



City of Brentwood 2015 SSMP Internal Audit

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Introduction

In May 2, 2006, the California State Water Resources Control Board adopted Order No. 2006-0003 (State Order) to create an equitable statewide mechanism to manage all publicly owned wastewater collection agencies with more than one mile of pipeline, to reduce the number and severity of Sanitary Sewer Overflows (SSOs), and to set up a central depository for online reporting of SSOs when they do occur.

A principal element of the State Order is the requirement that the collection agencies adopt and maintain a management plan for the system, referred to as a Sewer System Management Plan (SSMP).

The City of Brentwood's SSMP was certified and implemented on July 31, 2009, in accordance with the State Order.

One of the provisions of the State Order is that agencies perform an internal audit of the SSMP every two years. These audits are to focus on evaluating the effectiveness of the SSMP and the Enrollee's compliance with the SSMP requirements identified in section D.13., including identification of any deficiencies in the SSMP and what steps are/will be taken to correct them. The due date for this audit is March 15, 2013.

The SSMP must be updated every five years, and the update must include any significant program changes. If significant changes are made, the SSMP must be re-certified by the City Council. A revised version of the SSMP, based on the 2013 Internal Audit, was presented to the City Council and approved on May 14, 2014.

Background and System Overview

The City of Brentwood (City) was incorporated in 1948 as a General Law City. The City is predominately a bedroom community of approximately 54,000 residents that collects and treats wastewater generated primarily by domestic (household) users. The City currently has no categorical significant industrial users. The bulk of the commercial businesses are retail food establishments, retail grocery stores, home improvement centers and retail department stores.

The City has a service area of nearly 12 square miles with roughly 209 miles of City owned and maintained sanitary sewer piping systems and two lift stations. The City's sewer mains range in diameter from six inches to 42 inches with approximately 80% of these lines being eight inches in diameter or smaller. Nearly all of the sewer laterals are four inches in diameter. Similar to other organizations, the City owns a portion of the sewer laterals. The City owns the "lower" lateral, which is defined as the portion of the lateral extending from the edge of the property line to the sewer main.

Summary of SSO Events and Data

The City of Brentwood had two SSO's in 2011 (total volume = 15 gallons), three SSO's in 2012 (total volume = 857 gallons), one SSO in 2013 (total volume = 29 gallons), and no SSO's in 2014. This equates to an average SSO events per 100 miles of sewer main average ratio of 1.06 in 2011 and 1.60 in 2012. These ratios are considered to be indicative of a very high performing collection system. A 6-

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year historical chart (Figure 1) shows that the City consistently has a very high performing collection system, with a 6-year average ratio of 0.96 SSO events per year per 100 miles of sewer main.

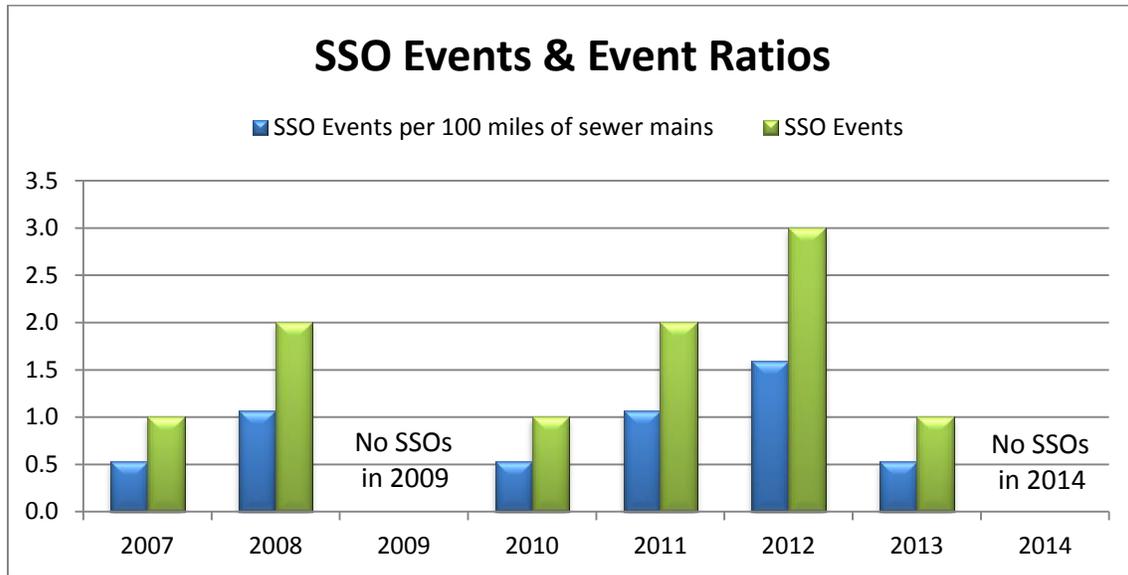


Figure 1

Figure 2 shows an 8-year history of SSO volumes. Of the 1,355,780,000 gallons of sewage that flowed through the City’s collection system in 2014 none was lost as SSOs. Since the City began measuring SSOs the highest annual total of SSO volume was 1225 gallons. The 8-year average total SSO volume is 410 gallons per year, with a per-event average volume of 328 gallons. There was one SSO in 2013 and none in 2014, resulting in an average volume of sewage overflow per event of 15 gallons during the last two years, which is well below the previous 6-year average.

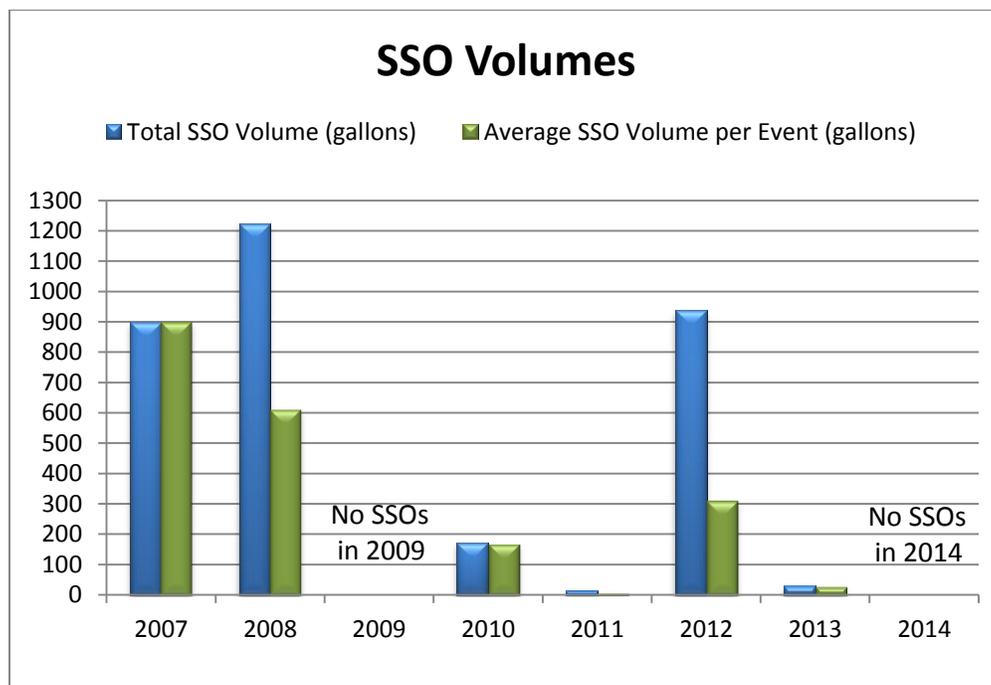


Figure 2

Table 1 below lists the data used in Figures 1 and 2 above.

Management, Operation and Maintenance System-Performance Metrics											
Source	Main Line SSOs per Year								Total	Average per Year	Average per 100 miles of sewer
	2007	2008	2009	2010	2011	2012	2013	2014			
Main Line SSOs	1	2	0	1	2	3	1	0	10	1	0.006
Volume (gal)	900	1225	0	170	15	937	29	0	3276	410	1.959

Table 1

Of the SSOs recorded since the State Order became effective, the City has kept track of the volume and percentage of each overflow that is recovered, and not discharged to a water of the State. Since 2007 the City has averaged an SSO recovery rate of 92% (Figure 3).

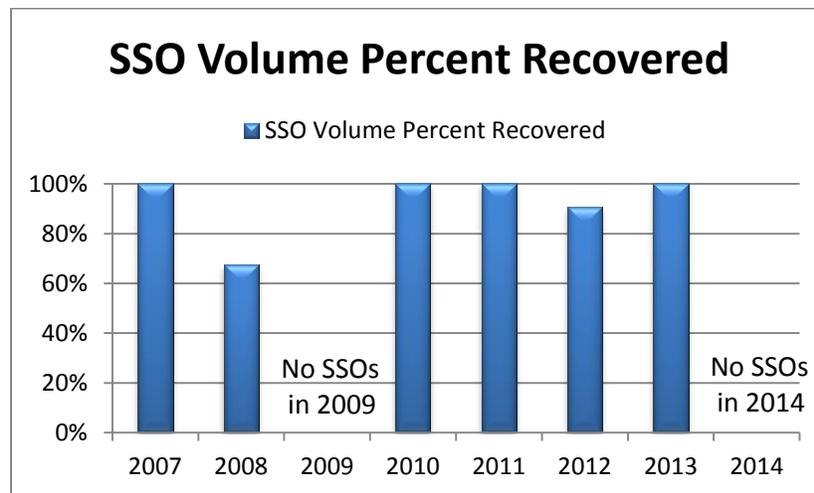


Figure 3

Table 2 below provides a breakdown of the causes of each of the SSOs recorded since 2007.

	Mainline Stoppages by Cause									
	2007	2008	2009	2010	2011	2012	2013	2014	Total	%
Debris - General						1			1	10
Debris - Rags									0	0
Flow exceeded capacity									0	0
Grease (FOG)		1		1	2	2	1		7	70
Operator Error									0	0
Pipe structural problem/failure									0	0
Pump station failure									0	0
Rainfall exceeded design									0	0
Root intrusion									0	0
Vandalism									0	0
Contractor Causes	1	1							2	20
TOTAL	1	2	0	1	2	3	1	0	10	100

Table 2

Up until 2013, the City footage of sewer mainline cleaning had been relatively consistent. Beginning in 2013 the City transitioned to more of a proactive investigation of sewer mainlines rather than a “blind cleaning” method. In 2014 the City actually CCTV’d more footage of mainlines than it cleaned. Figure 4 below illustrates the City’s trend toward more CCTV’ing than cleaning, and the overall footage maintained per year.

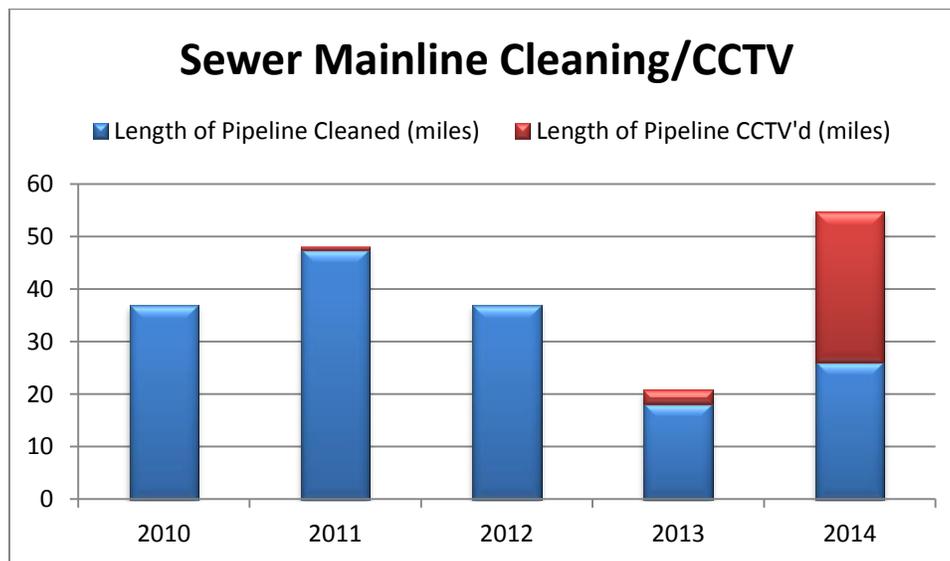


Figure 4

Figure 5 is a map of the City’s entire collection system with the locations of all the SSOs since 2007. There are only two instances where SSOs occurred in the same area. The two SSOs on Tarragon Dr. occurred one year apart and were both attributed to swimming pool contractors washing debris into the sewer system. The SSOs on Berry Ln. and Central Blvd. occurred three years apart. This map serves as an indicator of overall system health. Since the SSOs occur in random places, the City can reasonably conclude that there are no overly problematic areas that are in danger of having SSOs or needing repair.

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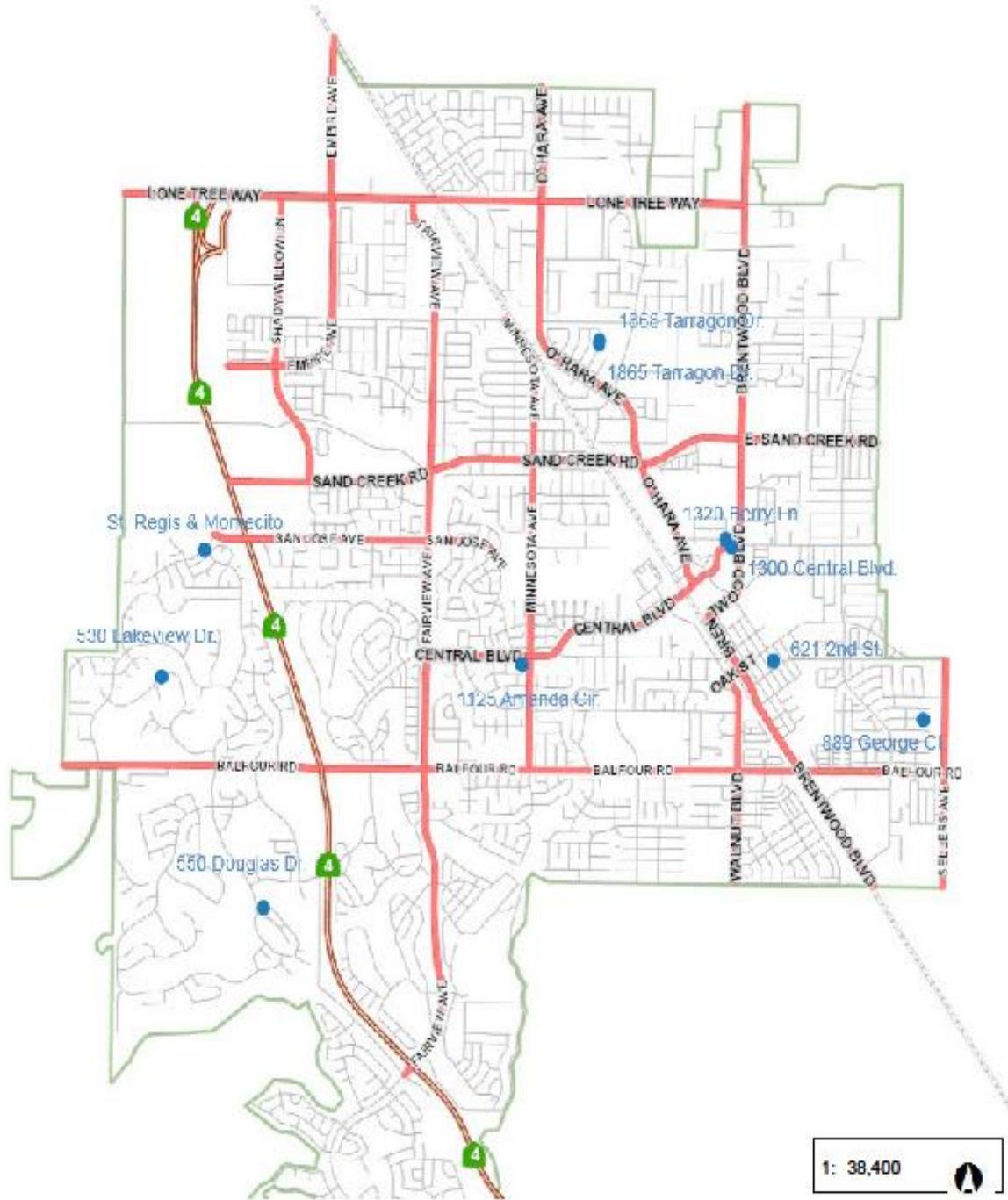
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Historical SSO Map 2007-2014



6,400.0 0 3,200.00 6,400.0 Feet

This map is a user generated static output from an internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. THIS MAP IS NOT TO BE USED FOR NAVIGATION

Notes:

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Audit Approach

As specified in the State Order, the SSMP is comprised of eleven sections or subsets of Section D.13 of the State Order, as follows:

D.13.i	Goals
D.13.ii	Organization
D.13.iii	Legal Authority
D.13.iv	Operation and Maintenance Program
D.13.v	Design and Performance Provisions
D.13.vi	Overflow Emergency Response Plan
D.13.vii	FOG (fats, oils, & grease) Control Plan
D.13.viii	System Evaluation and Capacity Assurance Plan
D.13.ix	Monitoring, Measurement and Program Modifications
D.13.x	SSMP Program Audits
D.13.xi	Communication Program

This internal audit is focused on the above eleven categories as required by the State Order. The evaluation of each element in each category is standardized with sufficiency. Compliance ranking has been based on State Order audit guidelines and sufficiency. A recommendation has been provided when there is enough information to support it.

The format for audit reporting is as follows:

- State Order Section/Subsection
- Sufficiency Ranking
 - Complies,
 - Substantially complies,
 - Partially complies,
 - Marginally complies,
 - Does not comply
- Findings
- Reference Information
- Recommendation when appropriate

1. Audit of Goals – State Order D.13.i

Review the SSMP to determine if it complies with the State Order by having a goal to provide a plan to manage, operate, and maintain all parts of the City of Brentwood Wastewater Collection System.

Sufficiency: **Complies.**

Findings: The City has established a list of goals in its SSMP that complies with the goals established in the State Order.

The City's Goals for the SSMP together with progress to date are as follows:

1. To minimize the number and impact of SSOs;

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Complete. Adherence to the SSMP has helped limit the number of SSOs to ten SSO events in the last eight years with an average annual SSO volume of 328 gallons.

2. To maintain existing infrastructure and plan for future Capital Improvement Projects (CIPs);

Complete. Adherence to the SSMP coupled with sound planning has resulted in an up to date infrastructure with no major deficiencies. The average age of the collection system piping is approximately 15 years, significantly less than most collection systems. Future CIPs are planned to ensure that infrastructure continues to be kept in good working condition.

3. To continue to provide capacity evaluation for the collection system and plan for future growth;

Complete. The Wastewater Collection System Master Plan was prepared in 2001. The Plan was subsequently updated in 2006 to accommodate a rapidly growing community. Another update was prepared in 2010 to forecast collection system flow conditions at “build-out”, and provided recommendations for capital improvements to optimize the collection system to handle the planned growth.

4. To develop a plan to increase the number of staff to meet the obligations of the SSMP;

Ongoing. Increasing staffing levels to meet the obligations of the SSMP has proven challenging. Economic difficulties associated with the housing bubble resulted in a hiring freeze for several years. The City added one full-time Collection System Worker in FY 2014/15.

5. To prevent public health hazards;

Complete. Adherence to the SSMP has prevented public health hazards.

6. To detect and reduce inflow and infiltration into the Collection System;

Complete. The influent flow comparison below shows flow from December 2013 through November 2014. This comparison (see Figure 3) shows that there is no evidence of excessive inflow and infiltration in the winter months. In fact, the winter months exhibited the lowest flows of the year.

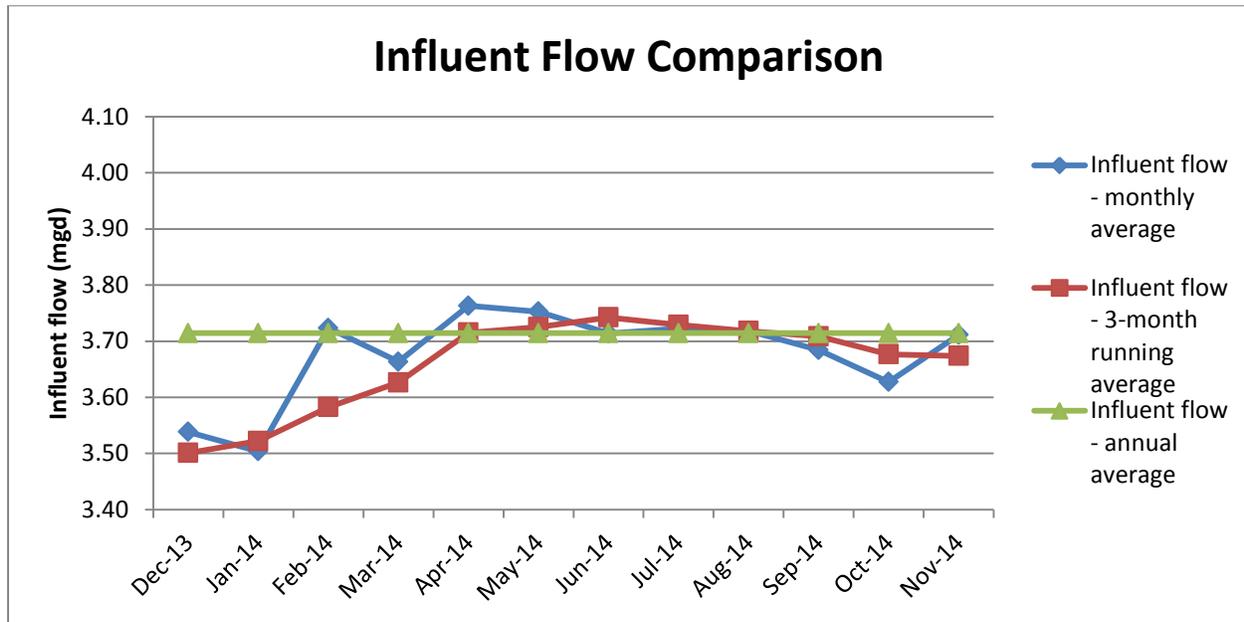


Figure 3

7. To operate the Collection System in a safe and efficient manner, thus maximizing production;

Complete. There were no lost-time injuries associated with the collection system since the last audit period.

Reference: City of Brentwood SSMP (COB SSMP).

Recommendation: None. The City is in compliance with the *Goals requirement of the State Order*.

2. Audit of Organization – State Order D.13.ii

Review the SSMP to determine if it complies with the State Order by having the names of authorized representatives published and updated in the SSMP.

Sufficiency: **Substantially Complies.**

Findings: The City has identified the names of its authorized representative, management, administration, and maintenance personnel and has shown the chain of communication for reporting SSOs. The organization chart needs to be updated to reflect personnel changes within the City

Reference: City of Brentwood Authorized Representatives List, COB SSMP, Appendix A

City of Brentwood Organization Chart, COB SSMP, Page 4.

City of Brentwood Communication Flow Chart, COB SSMP, Page 6

Recommendation: Update the organization chart to reflect current personnel and vacancies.

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3. Audit of Legal Authority – State Order D.13.iii

Review the SSMP to determine if it complies with the State Order by having ordinances and agreements in place and updated to prevent illicit discharges, provide for proper design of sewers and connections, ensure access for maintenance, inspection, and repair of laterals, limit the discharge of blockage causing debris, and enforce any violation of sewer ordinances.

Sufficiency: **Complies**

Findings: The City has an adopted Municipal Code that addresses the legal authority required to carry out actions identified in the SSMP. Specifically, section 13 of the Brentwood Municipal Code prohibits illicit discharges, sets standards for the design of sewers and connections, and provides a means to enforce violations of the provisions within the Code. At the time of this report's preparation, the City is in the process of updating section 13 (Sewers) of the Municipal Code. The update will include clarification on regulations pertaining to potential industrial users, and reinforcement of other portions of the code ensuring compliance with the SSMP and Federal Pretreatment Regulations.

Reference: COB SSMP, Appendix D

City of Brentwood Municipal Code, Section 13.

Recommendation: None

4. Audit of Operation and Maintenance Program – State Order D.13.iv

Review the SSMP and activities of staff, consultants, and contractors to determine compliance with the State Order by having (a) an up to date map of the Collection System that shows all pipe reaches, manholes, siphons, diversion structures, and pump stations and (b) a routine preventative maintenance program, (c) a rehabilitation and replacement plan, (d) an operations and maintenance training program, and (e) a parts inventory program including identification of critical replacement parts.

Sufficiency: **Complies**

Findings: The Collection System Map is kept up-to-date electronically through a GIS program (GeoVault) and managed by the Engineering division. The map is available on the City's intranet. Collections crews have access to the electronic map room via a laptop in the field, and through desktop computers in the office.

As outlined in the COB SSMP the routine preventative maintenance program consists of quarterly hot-spot cleaning, and CCTVing/cleaning of the balance of the collection system on a 4-year basis. The City utilizes Maintenance Connection, an enterprise asset management software package to track all the O&M activities of the collection system.

Rehabilitation and Replacement are accomplished through capital improvement projects. The City has an annual CIP project on the books and funded to cover any urgent major pipeline repairs. In addition to this project, periodic CIP's are done on a case-by-case

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basis. The latest example of this was a manhole coating and repair project completed in FY 2013/14.

The City sets aside a budget for collection system training each year. Collections staff participates in several industry-wide training events annually.

The City maintains a sufficient spare parts inventory of critical equipment.

Reference: Spare Parts Inventory List, COB SSMP, Appendix E

Recommendation: Increase level of training for collection system personnel.

5. Audit of Design and Performance Provisions – State Order D.13.v

Review the SSMP to determine if it complies with the State Order by having design and construction standards and specifications for installation of new facilities, including coverage for testing of new facilities prior to acceptance.

Sufficiency: **Complies**

Findings: The City has adopted Standard Plans and Specifications for, among other things, construction of sewers and sewer appurtenances. A copy of the applicable Standard Specifications (Section 71 and 75) are attached to the COB SSMP. These specifications also address testing necessary for acceptance.

Reference: COB SSMP, Appendix F

City of Brentwood Standard Plans and Specifications

Recommendation: None

6. Audit of Overflow Emergency Response Plan – State Order D.13.vi

Review the SSMP to determine if it complies with the State Order by having an overflow emergency response plan that includes (a) proper notification procedures, (b) a program that assures proper response to all overflows (c) procedures that ensure prompt notification of regulatory agencies and other affected entities, (d) procedures to ensure that appropriate personnel are aware of the plan and appropriately trained, (e) procedures to address traffic control and crowd control, and, (f) implementation of steps to prevent SSOs from reaching waters of the United States.

Sufficiency: **Complies**

Findings: The City has a stand-alone Overflow Emergency Response Plan (OERP) that is incorporated into the SSMP. This plan effectively addresses notification procedures, assures proper response to overflows, contains procedures to ensure the proper regulatory notifications are made, and has provisions to address traffic control associated with SSOs.

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Copies of the Sewer Overflow Reports used by staff are found in the SSMP in Appendix B.

Reference: City of Brentwood Overflow Emergency Response Plan

COB SSMP, Appendix B

Recommendation: None

7. Audit of FOG (Fats, Oils, and Grease) Control Plan– State Order D.13.vii

Review the SSMP to determine if it complies with the State Order by having a FOG Control plan with (a) a public education outreach element, (b) a plan for the disposal of FOG, (c) ordinances, rules and regulations to prevent FOG, (d) requirements to install FOG traps together with standard drawings for traps, owner maintenance, record keeping, and reporting requirements, (e) FOG inspection and enforcement authority and staffing, (f) FOG mapping and cleaning schedule, and (g) source control measures.

Sufficiency: **Substantially Complies**

Findings: The City’s FOG program accomplishes the above requirements with the exception of (e). The Municipal Code establishes the enforcement authority for FOG inspections, but there is currently no staff devoted exclusively to FOG inspection/prevention/enforcement.

Reference: COB SSMP, Appendix C

Recommendation: Develop a plan for staffing FOG inspection/enforcement as economic growth dictates.

8. Audit of System Evaluation and Capacity Assurance Plan – State Order D.13.viii

Review the SSMP to determine if it complies with the State Order by having a Capital Improvement Plan (CIP) that considers (a) Evaluation of those portions of the Collection System that experience SSO’s due to hydraulic deficiency, (b) Design Criteria commensurate with the Collection System, (c) Capacity Enhancement Measures and steps to address short term and long term CIP goals and an implementation schedule, and (d) Schedule for completion of items identified in (a) – (c).

Sufficiency: **Complies**

Findings: The City has a Wastewater Collection System Master Plan that addresses the requirements identified in State Order D.13.viii. The City initially prepared the Wastewater Collection System Master Plan in 2001 following adoption of the “City of Brentwood General Plan 2021”. Due to an extremely accelerated growth rate in the years immediately following 2001, the City updated the Wastewater Collection System Master Plan in 2006. This Plan was updated again in 2010. The 2010 update includes a capacity assessment based on hydraulic modeling of the collection system with future design

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flows at ultimate “build-out” development of the City. This modeling identified nine CIPs that will ultimately require some sections of the sewer main piping to be replaced with larger diameter piping, or have parallel piping installed.

The City has not experienced any sanitary sewer overflows caused by hydraulic deficiencies in the existing wastewater collection system. As the City grows, the hydraulic capacity of the system will continue to be monitored and the previously identified sections requiring replacement or parallel piping will be implemented as CIPs.

The City has comprehensive design criteria and standards relating to collection system design and construction. These criteria may be found in the City of Brentwood Standard Plans and Specifications.

References: COB SSMP, Appendix F

Recommendations: None.

9. Audit of the Monitoring, Measurement, and Program Modifications – State Order D.13.ix

Review the SSMP to determine if it complies with the State Order by (a) maintaining relevant information that can be used to establish and prioritize appropriate SSMP activities, (b) measuring the effectiveness of each element of the SSMP, (c) assessing the success of the preventative maintenance program, (d) updating program elements, based on monitoring or performance evaluations, and (e) identifying and illustrating SSO trends, including frequency, location and volume.

Sufficiency: **Complies**

Findings: The City began collecting data on SSOs upon the implementation of the State Order. This data is summarized in the figures and tables in the Summary of SSO Events and Data since the Last SSMP Audit section on pages 3 and 4 of this document. This data continues to support the notion that the City’s SSMP is working effectively to properly manage the collection system. SSO trends based on frequency, location, and volume are readily available, as are records of pipeline cleaning.

References: COB SSMP

2015 SSMP Internal Audit, Summary of SSO Events and Data

Recommendations: None.

10. Audit of SSMP Program Audits – State Order D.13.x

Perform an internal audit of the SSMP to determine if it complies with the State Order by evaluating the effectiveness of the SSMP and the City’s compliance with the SSMP requirements including identification of any deficiencies in the SSMP and steps to correct them.

Sufficiency: **Complies**

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Findings: The City has embarked on this audit of its SSMP within the two-year requirement specified in the State Order. The previous audit was performed in March of 2013 and submitted on March 15th, 2013. This audit is due March 15th 2015, with the next audit due March 15th, 2017.

References: COB SSMP, Appendix H

Recommendations: None

11. Audit of Communication Program – State Order D.13.xi

Review the activities of staff to determine if they have complied with the State Order by (a) communicating the performance of the SSMP with the public, and (b) providing the public the opportunity to provide input.

Sufficiency: **Complies**

Findings: Public input was solicited during the development of the SSMP in 2006 and 2007. Since the adoption of the SSMP, there has been little public input to the program.

With the completion of each audit, City staff makes the audit available to the general public by posting it, along with a copy of the SSMP, on the City website.

References: City of Brentwood website, www.brentwoodca.gov

Recommendations: None.