



Long Beach Water

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1800 E. Wardlow Road, Long Beach, CA 90807-4931
562.570.2300 | lbwater.org

CHRISTOPHER J. GARNER, General Manager

Board of Water Commissioners
October 10, 2019 Board Meeting

Subject:

Approve the Long Beach Water Department's updated 2019-2024 Sewer System Management Plan (SSMP) and authorize the General Manager to submit the approved SSMP to the State Water Resources Control Board and to implement the SSMP.

Executive Summary:

The State Water Resources Control Board (SWRCB) requires public agencies in the State of California operating a sanitary sewer system to develop and implement a Sewer System Management Plan (SSMP). The overall objective of SSMP is to prevent and minimize sanitary sewer overflows (SSOs) and to mitigate SSOs that do occur. The SSMP establishes a detailed roadmap to effectively manage, operate, and maintain Long Beach Water Department's sewer collection system.

In accordance with SWRCB order No. 2006-003-DWQ, the SSMP shall be updated every 5 years. The Department has been working with HDR Engineering, Inc. to update the previous SSMP to include lessons learned internally and from other agencies. Approval and submission of the 2019-2024 SSMP will fulfill the SWRCB's order and will guide the Department over the next 5-years.

Staff Recommendation:

Approve the Long Beach Water Department's updated 2019-2024 Sewer System Management Plan (SSMP) and authorize the General Manager to submit the approved SSMP to the State Water Resources Control Board and to implement the SSMP.


Fiscal Impact: Funds associated with implementation of the SSMP are budgeted annually as part of the Sewer Fund Budget process.



Tai J. Tseng
Assistant General Manager - Operations

10/2/19

Date



Christopher J. Garner
General Manager

10/2/19

Date

Attachment





Long Beach Water Department Sewer System Management Plan

2019 Sewer System Management Plan Update

Long Beach, CA
September 2019



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Acronyms and Abbreviations

BMP	best management practice
Caltrans	California Department of Transportation
CCTV	closed-circuit television
CIP	capital improvement program
City	City of Long Beach
CIWQS	California Integrated Water Quality System
Department, Water Department, LBWD	Long Beach Water Department
FOG	fats, oils, and grease
FSE	food service establishments
GIS	Geographic Information System
LACSD	Sanitation Districts of Los Angeles County
LBDHHS	Long Beach Department of Health and Human Services
LBMC	City of Long Beach Municipal Code
LRO	Legally Responsible Official
NASSCO	National Association of Sewer Service Companies
O&M	operations and maintenance
SCADA	Supervisory Control and Data Acquisition
SSMP	Sewer System Management Plan
SSO	sanitary sewer overflow
SWRCB	State Water Resources Control Board
VCP	vitrified clay pipe



1 Goals and Overview

This section provides the goals and an overview of the Sewer System Management Plan (SSMP) for the City of Long Beach (City) Water Department (LBWD).

The purpose of this SSMP is to provide a plan and schedule to properly manage, operate, and maintain all parts of LBWD's sewer system. The overall objective of LBWD SSMP program implementation is to prevent and minimize sanitary sewer overflows (SSO) and to mitigate SSOs that do occur.

According to the State Water Resources Control Board's (SWRCB) Statewide General Waste Discharge Requirements for Sanitary Sewer Systems (Order No. 2006-0003-DWQ), the SSMP must be updated to incorporate changes every 5 years. This order is included as Attachment A1. This report is the updated version from the previous SSMP submitted in April 2014. A summary of changes to the SSMP is included as Attachment A2.

1.1 Structure

This SSMP is organized by 11 elements, as mandated in Order No. 2006-0003-DWQ:

1. Goal
2. Organization
3. Legal Authority
4. Operation and Maintenance (O&M) Program
5. Design and Performance Provisions
6. Overflow Emergency Response Plan
7. Fats, Oils, and Grease (FOG) Control Program
8. System Evaluation and Capacity Assurance Plan
9. Monitoring, Measurement, and Program Modifications
10. SSMP Program Audits
11. Communication Program

Each SSMP element is in full compliance with Order No. 2006-0003-DWQ and Order No. WQ 2008-0002-EXEC, and collectively, the SSMP elements meet the following objectives:

- a) Properly fund, manage, operate, and maintain, with adequately trained staff, and/or contractors possessing adequate knowledge, skills, and abilities, all parts of the collection system owned and/or operated by LBWD
- b) Provide adequate capacity to convey base flows and peak flows, including flows during wet weather events, to the minimum design criteria (as defined in Section 8), for all parts of the collection system owned and/or operated by LBWD

- c) Take all feasible steps to stop and mitigate the impact of SSOs in the collection system owned and/or operated by LBWD

This SSMP integrates documentation of numerous collection system management programs into one formal document. These programs are described in greater detail in a variety of documents, which are referenced in this SSMP when appropriate.

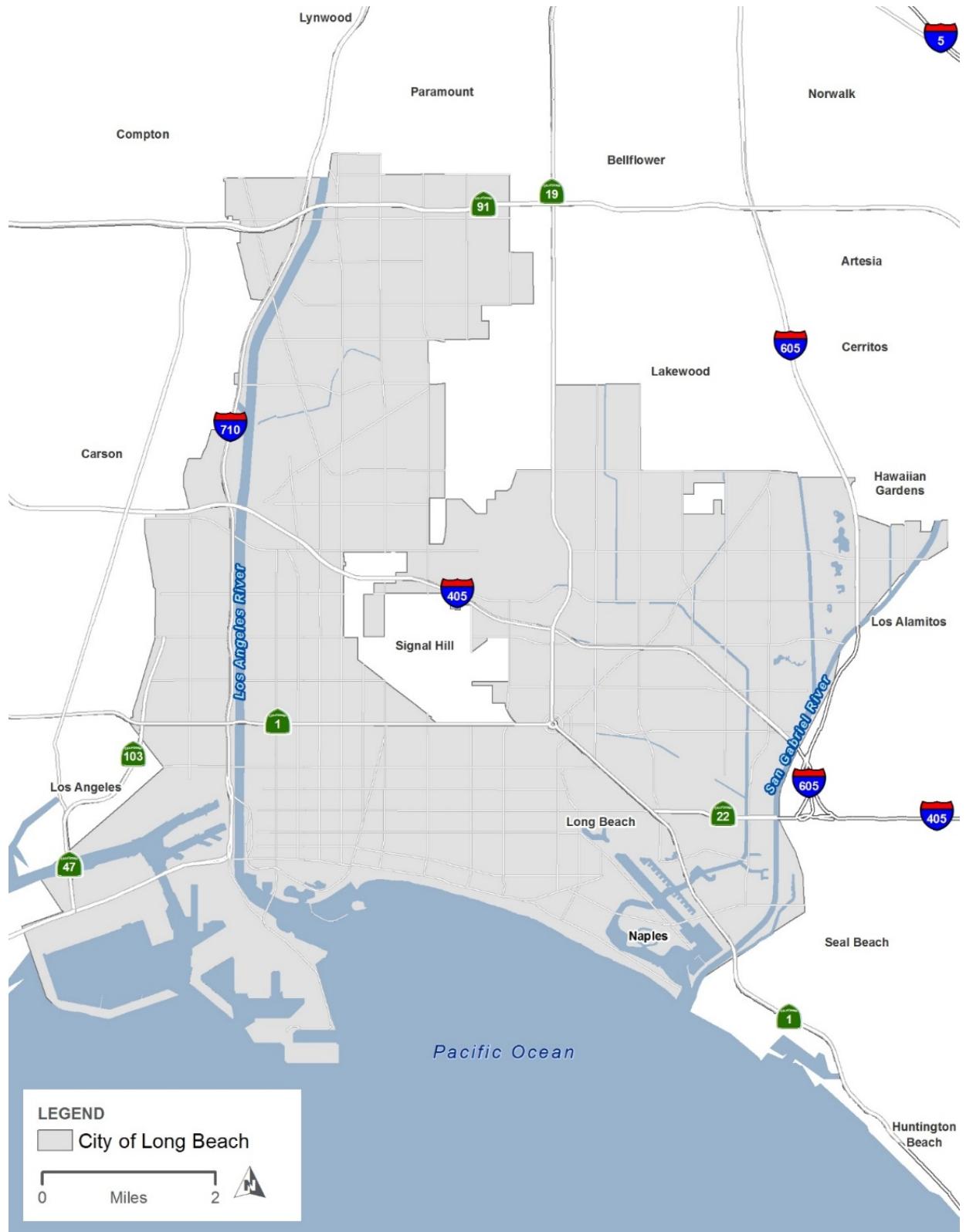
1.2 System Overview

The LBWD is a commission-governed department of the City consisting of over 200 employees and operating with an annual budget of approximately \$130 million. Established July 1, 1911, by the City Charter, LBWD's functions are to regulate and control the use, sale, and distribution of water owned or controlled by the City. In February 1988, LBWD assumed the responsibility of the various functions of the City's sanitary sewer system, including operations and maintenance.

LBWD's service area is located in Los Angeles County within Southern California, approximately 20 miles south of downtown Los Angeles and 105 miles north of San Diego. This coastal city is approximately bordered by the Pacific Ocean, the Los Angeles River, and the San Gabriel River, as shown on **Figure 1-1**.



Figure 1-1. City of Long Beach Map



With a population of approximately 492,000, the City is currently the second largest city in Los Angeles County and the fifth largest city in the state of California. The City is heavily developed, with a downtown at 4.2 million square feet of commercial office space. Major landmarks include the Long Beach Airport and the Port of Long Beach, one of the busiest container ports in the world. Tourism in the City continues to attract over 5.5 million visitors a year, as noted in *City of Long Beach Demographics* from the City website (City of Long Beach n.d.a):

http://www.longbeach.gov/globalassets/finance/media-library/documents/city-budget-and-finances/budget/budget-documents/fy-06-adopted-budget-webpage/understanding_the_city_s_budget

According to the 2018 SSMP Internal Audit (**Attachment J1**), the LBWD sanitary sewer system comprises of:

- 712 miles of gravity mains
- 7.6 miles of force mains (2-inch to 12-inch diameter)
- 28 sewer lift stations
- 115,133 lateral connections
- 16,158 sewer maintenance manholes

1.3 Sewer System Management Plan Goals

The overall goal of the SSMP is to achieve zero preventable SSOs, as encouraged by U.S. Environmental Protection Agency and State of California regulatory agencies. However, due to the sporadic and unexpected nature of the majority of SSO events, which can be caused by vandalism, contractor or property owner damage, excessive customer discharge of FOG, or extreme weather events, it is possible to minimize, not eliminate, SSO events.

LBWD has identified the following specific goals for the SSMP:

- Goal 1. To properly manage, operate and maintain all portions of LBWD's wastewater collection system.
- Goal 2. To provide adequate capacity to convey peak flows.
- Goal 3. To minimize the frequency of SSOs.
- Goal 4. To mitigate the impact of SSOs.
- Goal 5. To meet all applicable regulatory notification and reporting requirements.

1.4 Regulatory Goals

Federal and state regulatory agencies consider SSOs to be a violation of the Clean Water Act. Furthermore, federal and state regulatory agencies consider SSOs to be a potential



indicator of improper management, operation, and maintenance of the wastewater system. Regulatory requirement is designed to accomplish the overall goal of “zero” SSOs.

Most regulatory officials recognize that it is extremely difficult to achieve zero SSOs on a consistent basis. This is especially true for “dry weather SSOs” that are caused by blockages, as opposed to “wet weather SSOs” that are caused by peak flows exceeding system capacity. Wet weather SSOs tend to occur at somewhat predictable, repeat overflow locations, unless a specific storm event is especially heavy in a particular section of the sewer system. Dry weather SSOs tend to occur at more random, isolated locations. Some dry weather SSOs can be prevented by recognizing sections of the sewer system that may be prone to certain types of dry weather overflows. Other dry weather SSOs, such as those caused by vandalism or by damage caused by external agencies or contractors, can seldom be prevented by collection system managers or operators.

Consequently, SSMP elements are designed as a starting point in formalizing and institutionalizing an evaluation and continuous improvement process for the wastewater collection system. As the SSMP elements are implemented, the Monitoring, Measurement, and Program Modifications SSMP element will develop performance measurements to track success of each of the SSMP elements. If any of the SSMP elements are not contributing sufficiently to the overall goal of “zero” SSOs, then those SSMP elements should be re-evaluated and refined to facilitate further progress toward the goal and thus implement a philosophy of continual improvement for the collection system management and operations.

1.4.1 Regulatory Context

LBWD is required to comply with the SWRCB *Waste Discharge Requirements*, adopted May 2, 2006. Order No. 2006-0003-DWQ and associated *Monitoring and Reporting Program* requirements are included as **Attachment A1** and **Attachment A3**, respectively.

Additional information can be found at:

https://www.waterboards.ca.gov/water_issues/programs/ssw

1.4.2 Summary of State Water Resources Control Board Waste Discharge Requirements

Table 1-1 summarizes the SWRCB *Waste Discharge Requirements* and associated monitoring and reporting requirements under which the collection system operates and that are addressed by this SSMP. All agencies that own and operate collection systems greater than 1 mile in length must comply with these requirements. In addition, Section C of the SWRCB *Waste Discharge Requirements* prohibits SSOs to waters of the United States, and SSOs that cause a nuisance, per the California Water Code Section 13050(m).

Table 1-1. Summary of State Water Resources Control Board Waste Discharge Requirements and Monitoring and Reporting Program Requirements

Provisions	Description	Applies to
D.3-5, 7	SSO prevention, response, and control	Element 4, Operation and Maintenance Program; Element 6, Overflow Emergency Response Plan; Element 7, FOG Control Program; Element 8, System Evaluation and Capacity Assurance Plan
D.8-9	System operations and maintenance, adequate resource allocation, appropriate training, knowledge, and abilities	Element 4, Operation and Maintenance Program
D.10	Adequate capacity for base, peak, and wet weather flows	Element 8, System Evaluation and Capacity Assurance Plan
D.11, 13-14	SSMP requirement, content, update and certification	All Elements of SSMP
D.12	Use of qualified professionals for engineering and geological evaluations and judgments	Element 5, Design and Performance Provisions
Monitoring and Reporting Requirements	SSO reporting and notification; water quality monitoring; change log	Element 6, Overflow Emergency Response Plan; Water Quality Monitoring Plan; SSMP Revision Log

Notes:

SSMP=Sewer System Management Plan; SSO=sanitary sewer overflows

1.4.3 Application for Coverage under the State Water Resources Control Board Waste Discharge Requirements

LBWD applied for coverage under the general *Waste Discharge Requirements* in 2006 for one collection system and was assigned a Wastewater Discharger Identification Number of **4SSO11423** in the California Integrated Water Quality System (CIWQS).



2 Organization

This section identifies the authorized representative to meet the SWRCB requirements for completing and certifying spill reports and the implementation and development of the SSMP. This section also includes the staff responsible for managing and maintenance of the wastewater collection system and the responders to SSO events.

2.1 Overview

In 1911, LBWD created its own water company by buying out its two private suppliers, the Long Beach Water Company and the Alamitos Water Company. In 1931, voters amended the LBWD charter to establish the Board of Water Commissioners, 5 citizens appointed for 5-year terms by the LBWD General Manager (now by the Mayor) with City Council approval. In 1988, LBWD assumed responsibility for O&M of LBWD's sanitary sewer system. In 1990, voters amended LBWD charter to allow greater autonomy for LBWD in administering LBWD's sanitary sewer operations.

2.2 Authorized Representative

LBWD has designated a primary Legally Responsible Official (LRO) pursuant to Section J., Report Declaration, of the Order No. 2006-0003.

Primary LRO

Mrs. Lourdes Vargas

Director of Field Operations

1800 East Wardlow Road

Long Beach, CA 90807

(562) 570-2393

Lourdes.Vargas@lbwater.org

Backup LRO

Mr. Tai Tseng

Assistant General Manager

1800 East Wardlow Road

Long Beach, CA 90807

(562) 570-2420

Tai.Tseng@lbwater.org

2.3 Positions Responsible for Implementing Sewer System Management Plan Program

A summary of key positions, including the personnel responsible for responding to and reporting SSOs, is presented in **Table 2-1** below.

Table 2-1. Responsible Position for Implementing SSMP

SSMP Element	Responsible Position
Goal, Organization & Legal Authority	<ul style="list-style-type: none"> • AGM of Operations (LRO) • Director of Field Operations (LRO) • Director of Engineering • Superintendent of Sewer Operations
O&M – Mapping	<ul style="list-style-type: none"> • Engineering Manager for Development Services • Business System Specialist VII • GIS Analyst
O&M – Preventive Maintenance	<ul style="list-style-type: none"> • Superintendent of Sewer Operations • Sewer Operations Water Utility Supervisor II's • Sewer Operations Water Utility Supervisor I's • Treatment Plant Superintendent • Water Treatment Supervisor I
O&M – System Rehabilitation	<ul style="list-style-type: none"> • Director of Engineering • Engineering Manager for Facilities • Engineer Manager for Development Services
Design and Performance Provisions	<ul style="list-style-type: none"> • Director of Engineering • Engineering Manager of Pipeline Infrastructure • Engineering Manager for Facilities • Construction Services Officer
Overflow Emergency Response – Response & Reporting	<ul style="list-style-type: none"> • Superintendent of Sewer Operations • Sewer Operations Water Utility Supervisor II's • Sewer Operations Water Utility Supervisor I's
Overflow Emergency Response – Water Quality Monitoring	<ul style="list-style-type: none"> • LBDHHS Environmental Health Operations Officer • LBDHHS Environmental Health Specialist IV's • LBDHHS Environmental Health Specialist III
FOG Control Program	<ul style="list-style-type: none"> • Engineering – Facilities – Associate Civil Engineer • Engineering – Development Services – Sr. Civil Engineer • LBDHHS Environmental Health Operations Officer • LBDHHS Environmental Health Specialist IV's • LBDHHS Environmental Health Specialist III
System Evaluation and Capacity Assurance	<ul style="list-style-type: none"> • Director of Engineering • Engineering - Senior Program Manager



Table 2-1. Responsible Position for Implementing SSMP (Continued)

SSMP Element	Responsible Position
Monitoring, Measurement, and Program Modifications	<ul style="list-style-type: none"> • Director of Field Operations (LRO) • Superintendent of Sewer Operations • Director of Engineering • Engineering - Senior Program Manager • Engineering Manager for Facilities
SSMP Program Audits	<ul style="list-style-type: none"> • Director of Field Operations • Superintendent of Sewer Operations
Communication Program	<ul style="list-style-type: none"> • Public Information Officer • Superintendent of Sewer Operations

Notes:

FOG=fats, oils, and grease; LBDHHS=Long Beach Department of Health and Human Services; LBWD=Long Beach Water Department; LRO=Legally Responsible Official; O&M=operations and maintenance; SSMP=Sewer System Management Plan

An organization chart showing the lines of authority for key positions responsible for implementing various elements of the SSMP program is included in **Attachment B1**. The contact information for each key position is included in **Attachment B2**.

2.4 Chain of Communication for Reporting Sanitary Sewer Overflows

The chain of communication for reporting and notification of sanitary sewer overflows is documented in the *Overflow Emergency Response Plan*, which is included in **Attachment F1**. Key positions described in the workflow include:

Water Communications Dispatch Control 1 (Normal Working Hours): The Water Communications Dispatch Control 1 receives complaint calls during Normal Working Hours and forwards these calls to Radio #530.

Radio #530: Radio #530 receives SSO complaints during Normal Working Hours and contacts the Water Utility Supervisor II to notify the potential SSO and also contacts a Cleaning Truck Crew to be dispatched and investigate.

Water Utility Supervisor II: The Water Utility Supervisor II receives notification of a potential SSO and sends out information to LBWD's SSO email list. After receiving SSO facts from Radio #530, the Water Utility Supervisor II will send out a confirmation of the SSO with additional information to the SSO email list. If there is no reportable SSO, the Water Utility Supervisor II will notify the SSO email list. The Water Utility Supervisor II is responsible for draft SSO reporting in CIWQS.

Cleaning Truck Crew: The cleaning truck crew will respond to all SSOs notified by Radio #530. If the SSO is confirmed, the cleaning truck crew will notify the Water Utility Supervisor II and begin leading spill response activities and documentation of the spill event. In addition, the Cleaning Truck Crew Lead is responsible for SSO notifications to the Office of Emergency Services, Regional Board, and other stakeholders.

Water Communications Dispatch Control 1 (After Hours 5:00 p.m. to 7:30 p.m.): The Water Communications Dispatch Control 1 receives complaint calls during After Hours, from 5:00 p.m. to 7:30 p.m., and contacts the Standby Sewer Lead of a potential SSO.

Water Communications Dispatch Control 2 (After Hours 7:30 p.m., Weekends and Holidays): The Water Communications Dispatch Control 2 receives complaint calls after 7:30 p.m. Monday through Friday, and on weekends and Holidays. Control 2 notifies the Standby Sewer Lead of a potential SSO.

Sewer Standby Lead: The Sewer Standby Lead receives notifications of a potential SSO and contacts a second standby crew person to pick up a cleaning truck at the Operations Service Center yard and meet at the spill location. The Sewer Standby Lead will call and inform the Standby Water Utility Supervisor II of a potential SSO.

Standby Water Utility Supervisor II: The Standby Water Utility Supervisor II will send out notification to the SSO email list and receive SSO facts from the Sewer Standby Lead. Once the facts of the potential SSO have been received and SSO has been verified, the Standby Water Utility Supervisor II will send additional information out to the SSO email list. The Standby Water Utility Supervisor II is responsible for draft SSO reporting in CIWQS.

Sewer Operations Superintendent: The Sewer Operations Superintendent is responsible for verifying that all Sewer Water Utility Supervisors follow the established SSO protocols pertaining to the SSMP.

Normal Working Hours are 6:30 a.m. to 5:00 p.m., Monday through Friday, except holidays. After Hours are 5:00 p.m. to 6:30 a.m., Monday through Friday, as well as weekends and holidays.

A detailed workflow for the sanitary sewer overflow response is shown on Figure 3-1 (Working Hours) and Figure 3-2 (After Hours) in **Attachment F1**.



3 Legal Authorities

The SWRCB *Waste Discharge Requirements* require LBWD to demonstrate, through sanitary sewer system use ordinances, service agreements, or other legally binding procedures, that it possesses the necessary legal authority to:

- Prevent illicit discharges into its sanitary sewer system (examples may include infiltration and inflow, stormwater, chemical dumping, unauthorized debris and cut roots, etc.)
- Require that sewers and connections be properly designed and constructed
- Ensure access for maintenance, inspection, or repairs for portions of the lateral owned or maintained by the Public Agency
- Limit the discharge of FOG and other debris that may cause blockages
- Enforce any violation of its sewer ordinances

Section 3 describes the sources of LBWD's legal authorities and the key legal authorities LBWD possesses to support proper management of the sewer system.

3.1 Sources of Long Beach Water Department Legal Authorities

3.1.1 City of Long Beach Charter

Article XIV of the City's Charter established LBWD and grants LBWD full and complete jurisdiction over all of the City's sewer system. According to Article XIV, LBWD is under the exclusive jurisdiction and control of the LBWD Board of Water Commissioners (Board) who have complete and exclusive power and duty to supervise, control, regulate, and manage the LBWD and to make and enforce all necessary rules and regulations.

The City Charter is available online at:

https://library.municode.com/ca/long_beach/codes/city_charter

3.1.2 Long Beach Water Department Rules and Regulations

LBWD's Board adopts Rules, Regulations and Charges Governing Potable Water, Reclaimed Water, Sewer Service, and the Water Conservation and Water Supply Shortage Plan (Rules and Regulations) to govern departmental operations. Key sewer terms and phrases are capitalized throughout the document and are defined in Part 10.

The Rules and Regulations are available on LBWD's website at:

<https://lbwater.org/about-us/important-documents/rules-regulations/>

3.1.3 City of Long Beach Municipal Code

LBWD's Rules and Regulations are codified into Chapter 15, *Public Utilities of the City of Long Beach Municipal Code* (LBMC), as approved and adopted by City Council. The LBMC 15.01.010, states in part:

The current edition of the rules, regulations, and charges governing water and sewer service as approved by the Board of Water Commissioners is incorporated by this reference. A copy of the rules, regulations, and charges governing water and sewer service is available in the office of the General Manager.

The Board of Water Commissioners has further charged the General Manager of LBWD with administration of the Rules and Regulations as noted in the LBMC 15.01.020:

The General Manager is charged by the Board of Water Commissioners with the responsibility to administer the rules, regulations and charges governing water and sewer service.

The LBMC is available online at:

https://library.municode.com/ca/long_beach/codes/municipal_code

Table 3-1 summarizes LBWD's legal authorities for each of the legal authorities required by the *Waste Discharge Requirements*. Refer to Attachment 1 for details.

Table 3-1. Summary of Legal Authorities

Requirement	Source of Authority
GENERAL	
Prevent illicit discharges into the wastewater collection system	<ul style="list-style-type: none"> Rules and Regulations, Section 1401 – Discharges Prohibited
Limit the discharge of FOG and other debris that may cause blockages	<ul style="list-style-type: none"> Rules and Regulations, Section 1301 – Standards for Discharge
Require that sewers and connection be properly designed and constructed	<ul style="list-style-type: none"> Rules and Regulations, Section 1402 – Approval Required Prior to Occupancy Rules and Regulations, Section 1408 – Existing Sewer Laterals Rules and Regulations, Part 15 – Sewer Installation
Require proper installation, testing, and inspection of new and rehabilitated sewers	<ul style="list-style-type: none"> Rules and Regulations, Section 1417 – Inspection Rules and Regulations, Part 16 – Sewer Inspection and Enforcement
LATERALS	
Clearly define City lateral responsibility and policies	<ul style="list-style-type: none"> Rules and Regulations, Section 1406 – Sewer Lateral Responsibility
Ensure access for maintenance, inspection, or repairs for portions of the service lateral owned or maintained by the City	<ul style="list-style-type: none"> Rules and Regulations, Section 1406 – Sewer Lateral Responsibility, Subsection B.3



Table 3-1. Summary of Legal Authorities (Continued)

Requirement	Source of Authority
Control infiltration and inflow from private service laterals	<ul style="list-style-type: none"> Rules and Regulations, Section 1401 – Discharges Prohibited, Subsection F Rules and Regulations, Section 1412 – Disposal of Uncontaminated Water
FOG SOURCE CONTROL	
Installation of grease removal device	<ul style="list-style-type: none"> Rules and Regulations, Section 1306 – Grease Trap Requirements Rules and Regulations, Section 1308 – General Interceptor Requirements
Design standards for grease removal device	<ul style="list-style-type: none"> Rules and Regulations, Section 1306 – Grease Trap Requirements LBMC, Section 8.46.040 – Requirements for Grease Interceptors, Subsection A LBMC, Section 8.46.050 – Requirements for Grease Traps, Subsections B and C
Maintenance and BMP requirements	<ul style="list-style-type: none"> Rules and Regulations, Section 1307 – Operator's Responsibility LBMC, Section 8.46.030 – Requirements for Food Facilities, Subsection A
Record keeping and reporting	<ul style="list-style-type: none"> Rules and Regulations, Section 1307 – Operator's Responsibility, Subsection B LBMC, Section 8.46.030 – Requirements for Food Facilities, Subsection E
Authority to inspect grease producing facilities	<ul style="list-style-type: none"> LBMC, Section 8.46.030 – Requirements for Food Facilities Subsection G LBMC, Section 8.46.060 - Enforcement
ENFORCEMENT	
Enforce any violations of sewer ordinances	<ul style="list-style-type: none"> Rules and Regulations, Section 1101 – Conditions of Sewer Service Rules and Regulations, Section 1301 – Permit Revocation Rules and Regulations, Section 1503 – Notice of Noncompliance LBMC, Section 8.46.060 – Enforcement

Notes:

BMP=best management practice; FOG=fats, oils, and grease; LBMC=City of Long Beach Municipal Code

3.2 Authority to Prevent Illicit Discharges

Section 1401 – *Discharges Prohibited* of LBWD's Rules and Regulations prohibit illicit discharges into its sanitary sewer system. Key discharge prohibitions related directly to reduction of sewer blockages and infiltration and inflow include prohibitions on the following discharges:

- Earth, sand, rocks, ashes, gravel, plaster, concrete, glass, metal filings, metal objects, other materials which will not be carried by the Sewer stream, anything which may obstruct the flow of Sewage in the Sewer, or any object which will

cause clogging of a Sewage pump or a Sewage sludge pump. (Rules and Regulations: Section 1401.A)

- Any garbage which has not been first shredded so that each particle is not more than 3/8-inch in any dimension or any garbage containing broken glass. (Rules and Regulations: Section 1401.B)
- Any solid or semisolid material such as garbage, trimmings, cuttings, offal, or other waste produced in the processing of meats, fruits, vegetables, foodstuffs or similar materials except garbage produced which meets the requirements of Parts 10 through 18. (Rules and Regulations: Section 1401.C)
- Any storm water or runoff from any roof, yard, driveway, street or pump station, except where prior approval has been given by the Chief Engineer. (Rules and Regulations: Section 1401.F)
- Any materials which will cause damage to any part of the Sewer System, abnormal sulfide generation, abnormal maintenance or operation costs of any part of the Sewer System, or which may cause any part of the Sewer System to become a nuisance or a menace to public health or a hazard to workers or which will cause objectionable conditions at the final point of disposal of the Sewage. (Rules and Regulations: Section 1401.G)

Other discharge prohibitions include:

- Any volatile liquids or substances which can produce toxic or flammable atmospheres in the Sewer
- Any compounds which may produce strong odors in the Sewer or Sewage Treatment Plant
- Any liquid having a temperature in excess of one hundred twenty degrees Fahrenheit
- Unpolluted water from refrigeration systems, air conditioning systems, industrial cooling systems, swimming pools or other unpolluted water from any origin except as authorized by the LBWD
- Any radioactive waste which constitutes, or may constitute, a public health hazard or endanger workmen charged with the maintenance of Public Sewers

3.3 Authority to Require Proper Design and Construction of Sewers and Connections

LBWD has strong legal authorities to require proper design and construction of sewers and connection as well as proper installation, testing, and inspection of new and rehabilitated sewers.

3.3.1 Proper Design and Construction of Sewer and Connections

Section 1402 of LBWD's Rules and Regulations requires approval by an LBWD authorized inspector prior to use or occupancy of any building or structure for which a sewer has been constructed. This mainly applies to new sewer construction. For existing sewer laterals, Section 1408 of LBWD's Rules and Regulations requires any sewer lateral alterations or changes to conform to requirements applying to new construction.



Part 15 of the LBWD's Rules and Regulations includes requirements for proper design and construction of sewers and connections, including the following:

- Notice of Noncompliance

If work performed on Sewers in a public street pursuant to a permit does not comply with the Rules, the LBWD shall notify the person to whom the permit was issued and specify the defect of the work. The person shall, without delay, take such steps as may be necessary to protect the public and within a period of five days after service of notice shall proceed with reasonable diligence to remedy the defect. If the person does not comply with the requirements of the notice, the LBWD shall not grant to the person a permit authorizing the installation of Sewers until the person has complied in full with the terms of the notice. (Rules and Regulations: Section 1503)

- Materials and Specifications Standards

All materials used in any work shall be new, first-class materials and shall conform to and the manner of construction shall meet all the requirements of the Rules. LBWD, at the expense of the permittee, may order tests of any material to determine whether such material meets the specifications as defined in Section 1507. (Rules and Regulations: Section 1504)

- Main Line Sewer Size

Main line Sewer pipe shall have an inside diameter of not less than eight inches and shall have sufficient capacity to carry Sewage from the area tributary when computed upon the basis developed in the Sewer master plan. (Rules and Regulations: Section 1505)

- Main Line Sewer Gradient

A Main Line Sewer shall be designed so as to provide a minimum velocity of two feet per second for pipes up to a 15-inch diameter flowing one-half (1/2) full, and pipes with an 18-inch diameter flowing three-quarters (3/4) full except that LBWD may approve a gradient that will develop a lower velocity if it finds that the gradient required to develop the above-stated velocity of two feet per second is unfeasible. (Rules and Regulations: Section 1506)

- Pipe Specifications

A. The pipe used shall be either vitrified clay pipe (VCP) or ductile iron pipe with fusion bond epoxy coating. All VCPs 6 inches or greater shall conform to the "Standard Specifications for Public Works Construction", latest edition, and the Long Beach, California Amendments thereto. All 4-inch diameter VCPs shall be first-class VCP, ceramic glazed on the inside. (Rules and Regulations: Section 1507.A)

B. That portion of the pipe extending from the Public Sewer Main to the Property Line shall be not less than six inches in internal diameter. That portion extending from the Property Line to the house or building shall be not less than four inches in internal diameter provided, however, that the size of the pipe shall meet all of the requirements of the Uniform Plumbing Code. (Rules and Regulations: Section 1507.B)

- **VCP Strength**
 - A. Standard strength for Sewers not more than ten feet in depth from the surface to invert. (Rules and Regulations: 1508.A)
 - B. Extra strength for Sewers more than ten feet and not more than twenty feet in depth. (Rules and Regulations: 1508.B)
 - C. Extra strength reinforced with concrete cradle or concrete encasement, for Sewers more than twenty feet in depth. (Rules and Regulations: Section 1508.C)
 - D. Extra strength encased in concrete or placed inside of steel pipe back filled with sand for Sewers under railways, freeways, major highways and such other streets as may be designated by the LBWD. (Rules and Regulations: Section 1508.D)
 - E. Reinforced as required by the LBWD for Sewers under large conduits or other Structures. (Rules and Regulations: Section 1508.E)
- **Pipe Laying Method**

All pipe shall be laid up grade on an unyielding foundation true to line and grade and with a uniform bearing under the full length of the barrel of the pipe. Bell and spigot pipe shall be laid with sockets up grade. Suitable excavations shall be made to receive the bells or collars of the pipe. All adjustments to bring the pipe to line and grade shall be made by scraping away or filling in under the body of the pipe, and not by wedging or blocking. (Rules and Regulations: Section 1509)
- **Main Line Sewer Slope**

The grade or slope of Main Line Sewers shall be shown on the plans in feet of fall per foot of horizontal distance expressed as a decimal. Slopes shall be calculated to four decimal places. (Rules and Regulations: Section 1510)
- **Pipe Joint Materials**

All joints in VCP or ductile iron pipe shall be made with approved joint materials to the satisfaction of the LBWD. (Rules and Regulations: Section 1511)
- **Pipe Disturbance after Joints Made:**

No person shall walk upon or disturb the pipe in any manner after the joints have been made. (Rules and Regulations: Section 1512)
- **Depth Of Lines To Top Of Pipe:**
 - The minimum depth of Main Line Sewers to top of pipe in residential districts shall be 5 feet and, in business districts, shall be sufficient to provide a House Connection depth of ten and one-half feet for areas where no groundwater is present. Minimum depth for six-inch House Connection shall be four feet in residential districts and ten and one-half feet in business or apartment house districts, respectively, below the top of curb or ground elevation at Property Line. (Rules and Regulations: 1513)
 - Where the Lot to be served has a slope greater than one percent, the depth for residential Main Line Sewers shall be sufficient to provide for a Sewer



Lateral with a minimum depth of at least one foot below the surface at any part of the Lot and a grade of not less than two percent. (Rules and Regulations: Section 1513)

- Exceptions to the minimum depths set out in this Section may be made only on written approval by LBWD. (Rules and Regulations: Section 1513)

- **Sewer Structures**

Manhole Structures shall be placed in the Main Line Sewer, except curved Sewers, at all changes of alignment or gradient; the maximum distance between such structures shall not be more than 350 feet. All Sewer Structures shall be designed and constructed in accordance with the standard drawings for such Structures on file in the offices of the LBWD. (Rules and Regulations: Section 1514)

- **End Structures**

End Structures shall be located at least ten feet up grade from the point where the last lateral crosses the Property Line. (Rules and Regulations: Section 1515)

- **Sewer Requirement per Lot**

Six-inch House Connection service shall be provided within the street right-of-way for each Lot. (Rules and Regulations: Section 1520)

- **Building Sewer Grade**

All Building Sewers shall be laid on straight lines and uniform grades between Cleanouts shall be located as specified in Parts 10 through 18. Minimum grades of Building Sewer shall be one-quarter inch per foot except where otherwise permitted, in writing, by LBWD. (Rules and Regulations: Section 1521)

- **House Connection Grade**

The alignment and grade of a House Connection shall be straight from the Public Sewer to the street Property Line and shall have a fall of not less than one foot in fifty feet towards the Public Sewer, except where otherwise permitted, in writing, by LBWD. (Rules and Regulations: Section 1522)

- **VCP Placement**

VCP shall not be placed closer than two feet to the exterior wall of any building or Foundation or closer than twelve inches to the surface of the ground at any point in its course. (Rules and Regulations: Section 1523)

- **Reducers**

A six-inch by four-inch reducer shall be inserted in the Sewer Lateral just inside the Property Line when the pipe size is changed from six-inch to four-inch. A six-inch by four-inch reducer TEE may be used at this location to serve as reducer, test TEE, and Cleanout. (Rules and Regulations: Section 1524)

- **Cleanouts**

A. Cleanouts in a Sewer Lateral shall be made by inserting either a WYE branch or a two-way Cleanout fitting in the line, with the Cleanout hub placed vertically above the flow line of the pipe. A cap of the same material shall be tightly sealed in the bell of the access or vertical outlet. (Rules and Regulations: Section 1525)

B. Cleanouts shall be accessible for maintenance and shall be placed in every Sewer Lateral at: 1. the junction with the Building Sewer at the building; 2. intervals of not more than fifty feet in straight runs. Cleanouts in straight runs longer than fifty feet shall be uniformly spaced; 3. the junction with the Main Line Sewer, or the junction of the House Connection and Building Sewer at the Property Line; 4. all significant changes in alignment or grade or when required by the LBWD. (Rules and Regulations: Section 1525)

C. No rent or other charge will be paid by the LBWD for a Property Line Cleanout located on private property. (Rules and Regulations: Section 1525)

D. A four inch or larger cleanout is required to receive any video inspection services from the LBWD. Installation is at the owner's expense. (Rules and Regulations: Section 1525)

3.3.2 Proper Installation, Testing, and Inspection of New and Rehabilitated Sewers

LBWD's Rules and Regulations have extensive requirements providing LBWD with authorities to require the proper installation, testing, and inspection of new and rehabilitated sewers, as shown below.

- **Inspection**

LBWD may inspect as often as deemed necessary, every Sewer Pumping Plant, Private Sewage Disposal System, Sewer Lateral, dilution basin, neutralization basin, backwater Trap or valve, or other similar appurtenances, for the purpose of ascertaining whether such facilities are maintained and operated in accordance with the Rules. All persons shall permit LBWD to have access to all such facilities at all reasonable times. No object, whether a temporary or permanent Structure, nor any object which is difficult to remove, shall be placed in such a position so as to interfere with the ready and easy access to any such facility. Upon request by LBWD any such obstruction shall be immediately removed at no expense to LBWD and shall not be replaced. (Rules and Regulations: Section 1417)

- **Building Sewer Testing**

- Upon completion, every House Connection and Building Sewer shall be subjected to a water pressure test by completely filling with water every portion of pipe from the lowest to the highest portion thereof. (Rules and Regulations: Section 1528)
- No House Connections or Building Sewer shall be Approved if any portion thereof, including any fitting, material, work or construction, fails to withstand the test without leaking at any point or does not comply with the provisions of Parts 10 through 18. (Rules and Regulations: Section 1528)

- **Right of Entry**



LBWD shall have the right of entry into and upon any property, building, Structure, or site served by any public or Private Sewer, Cesspool, Septic Tank, or appurtenances thereon, for the purpose of examining and inspecting the construction or condition of the Sewer, Cesspool, Septic Tank or appurtenances, and every person owning, controlling, or otherwise occupying the property, Structure, or site shall permit the entrance and give such aid as may be necessary or required for the examination and inspection. (Rules and Regulations: Section 1601)

- **Inspection Requirements**

All construction and installation made pursuant to the Rules shall be subject to: 1) a permit from LBWD for Sewer connections to the Main Line Sewers, 2) an encroachment permit issued by the City Department of Public Works for excavation in City streets, 3) a rider from the California Department of Transportation (Caltrans) for excavation in a Caltrans right-of-way and 4) inspection and approval by each of these agencies. Approval by LBWD shall not relieve any person from fully complying with all of the Rules. (Rules and Regulations: Section 1602)

- **Work To Be Observed**

At the time of the inspection the permittee shall have all work uncovered and convenient for the LBWD's examination and shall give the LBWD every facility necessary to make a thorough examination and to apply the required water pressure test. The permittee shall furnish all labor, tools, and materials necessary for the test. No Sewer Lateral shall be inspected unless the required plug and water for tests are available on the job when the LBWD arrives. The permittee shall demonstrate to the LBWD that every Plumbing fixture requiring drainage has been connected to a Building Sewer and drains into a Public Sewer. (Rules and Regulations: Section 1603)

- **Defective Work Correction**

If the LBWD notifies a permittee that the construction or installation of any part thereof is defective, the permittee shall, within ten days after notice from the LBWD, remove and reconstruct the construction or installation of any part thereof found to be defective. (Rules and Regulations: Section 1604)

- **Certificate of Final Inspection**

Upon request, a certificate of final inspection may be issued to the person constructing the work if it appears that all work done under a permit issued pursuant to these rules has been constructed according to, and meets all the requirements of, the applicable provisions of these rules, and that all charges have been paid. (Rules and Regulations: Section 1605)

3.4 Authority to Ensure Access for Maintenance, Inspection or Repairs for Portions of Lateral Owned or Maintained by the City

Section 1406 of LBWD's Rules and Regulations documents the property owner's sewer lateral responsibility versus LBWD's responsibility, as follows:

Owner's Responsibility

1. The property owner is responsible for ensuring sewage flow through the Building Sewer extending from the building to the property line, including the investigation and repair of the line. The responsibilities shall not be limited to root cutting, so as to ensure sewage flow.
2. The property owner shall ensure that all Building Sewers, Industrial Sewers, Private Sewage Disposal Systems and appurtenances thereto are in a safe and sanitary condition and, further shall maintain in good working order all devices or safeguards which are required by Parts 10 through 18 of these Rules.
3. A Force Main which discharges Sewage from a lift station or an ejector vacuum system to a public manhole in a Main Line Sewer shall be considered private and shall be operated and maintained by the private property owner.

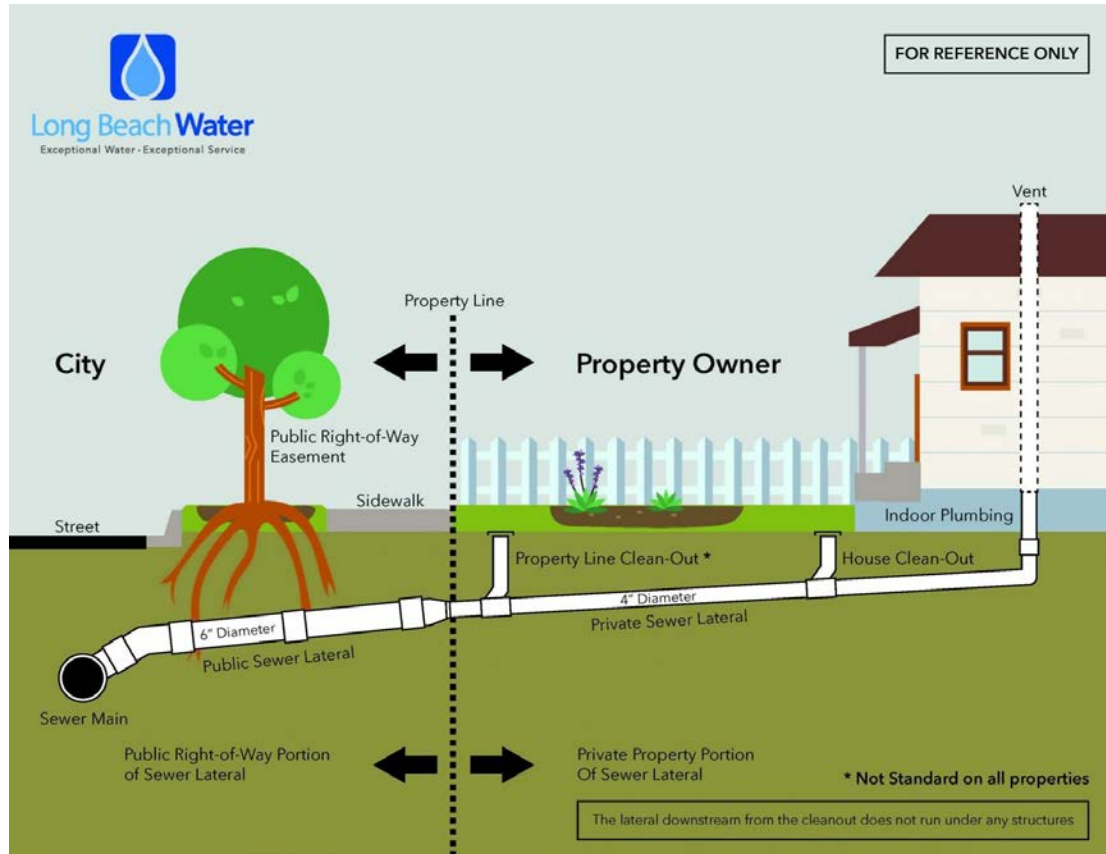
Long Beach LBWD Responsibility

1. The Department is responsible for ensuring sewage flow through the House Connection, extending from the property line to the sewer main within the public right-of-way, including repairs to the House Connection. The Department has the sole discretion in the House Connection repair process.
2. If the property owner believes that a problem in the House Connection is preventing sewage flow from the Building Sewer to the Main Line Sewer, the Department will not investigate until the property owner has performed an initial inspection, clearing, and draining of the Sewer Lateral. In order to expedite the process, the Department strongly encourages the property owner to secure and provide the Department with a video recording performed by a plumber of the Sewer Lateral.
3. The property owner shall provide an accessible 4-inch cleanout (see Section 1525) in order for the Department to inspect the House Connection. The Department will not investigate the failure of a House Connection unless an adequate and accessible Cleanout is present.
4. In conjunction with the repair or replacement of a House Connection by the Department, the Department retains the right to install a standard Cleanout at the Property Line, if needed. The Department will not pay rent or any other charge to the property owner for such cleanout.

Figure 3-1 illustrates the property owner's sewer lateral responsibilities versus LBWD's responsibilities (Long Beach Water n.d.a).



Figure 3-1: Property Owner versus Long Beach Water Department Sewer Lateral Responsibility



This graphic is also provided along with an explanation of these responsibilities on LBWD's website at: <https://lbwater.org/customer-services/sewer/>

In addition, LBWD has created a two-page *Sewer Systems Fact Sheet* that staff provides to property owners to clearly explain the division of responsibilities between property owners and LBWD regarding sewer system operation, maintenance, repair, and replacement. The *Sewer Systems Fact Sheet* is included as **Attachment C1**.

In summary, LBWD is responsible for performing repairs on house connections (i.e., the lower lateral) for portions of sewer laterals in the public right-of-way (e.g., streets and alleys). The City ensures access to house connections and sewer mainlines in the public right-of-way by not allowing any private construction in the public right-of-way.

As previously mentioned, Section 1525 in Rules and Regulations and on LBWD's website states that the property owner is responsible for providing a 4-inch cleanout on the private property side at the property line. LBWD is not responsible for a house connection sewer unless a cleanout is provided and accessible for LBWD to investigate and verify a failure in the house connection. The property owner is responsible for initial inspection, clearing, and draining of the entire Sewer Lateral before LBWD will respond to investigate.

Furthermore, LBWD is not responsible for any portion of the Sewer Lateral on private property or on an easement that is not a public right-of-way.

3.5 Authority to Limit Discharge of Fats, Oils and Grease or Other Debris

The LBWD's Rules and Regulations provide LBWD with the authority needed to limit the discharge of fats, oils, grease, or other debris. Section 1306 of the Rules and Regulations includes requirements for food service establishments (FSE) to install grease traps to capture grease prior to discharge into the sewer system. Section 1307 details the responsibilities of FSEs to operate grease traps properly.

- **Grease Trap Requirements**

All restaurants, commercial kitchens, and facilities where food is prepared and served to the public, also known as FSEs, shall install and maintain an Approved Grease Trap so as to prevent excessive discharges of grease and oil which could result in sewer blockage. Three departments within the City have coordinated their efforts to establish a policy to detail the requirements for the design and installation of Grease Traps. These departments are the Long Beach Department of Health and Human Services (LBDHHS), the Planning and Building Department, and the LBWD.

A Grease Trap could be a Grease Interceptor or a Grease Recovery Device. In most instances, the FSE shall install a Grease Interceptor in accordance with the Rules. In special circumstances, with the LBWD's prior written approval, the FSE may install a Grease Recovery Device. In either case, garbage disposals and dishwashers must be plumbed downstream of the Grease Trap. (Rules and Regulations: Section 1306)

- **Grease Interceptors**

Grease Interceptors are designed and constructed to retain floating material such as grease and oils and are typically concrete box structures located outside, but usually adjacent to, the building containing the source of the grease (e.g., restaurant, cleaning room, vehicle wash, vehicle or equipment servicing and/or cleaning facility, etc.).

The Grease interceptor shall be installed and connected so that it is easily accessible for inspection, cleaning, and removal of the grease. (Rules and Regulations: Section 1306)

- **Grease Recovery Devices**

Grease Recovery Devices are generally located within the building and typically consist of a stainless steel chamber which traps the solid grease and a mechanism for separating the grease from the Wastewater stream and holding it in a separate chamber, or stand-alone container.

A. General Information: A grease recovery device must be listed by the following agencies:

1. International Association of Plumbing and Mechanical Officials
2. National Safety Foundation by December 31, 1995
3. Underwriters Laboratory



The LBDHHS must approve the location of the Grease Recovery Device, usually below or near the kitchen sink, and the Long Beach Planning and Building Department must approve the plumbing and installation. (Rules and Regulations: Section 1306)

- **Operator's Responsibility**

The operator of the food facility shall maintain, or cause to be maintained, proper operation of the grease trap by performing cleaning and preventive maintenance, as necessary. Failure to prevent grease from entering the Sewer System may result in the operator paying all costs associated with the response and cleaning of the Sewer System and liability for any private losses or damages incurred by the stoppage in the Sewer System. Failure to take the necessary corrective action to prevent future occurrences of grease discharge to the Sewer System will result in the shut-off of water services, per Rules Section 206.

A. If there is an existing grease trap, the operator must ensure that it is adequately and properly designed for the site. The operator may need to upgrade or make improvements if the grease trap is found by the LBWD to be deficient.

B. The operator must properly and regularly maintain the grease trap and keep records of registered haulers' manifests. These records shall be presented to the LBWD's authorized Inspector on request.

C. If an existing facility does not have a grease trap, the operator can call the LBWD for special programs or advice for installing grease traps in existing sites.

D. If an existing facility does not have, and fails to install, a grease trap, the operator shall make arrangements to clean the Sewer. If the operator still fails to take action after receiving a "Notice of Non-Compliance," the LBWD will make arrangement to have the Sewer cleaned by a private contractor. The LBWD will bill the operator for the cost plus a 35% administrative fee.

E. If the operator fails to prevent grease from entering the Public Sewer, the operator shall pay for all costs associated with the inspection, videotaping, and cleaning of the Public Sewer, as well as indemnify the LBWD for any losses or damages claimed by third parties and resulting from the stoppage in the Sewer System. (Rules and Regulations: Section 1307)

3.6 Authority to Enforce and Violations of Sewer Ordinances

Both the LBWD and the City have enforcement authorities related to the sewer system and the disposal of FOGs.

3.6.1 Long Beach Water Department Enforcement Authorities

As noted in City's Charter, the Board of Water Commissioners has complete and exclusive power and duty to supervise, control, regulate, and manage LBWD, and to make and

enforce all necessary rules and regulations. The Board has charged the General Manager of the LBWD with the responsibility of administering these Rules and Regulations.

- **Conditions of Sewer Service**

Sewer Service provided by the LBWD is subject to these Rules. All customers shall accept service subject to such Rules, City ordinances, and State laws. Any Customer not in compliance with these Rules may be subject to discontinuation of sewer service. Sewer Service is subject to shutdowns as required by the LBWD to make improvements or repairs to the Sewer System.

The LBWD will enforce all of the provisions of Parts 10 through 18. Such powers shall not limit or otherwise affect the powers and duties of the City's Health Officer or other persons authorized by law to make inspections. (Rules and Regulations: Section 1101)

- **Permit Revocation**

If the LBWD finds that the Applicant has not complied with the provisions of the permit, or has failed to comply with the provisions of Parts 10 through 18, or other applicable ordinances or statutes governing the discharge of Wastewater into a Public Sewer, or such person supplied false or misleading information in the application or if the discharge of Wastewater into a Main Line Sewer causes a nuisance in the operation of a Main Line Sewer, LBWD may give such person a thirty-day notice, in writing, specifying the manner in which such person has failed to comply with the provisions of the permit, or the manner in which the discharge constitutes an unreasonable burden in the operation of a Main Line Sewer. If the person within the time specified in the notice does not remedy the condition or conditions specified in the notice, LBWD may revoke the permit and cause to be capped the Wastewater outlet so that Wastewater will not be discharged into a Main Line Sewer. (Rules and Regulations: Section 1310)

- **Notice of Noncompliance**

If work performed on Sewers in a public street, pursuant to a permit issued under Parts 10 through 18, does not comply with the provisions of Parts 10 through 18, LBWD shall notify the person to whom the permit was issued and specify the defect of the work. The person shall, without delay, take such steps as may be necessary to protect the public and within a period of five days after service of notice shall proceed with reasonable diligence to remedy the defect. If the person does not comply with the requirements of the notice, LBWD shall not grant to the person a permit authorizing the installation of Sewers until the person has complied in full with the terms of the notice. (Rules and Regulations: Section 1503)



3.6.2 City of Long Beach Enforcement Authorities

- **Municipal Code, Section 8.46.060 – Disposal of Fats, Oils and Grease:** Section 8.46 of the LBMC covers the Disposal of FOG. Section 8.46.060 provide the City and LBWD with authority to enforce this section of the Municipal Code and states that it "shall be enforced by the City Health Officer, or designee, or by the General Manager of the LBWD, or designee. These persons shall be known as enforcement officials and they are authorized to take any actions necessary to enforce this Chapter."

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4 Operations and Maintenance Program

This section describes LBWD's O&M program.

4.1 Sanitary Sewer System Mapping

LBWD implemented a Geographic Information System (GIS) in 1994. The GIS is SQL Server-based and consists of Environmental Systems Research Institute software programs. The GIS runs on Windows Server with networked computers over intranet and Internet.

The comprehensive GIS database contains detailed and up to date information on the sanitary sewer network. The key GIS information and uses are briefly summarized below:

Planning. The GIS database has information on existing sewer mains, planning and zoning information, census information, and parcel map information. The information is used to evaluate the capacity of existing sewer mains and to determine the size of proposed improvements.

Engineering. The LBWD has a sortable database of as-built drawings. Along with GIS attribute data for key sewer main elements (i.e., gravity sewer mains, laterals, manholes, pump stations, force mains), the GIS attribute data is populated with drawing reference numbers that enable Engineering staff to find as-built drawings. The GIS map also includes data on water, storm drain, street, county trunk sewer, and other underground utility data that is essential to sewer improvement design. In addition to the underground facility locations, the GIS map shows above ground building locations for things, such as pump stations, desalination facilities, and maintenance facilities.

Operation and Maintenance. The GIS map is compiled from LBWD's historic Sewer Atlas Maps. Currently, updated Sewer Atlas Maps are used by sewer operations crews to locate and identify sewer facilities. With the implementation of GIS mapping capabilities, the Sewer Atlas Maps are now maintained within the GIS platform and hard copies are re-issued to Operations on an as-needed basis. Sewer investigators have laptop computers in their trucks with GIS maps. The GIS database capabilities have enhanced sewer operations activities beyond reliance on paper mapping sources by adding capabilities, such as developing repeat sewer cleaning route maps, locating FSEs and grease traps, and performing SSO analysis tracking.

Training. An introductory training session is provided to staff with an introduction guide to GIS to familiarize new employees with the sewer system GIS. The training also identifies GIS capabilities, such as zoom-in and zoom-out of the mapping system and how to extract sewer system information from GIS.

The sewer GIS is routinely updated with new and rehabilitated facilities and is corrected as needed when staff identify errors or inconsistencies with existing data. Staff complete a form and attach pictures to report problems with existing GIS data to the GIS group. GIS staff make updates based on a standard operating procedure. As part of these updates, the GIS group adds laterals to GIS based on closed-circuit television (CCTV) inspection videos.

4.2 Sewer System Preventive Maintenance

The LBWD's sewer system preventive maintenance program applies the following strategies to reduce sewer overflows:

- Aggressive system-wide sewer cleaning
- Targeted and frequent repeat cleaning of pipe segments with known maintenance issues
- Targeted chemical root control on pipe segments with known root issues
- Flow level monitoring at locations with an elevated risk of sewer overflow
- Regular CCTV inspection of sewer pipelines
- CCTV investigations to determine the root cause of sewer pipeline blockages and overflows to adjust maintenance approach

LBWD has the necessary staffing and equipment to accomplish each of these strategies. Major equipment includes: five jetter trucks, five CCTV inspection trucks and one high-pressure/low-volume lateral jetting truck.

4.2.1 Gravity Sewer Preventive Maintenance

System-wide Sewer Main Cleaning

LBWD cleans all sewer mains on a 2-year rotation. The system is divided into map grids that are divided into 5 Sewer Cleaning Groups. One sewer cleaning crew is assigned to each Sewer Cleaning Group. The map grids within each Sewer Cleaning Group are systematically assigned to sewer cleaning crews to accomplish the 2-year cleaning cycle. Once a cycle is complete, the sewer cleaning crews repeat the process. The grids are generally cleaned in the same order with each cycle. The Sewer Cleaning Water Utility Supervisor tracks the percentage of sewer map grids completed versus the percentage of the 2-year cycle expended and can easily see which crews are ahead of or behind schedule. Sewer cleaning crews ahead of schedule may be deployed to support crews that are behind schedule. Sewer cleaning crews document maintenance issues on the paper service rendered forms and will recommend potential additions to the targeted preventive maintenance program when significant maintenance issues (i.e., roots, grease, and debris) are found.

Targeted Sewer Main Cleaning

LBWD targets more frequent sewer cleaning on specific pipe segments with known maintenance issues. The Water Utility Supervisor responsible for sewer cleaning maintains a list identifying pipe segments cleaning on either a 60-day, 90-day, 120-day, or 180-day cleaning cycle. Targeted sewer cleaning takes precedence over system-wide sewer cleaning.



Targeted Chemical Root Control

LBWD performs targeted chemical root control on pipe segments with known root intrusion issues. Chemical root control is performed on an ad hoc basis as a supplement to the sewer cleaning preventive maintenance program.

Sewer Manhole Visual Inspection and Flow Level Monitoring

LBWD currently performs manhole visual inspection during routine cleaning and CCTV inspection. LBWD performs more detailed inspection of manholes where warranted or when a significant number of manholes have been identified for potential rehabilitation. LBWD utilizes flow level sensors to monitor flow levels in some areas to identify potential stoppages, monitor locations with high flows, or monitor areas with a high consequence of failure, such as next to a water body.

Periodic Gravity Main Closed Circuit Television Inspection

LBWD is currently inspecting the gravity sewer system over a 5-year period using CCTV and the National Association of Sewer Service Companies (NASSCO) Pipeline Assessment Certification Program. Crew supervisors perform quality control reviews of CCTV data to maintain data quality and reliability of condition scoring. This quality control review is incorporated into staff training.

LBWD maintains CCTV inspection data in Pipelogix software, which provides easy access for review. The CCTV data can be mapped spatially through GIS to view problem sewer pipes on a map.

CCTV Investigation to Determine Root Cause of Maintenance Issues

LBWD performs investigative CCTV inspections when issues or needs are identified from customer calls, the Engineering Bureau, cleaning crews, or other sources. In some cases, these investigative CCTV inspections result in targeted adjustments to the preventive maintenance program. This type of investigative CCTV inspection is also performed after SSOs and blockages to determine the root cause of failure and to determine an appropriate corrective action, which in many cases is targeted and increased sewer cleaning.

Sewer Manhole Inspections

Manhole inspection records are documented on paper forms, and a photo is taken. The manhole inspection data is entered into a Microsoft Excel database. Manhole inspections and CCTV inspections are tracked and reported internally on a regular basis.

4.3 Pump Station Preventive Maintenance

LBWD owns and operates 28 pump stations as listed in **Table 4-1**. A flow schematic illustrating the relationship of the pump stations is shown on **Figure 4-1**.

The pump stations are monitored through a Supervisory Control and Data Acquisition (SCADA) system located at the Long Beach Groundwater Treatment Plant. Two staff are on duty 24 hours a day to monitor the SCADA system. Alarms are monitored for each

pump station, including pump start, pump stop, high- and low- alarm levels, and wet well level. Newer pumps have extended run time alarms.

Pump station operators respond to SCADA alarms to ensure stations are operating properly. Each station has been evaluated to determine the required emergency response. Pump station failure is typically addressed through emergency bypass pumping. Larger bypassing needs, such as at pump station S-10 with force main length of 7,205.70 feet, may be addressed through an on-call contractor and coordination with LBWD Engineering Bureau. Tow-behind generators may also be used in the event of a power outage at a pump station. LBWD staff proactively prepare for a sustained high flow event, such as the Grand Prix, by mobilizing back-up generators and bypass pumps to the site prior to the event.

Two stations, S-27 and S-28, are currently not connected to SCADA. These stations are low flow and are checked weekly by LBWD staff and are also monitored by Airport personnel. The comfort stations along the beach and Marina are currently checked by Parks, Recreation, and Marine staff during cleaning. All pump stations have a sign with information for contacting LBWD in case of emergency.

Table 4-1. Pump Station Summary

Station No.	Station Name	Year Installed/Year Rehabilitated	No. of Pumps	Horsepower Per Pump	Pump Capacity (gpm)
1 ⁷	Hill & Atlantic	1920/2019	2	20	1,200
2	North Airport	1967	2	10	600
3	South Airport	1941	2	7.5	450
4	Los Altos	1964	2	7.5	800
5 ¹	Westminster	2012/2014	2	5, 7.5	200
6	Ultimo	1981	3	7.5	680
7	Belmont Park	1929	2	14	1,000
8	Marina 2	1973	3	7.5	680
9 ²	Marina 1	1957	1 ³	5	Unknown
10	Naples	1952 ⁴ /2002	2	24	900
11	Alamitos Bay	1926	2	7.5	580
12 ⁷	Belmont Shore	1991/2017	3	115	2240
13 ^{2,5}	Belmont Pier	1965	2	2	180
14 ²	Coronado	1961	2	3	150
15 ²	Molino	1961	2	5, 3	100
16 ²	Cherry	1961	2	5, 10	220
17 ²	8 th Place	1961	2	3, 5	Unknown
18 ⁸	Hart Place	1975/2020 ⁶	4	18 (2), 7.5 (2)	292
19	Harbor	Unknown/2003	2	7.5	Unknown



Table 4-1. Pump Station Summary (Continued)

Station No.	Station Name	Year Installed/Year Rehabilitated	No. of Pumps	Horsepower Per Pump	Pump Capacity (gpm)
20 ²	Shoreline Marina 1	1982	2	2	200
21 ²	Shoreline Marina 2	1982	2	2	200
22 ²	Shoreline Marina 3	1982	2	2	200
23 ²	Shoreline Marina 4	1982	2	2	200
24 ^{2,5}	Shoreline Marina 5	1982	2	2	Unknown
25	Magnolia	1968/2021 ⁶	4	24.4 (2), 18.8, 10.4	500
26	Santa Fe	1980	3	30	820
27 ²	Airport Admin. Bldg.	Unknown	2	3	100
28	Marine Stadium	Unknown	1	Unknown	Unknown

Notes:

¹ Serves approximately 20 acres that discharges flow to the County Sanitation Districts of Orange County.

² Comfort station.

³ Ejector pump listed, but not used.

⁴ New pumps added in 1988.

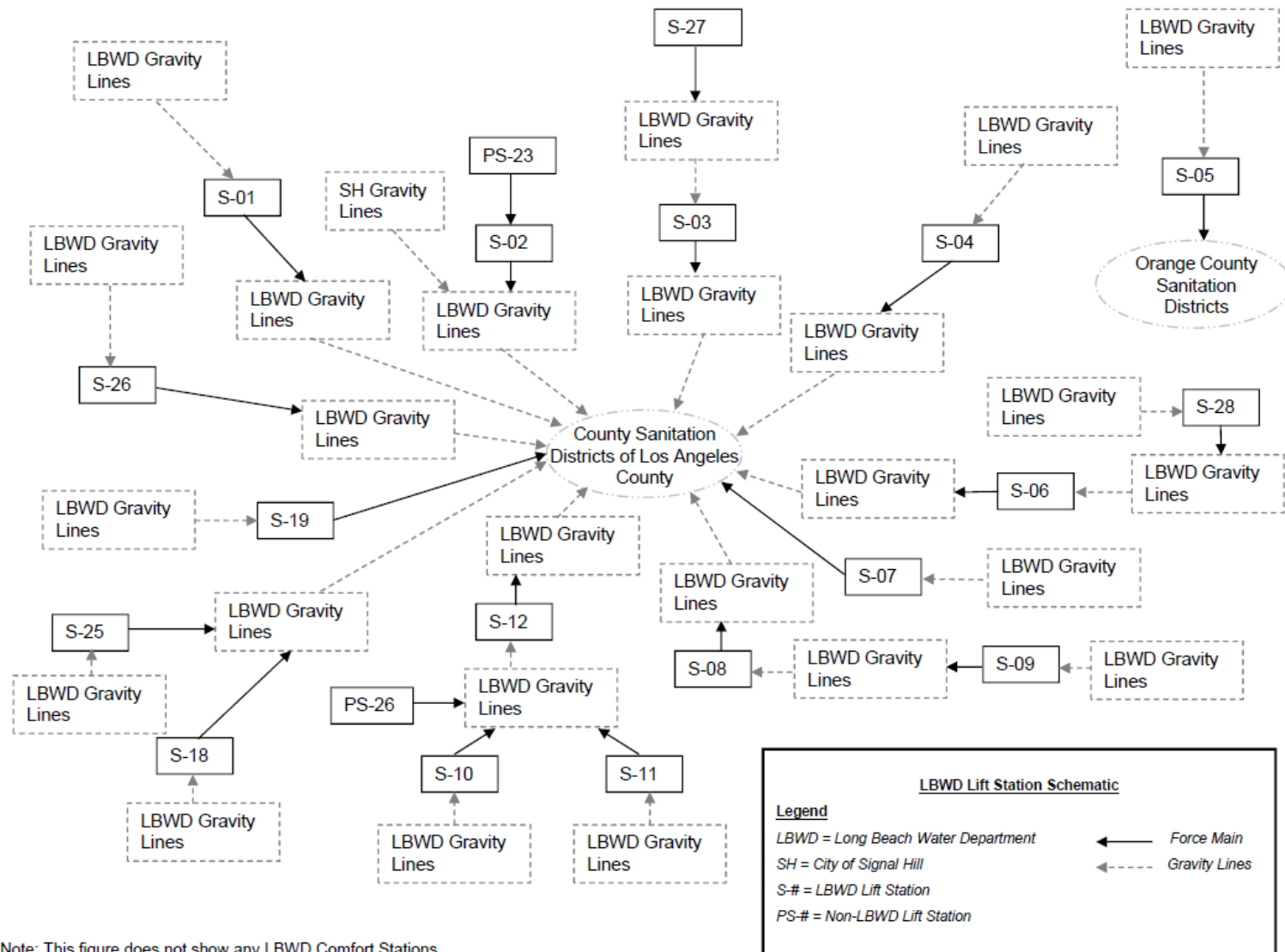
⁵ No longer operated by the LBWD.

⁶ Estimated completion for rehabilitation.

⁷ Flow meter currently installed.

⁸ Flow meter to be installed once rehabilitation is completed.

Figure 4-1. Long Beach Water Department Pump Station Flow Schematic





Pump station inspection rounds begin with a visual inspection of the facility for items such as vandalism or damage to the site. The wet well is inspected for grease. Excessive grease can cause issues with sensors and is cleaned when identified. A contractor may be called in to clean grease if necessary. LBWD staff check the condition of each motor and pump, amps are checked to ensure they are within proper operating range, lug joints or connections are checked, the station is inspected for leaks, and fittings are greased where appropriate. Pumps are pulled for repairs or replacement when operators identify issues from rags or debris based on visual inspection and an audio assessment. All generators located on pump station sites are tested on a monthly basis. A log book is maintained at the pump station and also at LBWD Control 2. If a station is equipped with an odor control scrubber, the scrubbers are inspected regularly. Additionally, pump stations S-10, S-12, and S-18 receive weekly deliveries of BioMagic enzymes for grease control.

Force Main Inspection and Maintenance

LBWD visually inspects the alignment of each force main annually to detect any signs of leakage. LBWD monitors the performance of pump stations using SCADA and will investigate a force main if pump station performance issues indicate an issue with a force main.

4.4 Rehabilitation and Replacement Planning

This section describes LBWD's program for condition assessment and Capital Improvement Program (CIP) planning for pipelines, manholes, and pump stations. LBWD has historically performed rehabilitation and replacement planning on the collection system. In 1990, LBWD compiled a comprehensive sewer system master plan and management program. Detailed plans and studies were completed for 3 of the 14 service areas (Areas 1, 7 and 8), and special studies were conducted for the pump stations. In 2008, LBWD completed a sewer system master plan update to identify new improvement projects and reclassify the existing CIP list to address gravity sewer rehabilitation and replacement using geographic areas. Since 2008, LBWD has moved to utilizing NASSCO structural condition scores for gravity sewers to target rehabilitation and replacement. In 2013, a field assessment of fourteen sewer pump stations was completed and potential improvements were identified.

Gravity sewer main structural condition issues are currently identified through LBWD's CCTV inspection program and these condition issues are addressed based on risk. LBWD repair crews or emergency contractors address sewer main collapses or other major issues when identified. Less urgent gravity sewer main issues are compiled into a structural repair package and sent to LBWD Engineering Bureau for review and CIP project packaging. Sewer lateral defects are addressed by LBWD repair crews. LBWD has completed approximately 100 to 150 sewer lateral repairs per year over the prior few years.

LBWD's Engineering Bureau typically develops CIP projects once or twice per year. Gravity sewer main condition scores from CCTV data are used to identify approximately 20,000 linear feet of pipe per year with the highest risk of failure. These selected gravity mains are then packaged into CIP projects. LBWD typically utilizes pipe lining rehabilitation methods to address pipe condition, but point repairs and pipe replacement are also performed where appropriate. LBWD considers additional factors when packaging gravity

sewers into projects including pavement moratoriums, coastal zoning permitting, Caltrans permitting, railroad permitting, and easements.

When inspecting and cleaning gravity sewer mains, LBWD crews will open manholes and perform initial inspections of manholes. LBWD will perform a more detailed inspection on the manholes when appropriate. Typical manhole rehabilitation work includes raising the manhole rings to grade, addressing missing bricks, addressing channel degradation, and replacing missing lids. LBWD crews perform manhole rehabilitation work where appropriate. Manholes identified for rehabilitation that will not be addressed by LBWD crews are referred to LBWD Engineering Bureau. The Engineering Bureau develops manhole rehabilitation projects based on referrals from the Operations Bureau on a regular basis.

Rehabilitation and replacement needs for pump stations and force mains are typically identified through regular planned maintenance activities at the pump stations and referred to the Engineering Bureau when appropriate.

4.4.1 Capital Improvement Plan

The CIP represents the City's strategic capital investment plan. The CIP identifies and provides two types of expenditures. The first covers strategic improvements to the City's existing infrastructure and the second type involves one-time projects designed to address important community needs.

The Sewer CIP is developed and managed by LBWD's Engineering Bureau.

Public Works, in conjunction with the Sewer Operations, review LBWD's capital needs and prioritize project submittals based on established criteria:

- The ability of the project to meet health, safety and legal concerns and mandates
- The value of the project to prolong the life of City assets or avoid/minimize future repair costs
- The benefit the project will provide the community in support of the goals articulated in the Strategic Plan
- The potential for the project to generate savings or increase productivity
- The extent to which the project will secure future funds through program planning or grant eligibility

Planned capital improvements to the LBWD's sewer system encompass a wide range of projects. The Sewer CIP budget covers a 5-year period for long-term needs and reflects a sustained level of investment in infrastructure. LBWD Engineering Bureau updates the CIP and project priorities annually through workshops with engineering and operations staff based on current operating conditions including recent data such as inspections or flow monitoring. The CIP includes rehabilitation and replacement projects, as well as repair projects developed by a collaboration of the Engineering Bureau and Sewer Operations.

The City's CIP covers a 3-year period and describes sources of funding and can be found on the Capital Improvement Plan webpage (City of Long Beach n.d.b.).



The LBWD develops a fiscal year CIP budget summary and presentation which is located on the LBWD website (Long Beach Water n.d.b).

4.5 Equipment and Replacement Part Inventories

The Sewer Operations maintains an inventory of 6-, 8-, 10- and 12-inch pipes and fittings for point repair and replacement activities. All spare parts are kept at the Operations Service Center in either the warehouse, the sewer storage areas, or on sewer construction vehicles.

The Pump Stations have been evaluated to identify spare parts. Typical spare parts include pumps and bypass pumps. An inventory of spare parts is maintained to ensure continued pump station operation. LBWD's goal is to have at least one spare pump per station.

LBWD has contracts in place with material vendor(s) to obtain parts or equipment during an emergency situation. These contracts have gone through the procurement process during initial set-up, and vendors are required to provide contact information for after-hours service.

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5 Design and Performance Provisions

This section documents the design and performance provisions.

LBWD requires that all new sewer systems, pump stations and other appurtenances, as well as the rehabilitation and repair of existing sewer facilities, be designed and constructed in accordance with the following design requirements:

- LBMC, Section 15 (City of Long Beach 2019)
 - https://library.municode.com/ca/long_beach/codes/municipal_code
- LBWD Sewer System Design Guidelines (Long Beach Water n.d.c)
 - <https://lbwater.org/customer-services/designing-and-planning/developers-agreement/>
- Standard Drawings and Designs (Long Beach Water n.d.d)
 - <https://lbwater.org/customer-services/designing-and-planning/standard-drawings-and-designs/>
- The latest edition of the Standard Specifications for Public Works Construction (Green Book)

Where LBWD standards do not fully cover the design, the new sewer systems, pump stations, and rehabilitated sewer facilities are designed and constructed in accordance with the following design requirements:

- Los Angeles County Sanitation Districts, Standard Drawings for Construction (Sanitation Districts of Los Angeles County 2018)
 - <https://www.lacsd.org/businesses/bidspur/amendments.asp>
- City of Los Angeles Department of Public Works, Bureau of Engineering, Part F – *Sewer Design*, latest edition (City of Los Angeles Department of Public Works 2008)
 - <http://eng2.lacity.org/techdocs/index.htm>
- Los Angeles County, Department of Public Works, *Private Contract Sanitary Sewer Procedural Manual*, latest edition. (City of Los Angeles Department of Public Works 1987)
 - <https://dpw.lacounty.gov/ldd/lib/fp/Sewer/Private%20Contract%20Sanitary%20Sewer%20Manual.pdf>

Electronic files for sample sewer drawings and for construction specifications are available upon request.

5.1 Design and Construction Standards and Specifications

LBWD updates the design and construction standards and specifications on an as-needed basis. The Long Beach sewer service area is largely built out with limited new sewer extensions. Growth within the City is typically associated with redevelopment that may be more likely to utilize existing sewer infrastructure. If the proposed growth adds significantly

to flows in the existing sewers and downstream facilities, LBWD will require upsizing or the addition of new pump stations to accommodate the additional flow.

5.1.1 Standards for Gravity Sewers

LBWD's *Sewer System Design Guidelines* includes design criteria applying to both new, repaired and rehabilitated assets (Long Beach Water n.d.c). The following are key design standards included in *LBWD's Sewer System Design Guidelines*:

- Sewer main depth, size, and location
- Sewer lateral depth, size, and location
- Pipeline material types
- Design parameters for gravity sewer main slope, flow, and demand
- Sewer laterals shall have a minimum diameter of 6 inches. Laterals shall have a minimum slope of 2 percent from the sanitary sewer main to the property line and shall have a minimum cover of 5 feet at the property line.
- Manholes shall be spaced at 350 foot maximum intervals. A manhole shall be constructed at the end of construction with 1-foot and 2-foot stub outs for future connection. Stub shall be plugged with brick and mortar.
- Cleanouts in a sewer lateral shall be made by inserting either a WYE branch or a two-way cleanout fitting in the line, with the cleanout hub placed vertically above the flow line of the pipe. Cleanouts shall be accessible for maintenance and shall be placed in every sewer lateral at specified areas, as outlined in *LBWD's Sewer System Design Guidelines*.
- LBWD refers to the *Standard Specifications for Public Works Construction (Green Book)* for gravity sewer rehabilitation and repairs.

5.1.2 General Guidelines for Sewer Force Mains

LBWD force mains are designed on a case-by-case basis for each force main. LBWD may refer to The City of Los Angeles Department of Public Works, Bureau of Engineering, Part F – Sewer Design and the Standard Specifications for Public Works Construction (Green Book) for sewer force main design.

5.1.3 General Guidelines for Sewer Lift Stations

LBWD pump stations are designed on a case-by-case basis for each unique situation. LBWD may refer to The City of Los Angeles Department of Public Works, Bureau of Engineering, Part F – Sewer Design and the Standard Specifications for Public Works Construction (Green Book) for sewer pump station design.

5.1.4 Standard Drawings

LBWD's *Standard Drawings and Designs* contains standard drawings for standard sewer improvements, including:



- WDS-501: Manhole Type “C”
- WDS-502: Manhole Type “D”
- WDS-503: Drop Manhole
- WDS-504: Inverted Siphon
- WDS-505: Sewer Manhole
- WDS-506: Sewer Cleanout
- WDS-507: Chimney
- WDS-508: Typical Grease and Grit Interceptor
- WDS-509: Rainwater Diversion System – Automatic
- WDS-403: Sewer Main Support
- WDS-404: House Sewer Connection

5.2 Procedures and Standards for Inspection and Testing

All work for LBWD is subject to inspection and gravity sewer construction must be warranted for a minimum of 1 year by the contractor. An internal CCTV inspection may be conducted prior to the end of the warranty period to ensure continued conformance to design standards.

The City's Public Works Department assists LBWD with processing applications and issuing permits for new sewer connections on behalf of the LBWD. The LBWD inspector will inspect the installation of the lateral in the public right-of-way to insure compliance with the permit and LBWD standards. The LBWD inspector and the contractor will coordinate the construction schedule to insure sewer laterals are inspected during construction.

LBWD refers to Engineering Bureau Specifications and the *Standard Specifications for Public Works Construction (Green Book)* for gravity sewer rehabilitation and repair inspection standards and testing.

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6 Overflow Emergency Response Plan

LBWD's Overflow Emergency Response Plan documents the protocols LBWD staff follow in the event of a sewer overflow and is included as **Attachment F1. Table 6-1** provides a summary of the Waste Discharge Requirements for an Overflow Emergency Response Plan and the relevant section of LBWD's Overflow Emergency Response Plan addressing the Waste Discharge Requirements.

Table 6-1. Linkage between Overflow Response Requirements and Overflow Emergency Response Plan

Overflow Emergency Response Program Requirement	Overflow Emergency Response Program Section
Prompt Initial Notification Procedures	Section 2 – SSO Detection Section 3.4 – Initial Response
Appropriate Response to SSOs	Section 2 – SSO Detection; Section 3 – SSO Response Procedures; Section 5 - Equipment
Prompt Notification of SSO Reaching Waters of the State	Section 3.5 – Water Quality Sampling and Testing Section 4 – SSO Documentation and Reporting
Procedures for Awareness and Training for Emergency Response Plan	Section 6 – SSO Response Training
Procedures to Address Emergency Operations	Section 3 – SSO Response Procedures
Program to Ensure Reasonable Steps Taken to Contain and Prevent Discharge	Section 3 – SSO Response Procedures; SSMP Chapter 4 - Operations and Maintenance Program

Notes:

SSMP=Sewer System Management Plan; SSO=sanitary sewer overflows

6.1 Summary of the Overflow Emergency Response Plan Sections

The City's Overflow Emergency Response Plan contains the following sections.

- **Section 1 - Purpose**

This section states that the Sewer Overflow Response Plan has been developed to ensure an appropriate standardized response in the event of a sewer overflow. The Plan also ensures that the City is adequately prepared to respond to SSO events by:

- Reducing or eliminating public health hazards
- Preventing unnecessary property damage
- Ensuring thorough recovery and cleanup efforts
- Properly documenting, notifying, and reporting overflow spill events
- Minimizing the inconvenience of service interruptions

- Ensuring staff and contracted personnel are properly trained to respond to such events

- **Section 2 - Sanitary Sewer Overflow Detection**

This section describes the methods in which overflows may be discovered or detected as well as the communication reception and response during working hours, afterhours, weekends, and holidays.

- **Section 3 – Sanitary Sewer Overflows Response Procedures**

This section describes the responsibilities of LBWD personnel to respond to overflows, what a preliminary assessment and response might consist of, and how to respond to overflows in the collection system and on private property. Mitigation and spill containment measures describes the concept of reducing spill severity and the sensitivity of the coastal waters and the environment to SSOs.

Water quality sampling is performed by the LBDHHS. **Attachment F2** describes the current water quality monitoring program sampling protocols, including for SSO events spilling greater than 50,000 gallons to a surface water.

The Recovery and Cleanup section of the Overflow Emergency Response Plan describes procedures to be followed by LBWD's contractor for clean-up and disinfection on hard surfaces, into waterways, lawns or landscaped areas, storm drains, catch basins, and wet weather modifications. The procedures to estimate the volume of spills and recovery of spilled sewage ensures that overflow quantification is accurate and lists several means of quantifying overflow.

SSO event investigation, traffic and crowd control, public notification, and follow up activities are also included in this section.

- **Section 4 – Sanitary Sewer Overflows Documentation and Reporting**

The California SWRCB has established guidelines for classifying and reporting an SSO. These categories are described in detail in this section.

In addition, all SSOs should be thoroughly investigated and documented for use in managing the wastewater collection system and meeting established reporting requirements. This section includes the procedures for investigating and documenting SSOs as well as the reporting protocol for various spill types.

- **Section 5 - Equipment**

This section includes a description of vehicles and equipment to support the daily needs, routine maintenance, and emergency situations for sewer operations.

- **Section 6 – Sanitary Sewer Overflows Response Training**

The Training section outlines various routine Overflow Emergency Response Plan related trainings, as well as record keeping.



6.2 Contractor Spill Prevention and Emergency Response Plans

LBWD requires all construction contractors performing work on the collection system to develop, submit and implement a Spill Prevention Plan in construction contracts. **Attachment F3** includes the Engineering Bureau's specification that includes description for the Spill Prevention, Control, and Countermeasure Plan.

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7 Fats, Oils, and Grease Control Program

This section describes how FOG control is accomplished within LBWD.

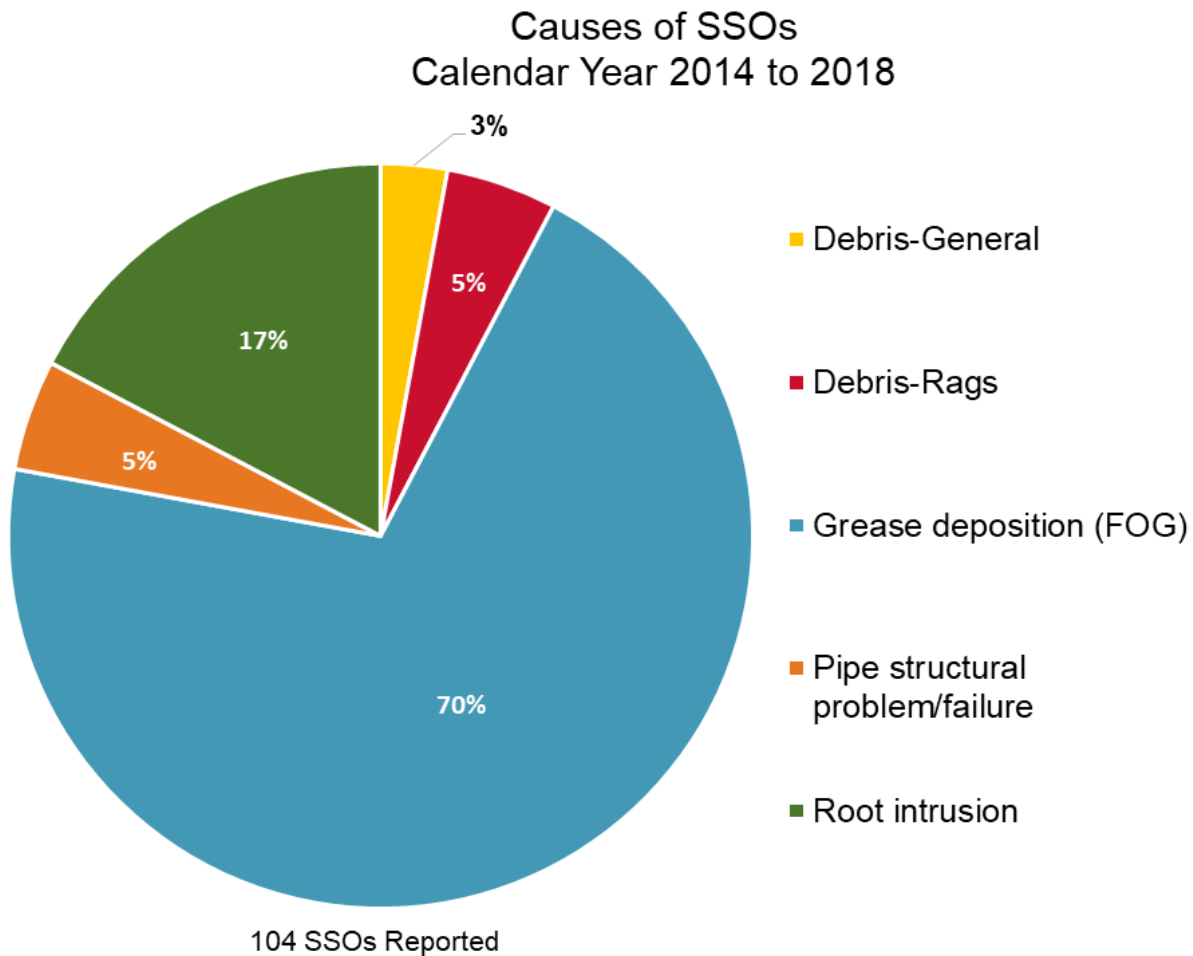
Under Order No. 2006-0003-DWQ, LBWD is responsible for evaluating the necessity of a FOG control program. If FOG is identified to be an issue, LBWD must prepare and enforce an implementation plan to reduce the amount of substance discharged into the sanitary sewer system. Otherwise, justification to the Board is required to validate that a FOG control program is not needed.

In 2003, LBWD determined that a formal FOG control program was necessary to meet the following objectives:

- Reduce the number of blockages in City sewer lines caused by FOG
- Reduce the number of sewer overflows onto City streets and storm drains due to FOG
- Reduce the frequency of cleaning needed to control FOG in “repeat” sewer lines

In 2005, the City Council implemented FOG Ordinance No. ORD-05-0003, which added regulations for the disposal of FOG into the LBMC under Chapter 8.46. In September 2016, a Memorandum of Understanding between the LBWD and the LBDHHS was reinstated to reduce blockages in City sewer lines due to FOG from FSEs and to reduce frequency of raw sewage backups in FSE and overflows into the streets and storm drains. Currently, the FOG control program remains active and enforced because FOG continues to be a major contributor to SSO events. **Figure 7-1** illustrates the percentage of FOG-related SSOs out of 104 reported SSOs from the past five calendar years (Year 2014 to 2018).

Figure 7-1. Percentage of Fats, Oils, and Grease-Related Sanitary Sewer Overflows



Source: CIWQS SSO Report

LBDHHS has more than 2,200 FSEs that are required to comply with the FOG regulations.

7.1 Public Education Outreach Program

LBWD and LBDHHS have developed the following public education outreach programs in an effort to reduce FOG:

- LBWD shared brochures to Long Beach students on Earth Day to highlight best management practices (BMP) that can be performed in households
- LBWD posted advertisements in local newspapers and bus tails
- LBWD displayed BMP posters in several languages (Spanish, English, Khmer, and Tagalog) in FSE kitchen
- LBWD distributed utility bill inserts and flyers
- LBWD and LBDHHS utilized social media to spread FOG messaging



- LBDHHS conducted FOG education and outreach during routine food inspections and provided FOG educational materials to FSEs
- LBDHHS posted FOG brochures and other educational materials on website and social media pages
- LBDHHS presented FOG information at several community events

In addition, during CCTV inspection, LBWD staff takes initiative to verbally educate homeowners on FOG reduction strategies when the homeowner's lateral is identified as a heavily greased line.

LBWD and LBDHHS are dedicated to improve and strengthen the community effort to reduce FOG-related SSOs. LBWD and LBDHHS plan to update and implement the following public outreach materials within the next 2-5 years:

- Develop an Informational Bulletin and other educational brochures or pamphlets for FOG to educate FSE owner
- Develop a robust training program for food inspectors on FOG regarding BMPs
- Present FOG information at the annual National Food Safety Month's Meet and Greet celebration, where food service facility owners are informed about upcoming legislative laws and food safety information

7.2 Disposal of Fats, Oils, and Grease

LBMC 8.46.030 – *Requirements for Food Facilities* outlines the process to adequately dispose of FOG generated within a sanitary sewer system area. A list of several acceptable disposal facilities needed to adequately dispose of FOG generated within a sanitary sewer system service area is included in **Attachment G1**. Note: this list is neither a referral nor a recommendation by the City.

7.3 Fats, Oils, and Grease Legal Authorities

The legal authority for LBWD's FOG control program are presented in Sections 3.5 and 3.6 of this SSMP.

7.3.1 Fats, Oils, and Grease Inspection

The LBDHHS is responsible for conducting FOG inspections annually at each FSE to ensure compliance to LBMC. Results are reported to LBWD to track how many inspections were in or out of compliance. If required documents are not prepared during the time of the FOG inspection, the FSE can submit at a later time via email. If a violation is determined, the FSE is given an allotted time by the health inspector to correct and sign a Certificate of Compliance Form. If the FSE exceeds the timeframe to correct an outstanding violation, it is up to the discretion of the health inspector whether or not to assess a reinspection fee. The health inspectors evaluate for:

- FOG BMP Compliance:
 - The owners and employees of an FSE shall be able to demonstrate that food facility complies with BMPs for handling FOG upon request from a LBDHHS representative, as noted in LBMC, 8.46.030.A.
- FOG Storage and Recycling:
 - A food facility shall have one or more drums or containers for the recycling and disposal of FOG, as noted in LBMC 8.46.030.B.
 - Drums and containers used for storage of FOG shall be leak proof and shall be secured with close fitting lids, as noted in LBMC 8.46.030.B.
 - The drums and containers shall be removed for recycling as frequently as necessary to avoid unsafe, hazardous, or untidy condition or an impediment to passage, as noted in LBMC 8.46.030.B.
- Clean and Maintain Facility:
 - The owner or operator of a FSE shall keep a written record of the maintenance, repair, and cleaning of grease traps and interceptors for one year, beginning the date a new business is open to the public or, in the case of a modification to the FSE which requires a building permit, on the date of final inspection, as shown on the building permit. A copy of the building permit is to be delivered to LBWD. The written record shall contain (but is not limited to) the following documentation:
 - Receipts showing the times, dates, nature of the maintenance, repair, and cleaning
 - Quantities of fats, oils, and grease removed
 - Name, address, and phone number of the person or entity cleaning the grease interceptor, grease trap, or alternative pretreatment technology (approved by City), as noted in LBMC 8.46.030.E
 - The owner or operator of a food facility shall install grease interceptors at a location easily accessible for inspection and for the cleaning and removal of grease, as noted in LBMC 8.46.040.C.
 - The grease interceptor shall not be installed near or in any part of a building where food is handled. The location of the grease interceptor must have a written approval by the LBDHHS, as noted in LBMC 8.46.040.C.
- Changes to Grease Interceptors
 - An FSE shall submit plans to LBWD for approval prior to installing, removing, or modifying a grease interceptor.
- Records:
 - The owner or operator of an FSE shall inspect the grease interceptor at least once per month. This frequency may be increased, as directed by an enforcement official, if the maintenance of the grease interceptor is found unsatisfactory, as noted in LBMC 8.46.040.E.



- FSE operators are required to maintain 12 months of written records documenting maintenance, repairs or cleaning of grease traps and grease interceptors, as well as invoices or manifests for grease removal services, as noted in LBMC 8.46.030.E.
- Grease Interceptor Maintenance:
 - The owner or operator of an FSE shall empty grease interceptors of accumulated grease necessary to maintain the minimum capacity or volume of the grease interceptor, as noted in LBMC 8.46.040.D.
 - The owner or operator of a FSE shall keep the grease interceptor free from inorganic-solid materials that could settle into the sludge pocket and reduce the effective volume of the grease interceptor, as noted in LBMC 8.46.040.G.
 - The owner or operator of an FSE shall maintain the grease interceptor in clean, good repair, and proper operating condition at all times, in accordance with the manufacturer's directions. This includes proper spillage clean-up, storage of waste grease, frequent disposal of wastewater, food debris, and grease, and grease hauling. Grease shall not accumulate in any drain pipe or public or private sewer line as noted in LBMC 8.46.050.D.
 - A health inspector checks for maintenance invoices to ensure the grease interceptors are regularly cleaned.

7.4 Fats, Oils, and Grease Program Requirements

7.4.1 Grease Removal Device Requirements

Section 1306 – *Grease Trap Requirements* in LBWD's Rules and Regulations states the grease removal device requirements. A grease system can either be a grease interceptor or grease recovery device. LBWD's requirements to install and design grease removal devices are discussed in LBMC 8.46.040 – *Requirements for Grease Interceptors*.

7.4.2 Best Management Practice, Record-Keeping, and Reporting Requirements

The maintenance requirements, BMP requirements, record keeping, and reporting requirements are found in LBMC 8.46.030 – *Requirements for Food Facilities*. The majority of BMP materials are from County Sanitation District of Los Angeles County. Examples of BMP practices include:

- Dry clean-up, wiping cookware, utensils and work areas prior to washing; disposing of food waste directly into the trash; avoid use of garbage disposal
- Spill prevention
 - Immediately remove spilled FOG using absorbents
 - Empty grease collection containers before full
 - Properly operate and maintain grease trap/interceptor by having the equipment regularly and frequently cleaned and serviced

- Develop rotation system for multiple fryers
- Clean floor mats in a janitorial sink

7.5 Fats, Oils, and Grease Program Staffing

LBDHHS has an established Memorandum of Understanding with LBWD to perform FOG source control inspections. Currently, there are 10 FSE district areas throughout the City. Each district area is assigned a health inspector to conduct FOG inspections and to enforce the FOG ordinance for relevant FSEs.

7.6 Preventive Maintenance Program to Address Fats, Oils, and Grease Accumulation

LBWD has identified the pipe segments of the sewer system subject to higher levels of FOG. Heavily greased lines initially undergo hydro jet cleaning prior to being assigned to a repeat schedule. Maintenance for the grease interceptor depends upon operation, but it is typically quarterly.

7.7 Source Control Measures for All Sources of Fats, Oils, and Grease Discharged

LBWD and LBDHHS work together to address all known locations of FOG accumulation through either FOG source control inspections of food service facilities and/or preventive maintenance cleaning on pipe segments with known propensity for FOG accumulation. LBWD's Sewer Operations Division cleans pipe segments with excessive FOG accumulation.



8 System Evaluation and Capacity Assurance Plan

LBWD has implemented a program to assure system capacity to convey peak dry weather flows. The *Sewer Master Plan* was updated in 2013 and is included in **Attachment H1**. The plan includes wet weather monitoring, evaluation of peak flow including rainfall derived infiltration and inflow, projected future wastewater flows, and a hydraulic model of the entire collection system. The plan determined that the effects of infiltration and inflow were insignificant compared to the amount of sewer flow through the sewer system. The LBWD is in the process of updating the *2013 Sewer Master Plan*.

8.1 Evaluation to Identify Potential Hydraulic Deficiencies

In 2013, the LBWD updated its capacity analyses of the existing and future scenarios to determine if there are any potential capacity deficiencies. The plan aligned flow monitoring data with the InfoSWMM hydraulic model and updated flows for weekday and weekend demands. Weekend flows were higher than weekday flows which are attributed to tourism and increased commercial activity on weekends. Locations with potential surcharge identified through the analysis were evaluated to verify project needs through additional flow monitoring or other investigation such as CCTV inspection.

System flows have declined since the initial 2008 Sewer Master Plan and the 2013 update. This decline is primarily attributed to active and passive indoor water conservation measures. Previously identified potential surcharge locations were reevaluated through the *2013 Sewer Master Plan Update* and *Sewer Master Plan Supplement* work in 2014, and capacity improvements are not warranted.

8.1.1 Dynamic Hydraulic Model

A dynamic hydraulic model of the collection system was developed as part of the *2008 Sewer Master Plan*. The model was created using InfoSWMM software from Innovyze using the U.S. Environmental Protection Agency SWMM hydraulic engine which operates in the Environmental Systems Research Institute ArcGIS environment. InfoSWMM is an extension to Environmental Systems Research Institute ArcGIS, and this brings a powerful modeling system into a fully featured GIS, allowing all advanced GIS functions to be utilized. The hydraulic model is utilized to evaluate potential surcharge and SSO conditions in addition to pipe flows and capacity. The hydraulic model is also used to evaluate new development. The hydraulic model includes all gravity sewer mains 12-inch and greater diameter and select smaller gravity mains. An all pipe model was developed for the Downtown Sewer Focus Study completed in 2019.

8.2 Evaluation and Design Criteria

The LBWD's sewer system evaluation criteria is located in Appendix F of the *2013 Sewer Master Plan Update*. Evaluation criteria for potential gravity sewer main upsizing is d/D of 0.90 or greater. Design criteria for new gravity sewer main infrastructure is d/D of less than or equal to 0.75 for gravity sewer mains greater than 18-inch diameter, and less than or equal to 0.50 for mains less than or equal to 18-inch diameter. Pump station and force

main criteria includes a maximum velocity at 10 feet per second during peak dry weather flow at build out and a minimum of 3 feet per second at average dry weather flow for existing system conditions.

8.3 Capacity Enhancement Measures

The *2013 Sewer Master Plan Update* utilizes the results of the hydraulic model evaluation to recommend CIP projects for existing and future scenarios. Some potential deficiencies were identified for near-term monitoring and verification. Verification through flow monitoring and CCTV were performed as part of *2014 Sewer Master Plan Supplement* work, which identified the locations as having adequate capacity. The *2013 Sewer Master Plan Update* includes cost estimates and schedule for condition improvement of existing wastewater collection pump station facilities.

8.4 Schedule for Completion of Capital Program

The *2013 Sewer Master Plan Update* identifies targeted completion years for proposed projects. The LBWD updates the CIP and project priorities annually through workshops with the Engineering Bureau and Sewer Operations staff based on current operating conditions including recent data such as inspections or flow monitoring. The LBWD maintains a 5-year CIP budget internally and supports preparation of the City CIP plan which includes a 3-year CIP and identifies sources of funding. Current and historical CIP plans for the City are located on the City of Long Beach Website (City of Long Beach n.d.b): <http://www.longbeach.gov/pw/resources/general/capital-improvement-plan/>

The LBWD develops a fiscal year CIP budget summary and presentation which is located on the LBWD website (Long Beach Water n.d.b.): <https://lbwater.org/about-us/important-documents/budget/>



9 Monitoring, Measurement, and Program Modifications

Monitoring, measurement, and program modification is required to:

- Maintain relevant information to establish and prioritize appropriate SSMP activities
- Monitor the implementation and, where appropriate, measure the effectiveness of each element of the SSMP
- Assess the success of preventive maintenance activities
- Update program elements, as appropriate, based on monitoring of performance evaluations
- Identify and illustrate SSO trends, including frequency, location and volume

This section describes LBWD's monitoring, measurement, and program modification program.

9.1 Performance Measure Identification

Improved wastewater infrastructure performance is a core task of any properly run utility. LBWD is committed to fulfilling its Mission Statement through a program of continuous improvement that:

- Utilizes a formalized program for continuous improvement
- Institutionalizes continual evaluation of its performance
- Identifies opportunities for continuous improvement
- Rewards or recognizes staff when performance is improved

To accomplish the above goals, LBWD has established a number of performance measures and routinely monitors progress in meeting those performance measures. The performance measures relating to each SSMP program element are listed in Table 9-1.

Table 9-1. Performance Measures per Each Sewer System Management Plan Element

Element	Performance Measure	Source
Goal	<=2 SSOs/100 miles/year	CIWQS
Organization	Percentage of vacant sewer operations positions	Operations Bureau
Operation and Maintenance	Miles of sewer cleaned	Operations Bureau
	Miles of sewer inspected	Operations Bureau
	Number of sewer repairs (mainline and lateral)	Operations Bureau
	Miles of sewer rehabilitated/replaced	Engineering Bureau
	Number of wet wells cleaned	Operations Bureau
	Number of pump station inspections	Operations Bureau
	Number of air relief valves inspected	Operations Bureau
SSO Response	SSO response time	Operations Bureau
FOG Control Program	Number FSE inspections	LBDHHS
	Number of FSE enforcement actions initiated	LBDHHS
	Number of FSE enforcement actions resolved	LBDHHS
	Number of grease-related SSO events	Operations Bureau
	Number of FSE enforcement actions initiated	LBDHHS
Capacity Assurance	Number of capacity-related SSO events (including wet weather-related SSOs)	Engineering Bureau
	Number of recommended Capacity Enhancement CIP Projects completed	Engineering Bureau
Monitoring & Measurement	Monthly performance review at manager level with executives	Engineering and Operations Management
Communication Program	Number of sewer-related public information brochures or newsletters distributed	Public Information Officer
	Number of sewer-related public education activities (i.e., events, presentations)	Public Information Officer

Notes:

LBDHHS=Long Beach Department of Health and Human Services

CIP=capital improvement program; CIWQS=California Integrated Water Quality System; FSE=food service establishments; FOG=fats, oils, and grease; SSO=sanitary sewer overflow



9.2 Monitoring

Each operational unit responsible for SSMP program activities (i.e., Operations Bureau, Engineering Bureau, Public Information Officer, and LBDHHS) is responsible for collecting performance measurement data to track progress. Water Department management reviews performance data monthly to identify trends and progress towards achieving goals and, if performance issues are identified, will work with staff to identify corrective actions.

9.3 Program Modification Plan

The success of the SSMP program elements should lead to a reduction of SSOs within the collection system. If no reduction in SSOs is seen, the program elements should be critically reviewed to determine areas for improvement. Those program elements should be modified as needed to improve performance.

LBWD monitors and measures the effectiveness of the SSMP program to diagnose the root causes of issues impacting SSMP program effectiveness. This includes on-going data analysis and standing meetings with various work groups to discuss performance and best practices. A few examples are weekly Sewer Operations meetings, monthly Engineering/Field Ops meetings, quarterly General Manager meetings, and annual Budget review meetings.

Program modifications usually occur during the planning process for the following year's budget, but it can also occur at any time during the year if performance issues are identified through performance monitoring. Program modifications also occur as a result of the biennial SSMP program audit process. Planned changes or corrective actions to the SSMP program implementation are monitored and tracked by the Sewer Operations Superintendent.

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10 Sewer System Management Plan Program Audit and Updates

The SSMP requires periodic internal audits to evaluate the effectiveness of the SSMP. This section details LBWD's plans to conduct such internal audits.

10.1 Sewer System Management Plan Program Audit Process

LBWD performs an SSMP Program Audit once every 2 years. The Sewer Operations Superintendent is responsible for initiating the SSMP Program Audit process, reviewing performance trends and the overall SSMP program implementation, and developing a set of audit findings and proposed corrective actions. The previous audit, input gathered throughout the term, and an assessment of current SSMP performance are all used to construct the initial draft of a new audit.

This initial set of audit findings and proposed corrective actions are provided to SSMP program implementation stakeholders for their review, comments, and additions. Stakeholders include Sewer Operations, LBWD Engineering, Pump Station Personnel, Health Department Environmental Services Bureau, and the Public Information Officer. Each SSMP element is evaluated for compliance with Waste Discharge Requirements, as well as effectiveness. Any deficiencies are identified, along with actions to correct each deficiency. The Sewer Operations Superintendent will collect and compile all of the input from the program stakeholders and will document the findings in the audit report.

The final audit report is reviewed by the Primary LRO (Director of Field Operations or the Assistant General Manager of Operations) before final acceptance. Audit reports and related materials are maintained in a hard copy and an electronic file is stored on the LBWD's server. The LBWD's most recent SSMP Program Audit Report from 2018 is included as **Attachment J1**.

Table 10-1 shows the timeline for SSMP audits and updates for the last 5 years and the anticipated schedule for the next 5 years.

Table 10-1. Sewer System Management Plan Audit and Update Schedule

Year	Audit
2014	5-year SSMP update completed in April 2014
2016	Biennial internal audit completed in early 2016
2018	Biennial internal audit completed in early 2018
2019	5-year SSMP update completed in August 2019
2020	Biennial internal audit planned in early 2020
2023	Biennial internal audit planned in early 2023

**Table 10-2. Sewer System Management Plan Audit and Update Schedule
(Continued)**

Year	Audit
2024	5-year SSMP update planned in late 2024

Notes:

SSMP=Sewer System Management Plan

10.2 Audit Implementation and Tracking of Results

Once audit report findings and corrective actions are finalized, LBWD staff responsible for the various elements of the SSMP program implementation review the SSMP program audit findings to determine an appropriate course of action. The Sewer Operations Superintendent tracks implementation progress of SSMP program audit corrective actions. Any deficiencies in meeting the schedule are identified or anticipated and mitigation measures developed and implemented to ensure the corrective actions from the audit are addressed. Each subsequent audit update begins with a review of the previous audit to identify any corrective actions that have been or have not been addressed. Any updates necessary to enhance the SSMP performance are included as a part of the following year's budgeting process and/or the formal SSMP program audit.

10.3 Sewer System Management Plan Update Process

The Superintendent of Sewer Operations and the Director of Field Operations is responsible for ensuring the SSMP is updated when major changes occur to the SSMP program implementation or at a minimum of 5 years from the previous SSMP update, approval, and recertification. The results of the prior SSMP program audit reports are factored into the SSMP update process.



11 Communication Plan

LBWD communicates with the public and neighboring agencies on an on-going basis. The following sections describe the processes LBWD uses to communicate with the public and neighboring agencies.

11.1 Communication with the Public

LBWD communicates with the public on a continual basis through the LBWD website and Water Commission meetings, which are open to the public. LBWD's SSMP was reviewed and approved by the Board at the April 2, 2009, Board Meeting, providing the public with the opportunity to review the SSMP and, as part of the Water Commission meeting, to comment on the SSMP.

This 5-year SSMP update was approved at a public Water Commission meeting on October 3, 2019, providing the public with the opportunity to review and comment on the SSMP.

LBWD's website also provides a continual link for the public to download the Sewer System Management Plan (Long Beach Water n.d.a) at:

<https://lbwater.org/customer-services/sewer/>

The webpage also invites the public to send any comments on the SSMP to SewerService@longbeach.org or call (562) 570-2390. These modes of communication can occur at any time during development and implementation of the SSMP.

LBWD's goal is to educate the community about healthy sewers through campaigns, social and digital media, community events, engaging games and promotional products. LBWD seeks to utilize prominent events throughout the city and holidays to promote the healthy sewers campaign, for which we have already seen results of less sewer overflows when social media is used strategically

Within Long Beach, the LBWD publicizes wastewater issues through local newspapers, customer newsletters, and on the department's external website. Periodic press releases related to wastewater topics are also utilized. The LBWD website provides general information and publicizes sewer projects. If a significant project is planned that will impact a neighborhood, the LBWD will communicate with community leaders and specific informational meetings for residents and businesses in the neighborhood.

LBWD's Communications Dispatch Office has three operators who log all complaints and refer callers to the appropriate division for resolution. The Communications Dispatch Office tracks how long it takes to get each issue resolved. Customers are also asked to complete a survey to gauge customer service satisfaction levels.

Specific to the sewer system, LBWD periodically receives unsolicited feedback from customers whom have had dealings with the department. Those unsolicited responses from customers are in the form of telephone calls or emails and are frequently complimentary of the work performed by LBWD crews. LBWD recognizes these employees at quarterly All Employees' Meetings, to reinforce this positive behavior.

11.2 Communication with Tributary or Satellite Systems

Satellite systems are those collection systems owned and maintained by others, but which transport flow into the LBWD's collection system. The following satellite systems have been identified as tributary to the LBWD:

- Long Beach Harbor Department
- City of Signal Hill (only one interconnection point, flow from which could be segregated with the installation of missing stop logs at the interconnection)

All of the above listed satellites transport flow through the LBWD collection system to the Sanitation Districts of Los Angeles County (LACSD) regional collection system and transported to LACSD's treatment facilities for treatment and disposal.

Additionally, LBWD's Pump Station S-05 serves a small private tract of homes of approximately 20 acres, known as the "Island Village," located south of 2nd Street and east of the San Gabriel River. Flow collected in this area is carried through a force main that extends eastwards to Seal Beach Boulevard to Orange County Sanitation District facilities. Consequently, the LBWD is a satellite system of both the LACSD and Orange County Sanitation District systems.

LBWD supervisors and crews currently provide technical and emergency response to its satellite systems on an as-needed basis. These communications, as well as similar communications with Orange County Sanitation District and LACSD supervisors and crews, occur as needed on an informal basis. Specifically related to SSMP communications, the Water Department sends each satellite agency a copy of the latest version of the SSMP document along with a brief cover letter and a current telephone, email contact list for key LBWD staff.



12 References

- City of Long Beach. n.d.a. *City of Long Beach Demographics*. <http://longbeach.gov/>
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- _____ 2018. *Long Beach SSMP Final Report*. <https://lbwater.org/wp-content/uploads/2018/09/Long-Beach-SSMP-Final-Report.pdf>
- _____ 2019. Long Beach Municipal Code. Updated July 2019. https://library.municode.com/ca/long_beach/codes/municipal_code
- City of Los Angeles, Department of Public Works. 1987. *Private Contract Sanitary Sewer Procedural Manual*. <https://dpw.lacounty.gov/ldd/lib/fp/Sewer/Private%20Contract%20Sanitary%20Sewer%20Manual.pdf>
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- _____ n.d.c. Sewer System Design Guidelines. https://lbwater.org/wp-content/uploads/2018/09/3.0-Sanitary-Sewer-Design-Criteria_v2.pdf
- _____ n.d.d. Standard Drawings and Designs. <https://lbwater.org/customer-services/designing-and-planning/developers-agreement/>
- _____ 2011. Rules, Regulations, and Charges Governing Potable Water, Reclaimed Water, Sewer Service, and the Water Conservation and Water Supply Shortage Plan. <https://lbwater.org/about-us/important-documents/rules-regulations/>
- _____ 2014. *Long Beach SSMP Final Report*. <https://lbwater.org/wp-content/uploads/2018/09/Long-Beach-SSMP-Final-Report.pdf>
- Sanitation Districts of Los Angeles County. 2018. Standard Drawings 2018 Edition. <https://www.lacsd.org/businesses/bidspur/amendments.asp>

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13 Attachments

The following letter IDs are assigned to each SSMP element:

- A – Goals
- B – Organization
- C – Legal Authorities
- D – Operation and Maintenance Program
- E – Design and Performance Provision Section
- F – Overflow Emergency Response Plan
- G – Fats, Oils, and Grease Program
- H – System Evaluation and Capacity Assurance Plan
- I – Monitoring, Measurement, and Program Modifications
- J – SSMP Program Audit and Updates
- K – Communication Plan

ID	Title	Owner	Last Updated
A1	Order No. 2006-0003-DWQ	LBWD	5/2/06
A2	Summary of Changes to the SSMP	HDR	8/22/2019
A3	Monitoring and Reporting Program	LBWD	9/9/2013
B1	Organization Chart for Key Positions Responsible for Implementing SSMP Elements	LBWD	8/26/2019
B2	Contact Information for Key Positions Responsible for Implementing SSMP Elements	LBWD	8/26/2019
C1	Sewer System Fact Sheet	LBWD	Unknown
F1	Overflow Emergency Response Plan	LBWD	August 2019
F2	Beach Water Quality Monitoring and Public Notification Program	LBWD	Unknown
F3	Spill Prevention, Control, and Countermeasure Plan Specification	LBWD	Unknown
G1	List of Disposal Facilities	LBDHHS	August 2019
H1	2013 Sewer System Master Plan Update	LBWD	August 2013
J1	SSMP Program Audit Report 2018	LBWD	2018

Notes:

LBDHHS=Long Beach Department of Health and Human Services; LBWD=Long Beach Water Department;
SSMP=Sewer System Management Plan; SSO=sanitary sewer overflows

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