SECTION X—SSMP PROGRAM AUDITS

Requirement[1]

a. Perform an internal SSMP Program audit a minimum of every two years. Prepare a report to be kept on file;

b. The audit shall focus on the effectiveness of the SSMP and the City's compliance with SSMP requirements including identifying SSMP deficiencies and corrective steps.

Supporting Documents

A summary of the work related to this section and the supporting official documents are shown in Table X.1.

A copy of each document follows the table.

[1] SWRCB Order No. 2006-003-DWQ § B.13 (x)

TABLE X.1—SUMMARY OF SSMP PROGRAM AUDITS

Item Required	Supporting Documents
a. Perform a bi-annual internal audit	SSMP Audit Program. April 2014. Memorandum from the City of Benicia Management Analyst. Sewer System Management Plan Annual Audit Report. Prepared by EOA, Inc. and City of Benicia. Attach most current audit report.
b. Demonstrate effectiveness and compliance with SSMP requirements	SSMP Audit Program. March 2010. Memorandum from the City of Benicia Management Analyst.

SSMP Audit Program

Public Works Department
MEMORANDUM

Date: April 30, 2014

To: File

From: Carrie Wenslawski, Management Analyst

Re: **SSMP Audit Program**

Internal audits to identify the progress of the implementation of the SSMP and evaluate its effectiveness (including any corrective measures needed) are required on a periodic basis. Audits shall be conducted bi-annually (covering the previous two calendar years) with a copy of the audit included in Section X of the SSMP and made available to regulators upon request.

The City's plan is to conduct the internal audit in conjunction with a bi-annual review (and, as necessary, update) of the SSMP. In addition to identifying and correcting deficiencies (or specifying the schedule for such correction), the audit will review effectiveness of implementing the SSMP elements using the performance measures listed in SSMP Section IX and Table 1 of the audit form. As indicated in Section IX, performance measures are expected to yield meaningful results only when viewed over a number of years (i.e. long-term trends) and may show significant variability on a year-to-year basis.

The first audit (2008) focused primarily on the completeness of the SSMP to date. Subsequent audits have focused on SSMP implementation and evaluation of SSMP effectiveness as indicated above.

Sewer System Management Plan Annual Audit Report

Adapted from format developed by BACWA

Name of agency	*City of Benicia*
Date of audit	*April 2, 2014*
Reporting Period	*Calendar years 2012- 2013*
Audit Team	*Ray Goebel, P.E. (EOA, Inc.)* *Nathaniel Rankin (Public Works Maintenance Superintendent)* *Jeff Gregory (WWTP Plant Superintendent)* *Carrie Wenslawski (Public Works Management Analyst)* *Brad Harms (Water Quality Technician/FOG Program)* *Nicole Van Aken (Acting Water Quality Supervisor)*

System Overview	
Miles of gravity sewer mains	*145*
Miles of force mains	*5*
Total miles of all sewer lines	*150*
Number of pump stations	*23*
Miles of private sewer mains, excl. laterals	*0*
Miles of private sewer laterals	*~80*
Population served	*~28,000*
Current average monthly single family residential sewer rate	*$50.01*

This audit includes information regarding the status and implementation of the SSMP as for calendar years 2012 and 2013. Some information from early 2014 is also included in the narrative. Annual SSO statistics through calendar year 2013 are presented in Table 1. Audit team comments for particular sections (or subsections) are indicated in italics. In many cases, comments are included even if the response to the question(s) were "Yes".

Note: The Order of headings below is based on Statewide Order 2006-003-DWQ.

I. GOALS

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

2. If you answered NO to question 1, describe content and schedule for updates, or provide additional comments for YES response.

II. ORGANIZATION

REFERENCE MATERIAL

- **Organization chart**
- **Phone list**

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

4. If you answered NO to question 3, describe content and schedule for updates, or provide additional comments for YES response.

Organization and contact information is in Section II and also on p. PB-3 of the SSO and Backup Response Plan (Section VI). The City's SSMP web site has the org chart and contact numbers for Public Works Maintenance and Wastewater Operations Divisions. Position descriptions, titles, phone numbers, org chart, etc. were updated in early 2014.

III. LEGAL AUTHORITY

REFERENCE MATERIAL

- **Ordinances**
- **Enforcement actions**

5. Does the SSMP contain up-to-date information about your agency's legal authority? **YES / NO**

6. Does your agency have sufficient legal authority to control sewer use and maintenance? **YES / NO**

7. If you answered NO to questions 11 and/or 12, describe content and schedule for necessary changes, or provide additional comments for YES response.

The City is in the process of creating a Building Sewer Lateral Inspection and Repair Program. The specific contents of the Program have yet to be finalized.

Sewer rates were increased in 2012 to meet increasing costs for system capital and O&M needs. The monthly EDU charge will increase over a five-year period as follows:

Previous	2012/13	2013/14	2014/15	2015/16	2016/17
$41.33	$45.88	$50.01	$53.26	$55.39	$56.49

IV. MEASURES AND ACTIVITIES

a. COLLECTION SYSTEM MAPS

REFERENCE MATERIAL

- **Summary of information included in mapping system**

8. Does the SSMP contain up-to-date information about your agency's maps? **YES / NO**

9. Are your agency's collection system maps complete, up-to-date, and sufficiently detailed? **YES / NO**

10. If you answered NO to questions 14 and/or 15, describe content and schedule for necessary changes, or provide additional comments for YES response.

Utility maps were updated in 2008. The revised pages were printed bound into the map books in 2010. Changes are tracked on the sewer department master copy. When a sufficient number of changes have accumulated, the map books will be reprinted.

b. RESOURCES AND BUDGET

REFERENCE MATERIAL

- **Current Capital Improvement Plan (CIP)**
- **Current operating budget**

11. Does the SSMP contain up-to-date information about your agency's resources and budget? **YES / NO**

12. Are your agency's resources and budget sufficient to support effective sewer system management? **YES / NO**

13. Do your agency's planning efforts support long-term goals? **YES / NO**

14. If you answered NO to questions 17, 18, and/or 19, describe content and schedule for necessary changes, or provide additional comments for YES response.

The City's allocated resources and budget for the audited period were sufficient to maintain and manage known issues within the sewer system. However, the City's wastewater collection system budget does not include any contingency funding for unanticipated repairs. Also, the City is in the process of completing CCTV inspection of the all sewer pipes within 200' of a waterway. These inspection results will identify new rehabilitation needs that may require increased funding in the future years. The City addressed long-term capacity needs through its Sewer Master Plan, and is in the process of integrating these findings into a multi-year strategy and updated CIP for sewer system management (to address long-term goals). This effort integrates a repair and replacement forecast that, when fully developed, will be discussed in a future SSMP update.

c. PRIORITIZED PREVENTIVE MAINTENANCE

REFERENCE MATERIAL

- **Cleaning schedules**
- **List or map of hotspots**
- **Work orders**
- **Service call data**
- **Customer feedback**

15. Does the SSMP contain up-to-date information about your agency's preventive maintenance activities? **YES / NO**

16. Considering the information in Tables 1 – 3, are your agency's preventive maintenance activities sufficient and effective in reducing and preventing SSOs and blockages? **YES / NO**

17. If you answered NO to questions 22 and/or 23, describe content and schedule for necessary improvements or provide additional comments for YES.

Overall, the number and total volume of SSOs is trending downward, as indicated in Table 1. However, significant year-to-year variability can still be expected.

d. SCHEDULED INSPECTIONS AND CONDITION ASSESSMENT

REFERENCE MATERIAL

- **Inspection reports**
- **Infiltration and Inflow (I/I) monitoring studies and reports**
- **Pipe and manhole condition data**

Note: Statewide Order 2006-003-DWQ describes this sub-element as a Rehabilitation and Replacement Plan.

18. Does the SSMP contain up-to-date information about your agency's inspections and condition assessment? **YES / NO**

19. Are your agency's scheduled inspections and condition assessment system effective in locating, identifying, and addressing deficiencies? **YES / NO**

20. If you answered NO to questions 24 and/or 25, describe content and schedule for necessary changes, or provide additional comments for YES.

The results of earlier condition assessment studies are incorporated into the Capital Improvements budgets that are part of the SSMP. The City also uses information from inspections (including CCTV) conducted during maintenance activities to identify problems/deficiencies. See Table IV.1.c, October 2009 Public Works Memorandum "O&M Maintenance Procedures – Infrastructure Continuous Improvement (Rehabilitation and Replacement)"

The condition assessment process is expected to improve upon purchase of a dedicated CCTV truck and its operation by a separate "camera crew".

e. CONTINGENCY EQUIPMENT AND REPLACEMENT INVENTORIES

REFERENCE MATERIAL

- **Funds spent on equipment and materials**
- **Equipment and parts inventory**

21. Does the SSMP contain up-to-date information about equipment and replacement inventories? **YES / NO**

22. Are contingency equipment and replacement parts sufficient to respond to emergencies and properly conduct regular maintenance? **YES / NO**

23. you answered NO to questions 27 and/or 28, describe content and schedule for necessary arrangements, or provide additional comments for YES response

The spare parts inventory was updated in 2011 and again in early 2014.

f. TRAINING

REFERENCE MATERIAL
- **Employee training records**

24. Does the SSMP contain up-to-date information about your agency's training expectations and programs? **YES / NO**

25. Do supervisors believe that their staff is sufficiently trained? **YES / NO**

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

27. If you answered NO to questions 30, 31, and/or 32, describe content and schedule for necessary improvements, or provide additional comments for YES response.

Training is an ongoing activity as documented in the SSMP. Given the recent changes in the General Order's MRP related to monitoring for SSOs, the City plans to repeat training of the collections crew for sample collection in 2014. Training will be provided by WWTP laboratory staff. Upon completion of the 2014 Emergency Response Plan revisions, the City plans to repeat training of the collection crew in methods for SSO volume estimation.

g. OUTREACH TO PLUMBERS AND BUILDING CONTRACTORS

REFERENCE MATERIAL
- **Fliers / mailings**
- **Mailing lists**

Note: Statewide Order 2006-003-DWQ does not include this requirement.

28. Does the SSMP contain up-to-date information about your agency's outreach to plumbers and building contractors? **YES / NO**

29. Has your agency conducted or participated in any outreach activities to plumbers and building contractors? **YES / NO**

30. If you answered NO to questions 34 and/or 35, describe content and schedule for future activities, or provide additional comments for YES response.

Information regarding the City's outreach activities, including the October 2009 mailing to plumbers and sewer contractors are in SSMP Section IV. The City's Building Division has copies of the outreach brochure in the Division's waiting room, and distributes it to plumbers who pull building permits. The brochure is also on the bidder notification section of the City's web site. DPW staff have verified with the Building Division that it conducts inspections when a customer does a full or partial replacement of a private sewer lateral. However it does not inspect when a customer hires a licensed plumber to do work on a private lateral.

V. DESIGN AND CONSTRUCTION STANDARDS

REFERENCE MATERIAL
- **Design and construction standards**
- **Ordinances**

31. Does the SSMP contain up-to-date information about your agency's design and construction standards? **YES / NO**

32. Are design and construction standards, as well as standards for inspection and testing of new and rehabilitated facilities sufficiently comprehensive and up-to-date? **YES / NO**

33. If you answered NO to questions 38 and/or 39, describe content and schedule for necessary revisions, or provide additional comments for YES response.

The SSMP's Section V has a copy of the City's Engineering Design Standards and Standard Plans that apply to collection system components in Public Works projects. These standards are current.

VI. OVERFLOW EMERGENCY RESPONSE PLAN

REFERENCE MATERIAL

- **Data submitted to CIWQS**
- **Service call data**

34. Does the SSMP contain an up-to-date version of your agency's Overflow Emergency Response Plan? **YES / NO**

35. Considering the information in Table 1, is the Overflow Emergency Response Plan effective in handling SSOs? **YES / NO**

36. If you answered NO to questions 5 and/or 6, describe content and schedule for necessary revisions and implementation, or provide additional comments for YES response.

Section VI's "Overflow Emergency Response Plan" is reviewed and updated periodically. A copy of this Plan is included in the SSMP and is carried in collection system vehicles. The current version (effective date January 2010) is in the process of being updated by DKF Solutions Group. Upon completion in mid-2014, it will replace the current version.

For the 2014 SSMP update, the "Spill and Bypass Reporting" document in Section VI was deleted and replaced with a new document "SSO Regulatory Notification, Reporting and Record Keeping" The latter reflects the SWRCB's 2013 revisions the General Order MRP. Also added to Section VI is the "SSO Monitoring Plan", detailing SSO monitoring requirements for SSOs where >50,000 gallons reaches surface waters. The Monitoring Plan is also used by the City for discretionary monitoring for smaller spills.

Table 1. Annual SSO Statistics

Indicator	2007	2008	2009	2010	2011	2012	2013
Number of SSOs (total)	27	17	22	10	13	15	14
Wet season SSOs[1]	*	3	6	4	10	8	9
Dry season SSOs[1]	*	14	16	6	3	7	5
Number of SSOs (by conditions at time of SSO)							
Wet Conditions				0	0	0	0
Dry Conditions				10	13	15	14
Number of SSOs (by volume range)							
< 10 gal	12	2	3	1	2	4	0
10 – 99 gal	8	9	11	5	6	8	
100 – 999 gal	3	4	7	4	1	3	
1000 – 9999 gal	4	2	1	0	4	0	0
≥10,000 gal	0	0	0	0	0	0	0
Total SSO Volume	12,326	7,486	3,264	1,873	7,251	2,625	1,838
Volume reaching waters of the State	5,800	425	240	101	4,675[4]	1,275	251
Volume not contained but not reaching waters of the State	2,806	3,255	0	0	2	100	589
Volume recovered	3,720	3,806	1,189	1,772	2,574	1,250	998
Net volume (total minus recovered)	8,606	3,680	2,078	101	4,677	1,375	840
Number of SSOs per 100 miles of sewer per year[2]	18.0	11.3	14.7	6.67	8.67	10	9.33
Volume of SSOs per 100 miles of sewer per year[2]	8,217	4,991	2,178	1,249	4,834	1,750	1,225
Total Volume conveyed to the plant (million gal)	865	830	806	837	920	841	738
Total volume SSO / Total volume conveyed, gallons / million gallons	14.2	9.0	4.0	2.24	7.88	3.12	2.49
Number of SSO (by cause)							
Blockages							
Roots	8	7	6	4	7	3	4
Grease	5	3	2	2		2	2
Debris	4	4	5		4	7	4
Debris from Laterals				2			
Animal Carcass							
Construction Debris							
Multiple causes		1					
Infrastructure failure,	3	1	9	1	1	2	2
Inflow & Infiltration					1[4]		
Electrical Power Failure							
Flow Capacity Deficiency							
Natural Disaster							
Bypass							
Cause Unknown	7	1		1	1	1	2
Average Emergency Response Time, minutes[3]							
Business Hours	*	*	*	*		11.8	8.5
Non-business hours	*	*	*	*		21.3	25
Number of locations with multiple SSOs	*	0	1	0	0	0	1
Maintenance Activities							
Footage Cleaned (linear feet)			107,767	103,633	87,314	97,949	107,491
Televised Inspection (number)	*	*	43	45	42	47	56
Top-down Cleaning (number)	*	*	0	0	0	0	0
Manholes Repaired (number)			4	2	3	3	2

Notes for Table 1:

1. Wet season defined as Nov-April, dry season May-Oct. **This seasonal categorization does not necessarily reflect weather or flow conditions at the time of the SSO.**
2. 2007 statistics revised in Sept version 2009 to reflect corrected total miles of sewer lines (150 mi)
3. From time SSO call received by PW Maintenance Division
4. Of this total, 2200 gallons is attributed to an SSO that was caused by a potable water main brake that resulted in potable water entering a sewer manhole, exceeding the capacity of the sewer line. In CIWQS, the cause of this SSO is identified a I&I (inflow). The estimate for spill volume that reached waters of the state included both sewage and potable water.

* Raw data is available on field log sheets but cannot easily be compiled for this summary. Summary data for these metrics will be more accessible in the future upon implementation of a computerized maintenance management system.

VII. FATS, OILS, AND GREASE (FOG) CONTROL PLAN

REFERENCE MATERIAL

- **List or map of FOG sources in service area**
- **List or map of hotspots**
- **Cleaning schedules**
- **Restaurant inspection reports or summaries**
- **Data submitted to CIWQS**
- **Service call data**

Table 2. FOG Control Statistics

	2007	2008	2009	2010	2011	2012	2013
Number of SSOs caused by FOG	**5**	**3**	**2**	**2**	**0**	**2**	**2**
Number of FOG inspections completed	**N/A**	**5**	**16***	**28**	**12**	**37**	**42**

*Includes 12 restaurant inspections and 16 oil/water separator inspection.

37. Does the SSMP contain up-to-date information about your agency's FOG control program? **YES / NO**

38. Considering the information in Table 2, is the current FOG program effective in documenting and controlling FOG sources? **YES / NO**

39. If you answered NO to questions 8 and/or 9, describe content and schedule for necessary changes, or provide additional comments for YES response.

Based on investigations conducted in 2010, the City determined that structural deficiencies (generally sections of line that are flat as a result of settling) were the primary cause of many SSOs historically attributed to FOG. As a result, the City updated it's FOG Control Program in 2011 to focus on large facilities that are potential sources of FOG, and addressed the structural deficiencies by revising cleaning intervals to prevent FOG accumulation. The City updated the FOG Program description in Section VII of the SSMP, and also streamlined the many attachments to that section.

In 2011, the FOG Program issued permits to owners of all large underground interceptors (12 in number). In response to a 2013 SSO attributed to a large grease producer, the City required installation of two additional grease interceptors at that facility. It also continued its residential education/outreach efforts for FOG, which are

described in the City's Annual Pollution Prevention Reports. The Program also revised its list of FOG "Watch Areas".

Although some data on sewer cleaning activities specifically related to FOG is contained in Public Works field log sheets (these data are primarily for corrective maintenance), it is currently not possible to accurately differentiate preventative maintenance cleaning that is performed specifically for FOG reduction versus other reasons, and thus comparative metrics (linear feet cleaned for FOG, planned vs unplanned) cannot be compiled.

VIII. CAPACITY MANAGEMENT

REFERENCE MATERIAL

- **Capacity assessment reports**
- **CIP**
- **SSO data**

Table 3. SSOs Caused by Hydraulic Limitations

	2007	2008	2009	2010	2011	2012	2013
Number of SSOs caused by capacity limitations	**0**	**0**	**0**	**0**	**0**	**0**	**0**

40. Does the SSMP contain up-to-date information about your agency's capacity assessment? **YES / NO**

41. Has your agency completed a capacity assessment and identified and addressed any hydraulic deficiencies in the system? **YES / NO**

42. If you answered NO to questions 41 and/or 42, describe content and schedule for necessary activities, or provide additional comments for YES response.

The SSMP includes three documents related to capacity assessment:

1) *July 2011 Master Plan Executive Summary (Section VIII)*
2) *September 2000 I/I Improvements Project Master Plan Executive Summary (Section VII)*
3) *FY2011-2016 Capital Improvement Plan (Section IV)*

All potential hydraulic deficiencies have not yet been addressed through capital projects, but have been identified and prioritized in the July 2011 Master Plan for inclusion in future capital projects. Referring to Table 3, it is evident that hydraulic deficiencies are not a significant contributor to SSOs, largely due to capacity-related improvements implemented prior to 2007.

IX. MONITORING, MEASUREMENT, AND PROGRAM MODIFICATIONS

43. Does the SSMP contain up-to-date information about your agency's data collection and organization? **YES / NO**

44. Is your agency's data collection and organization sufficient to evaluate the effectiveness of your SSMP? **YES / NO**

If you answered NO to questions 44 and/or 45, describe content and schedule for necessary improvements, or provide additional comments for YES response.

The SSMP includes examples of forms used to document field activities, and the Maintenance Superintendent's monthly report. It also includes a table of SSMP performance indicators that are tracked to assess the effectiveness of SSMP over the years (see Table 1 of this audit). Data collection and tracking is still depends on "hard copy" methods, as the Sewer Collection Divison's implementation of a CMMS is taking longer than originally anticipated. However, the City believes these methods do provide the information needed evaluate SSMP effectiveness

X. SSMP AUDITS

45. Will the SSMP Audit be conducted a minimum of every two years and included in the SSMP? **YES / NO**

XI. COMMUNICATION PROGRAM

REFERENCE MATERIAL

- **Mailings and mailing lists**
- **Website**
- **Other communication records such as newspaper ads, site postings, or other outreach**
- **Customer feedback**

46. Does the SSMP contain up-to-date information about your agency's public outreach activities? **YES / NO**

47. Does the SSMP contain up-to-date information about your agency's communications with satellite and tributary agencies? **YES / NO**

48. Has your agency effectively communicated with the public and other agencies about the SSMP, and addressed feedback? **YES / NO**

49. If you answered NO to questions 47, 48, and/or 49, describe content and schedule for necessary improvements, or provide additional comments for YES response.

The Communication Program was certified in August 2009 in accordance with the Statewide Order schedule. One component of the Communication Plan is the posting of the entire SSMP, the Annual SSO report, and related documents on the City's web site. Through a link on the SSMP web page, the public is encouraged to contact the Public Work Department Maintenance Division for more information or to provide feedback regarding the Plan. As part of its public education and outreach activities, "Sustainability" brochures were mailed in January/February 2010.

The Communication Program is a relatively modest effort that reflects what City staff can realistically achieve in the area of public outreach and education (and the frequency of these activities), given available resources and priorities.