irate homeowner. A sewer backup is a stressful event and even a reasonable homeowner can become irate if it is perceived that staff members as being indifferent, uncaring, unresponsive, and/or unprepared.

Although sometimes difficult, effective management of a sewage backup situation is critical. If it is not managed well, the situation can end up in a costly, prolonged process with the homeowner. The homeowner should feel assured that the City is responsive and the homeowner's best interest is a top priority.

It is important for employees to communicate effectively with customers, especially in sewage backup situations. How they communicate – on the phone, in writing, or in person – is how the City is perceived. Good communication with the homeowner results in greater confidence in the City's ability to address the problem satisfactorily, less chance of having the homeowner prolong the claims process, and less chance of the customer exaggerating the damage done on the property. Some communication tips for City staff in dealing with homeowners affected by an SSO are listed below.

- Give the homeowner ample time to explain the situation or to vent. Show interest in what the homeowner has to say, no matter how many times you have heard it before, or how well you understand the problem.
- As soon as possible, let the customer know that you will determine if the source of the sewer backup is in the sewer main and, if it is, will have it corrected as quickly as you can.
- Acknowledge the homeowner's concerns. For example, if the homeowner appears angry or worried about property damage, respond with something like, "I understand that you're concerned about the possible damage to your property, but a professional cleanup crew can restore the area."
- Express understanding and empathy for any inconveniences caused by the incident, but do not admit fault. If it is determined that the City is at fault, the property owner has the right to file a claim for any reasonable repairs or losses resulting from the incident.
- As much as possible, keep the homeowner informed on what is being done and will be done to correct the problem.
- Keep focused on getting the job done in a very professional manner. Don't wander from the problem with too much unnecessary small talk with the homeowner.
- Don't find fault or lay blame on anyone.
- Provide Satisfaction Survey

6.5.2 First Responder Priorities

The first responder's priorities are:

- To follow safe work practices.
- To respond promptly with the appropriate equipment.
- To evaluate the cause of spill and determine responsibility.
- To contain the spill wherever feasible.
- To restore the flow as soon as practicable.
- To minimize public access to and/or contact with the spilled sewage.
- To promptly notify the Public Works Senior Supervisor or Public Works Supervisor and City Environmental Health Division in event of major SSO.
- To return the spilled sewage to the sewer system.
- To restore the area to its original condition (or as close as possible).

6.5.3 Safety

The first responder is responsible for following safety procedures at all times. Special safety precautions must be observed when performing sewer work.

There may be times when City personnel responding to a sewer system event are not familiar with potential safety hazards peculiar to sewer work. In such cases it is appropriate to take the time to discuss safety issues, consider the order of work, and check safety equipment before starting the job.

6.5.4 Initial Response

The first responder must respond to the reporting party/problem site and visually check for potential sewer stoppages or overflows.

The first responder should:

- Note arrival time at site using Sewer Field Crew Report form. A sample report is included as **Appendix 6-B**.
- Verify the existence of a sewer system spill or backup.
- Identify and assess the affected area and extent of spill.
- Contact caller if time permits.
- Notify the Public Works Senior Supervisor or Public Works Supervisor (working hours) or the On-Call Supervisor (after hours)
    - If the spill appears to be large, flowing to a storm drain, in a sensitive area, or there is doubt regarding the extent, impact, or how to proceed.
    - If additional help is needed.
- If the spill is large or in a sensitive area, document conditions upon arrival with photographs.
- Decide whether to proceed with clearing the blockage to restore the flow or to initiate containment measures. The guidance for this decision is:
    - Small spills – proceed with clearing the blockage.
    - Moderate or large spill where containment is anticipated to be simple – proceed with the containment measures.
    - Moderate or large spills where containment is anticipated to be difficult – proceed with clearing the blockage; however, call for additional assistance after 15 minutes without clearing the blockage and implement containment measures.

6.5.5 Restore Flow

Using the appropriate cleaning equipment, set up downstream of the blockage and hydro clean upstream from a clear manhole. Attempt to remove the blockage from the system and observe the flows to ensure that the blockage does not recur downstream.

If the blockage cannot be cleared within a reasonable time (15 minutes), or the sewer requires construction repairs to restore flow, then initiate containment and/or bypass pumping. If assistance is required, immediately contact other employees, contractors, and equipment suppliers.

6.5.6 Initiate Spill Containment Measures

The first responder should attempt to contain as much of the spilled sewage as possible using the following steps:

- Determine the immediate destination of the overflowing sewage.

- Plug storm drains using air plugs, sandbags, and/or plastic mats to contain the spill, whenever appropriate. If spilled sewage has made contact with the storm drainage system, attempt to contain the spilled sewage by plugging downstream storm drainage facilities.
- Contain/direct the spilled sewage using dike/dam or sandbags.
- Pump around the blockage/pipe failure/pump station or vacuum flow from upstream of the blockage and dispose of downstream of the blockage to prevent further overflow.
- When an SSO occurs inside of a house or building, the property owner should be instructed to follow these guidelines:
    - Keep all family members and pets away from the affected area.
    - Place towels, rags, blankets, etc between areas that have been affected and areas that have not been affected.
    - Do not remove any contaminated items
    - Turn off the HVAC system
    - Move any uncontaminated property away from the overflow area.

6.5.7 Equipment

The following is a list of specialized equipment that is required to support SSO response.

Camera -- A digital or disposable camera is required to record the conditions upon arrival, during clean up, and upon departure.

Emergency Response Truck -- A utility body pickup truck is required to store and transport the equipment needed to effectively respond to sewer emergencies. The equipment and tools should include containment and clean up materials.

Global Positioning System (GPS) Unit -- A hand held GPS unit is required to determine the coordinates of spills for use in meeting RWQCB SSO reporting requirements.

Portable Generators, Portable Pumps, Piping, and Hoses -- The list of portable equipment that is required to support this plan is included in the Public Works Standby procedures book.

Combination Sewer Cleaning Truck -- A combination high velocity sewer cleaning truck with vacuum tank is required to clear blockages in gravity sewers, vacuum spilled sewage, and wash down the impacted area following the SSO event.

Closed Circuit Television (CCTV) Inspection Unit – A CCTV Inspection Unit is required to determine the root cause for all SSOs from gravity sewers.

6.6 SSO Volume Estimation

An initial estimation of the volume of spilled sewage and determination of SSO category should be made by the first responder as soon as possible upon arriving at the SSO site. The first responder will use the initial estimation and determination to determine appropriate internal and external notifications. A final estimation should be based on the best available information. Methods that can be used for estimating spill volume are described in **Appendix 6-D**. Wherever possible, document the estimate using photos of the SSO site before and during the recovery operation.

6.7 Water Quality Sampling and Monitoring Program

Water quality sampling and testing are required in order to determine the extent and impact of the SSO whenever 50,000 or more of spilled sewage enters a water body. Water quality sampling may also be performed for smaller spills based on the recommendation of the City Environmental Health Division. Samples should be collected as soon as possible after the discovery of the SSO event. Environmental Health Division staff will be responsible for collection of samples.

The MRP requires that the City develop a SSO Water Quality Monitoring Program Plan to be implemented whenever water quality sampling is required. The City's Water Quality Monitoring Program Plan, included in **Appendix 6-F** contains guidelines and procedures for water quality sampling and analysis**.**

6.8 Recovery and Clean-Up

The recovery and clean-up phase begins when the flow has been restored and the spilled sewage has been contained to the extent possible. The SSO recovery and clean-up procedures are:

6.8.1 Recovery of Spilled Sewage

Vacuum up and/or pump the spilled sewage and discharge it back into the sanitary sewer system.

If sewage has reached the storm drain system, the combination sewer cleaning truck should be used to vacuum/pump out the catch basin and any other portion of the storm drain that may contain sewage.

6.8.2 Clean-up and Disinfection

Clean-up and disinfection procedures should be implemented to reduce the potential for human health issues and adverse environmental impacts that are associated with an SSO event. The procedures described are for dry weather conditions and should be modified as required for wet weather conditions. In the event that an overflow occurs at night, the location should be reinspected first thing the following day. The operator should look for any signs of sewage solids and sewage-related material that may warrant additional cleanup activities. Where clean-up is beyond the capabilities of City staff, a clean-up contractor will be used.

Private Property

The City's procedures for responding to SSOs on private property are included in the Sanitary Sewer Maintenance Field Manual in Appendix 4-A.

Hard Surface Areas

- Collect all signs of sewage solids and sewage-related material with the use of rakes, shovels, and brooms.
- Wash down the affected area with clean water until the water runs clear. Take reasonable steps to contain and vacuum up the wastewater.
- Disinfect all areas that were contaminated from the overflow using disinfectant solution. Apply minimal amounts of the disinfectant solution using a hand sprayer. Document the volume and application method of disinfectant that was employed.
- Allow area to dry. Repeat the process if additional cleaning is required.

Landscaped and Unimproved Natural Vegetation

- Collect all signs of sewage solids and sewage-related material with the use of rakes, shovels, and brooms.
- If deemed necessary, wash down the affected area with clean water. Take reasonable steps to contain and vacuum up the wastewater.

Natural Waterways

The California Department of Fish and Wildlife (CDFW) should be notified in the event an SSO impacts any riparian habitat. CDFW will provide the professional guidance needed to effectively clean-up spills that occur in these sensitive environments.

Clean-up should proceed quickly in order to minimize negative impact. Any water that is used in the clean up should be de-chlorinated prior to use.

Storm Drain System

Flush the storm drain system catch basins and pipelines impacted by an SSO. Vacuum excess water utilized for flushing. In cases where the SSO travelled long distances through the storm drain system, dump a large volume of water into the storm drain system and set up a vacuum truck downstream to recover the flush water.

Wet Weather Modifications

Omit flushing and sampling during heavy storm events with heavy runoff where flushing is not required and sampling would not provide meaningful results.

6.9 Public Notification

Post signs and place barricades to keep vehicles and pedestrians away from contact with spilled sewage. Do not remove the signs until directed by the City Environmental Health Division. A sample warning sign is included as **Appendix 6-E**.

Creeks, streams and beaches that have been contaminated as a result of an SSO should be posted at visible access locations until the risk of contamination has subsided to acceptable background levels. The warning signs, once posted, should be checked every day to ensure that they are still in place.

In the event that an overflow occurs at night, the location should be inspected first thing the following day. The field crew should look for any signs of sewage solids and sewage-related material that may warrant additional clean-up activities.

Major spills may warrant broader public notice. The City Manager will authorize contact with local media when significant areas may have been contaminated by sewage.

6.10 Failure Analysis Investigation

The objective of the failure analysis investigation is to determine the “root cause” of the SSO and to identify corrective action(s) needed that will reduce or eliminate future potential for the SSO to recur.

The investigation should include reviewing all relevant data to determine appropriate corrective action(s) for the line segment. The investigation should include:

- Reviewing and completing the Sewer Field Crew Report form,

- Reviewing past maintenance records,
- Reviewing available photographs,
- Conducting a CCTV inspection to determine the condition of the line segment immediately following the SSO and reviewing the video and logs, and
- Interviewing staff that responded to the spill.

The product of the failure analysis investigation should be the determination of the root cause and the identification of corrective actions. The Collection System Failure Analysis Form in **Appendix 6-C** should be used to document the investigation.

6.11 SSO Documentation and Reporting

All SSOs should be thoroughly investigated and documented for use in managing the sewer system and meeting established notification and reporting requirements. The procedures for documenting and reporting SSOs are described below.

6.11.1 Internal SSO Notification and Reporting Procedures

Category 1 and 2 SSOs

The field crew will immediately notify the Public Works Senior Supervisor or Public Works Supervisor (working hours) or the On Call Supervisor (after hours). The Supervisor will notify the Public Works Maintenance Superintendent or the Deputy Director of Public Works.

The field crew will fill out the Sewer Field Crew Report form and turn it in to the Public Works Senior Supervisor or Public Works Supervisor. The Public Works Senior Supervisor or Public Works Supervisor will forward the report to the Public Works Maintenance Superintendent.

The Public Works Senior Supervisor or Public Works Supervisor (working hours) or the On Call Supervisor (after hours) will meet with field crew(s) at the site of the SSO event to assess the situation and to document the conditions with photos.

In the event of a very large overflow or an overflow in a sensitive area, the Deputy Public Works Director or the Public Works Director will notify the City Manager. The City Manager may notify the City Council.

In the event of a Category 1 SSO, the first responder should notify the City Environmental Health Division to collect water samples for determining water quality impacts of the SSO. Samples should be collected as soon as possible after the discovery of the SSO event.

Category 3 SSOs

The field crew will fill out the Sewer Field Crew Report form and turn it in to the Public Works Senior Supervisor or the Public Works Supervisor. The Public Works Senior Supervisor or Public Works Supervisor will forward the report to the Public Works Maintenance Superintendent.

6.11.2 External SSO Reporting Procedures

The California Integrated Water Quality System (CIWQS) electronic reporting system is used for reporting SSO information to the SWRCB. **Table 6-2** summarizes notification, reporting, monitoring, and record keeping requirements as specified in the WDR MRP. A flow chart showing the external reporting response requirements based on the type of SSO is included as **Figure 6-2**. **Figure 6-3** is a checklist listing external notification and reporting requirements.

Table 6-2: Notification, Reporting, Monitoring, and Record Keeping Requirements

ELEMENT	REQUIREMENT	METHOD
NOTIFICATION (see Section B*)	• Within 2 hours of becoming aware of any **Category 1 SSO greater than or equal to 1,000 gallons**, notify the California Office of Emergency Services (Cal OES) and obtain a notification control number.	Call Cal OES at: **(800) 852-7550**
REPORTING (see Section C*)	• **Category 1 SSO**: Submit Draft report within 3 business days of becoming aware of the SSO and certify within 15 calendar days of SSO end date. • **Category 2 SSO**: Submit Draft report within 3 business days of becoming aware of the SSO and certify within 15 calendar days of SSO end date. • **Category 3 SSO**: Submit Certified report within 30 calendar days of the end of month in which SSO occurred. • **SSO Technical Report**: Certify within 45 calendar days after the end date of any Category 1 SSO in which 50,000 gallons or greater is spilled to surface waters. • **"No Spill" Monthly Certification**: Certify that no SSOs occurred within 30 calendar days of the end of the month in which no SSOs occurred. • **Collection System Questionnaire**: Update and Certify every 12 months.	Enter data into the California Integrated Water Quality System (CIWQS) Online SSO Database (http://ciwqs.waterboards.ca.gov/), certified by enrollee's Legally Responsible Official(s).
WATER QUALITY MONITORING (see Section D*)	• Conduct water quality sampling **within 48 hours** after initial SSO notification for **Category 1 SSOs** in which **50,000 gallons or greater** is spilled to surface waters.	Water quality results are required to be uploaded into CIWQS for **Category 1 SSOs in which 50,000 gallons or greater** is spilled to surface waters.
RECORD KEEPING (see Section E*)	• SSO event records. • Sanitary Sewer Management Plan (SSMP) implementation and changes/updates to SSMP. • Records to document **Water Quality Monitoring for SSOs of 50,000 gallons or greater** spilled to surface waters. • Collection system telemetry records if relied upon to document and/or estimate SSO Volume.	Self-maintained records shall be available during inspections or upon request.

*Refers to section in Order No. WQ 2013-0058-EXEC (2013 amendment to Monitoring and Reporting Program associated with Order 2006-003-DWQ).

Figure 6-2: External Notification and Reporting Requirement Flow Chart

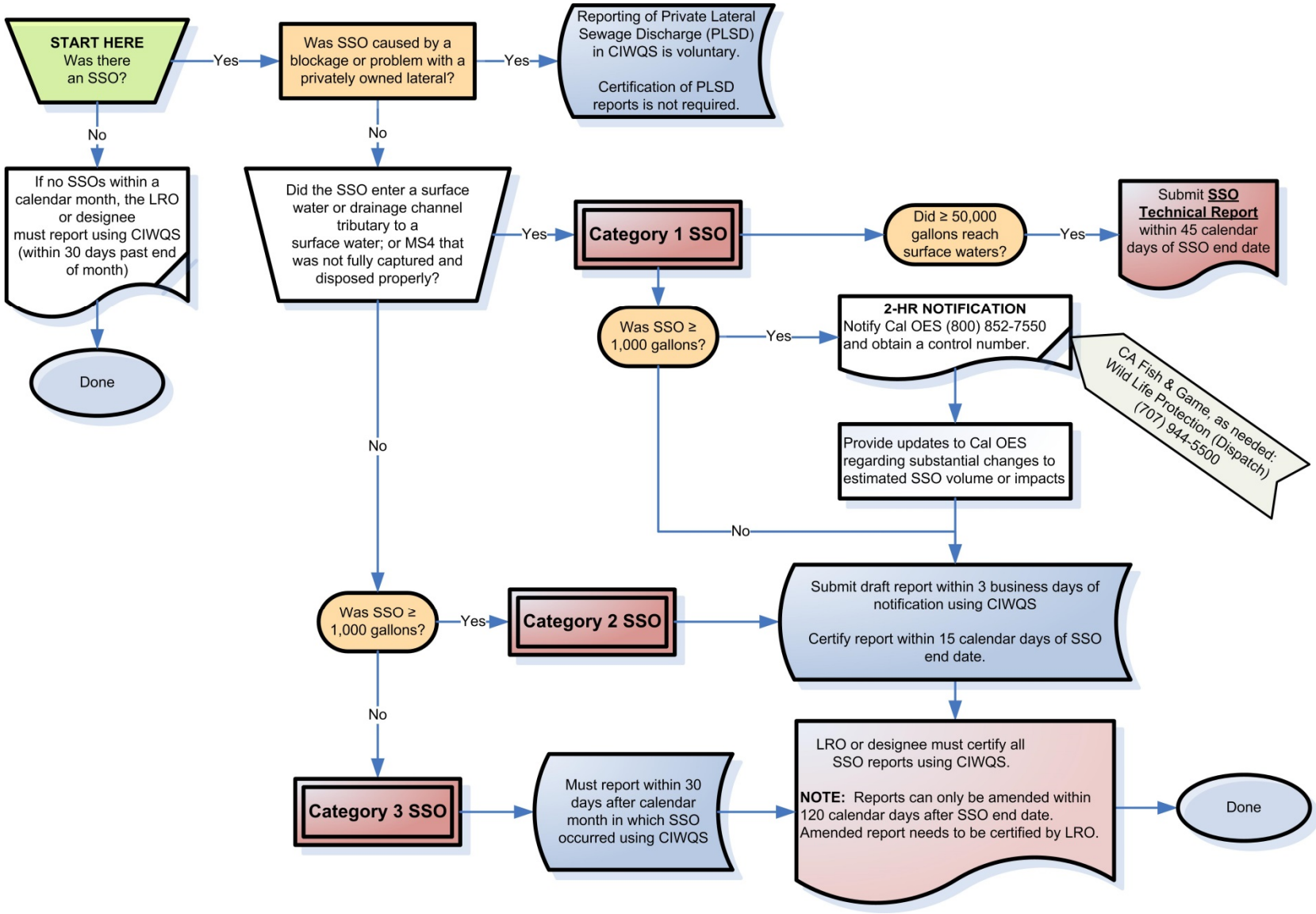


Figure 6-3: External Notification and Reporting Checklist

Reporting and Certification Checklist	Two-Hour Notification / 24-Hour Certification & SWRCB
Category 1 SSOs **2-Hour Notification:** √ Regulatory Agencies (OES and City Environmental Health Division) must be notified within two hours of ANY discharge of sewage (untreated/partially treated) to a surface water or drainage channel (that is not fully captured and returned to sewer). **Within 3 Business Days of Notification:** √ As a Category I SSO, it must be reported to SWRCB using CIWQS. **Within 15 Calendar Days of SSO end date:** √ Must be certified by LRO using CIWQS.	1) **OES** (916) 845-8911 Make sure you ask for an "OES Control Number" (for RWQCB). 2) **City Environmental Health Division** □ Phone Number: (510) 981-5310 Monday-Friday 08:00-17:00 □ After Hours: 911 or Central Dispatch at (510) 981-5900
Category 2 SSOs **Within 3 Business Days of Notification (SWRCB/CIWQS):** √ As a Category 2 SSO, it must be reported to SWRCB using CIWQS. **Within 15 Calendar Days of SSO end date:** √ Must be certified by LRO using CIWQS.	**California Integrated Water Quality Systems (CIWQS)** SWRCB Reporting Timeframes Depend on the Size and Final Destination of the SSO. o CIWQS must be used for reporting if the website is available □ http://ciwqs.waterboards.ca.gov □ User Name: □ Password: □ Waste Discharge Identification Number (WDID) #. o RWQCB Fax is only for use if the CIWQS website is down
Category 3 SSOs (<1,000, no Property Damage or Surface Waters) **Within 30-Days After End of Calendar Month with SSO Event:** √ Must be reported to SWRCB using CIWQS. √ Must be certified by LRO using CIWQS.	
Negative Reporting (No SSOs in Month) **Within 30 days past the end of the month** √ The LRO or designee must report using CIWQS	**Sanitary Sewer Overflow (SSO)** Any overflow, spill, release, discharge or diversion of untreated or partially treated wastewater from a sanitary sewer system that: (i) Reach waters of the United States (including storm drains, unless fully captured and returned to sanitary sewer sytem); (ii) Do not reach waters of the United States; and (iii) Backs up into buildings and on private property that are caused by City-owned lines.
Private Lateral SSOs (Reporting is Optional) √ If reporting is desired, report to SWRCB as "Private Lateral Sewage Discharge and identify responsible party, if known (not the City), using CIWQS.	

Category 1 SSOs

The following reporting requirements apply to any Category 1 SSO:

Within two hours of notification of the spill event, the Public Works Senior Supervisor or Public Works Supervisor will:

- Notify OES (and obtain spill number for use in other reports), and
- Notify the City Environmental Health Division

Within 3 business days of the spill event, the Public Works Maintenance Superintendent or his/her designee will submit the initial report using CIWQS.

Within 15 calendar days of the SSO end date, the Public Works Maintenance Superintendent or other authorized representative will submit the Final Certification.

The Public Works Maintenance Superintendent will attach additional information to the certified report, in the form of an attachment, as needed at any time.

Category 2 SSOs

The following reporting requirements apply to any Category 2 SSO:

Within 3 business days of the spill event, the Public Works Maintenance Superintendent or his/her designee will submit the initial report using CIWQS.

Within 15 calendar days of the SSO end date, the Public Works Maintenance Superintendent or other authorized representative will submit the Final Certification.

The Public Works Maintenance Superintendent will attach additional information to the certified report, in the form of an attachment, as needed at any time.

Category 3 SSOs

Within 30 calendar days after the end of the calendar month in which the SSO occurs, the Public Maintenance Superintendent or his/her designee will submit an electronic report using CIWQS. The Public Works Maintenance Superintendent or other authorized representative will certify the report.

SSO Technical Report

The City will submit an SSO Technical Report in the CIWQS Online SSO Database within 45 calendar days of the SSO end date for any SSO in which 50,000 gallons or greater are spilled to surface waters. This report will include the following:

Causes and Circumstances of the SSO:

a) Complete and detailed explanation of how and when the SSO was discovered.

b) Diagram showing the SSO failure point, appearance point(s), and final destination(s).

c) Detailed description of the methodology employed and available data used to calculate the volume of the SSO and, if applicable, the SSO volume recovered.

d) Detailed description of the cause(s) of the SSO.

e) Copies of original field crew records used to document the SSO.

f) Historical maintenance records for the failure location.

City's Response to SSO:

a) Chronological narrative description of all actions taken by enrollee to terminate the spill.

b) Explanation of how the City's OERP was implemented to respond to and mitigate the SSO.

c) Final corrective action(s) completed and/or planned to be completed, including a schedule for actions not yet completed.

Water Quality Monitoring:

a) Description of all water quality sampling activities conducted including analytical results and evaluation of the results.

b) Detailed location map illustrating all water quality sampling points.

Private Lateral Sewage Discharges

The Public Works Maintenance Superintendent or his/her designee may report private lateral SSOs using CIWQS **at the City's discretion**, specifying that the sewage discharge occurred and was caused by a private lateral and identifying the responsible party (other than the City), if known.

No Spill Certification (Monthly)

If there are no SSOs during the calendar month, the Public Works Senior Supervisor or Public Works Supervisor will submit an electronic report that the City did not have any SSOs The Public Works Maintenance Superintendent or his/her designee will certify the report **within 30 calendar days after the end of each calendar month**.

Amended SSO Report

The City may update or add additional information to a certified SSO report in CIWQS within 120 calendar days after the SSO end date. If update or additional information is needed, the Public Works Maintenance Superintendent will update or attach additional information to the certified report.

CIWQS Not Available

In the event that CIWQS is not available, the Public Works Senior Supervisor or Public Works Supervisor will fax all required information to the RWQCB office in accordance with the time schedules identified above. In such event, the City will submit the appropriate reports using CIWQS as soon as practical. The RWQCB fax number is (510) 622-2460.

6.11.3 Internal Procedures to Ensure Timely and Accurate CIWQS SSO Certification

- Responsibility for SSO Certification is assigned to the Senior Supervisor responsible for sewer maintenance; additionally, CIWQS SSO Certification training is provided to other senior staff.
- Status of the reporting and certification of SSOs is covered during regular bi-weekly Operations Sewer Staff meetings.
- Reporting on the status of SSO Certification is included as an agenda item to the standing monthly Sewer meeting between Operations and Engineering, including review of the CIWQS database to verify that it is up to date.
- A shared Operations/Sewer scheduling calendar is created in Outlook for the purpose of tracking the certification of SSOs in the CIWQS database.

- The City's Computerized Sewer Maintenance Management System, Accela, has been modified to include a mandatory SSO field; this field must be populated to close the incident in Accela, ensuring capture of SSO data.
- The Senior Sewer Supervisor retrieves regular reports from Accela to compare against CIWQS, verifying that all SSO data captured in Accela has been reported and certified in the CIWQS database.

6.11.4 Internal SSO Documentation

Category 1, 2 and 3 SSOs

The first responder will complete a work order and the Sewer Field Crew Report form and provide copies to the Public Works Senior Supervisor or Public Works Supervisor.

The Public Works Senior Supervisor or Public Works Supervisor will complete the Private Property Incident Form (Appendix 6-D) if an SSO has occurred in a residence or building.

The Public Works Senior Supervisor or Public Works Supervisor will create and maintain a file for each individual SSO. The file should include the following information:

- Initial service call information
- Sewer Field Crew Report form
- Copies of the CIWQS report forms
- Volume estimate
- Failure analysis investigation results

The following are for Category 1 and 2 SSOs, but optional for Category 3 SSOs:

- Appropriate maps showing the spill location
- Photographs of spill location
- Water quality sampling and test results, if applicable

Private Lateral SSOs

The first responder will complete the Sewer Field Crew Report form and provide copies to Public Works Senior Supervisor or Public Works Supervisor.

A separate file will be prepared for each individual SSO, at the Public Works Maintenance Superintendent's discretion. The file should include any relevant information from the above list.

6.11.5 External SSO Record Keeping Requirements

The MRP requires that individual SSO records be maintained by the City for a minimum of **five years** from the date of the SSO. This period may be extended when requested by a RWQCB Executive Officer.

All records shall be made available for review upon SWRCB or RWQCB staff's request during on-site inspection or through an information request. Records shall be retained for all SSOs, including but not limited to the following when applicable:

- Service call records and complaint logs of calls received by the City, documenting how the City responded to all notifications of possible or actual SSOs (including complaints that did not result in SSOs), including:
    - Date, time, and method of notification
    - Date and time the complainant or informant first noticed the SSO
    - Narrative description of the complaint, including any information the caller can provide regarding whether or no he/she knows if the SSO has reached surface waters, drainage channels, or storm drains
    - Follow-up return contact information for complainant or informant for each complaint received, if not reported anonymously
    - Final resolution of the complaint
- Electronic monitoring records relied upon for documenting SSO events and/or estimating SSO volume discharged, including:
    - Supervisory Control and Data Acquisition (SCADA) systems
    - Alarm systems
    - Flow monitoring devices or other instruments used to estimate wastewater levels, flow rates, or volumes;
- Records documenting steps and/or remedial actions taken to control and terminate the SSO and recover as much of the discharged volume as possible;
- Records documenting how estimates of volume discharged and volume recovered were calculated.

If water quality samples are required by an environmental or health regulatory agency or State law or if voluntary monitoring is conducted by the City or its agent(s) as a result of any SSO, records of monitoring information shall include:

- The date, exact place, and time of sampling or measurements;
- The individual(s) who performed the sampling or measurements;
- The date(s) analyses were performed;
- The individual(s) who performed the analyses;
- The analytical technique or method used; and
- The results of such analyses.

6.12 Post SSO Event Debriefing

Every SSO event is an opportunity to evaluate the response and reporting procedures. Each SSO event is unique, with its own elements and challenges including volume, cause, location, terrain, and other parameters.

As soon as possible after major SSO events, all of the participants, from the person who received the call to the last person to leave the site, should meet to review the procedures used and to discuss what worked and where improvements could be made in responding to and mitigating future SSO events. The results of the debriefing should be recorded and tracked to ensure the action items are completed.

6.13 SSO Response Training

This section provides information on the training that is required to support this OERP.

6.13.1 Initial and Annual Refresher Training

All City personnel who may have a role in responding to, reporting, and/or mitigating a sewer system overflow should receive training on the contents of this OERP. All new employees should receive training before they are placed in a position where they may have to respond. Current employees should receive annual refresher training on this plan and the procedures to be followed.

6.13.2 SSO Response Drills

Periodic training drills should be held to ensure that employees are up-to-date on the procedures, the equipment is in working order, and the required materials are readily available. The training drills should cover scenarios typically observed during sewer-related emergencies (e.g. mainline blockage, mainline failure, force main failure, pump station failure, and lateral blockage). The results and the observations during the drills should be recorded and action items should be tracked to ensure completion.

6.13.3 SSO Training Record Keeping

Records should be kept of all training that is provided in support of this plan. The records for all scheduled training courses and for each overflow emergency response training event and should include date, time, place, content, name of trainer(s), and names of attendees.

6.14 Contractors Working On City Sewer Facilities

All contractors working on City sewer facilities will be required to develop a project-specific OERP that is subject to City approval. All contractor personnel will be required to receive training in the contractor's OERP and to follow that OERP in the event that they cause or observe an SSO.

Chapter 7 FOG Control Program

This section presents the City's Fats, Oils, and Grease (FOG) Control Program. This FOG Control Program will be managed, staffed, and administered by the East Bay Municipal Utility District (EBMUD), with the exception of enforcement, which is the City's responsibility. The City Environmental Health Division will assist EBMUD in investigating problem areas.

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 the FOG problems in the City's sewer system. The City has reported 102 SSOs during the period 2009 through 2013, 57 of which were associated with sewer mainlines. Five of the 57 SSOs (9% of the total) were caused by grease. The City is currently experiencing one to two grease-related SSOs per year.

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

7.3 FOG Source Control Program

The City will continue to contract with EBMUD for FOG Source Control Program services. EBMUD's services include targeted FOG hot spot investigations (as reported by the City), food service establishment (FSE) and grease interceptor inspections, and public outreach and education. EBMUD also maintains a FOG control database to manage information about FSEs, inspections, FOG hotspots, and enforcement status. A quarterly report is prepared for each agency. The EBMUD Regional FOG Control Program is described in **Appendix 7-A**. An example quarterly report for Berkeley is included in **Appendix 7-B.**

The City Environmental Health Division has a Commercial Food Facility Inspection Program that inspects restaurants and other food service establishments within the City. The inspections for sanitation compliance include checking the food handling facilities practices and storm water inspections, as well as for wastewater discharge in order to control FOG in identified hot spots. The City Environmental Health Division will assist EBMUD in the investigation of problem restaurants and other food service establishments.

7.4 Public Outreach Program

City crews provide information on proper FOG disposal to residents that have experienced a FOG-related blockage or SSO.

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 to commercial and residential sources that are tributary to sewers that experience FOG-related stoppages and SSOs. The City'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. The City uses the results from the sewer cleaning operations to revise sewer cleaning frequencies as required to address maintenance issues. City staff provides the EBMUD FOG Source Control Program staff with timely notice when gravity sewers experience FOG-related blockages or SSOs. **Appendix 7-E** contains a copy of the form used to report grease SSOs and blockages to EBMUD for investigation.

7.7 Legal Authorities

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

Chapter 8 System Evaluation and Capacity Assurance Plan

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

8.1 Regulatory Requirements for the SECAP Element

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

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

(a) ***Evaluation:*** *Actions needed to evaluate those portions of the sanitary sewer system that are experiencing or contributing to an SSO discharge caused by hydraulic deficiency. The evaluation must provide estimates of peak flows (including flows from SSOs that escape from the system) associated with conditions similar to those causing overflow events, estimates of the capacity of key system components, hydraulic deficiencies (including components of the system with limiting capacity) and the major sources that contribute to the peak flows associated with overflow events;*

(b) ***Design Criteria:*** *Where design criteria do not exist or are deficient, undertake the evaluation identified in (a) above to establish appropriate design criteria; and*

(c) ***Capacity Enhancement Measures:*** *The steps needed to establish a short- and long-term CIP to address identified hydraulic deficiencies, including prioritization, alternatives analysis, and schedules. The CIP may include increases in pipe size, I/I reduction programs, increases and redundancy in pumping capacity, and storage facilities. The capital improvement plan shall include an implementation schedule and shall identify sources of funding.*

(d) ***Schedule:*** *The District shall develop a schedule of completion dates for all portions of the capital improvement program developed in (a) - (c) above. This schedule shall be reviewed and updated consistent with the SSMP review and update requirements in Section D. 14.*

8.2 Evaluation and Design Criteria

In October 2012, the City completed a *Sewer System Hydraulic Modeling and Capacity Assessment* study that included wet weather flow monitoring in the system, development of a dynamic hydraulic model of the collection system calibrated to the flow monitoring data, and use of the model to identify potential capacity deficiencies in the system. This report is incorporated into this SSMP by reference.

The capacity analysis was based on use of winter water use data to estimate dry weather base wastewater flows for existing development and I/I rates determined based on the flow monitoring. The design storm used in the analysis is the 5-year return period event developed as part of the 1980s East Bay I/I Study. **Appendix 8-A** contains excerpts from the report describing the design flow, hydraulic, and capacity analysis criteria used for the analysis.

Capacity deficiencies were identified when the model predicted surcharge to within 5 feet of manhole rims during design storm peak wet weather flow conditions, and needed capacity improvements (either upsizing of existing pipes or flow diversions to route flow away from capacity-deficient pipes) were identified for each deficiency. The estimated amount of I/I reduction that would be required to eliminate the need for capacity improvements was also determined.

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 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. Some localized capacity restrictions may remain, as indicated by the model results; however, wet weather overflows have not been observed at these locations.

8.3 Capacity Enhancement Measures and Schedule

The City is evaluating each of the capacity deficient areas identified in the 2012 report and developing an approach for addressing each area. As of December 2013, five projects were in design or pre-construction phases, and five additional projects were in the planning phase. The table in **Appendix 8-B** lists the status of each project. The projects will be funded under the City's sewer rehabilitation CIP. The City will update the CIP schedule on an on-going basis as planning and design is completed for each project.

Note also that as part of the work being conducted under the City's EPA Stipulated Order, the City is conducting smoke testing in areas with high peak I/I flows to identify potential sources of direct inflow and infiltration into the sewer system from both private property and the public portions of the system. The City is conducting follow-up notification and enforcement for all sources of I/I found on private property, and investigating and correcting any such sources in the public system. 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 that may be contributing to capacity issues.

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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 the City's geographical information system (GIS), computerized maintenance management system (CMMS), and the State Water Resources Control Board's California Integrated Water Quality System (CIWQS) SSO database 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 monitors SSO performance and other sewer program parameters annually and documents performance in annual reports to the EPA as required under its Stipulated Order. 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 Accela CMMS and other databases maintained by the City contain information on the effectiveness of preventive maintenance activities and allows for historical review of pipeline conditions in order to adjust maintenance and repair priorities. The City also performs a failure cause analysis of all individual sewer overflow events and identifies corrective actions to prevent future SSOs at locations where SSOs occurred in the previous year, as well as corrective actions to SSMP program elements that are appropriate based on this review. The indicators that the City uses to measure the performance of its wastewater collection system and the effectiveness of its SSMP are listed in **Table 9-1.** The City will update the data and analysis of performance measures at the time of each evaluation and may use other performance measures as well in its evaluation.

Table 9-1: Performance Metrics for Monitoring and Measurement

	Performance Measure	Source
System Statistics	Total miles of gravity sewer	GIS
	Total miles of pressure sewer	GIS
	Total number of manholes	GIS
	Total number of sewage pumping stations	GIS
Measures Based on SSO Number	Total number and percentage of SSOs by Category	CIWQS
	Number and percentage of dry weather versus wet weather SSOs	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	Volume of SSOs per 100 miles per Year	CIWQS
	Number and percentage of SSOs by Volume	CIWQS
	Total volume of SSOs	CIWQS
	Mean and median SSO volume	CIWQS
	Total SSO volume recovered and percentage of overall total SSO volume	CIWQS
	Net volume of SSOs (total minus recovered) and percentage of overall total SSO volume	CIWQS
	Total volume reaching storm drainage channel and not recovered or reaching surface waters and percentage of overall total SSO volume	CIWQS
SSO Response Time	Average response time during business hours	CIWQS
	Average response time outside of business hours	CIWQS
Maintenance	Number of blockages in the past year by cause	Accela CMMS
	Amount of “hot spot” cleaning performed (LF)	Accela CMMS
	Amount of routine cleaning performed (LF)	Accela CMMS
	Amount of cleaning QA/QC CCTV performed (% of cleaning footage)	POSM
	Amount of root control performed (LF)	Accela CMMS
Condition Assessment, Rehabilitation, and I/I Control	Amount of CCTV inspection performed (LF)	POSM
	Number of manholes inspected	POSM
	Amount of mainlines (LF) and number of manholes and lower laterals rehabilitated	GIS, Contract Documents
	Number of inflow sources detected and corrected	Spreadsheet
	Number of PSLs repaired or replaced and certified	HTE

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 Berkeley (see Appendix 7-B).

9.3 Annual Reporting

Under its Consent Decree, the City submits Annual Reports to the EPA, SWRCB, and RWQCB documenting its compliance with the requirements of the Consent Decree and its performance during each calendar year, and identifying any planned changes to programs for the following year. The Annual Report includes metrics and narrative reports on the following programs that are relevant to the Monitoring, Measurement, and Program Modifications element of the SSMP:

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

9.4 SSMP Updates

The City will update its SSMP at least every five years. The first update was completed before May 2, 2014. The second update was completed in May 2019. The SSMP Program Audit, conducted every two years (and more frequently if deemed necessary) will be one of many indicators used to determine if any major updates are required prior to a 5-year update. Any major changes to the SSMP require approval by the City Council. The City may make minor changes, such as changes to the organizational chart, without City Council approval.

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

Chapter 10 SSMP Program Audits

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

10.1 Regulatory Requirements for the SSMP Program Audits Element

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

10.2 Plan for SSMP Program Audits

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

A team of Public Works staff will conduct the audit. 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 the last audit in May 21, 2019. A copy of the 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 Berkeley and its 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 City communicates on a regular basis with the public on the development, implementation, and performance of it SSMP. The communication system provides the public the opportunity to provide input to the District's SSMP and SSMP implementation. This communication occurs in the form of public notices at City Hall and on the City's website on the Sanitary Sewer Program webpage. Both postings during the update of the SSMP read as follows:

> *The City of Berkeley is updating its Sewer System Management Plan (SSMP) to meet the requirements established by the State Water Resources Control Board Order 2006-0003, Statewide General Discharge Requirements of Sanitary Sewer Systems. The goal of the SSMP is to minimize the frequency and severity of sanitary sewer overflows. The SSMP will cover the management, planning, design, operation and maintenance of the City's sanitary sewer system. The update began in November 2013 and it is expected to be complete by June 2014. The City's current SSMP is available for review at the Engineering Offices, 1947 Center Street, 4th Floor, during normal business hours. Interested parties can contact Tiffany Pham at (510) 981-6427 or TPham@cityofberkeley.info for additional information.*

The information provided to interested parties upon request included: a copy of the current SSMP and contact information and/or opportunities for input into the SSMP update and implementation process.

Table 11-1 lists the various strategies the City employs to communicate with the public on the development, implementation, and performance of the City's SSMP. A copy of the City's Sanitary Sewer Program webpage is included in **Appendix 11-A.**

Table 11-1: Strategies for Communication with Public on SSMP Development, Implementation and Performance

Subject Matter	Strategy	Description	Frequency
SSMP Development	Public Posting and Website Posting	The City posted a notice on its website and with the official notices on the Bulletin Board at City Hall to inform interested members of the public it was updating the SSMP. The public was given the opportunity to request and review the draft SSMP and to provide the City with input in person, via mail, via e-mail, or via phone. Public comments were accepted via e-mail or via phone. The City evaluated public input when provided and addressed questions and comments as appropriate.	During development of SSMP update
SSMP Implementation	Website	The City has a Sanitary Sewer Program webpage (http://www.ci.berkeley.ca.us/Public_Works/Sewers_-_Storm/Sanitary_Sewer_Program.aspx) dedicated to the collection system. The page includes an e-mail address and phone number for whom to call to view or request a copy of the SSMP, as well as to ask questions regarding SSMP content, implementation, and performance.	Always available on City webpage
Sanitary Sewer System Smoke Testing Program	Website	The City created a webpage (http://www.ci.berkeley.ca.us/pw/smoketesting/) to communicate the Sanitary Sewer System Smoke Testing Program to the public. The webpage provides background on the smoke testing program and maps indicating where the City's smoke testing contractor will perform testing during the summer months over the next 10 years starting in summer 2011.	Always available on City webpage
Private Sewer Lateral Compliance Policy	Website	The City website has a webpage (http://www.ci.berkeley.ca.us/psl/) providing information regarding recent changes to the City's private sewer lateral compliance policy. The webpage provides a Compliance Guide, section 17.24 of the Berkeley Municipal Code providing the City with authority to implement this program, and a phone number for the public to contact City staff for further information.	Always available on City webpage
SSMP Performance	CIWQS Website	Sewer overflow performance information is available to the public on the State Water Resources Control Board (SWRCB) California Integrated Water Quality System (CIWQS). Go to https://ciwqs.waterboards.ca.gov/ciwqs/readOnly/PublicReportSSOServlet?reportAction=criteria&reportId=sso_main. Type in "2SSO10096" in the **Enter WDID** field. Click on "Generate Report" button.	Always available on internet

11.3 Communication with Tributary Systems

The City of Berkeley has regular communication with systems that are tributary, satellite, and/or neighboring to the City's sanitary sewer system. The City has several opportunities to regularly communicate with tributary, satellite, or neighboring 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 tributary, satellite, and neighboring agencies in the Bay Area at monthly BACWA Collection System Committee meetings.

Table 11-2: Plan for Communication with Tributary and/or Satellite Agencies

Agency	Relationship	Communication Plan
Cities of Albany and Oakland	Neighboring agencies. Some flow from these systems discharge into Berkeley's collection system and vice versa.	Regular communication at Technical Advisory Board (TAB) meetings. Other meetings as needed.
East Bay Municipal Utility District (EBMUD)	Berkeley is a satellite of EBMUD.	Regular communication at TAB meetings.
Alameda, Albany, Emeryville, Oakland, Piedmont, and Stege Sanitary District	Other satellite agencies of EBMUD that discharge into the EBMUD interceptor system.	Regular communication at TAB and EBCSAC meetings.
University of California, Berkeley (UCB)	UCB is a satellite of City of Berkeley.	As required. The City has a copy of UCB's SSMP and contact information and communicates when necessary.
Lawrence Berkeley National Laboratory (LBNL)	LBNL is a satellite of both City of Berkeley and UCB.	As required. The City has a copy of LBNL's SSMP and contact information and communicates when necessary.