CITY OF SANTA MONICA
SEWER SYSTEM MANAGEMENT PLAN

2015
CITY OF SANTA MONICA
SEWER SYSTEM
MANAGEMENT PLAN

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<th>Definition</th>
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<tr>
<td>APWA</td>
<td>American Public Works Association</td>
</tr>
<tr>
<td>ASSFC</td>
<td>Amalgamated Sewerage System Facilities Charge</td>
</tr>
<tr>
<td>CCTV</td>
<td>Closed Circuit Television</td>
</tr>
<tr>
<td>CIP</td>
<td>Capital Improvement Plan/Project</td>
</tr>
<tr>
<td>CIWQS</td>
<td>California Integrated Water Quality System</td>
</tr>
<tr>
<td>City/CSM</td>
<td>The City of Santa Monica</td>
</tr>
<tr>
<td>CIS</td>
<td>Coastal Interceptor Sewer System</td>
</tr>
<tr>
<td>CMMS</td>
<td>Computer Maintenance Management System</td>
</tr>
<tr>
<td>CSI</td>
<td>Construction Standards Institute</td>
</tr>
<tr>
<td>CSMWRD</td>
<td>City of Santa Monica Water Resources Division</td>
</tr>
<tr>
<td>FEMA</td>
<td>Federal Emergency Management Agency</td>
</tr>
<tr>
<td>FROG</td>
<td>Fats, Roots, Oil and Grease</td>
</tr>
<tr>
<td>GIS</td>
<td>Geographical Information System</td>
</tr>
<tr>
<td>LA</td>
<td>Los Angeles</td>
</tr>
<tr>
<td>MAPS</td>
<td>Moss Avenue Pumping Station</td>
</tr>
<tr>
<td>MGD</td>
<td>Million Gallons per Day</td>
</tr>
<tr>
<td>NOC</td>
<td>Notice of Correction</td>
</tr>
<tr>
<td>NOV</td>
<td>Notice of Violation</td>
</tr>
<tr>
<td>O&amp;M</td>
<td>Operations and Maintenance</td>
</tr>
<tr>
<td>OES</td>
<td>Office of Emergency Services</td>
</tr>
<tr>
<td>SMMC</td>
<td>Santa Monica Municipal Code</td>
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<tr>
<td>SMURRF</td>
<td>Santa Monica Urban Runoff Recycling Facility</td>
</tr>
<tr>
<td>SSO</td>
<td>Sanitary Sewer Overflow</td>
</tr>
<tr>
<td>SOP</td>
<td>Standard Operating Procedure</td>
</tr>
<tr>
<td>SWRCB</td>
<td>State Water Resources Control Board</td>
</tr>
<tr>
<td>WRPP</td>
<td>Water Resources Protection Program</td>
</tr>
<tr>
<td>Yards</td>
<td>City Maintenance Yard</td>
</tr>
</tbody>
</table>
Element 0 - Overview

The Sewer System Management Plan, or SSMP, is a document that describes the activities that the City of Santa Monica Water Resources Division (CSMWRD) uses to manage its sanitary sewer collection system and its Coastal Interceptor Sewer (CIS) system. All together the sanitary sewer system includes approximately 152 miles of pipelines, two flow monitoring and sampling stations and one 26-million gallon/day (mgd) pumping station. This document helps ensure that the City of Santa Monica Water Resources Department collection system is operated and maintained to provide reliable service and to minimize the number of sanitary sewer overflows (SSOs).

<table>
<thead>
<tr>
<th>SSMP Element Name</th>
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<td>0 Overview</td>
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<td>1 Goals</td>
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<td>2 Organization</td>
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<tr>
<td>3 Legal Authority</td>
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<tr>
<td>4 Operation and Maintenance Program</td>
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<tr>
<td>5 Design and Performance Provisions</td>
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<td>6 Overflow Emergency Response Plan</td>
</tr>
<tr>
<td>7 FROG Control Program</td>
</tr>
<tr>
<td>8 Capacity Assurance Plan</td>
</tr>
<tr>
<td>9 Monitoring, Measurement and Program Modifications</td>
</tr>
<tr>
<td>10 SSMP Program Audits</td>
</tr>
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<td>11 Communication Program</td>
</tr>
<tr>
<td>12 MAPS Emergency Power System</td>
</tr>
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<td>13 Water Quality Monitoring Plan</td>
</tr>
</tbody>
</table>

System Overview

The City of Santa Monica is 8.25 square miles in area and has a resident population of approximately 93,283. In addition to collecting sewage from parcels within its corporate boundaries, the CSMWRD also collects pass-through flow from the City of Los Angeles, via the CIS system and unmetered locations, and then pumps and/or via gravity, conveys the sewage to the City of Los Angeles for treatment and disposal at the City of Los Angeles’ Hyperion Wastewater Treatment Plant.

Current CSMWRD net flows average 12.15 with total flow (including City of Los Angeles pass-through) averaging 15.01. These figures include metered and unmetered flow locations and are taken from the 2013 City of Los Angeles Sewer Report for the Amalgamated Hyperion System. The present total average flows at monitoring location SM-1 are 14.54 mgd for the period of May 2013 through February 2014.
In 2002, the CSMWRD completed an upgrade of 80% of the local collection wastewater pipelines, manholes and appurtenances; and, the complete replacement of the CIS, including the Moss Avenue Pumping Station (MAPS). The CIS system was designed to a sunset year of 2090 using wet weather flows estimated at full build-out at current zoning. The CIS system is designed for 51.7 mgd at its terminus at the southern City boundary with the City of Los Angeles (i.e SM-1). Presently the 14.54 mgd average flow at the CIS terminus represents approximately 28.1% of its capacity.

Figure 1 CSMWRD Wastewater System
Element 1 - Goals

1.1 Regulatory Requirements for Goals Element

The purpose of the SSMP is to provide the necessary administrative elements to properly schedule, manage, operate, and maintain all parts of the City’s sanitary sewer system in order to extend the functional life of the system and to reduce and prevent Sanitary Sewer Overflows (SSOs), as well as mitigate any SSOs that do occur. The goals listed below support the purpose of the SSMP.

1.2 Goals

In support of this SSMP, the City has developed the following goals to properly manage, operate and maintain its sewer system:

- Protect the City’s investment in its collection systems and prolong the operational life of the system by performing preventative maintenance.
- Prevent public health hazards.
- Meet all applicable regulatory notification, monitoring and reporting requirements.
- Minimize the frequency and magnitude of SSOs.
- Prevent damage to public and private property that could result from SSOs.
- Ensure that funds available for sewer operations are utilized in the most efficient manner.
- Convey wastewater to treatment facilities with a minimum of infiltration, inflow and exfiltration.
- Provide adequate capacity to convey peak wastewater flows.
- Control corrosion and minimize odor releases
- Perform all operations in a safe manner to avoid personal injury and property damage.

1.3 Element 1 Appendix

None
Element 2 - ORGANIZATION

This section of the SSMP identifies City staff that are responsible for implementing this SSMP, responding to SSO events, and meeting the SSO reporting requirements.

2.1 Organization Elements

Pursuant to current regulations, the City has implemented the following organizational elements as part of the SSMP:

- Identified the name(s) of the responsible or authorized representative(s);
- Identified and incorporated the names and telephone numbers for management, administrative, and maintenance positions responsible for implementing specific measures in the SSMP program. The SSMP also includes lines of authority as shown on the SSMP organization chart; and
- Identified and incorporated a chain of communication for reporting SSOs, from receipt of a complaint or other information, including the person responsible for reporting SSOs to the State and Regional Water Board and other agencies if applicable (such as County Health Officer, County Environmental Health Agency, Regional Water Board, and/or State Office of Emergency Services (OES)).

2.2 Organization

This section discusses the organization and roles of sanitary sewer system staff and the authorized representative to the State Water Resources Control Board (SWRCB).

Department Organization

The organization chart for the management, operation, and maintenance of the City’s wastewater collection system is shown on Figure A-1.

Authorized Representative

The CSMWRD Manager, or their designee, is the legally responsible individual(s) for signing and certifying all applicable SSMP documents. The CSMWRD Manager is also responsible for assigning staff from the division to implement the SSMP and all staff in the table below report to the CSMWRD Manager. The chain of communication for responding to and reporting SSOs is contained in Element 3 – Legal Authority.
Responsibilities within the SSMP

The following staff is responsible for implementing, managing and updating the SSMP:

Table 2-1

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PROGRAM &amp; POSITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goals</td>
<td>CSMWRD Manager</td>
</tr>
<tr>
<td>Overflow Emergency Response</td>
<td>CSMWRD WRPP &amp; W/WW Administrator</td>
</tr>
<tr>
<td>Fats, roots, oils and grease</td>
<td>CSMWRD WRPP &amp; W/WW Administrator</td>
</tr>
<tr>
<td>Measures &amp; Activities:</td>
<td></td>
</tr>
<tr>
<td>Maps</td>
<td>Water Resources Engineer &amp; GIS Section</td>
</tr>
<tr>
<td>Resources and Budgets</td>
<td>Principal Public Works Analyst</td>
</tr>
<tr>
<td>Preventive Operations &amp; Maintenance</td>
<td>CSMWRD WRPP &amp; W/WW Administrator and Water Resources Engineer</td>
</tr>
<tr>
<td>Rehabilitation and Replacement (Inspection and Condition Assessment)</td>
<td>CSMWRD WRPP &amp; W/WW Administrator and Water Resources Engineer</td>
</tr>
<tr>
<td>Contingency Equipment &amp; Replacement Parts</td>
<td>CSMWRD WRPP &amp; W/WW Administrator</td>
</tr>
<tr>
<td>Training</td>
<td>CSMWRD WRPP &amp; W/WW Administrator</td>
</tr>
<tr>
<td>Outreach</td>
<td>CSMWRD WRPP &amp; W/WW Administrator</td>
</tr>
<tr>
<td>Design and Construction Standards</td>
<td>Water Resources Engineer</td>
</tr>
<tr>
<td>Capacity Management</td>
<td>Water Resources Engineer</td>
</tr>
<tr>
<td>Monitoring Plan for SSMP</td>
<td>CSMWRD Manager</td>
</tr>
<tr>
<td>Audits for SSMP</td>
<td>CSMWRD Manager</td>
</tr>
<tr>
<td>Communications Program</td>
<td>CSMWRD Manager</td>
</tr>
</tbody>
</table>

2.3 Element 2 Appendix A

Supporting information for Element 2 is included in Appendix A. This appendix includes the following documents:

- **Figure A-1** Organizational Chart of Wastewater Utility Staff
- **Table A-1** Names and Contact Information of Staff Responsible for SSMP
Appendix A

Element 2.0
# Emergency Phone Contact List for SSO

<table>
<thead>
<tr>
<th>Wastewater</th>
<th>Water Resources Protection Program</th>
<th>Risk Management (in case of property damage)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assistant Water/Wastewater Manager (310)901-8413</td>
<td>Tom Watson Water Resources Protection Programs Coordinator (323)823-2324</td>
<td>Deb Hossli Risk Manager (310)458-8910</td>
</tr>
<tr>
<td>Danny Gomez Wastewater Supervisor (310)629-9436</td>
<td>George Rodriguez Senior Water Resources Protection Specialist (310)901-7069</td>
<td>Michael Mack Liability Claims Adjuster (310)458-2201 ext. 5944 (310)993-3557</td>
</tr>
<tr>
<td>Val Guzman Wastewater Crew Leader (310)629-9419</td>
<td>Chris Aguillon Water Resources Protection Specialist (310)912-9776</td>
<td></td>
</tr>
<tr>
<td></td>
<td>David Tu Water Resources Protection Specialist (310)901-8145</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Corey Bracken Water Resources Protection Specialist (310)490-3184</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gil Borboa Water Resources Manager (310)710-5249</td>
<td></td>
</tr>
</tbody>
</table>

NOTE: FOR EACH DEPARTMENT, CALL FROM TOP TO BOTTOM UNTIL CONTACT IS MADE.

After Hours: (310) 826-6712

Fire Department: (310) 458-8660     Police: (310) 458-8491
Element 3 – Legal Authority

This section of the SSMP provides an overview and summary of the City’s emergency response documents and procedures for sanitary sewer overflows.

3.1 Legal Authority Elements

Per current regulations, the City has demonstrated through collection system use ordinances, service agreements, or other legally binding procedures, that it possesses the necessary legal authority to:

- Prevent illicit discharges into its wastewater collection system (examples may include infiltration, storm water, chemical dumping, unauthorized debris and cut roots, etc.);
- Require that sanitary 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 City;
- Limit the discharge of fats, roots, oils, and grease (FROG) and other debris that may cause blockages, and
- Enforce any violation of its sanitary sewer ordinances.

3.2 City of Santa Monica Municipal Code

The legal authority for the City of Santa Monica’s sewer management practices are provided for under various resolutions adopted over the years and then codified in the Santa Monica Municipal Code (SMMC).

Table 3-1 provides a summary of the relevant code sections.
Table 3-1: Summary of Legal Authorities in Santa Monica Municipal Code

<table>
<thead>
<tr>
<th>Requirement</th>
<th>SMMC Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prevent unlawful discharges into its sanitary sewer system.</td>
<td>5.20.010</td>
</tr>
<tr>
<td>Ensure access for maintenance, inspection, or repairs for portions of the lateral owned or maintained by the Public Agency</td>
<td>5.20.430</td>
</tr>
<tr>
<td>Limit the discharge of fats, oils, and grease and other debris that may cause blockages</td>
<td>5.20.040(a)(4)(7), 5.20.090, 5.20.110,</td>
</tr>
<tr>
<td>Enforce any violation of its sewer ordinances</td>
<td>5.20.490 – 5.20.620 and CSM Enforcement Response Plan</td>
</tr>
</tbody>
</table>

3.3 Other Relevant, Appropriate and Applicable Rules and Regulations

1. SMMC Article 5: Sanitation and Health
   - Chapter 5.16 Toxic Chemical Disclosure.

2. SMMC Article 7: Public Works
   - Chapter 7.04 Streets, Sewers etc.
   - Chapter 7.08 Wastewater Control.
   - Chapter 7.12 Utility Division (WRD).
3.4 Element 3 Appendix B

1. City of Santa Monica Water Resources Division Sanitary Sewer Overflow Response Plan
   [http://smgov.net](http://smgov.net)
2. Santa Monica Municipal Code (SMMC) Chapter 5.16 - Toxic Chemical Control Disclosure Law
3. SMCC Chapter 5.20 - Industrial Wastewater Control
5. SMCC Chapter 7.04 - Streets, Sewers, etc.
6. SMCC Chapter 7.08 - Wastewater Control
7. SMCC Chapter 7.12 - Utility Division (WRD)
   [www.qcode.us/codes/santamonica/](http://www.qcode.us/codes/santamonica/)
ELEMENT 4 - OPERATIONS AND MAINTENANCE (O & M) PROGRAM

In 2002, the City of Santa Monica completed an upgrade of approximately 80% of its local collection wastewater pipe lines, manholes and appurtenances, and the complete replacement of the CIS, including the Moss Avenue Pumping Station (MAPS). This section of the SSMP discusses the City’s operations, maintenance and other related measures and activities.

4.1 Operations and Maintenance (O & M) Program Elements

Pursuant to current regulations, the City sewer O & M Program includes the following elements:

- Up-to-date maps of the sanitary sewer system, showing all gravity line segments and manholes, pumping facilities, pressure pipes and valves, and applicable storm water conveyance facilities;

- Routine preventive O & M activities by staff and contractors, including a system for scheduling regular maintenance and cleaning of the sanitary sewer system with more frequent cleaning and maintenance targeted at known problem areas. Work is documented by work orders and stored in the computer maintenance management system (CMMS)).

- A rehabilitation and replacement plan to identify and prioritize system deficiencies has been implemented. Regular inspections of manholes, sewer pipes and other infrastructure are conducted by City staff. The City also maintains a Capital Improvement Plan (CIP) that includes prioritized short and long-term activities for the maintenance and overall protection of collection system assets.

- Training on a regular basis for staff in safety, sanitary sewer system O & M, and the requirement that contractors be appropriately trained; and

- Equipment and replacement part inventories, including identification of critical replacement parts are maintained by City O & M staff.

4.2 Collection System Maps

The CSMWRD ESRI-GIS database was initially based upon as-built record drawings and was limited to horizontal data. As time progresses, more field information will continue to be added to the GIS database system. Linear assets older than 75 years usually have limited construction data and the record as-built drawings associated with the assets provide the best engineering data. As the CSMWRD’s asset management plan grows, more information will be incorporated including vertical pipe invert and soffit elevations, manhole rim elevations and pipe segment slopes. The database is continuously growing and is also tied to the CSMWRD’s maintenance management system, which is described in more detail below.
The City also has limited copies of its older (1960) sewer atlas, which provides some additional data, and can be used to find appropriate as-built drawings. The last updating of the sewer atlas occurred in 2000, at which time the City switched to the current GIS system.

As-built drawings are on file at the Office of the City Engineer. The Office of the City Engineer was also responsible for the construction of most of the collection system assets. The City is in the process of incorporating these drawings into the GIS format as funding allows.

4.3 O&M Activities

The City conducts system-wide routine preventative maintenance activities, including closed circuit television (CCTV) reconnaissance of its collection system, utilizing experienced dedicated O & M staff to ensure efficient and reliable operation of the various components of the sewer system.

To plan and track O&M activities, the City utilizes a computerized maintenance management system (CMMS). The CMMS (Hansen) is capable of tracking equipment and staff by work orders, assisting in the planning and prioritizing of O &M work based on past activity, and maintaining accurate work order and other maintenance documentation used in collection system analysis and reporting. The CMMS is also GIS compatible. One complete video-capable truck is available for immediate deployment 24 hours per day, and routine main jetting is conducted 5 days a week. The priority is to clean those lines that have a history of blockage or SSOs. Portions of the collection system with repeated SSOs are evaluated for immediate replacement or prioritization as part of the City’s CIP, depending on the specific conditions present.

All work conducted to maintain the operation of the sewer collection and pumping system are catalogued and tracked, and a system is in place to ensure prompt response 7 days per week/24 hours per day, to all incidents upon notification of O & M staff. For after-hours incident response, the CSMWRD maintains a Supervisory Control and Data Acquisition (SCADA) system that will automatically send an alert to the Arcadia Water Treatment Plant; which acts as the construction emergency response center for the City. A list of the nearest airports to the homes of staff is maintained in the event air transport of staff or materials is needed due to freeway and/or large scale system failure as a result of a catastrophic natural event.

Critical equipment and replacement part inventories are maintained at the City Maintenance Yard (Yards) Complex, located at 2500 Michigan Avenue in Santa Monica. Mechanical equipment and CSMWRD trucks and support vehicles are fueled, serviced and repaired at the Yards, and many of the administrative functions related to the collection system are also housed in this central location.
4.4 Contingency Plans

The City has prepared, and maintains through periodic review and practice exercises, an emergency response contingency plan that may be activated in response to natural disasters, failure or shut down of critical infrastructure (e.g. power, sewage pumps, and water supply) or other credible threats to the City or its residents. With regards to sewage pumps, in the event of primary power failure, the City would employ temporary diesel powered generators to maintain flow until primary power is restored or another alternative is identified. In the event of primary pump equipment failure, backup pumps are available on site.

4.5 Training

The City encourages, and sometimes requires staff, to obtain professional certifications or licenses. CSMWRD staff receives training on a regular basis in sewer system O & M developments and techniques, and in work safety topics. In addition, many CSMWRD staff maintains various professional certifications through related continuing education or professional participation credits.

4.6 Element 4 Appendix C

Supporting information for Element 4 is included in Appendix C. This appendix includes the following documents:

1. Figure C-1; Map of Santa Monica Sewer Service Area
Appendix C
Element 4.0
Element 5 – Design and Performance

This section of the SSMP discusses the City’s design and construction standards for the sewer collection system.

5.1 Design & Performance Elements

In order to ensure the safe and quality construction of collection system assets, the City has implemented the following design and performance elements;

- Adoption of design and construction standards and specifications for the construction/installation of new sanitary sewer systems, pump stations and other appurtenances; and for the rehabilitation and repair of existing sanitary sewer systems; and

- Standard procedures for the inspection and testing of construction/installation of new sewers, pumps, and other appurtenances.

5.2 Design & Performance Provisions

The CSMWRD’s wastewater construction standards are maintained by the Civil Engineering Division of the Public Works Department. These standards, which are based on Standard Specifications for Public Works Construction, are updated as required by CSMWRD staff and are made available to the public by the Civil Engineering Division upon request so that all engineering contractors and civil engineers are aware of the CSMWRD’s standards for wastewater construction. Presently, City wastewater projects are designed by the Civil Engineering Division within the City, and each project’s contract documents contain all wastewater specification standards, construction notes and details for the project. They are modified to be site-specific on a project-by-project basis. Contract documents are prepared in-house using consultant civil engineers for the plans and technical specifications. Specifications subject to inspection during construction are Construction Standards Institute (CSI) based and are modified as applicable by the Standard Specifications for Public Works Construction (GREENBOOK), latest edition, which is jointly produced by representatives of the American Public Works Association (APWA), the Associated General Contractors of California, the Engineering Contractors Association, the Southern California Contractors Association and BNI Publications, Inc.
Typically, because of historic development within the City, there are unique construction challenges presented by interfering utilities and confined rights-of-way, which require site or project specific modifications to existing standards. In those cases, the City usually depends upon construction applicants’ private engineers to modify or design a new standard and will review and approve it for site-specific construction.

5.3 Element 5 Appendix

None
Element 6 Overflow Emergency Response Plan

This section of the SSMP provides an overview and summary of the City’s emergency response documents and procedures for sewer overflows. Uniquely, a majority of the stormdrain system in the City is protected by diversion structures which return SSOs to the sanitary sewer system in best management practice devices which filter the flow.

6.1 Overflow Emergency Response Plan Elements

Pursuant to current regulations, the City has developed and implemented a sanitary sewer overflow emergency response plan (SSO Plan). The SSO Plan identifies measures to protect public health and the environment in the event of an overflow and includes the following elements:

- Proper notification procedures so that the primary responders and regulatory agencies are informed of all SSOs in a timely manner;
- A program to ensure appropriate response to all overflows;
- Procedures to ensure prompt notification to appropriate regulatory agencies and other potentially affected entities (e.g. health agencies, regional water boards, water suppliers, etc.) of all SSOs that potentially affect public health or reach the waters of the State.
- Procedures to ensure that appropriate staff and contractor personnel are aware of and follow the SSO Plan and are appropriately trained;
- Procedures to address emergency operations, such as traffic and crowd control and other necessary response activities; and
- Procedures to ensure that all reasonable steps are taken to contain untreated wastewater and prevent discharge of untreated wastewater to waters of the United States and minimize or correct any adverse impact on the environment resulting from the SSOs, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the discharge.

6.2 Sanitary Sewer Overflow Emergency Response Plan

An SSO is any overflow, spill, release, discharge, or uncontrolled diversion of untreated or partially treated wastewater from a sanitary sewer. SSOs may contain high levels of suspended solids, pathogenic organisms, toxic pollutants, nutrients and oil and grease and can adversely impact human health and the environment. In order to minimize the potential for health and environmental impacts, the City has developed the following plan and standard operation procedure (SOP) for responding to all SSOs.
SSO Emergency Response Plan:

City water resources and inspection staff have been trained to respond promptly upon receiving notification of an uncontrolled sewage discharge. An SSO can originate from residential structures, commercial facilities or City related devices, (e.g. broken sewer lines, and/ or manhole covers). Time is of the essence in responding to SSO incidents in order to control and reduce the potential for impact to the storm drain system and waters of the State.

The City SOP for responding to typical SSOs is available in hardcopy or on line at http://www.smgov.net/. The SSO plan involves two basic steps.

**Step# 1-** Upon notification, City Wastewater staff (both Operations and Water Resources Protection Program (WRPP) inspector) responds and identifies the location of the overflow and its characteristics (i.e. apparent source, volume released, extent, and whether or not it is on private property etc.). They also determine the potential cause of the SSO and the responsible party. This information is recorded on the SSO Response Form. To ensure containment, CSM Wastewater Staff locate the nearest down gradient (down slope) storm drain and determine if the release has, or will, reach this drain. Based on site conditions, the onsite incident manager decides if immediate action or additional staff or equipment is needed to prevent the release from reaching this drain. If the SSO occurred because of a blockage at a main City sewer line, the onsite incident manager will direct CSM Wastewater Staff to immediately contain the discharge by completely berming the storm drain inlet and to clear the blockage. Once the nature and extent of the discharge are known, staff will begin immediate cleanup of discharges caused by a City-owned pipeline; typically by vacuuming the discharge for lawful disposal.

The information collected on the SSO response form along with any other relevant information is reported by Wastewater Staff to all required outside agencies such as the Office of Emergency Services, LA County Dept. of Health Services, LA Regional Water Quality Control Board, and if applicable, LA Co. Flood Control and City of Los Angeles (see below for more detail).

Staff also ensures the release area (all public areas) are cleaned and disinfected after the normal sewer flow is restored and the blockage relieved. If the release has reached the storm drain system, staff will routinely check a couple of storm drain catch basins downstream from the contaminated catch basin to verify how far the release has traveled down the storm drain line. Depending on the severity of the release, samples may be required to be taken from those catch basins and analyzed for pathogenic organisms. Sampling, if any, is implemented at the discretion of the Water Resources Protection Program (WRPP) Inspector on site, and is based on site specific observations. If there is a question about the necessity for sampling, onsite staff confers with the WRPP supervisor on duty. All WRPP Inspector staff have basic sampling equipment available as part of their standard response equipment.
If a release from a City-owned main has visibly impacted private property, the onsite staff will photo document all such impacts identified at the time of the release response. Staff also documents the contact information of the property owner and any notes regarding the potential impact in their field notebook. Questions regarding repair costs are directed to the CSM Office of Risk Management at (310) 458-8910.

**Step # 2**- If the SSO occurred because of a blockage or other problems within a privately owned lateral line resulting in a discharge to the ground surface and /or into the public right-of-way such as City streets, alleys or side-walks, CSM Wastewater staff will contain and prevent further discharges into the Public Right- of- Way as described in Step #1, above. This is typically done by using a City vacuum truck. CSM staff then contact the subject property owner/manager and direct them to immediately contact a private plumber to relieve the sewer blockage. In instances where there is no effective response from the property owner or manager to abate the SSO within a reasonable time frame (less than an hour), or at the discretion of the onsite incident manager or the WRPP Inspector, the water service may be temporarily turned off at the subject property after proper notifications are made by calling the CSM Water Division staff and requesting a temporary water service disruption.

Before attempting to turn off the water service, CSM Wastewater Staff will try to contact the property owner or manager. Wastewater Operations Staff will make notification if a WRPP Inspector is unavailable (i.e. after hours, weekends). Notification is made verbally and by posting a large placard in a common area and a door hanger on each unit or residence/business. Each placard and door hanger has contact information for the CSM and the Los Angeles County DHS Public Health. If possible, door hanger notifications are placed on each tenant’s door depending on access.

**Note:** The duration, and therefore volume, of the SSO discharge is estimated from when the SSO is first reported to the City, NOT when staff arrives to the site. Staff are required to accurately estimate the volume of the discharge and note how the estimate was derived in their field book. Photographs of the SSO site are also included in the incident file when damage to private property is known to have occurred.

Other agency contact/reporting contacts include:

- **Office of Emergency Services (OES) at (800) 852-7550** to obtain an OES Control#. After business hours including weekends, CSM Wastewater staff makes the notification to OES and provides WRPP inspection staff with the OES Control #.
- **LA County Dept. of Health Services at (213) 974-1234** and obtain a ticket #. After business hours including weekends, CSM Wastewater staff contact the agency and provide WRPP inspection staff with the incident ticket #.

- **Los Angeles County Department of Health Services (DHS) “Public Health” at 310-665-8484** (8:00am-5:00pm) to respond if sewage has been released at private properties. After business hours including weekends Wastewater Staff call the Los Angeles County Department of Health Services at (213) 974-1234. Los Angeles County DHS will direct clean-up of private property outside surfaces i.e. grass, sidewalk, and patio areas. Wastewater staff does not perform clean up services on private property and therefore the clean-up is the responsibility of the property owner.

- **LA Regional Water Quality Control Board at (213) 576-6657.** The Contact is Augustine Anijielo who may also be e-mailed at aanijielo@waterboards.ca.gov. After hours including weekends, Wastewater Staff will notify the agency.

- For sewer discharges into the **County of Los Angeles Flood Control** storm drain system, call 24/7 dispatch – **1-800-675-4357**. For Sewer discharges into the City of Los Angeles storm drain system, call **1-800-974-9794**. WRPP inspection staff calls in incidents during regular work hours. Wastewater Staff makes this call during after hours, including weekends.

- For a significant spill (i.e. a spill that would bypass treatment and/or enter Santa Monica Bay) the **Recreational Waters Program at (626) 430-5360** is also contacted.

- For a significant spill into Ashland or Rose Diversions the contact is:
  - Jared Deck: (562) 861-0316
  - Mike Stephenson: (323) 776-7610

  During weekends and after hours: Dispatch: (800) 675-4357

For logistics planning, staff has determined it typically takes 45-60 minutes for a private plumber to arrive and/or relieve the sewer blockage on private property. Prior to the arrival of the plumber if the water is not shut down, City staff ensure that the property owner makes all efforts to contain sewer discharges on their property and not allow any discharges onto the Public Right-of-Way. Any discharge that reaches the public right-of-way will be contained by City staff.

Wastewater Staff monitor the SSO site continuously to make sure the plumbing problem is corrected and sewage at the site has been cleaned up and the release area is disinfected. Wastewater Operations Staff will disinfect the affected City street and sidewalk (public areas)
immediately in contact with the release using chlorine/water solution. Large discharges from private property requiring clean-up will be billed to the property owner for cost recovery of labor and equipment use. Once the sewer blockage is cleared, and the contaminated area cleaned and disinfected, the property owner/manager may call and request the Water Division to turn the water service back on, if needed.

If there is an extensive damage to privately owned properties because of an overflow and release of sewage due to a SSO, depending on the cause, staff will call or advise the property owner to contact directly LA County Dept. of Health Services (DHS) at 310-665-8484 to evaluate the health hazard and recommend detailed procedures for proper clean-up. Staff will also contact the CSM Office of Risk Management to evaluate any damages if the SSO is caused by blockages or flow conditions within the publicly owned portion of a sanitary sewer system.

It is important to remember that discharges into the City storm drain system from SSO’s typically are captured by one of the City diversion BMP projects such as SMURFF, Wilshire Blvd., Montana Ave., Rose Ave., Ashland Ave., Sunset-Canyon and Centinela-Pearl projects and therefore normally do not reach Santa Monica Bay as long as those diversion projects are operational at the time of the incident. Staff will confirm the operational status of the subject BMP project as part of the SSO response procedures.

Once the SSO response incident is concluded, WRPP Inspection Staff forward the required data to the California Integrated Water Quality System (CIWQS) by visiting the agency database at: http://ciwqs.waterboards.ca.gov and entering on-line the requested information about the SSO. WRPP Inspection Staff also retain a copy of all completed reports about an SSO incident in a folder designated for SSO records.

SSO Equipment and Training

Typical equipment required for response to an SSO, depending on location and size of the release, includes, but is not limited to, personal protective gear, reporting forms, traffic control devices such as cones or barricades, absorbent materials, sampling equipment, disinfectant solutions, pipe snake, vacuum trucks, backhoe, replacement pipe, and street sweepers.

The City conducts regular training to familiarize staff with health and safety issues, standard response procedures, and regulatory and technological developments. The City also encourages staff to recommend more efficient ways of completing work tasks based on staff field experience.
Moss Avenue Pump Station (MAPS) Emergency Response

CSM staff monitors MAPS through SCADA alarm system during and after hours. Upon discovery or notification of an SSO at the facility, staff would respond to the MAPS to make necessary SSO assessment. Staff would check the generator, wet well operation, pumps, and force mains. For SSOs that occur as a result of MAPS or force mains, notifications to proper regulatory agencies and response procedures apply that are discussed as part of this SOP.

Specific procedures include:

 Wet Well
  - Observe SCADA screen and PLC panel to confirm proper wet well level
  - If SCADA and PLC not operational, emergency notification to Plant Operator, Supervisor and Senior WRD staff and SCADA technician.
  - Call emergency pump contractor for emergency pump/bypass equipment set-up at facility.
  - Call emergency clean-up/truck pumping services vendor.
  - Inspect upstream manholes for SSOs.
  - Notify SMPD, SMFD, and Cal Trans.

 Force Main Pumps
  - Observe SCADA screen, PLC panel, and VFD to verify proper operation.
  - Identify pumps not working.
  - If plugged, remove obstruction, test and put pump back into service.
  - Call emergency pump contractor for technical and operational assistance, if required.

 Force Main Pipeline
  - Inspect force main manifolds in pump room, above ground force mains, and in ground segments leading Seaview Terrace terminus.
  - Isolate force main if damaged; turn off pumps associated with force main.
  - Call emergency clean-up/truck
Emergency Contacts:

SCADA Technician – Greg Argano (Beavens System’s) – (310) 466-1973 (Cell)

CSM ISD – Ivo Nkwenji - (310) 968-5620 (Cell)

CSM Engineer – Jessica Arden - (805) 816-2386 (Cell)

CSM Engineer – Selim Erin – (310) 437-9898 (Cell)

Emergency Generator/Pump Vendor – Ryan Valdez (Hertz Equipment Rental) – (310) 294-7027 (Cell)

Emergency Cleanup/Truck Pumping Services Vendors

- Major Cleanup Services – (800) 669-2783
- National Plant Services – (310) 261-0970
- Stericycle/PSC – (877) 577-2669 (Emergency Service), (866)303-7344 (Services)

Pump Contractor – Mike Woodward (Pumpman) – (626) 664-9078 (Cell), (626) 939-0300

Electrical Contractor – Gary Bogle (Golden West Electric) – (626) 695-7654 (Cell)

Water Treatment Plant Supervisor (Arcadia) – Gary Richinick (213)709-1888 (Cell)

Water Resources Division Standby – (310) 628-9378 (Cell)

Wastewater Supervisor – Danny Gomez – (310) 629-9436 (Cell)

Wastewater Plant Operator – Jeff Grooms - (310) 883-8350 (Cell)

Water Resources Assistant Manager – Gary Welling – (310) 901-8413 (Cell)

WRPP Coordinator – Tom Watson – (323) 823-2324 (Cell)
Appendix D
Element 6.0
### Sanitary Sewer Overflow Response Form

<table>
<thead>
<tr>
<th>Field</th>
<th>Input</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date &amp; Time of Notification</td>
<td></td>
</tr>
<tr>
<td>Date &amp; Time of Response</td>
<td></td>
</tr>
<tr>
<td>Location</td>
<td></td>
</tr>
<tr>
<td>Complainant's Name</td>
<td></td>
</tr>
<tr>
<td>Cause of SSO</td>
<td></td>
</tr>
<tr>
<td>Responsible Party's Name</td>
<td></td>
</tr>
<tr>
<td>Responsible Party's Address</td>
<td></td>
</tr>
<tr>
<td>Complainant's Telephone</td>
<td></td>
</tr>
<tr>
<td>Date of Discharge</td>
<td></td>
</tr>
<tr>
<td>Start Time of Discharge</td>
<td></td>
</tr>
<tr>
<td>End Time of Discharge</td>
<td></td>
</tr>
<tr>
<td>Total Gallons Discharged</td>
<td></td>
</tr>
<tr>
<td>Total Gallons Entered Storm Drain System</td>
<td></td>
</tr>
<tr>
<td>Total Gallons Contained</td>
<td></td>
</tr>
<tr>
<td>Point of Origin</td>
<td></td>
</tr>
<tr>
<td>City Main</td>
<td></td>
</tr>
<tr>
<td>Private Lateral</td>
<td></td>
</tr>
<tr>
<td>Location of SSO</td>
<td></td>
</tr>
<tr>
<td>City</td>
<td></td>
</tr>
<tr>
<td>State</td>
<td></td>
</tr>
<tr>
<td>Zip</td>
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<td>Date &amp; Time of Notification</td>
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<tr>
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<tr>
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<tr>
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<tr>
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<tr>
<td>Point of Origin</td>
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</tr>
<tr>
<td>City Main</td>
<td></td>
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<tr>
<td>Private Lateral</td>
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<tr>
<td>Location of SSO</td>
<td></td>
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<tr>
<td>City</td>
<td></td>
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<tr>
<td>State</td>
<td></td>
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<tr>
<td>Zip</td>
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<td>Date &amp; Time of Notification</td>
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<tr>
<td>Location</td>
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<tr>
<td>Complainant's Name</td>
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<tr>
<td>Cause of SSO</td>
<td></td>
</tr>
<tr>
<td>Responsible Party's Name</td>
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<tr>
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<td>Complainant's Telephone</td>
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<tr>
<td>Date of Discharge</td>
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<tr>
<td>Start Time of Discharge</td>
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<td></td>
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<tr>
<td>Total Gallons Discharged</td>
<td></td>
</tr>
<tr>
<td>Total Gallons Entered Storm Drain System</td>
<td></td>
</tr>
<tr>
<td>Total Gallons Contained</td>
<td></td>
</tr>
<tr>
<td>Final Destination of Spill:</td>
<td></td>
</tr>
<tr>
<td>Storm Drainage Basin and BMP**</td>
<td></td>
</tr>
<tr>
<td>Pier (SMURRF)</td>
<td></td>
</tr>
<tr>
<td>Wilshire Boulevard (Diversion)</td>
<td></td>
</tr>
<tr>
<td>Montana Avenue (Diversion)</td>
<td></td>
</tr>
<tr>
<td>Centinela-Pearl</td>
<td></td>
</tr>
<tr>
<td>Rose Avenue (County Diversion)</td>
<td></td>
</tr>
<tr>
<td>Ashland Avenue (County Diversion)</td>
<td></td>
</tr>
<tr>
<td>Santa Monica Bay</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
</tr>
<tr>
<td>Actions taken to clean up and/or correct problem:</td>
<td></td>
</tr>
<tr>
<td>Hydrojet</td>
<td></td>
</tr>
<tr>
<td>Vactor</td>
<td></td>
</tr>
<tr>
<td>CCTV</td>
<td></td>
</tr>
<tr>
<td>Disinfect</td>
<td></td>
</tr>
<tr>
<td>Follow up</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
</tr>
<tr>
<td>Notes:</td>
<td></td>
</tr>
</tbody>
</table>
### Agency Contacts

<table>
<thead>
<tr>
<th>Agency Contact</th>
<th>Contact Info</th>
<th>Date &amp; Time</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Office of Emergency Services</td>
<td>(800) 852-7550</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LA Co. Dept. of Health Services</td>
<td>(213) 974-1234</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LA Regional Water Quality</td>
<td>(213) 576-6657</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control Board</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LA Co. Flood Control (If applicable)</td>
<td>(800) 675-4357</td>
<td></td>
<td></td>
</tr>
<tr>
<td>City of Los Angeles (If applicable)</td>
<td>(800) 974-9794</td>
<td></td>
<td></td>
</tr>
<tr>
<td>City of Santa Monica staff (WRPP)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CIWQS (WRPP)</td>
<td><a href="http://ciwqs.waterboards.ca.gov">http://ciwqs.waterboards.ca.gov</a></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CSM SMURRF Diversion Operator</td>
<td>Jeff Grooms (310) 453-6015 x5272</td>
<td>(310) 883-8350 (c )</td>
<td></td>
</tr>
<tr>
<td>CSM Risk Management</td>
<td>Michael Mack (310) 458-2201</td>
<td>(310) 993-3557 (c )</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Deb Hossli (310) 458-4907</td>
<td>(310) 463-4580 (c )</td>
<td></td>
</tr>
</tbody>
</table>

**Notes / Assumptions / Calculations / Diagram**

- Visual (e.g. bucket/barrel)
- Calculated
- SSCSC Manhole Overflow Gauge
- SSO Flow Out Table (Table A)
- Photos Taken

Spill Estimation Method

- CIWQS (WRPP) [http://ciwqs.waterboards.ca.gov](http://ciwqs.waterboards.ca.gov)
- Report complete
TO: Homeowners/Tenants/Property Managers/Business Owners

RE: Sewage Overflows into Homes or Businesses

The City has responded to a report of a sewage overflow into your home or business and, as part of its response, would like to provide you with the following important information:

- **Clearing and/or Repairing the Sewer Line.** The City’s Wastewater Division staff will advise you soon after they arrive at your property whether the blockage (or other problem) that caused the sewage overflow occurred in the City’s main sewer line or in your private sewer lateral. If the blockage occurred in the City’s main sewer line, Wastewater Division staff will clear and/or repair the line as soon as possible and restore the line to its normal operating condition. If the blockage occurred in your private sewer lateral, you will be responsible for clearing the lateral and any necessary repair. It is important that you immediately contact a local plumber who can respond within one hour to prevent further negative impacts caused by the sewage overflow. You can contact the Better Business Bureau at la.bbb.org to obtain information and ratings on plumbers and contractors in the Los Angeles area.

When experiencing a sewage overflow, please do not use any water or water related fixtures in your home as doing so may cause further damage. The City may need to turn off your water in order to mitigate health/environmental issues.

- **Clean Up.** In the event of a sewage overflow caused by a blockage (or other problem) in the City’s main sewer line, the City’s Wastewater Division will clean all sewage in the public right-of-way and report the spill to the appropriate State and County oversight agencies. You are responsible for cleaning up all sewage on your private property, both inside and outside the structure. Your homeowners’ insurance or property insurance agent should be well-versed in handling these matters and able to provide a list of firms that specialize in emergency clean-up services.

- **Filing a Claim.** If you or your insurance carrier believes the City is responsible for the sewage overflow and you or your carrier intends to seek reimbursement for expenses incurred in connection with the incident or for any damage to personal property, you must file a claim against the City. The City’s Risk Management Division staff is available to explain the claim filing and damage documentation process; they can be reached during normal business at 310.458.8910.

- **Documenting Damages and Costs.** The City’s evaluation of the claim will focus on three key areas: 1) determining whether the City is responsible for the sewage overflow, and if so, 2) determining whether the cost incurred to mitigate any damage was reasonable and appropriate, and 3) whether the claim for damage to personal property is reasonable and appropriate. It is your obligation to present satisfactory evidence in support of the claim. Therefore, it is imperative that the claim package contain adequate supporting documentation. For example, the following documentation is advisable: the plumber’s video footage from before and after the sewer line repair showing intrusion or blockage at the City’s main sewer line, photographs of the property condition before and after clean-up, receipts for any expenses incurred or for the purchase of any personal property you claim was damaged or destroyed as a result of the sewage overflow, estimates for any necessary repairs, etc.

- **Preventing Future Sewage Overflows:** Properly maintaining your private sewer lateral is key to preventing future sewer overflows. The attached brochures provide important sewer lateral maintenance tips, as well as, information on the benefits of installing a sewer backwater valve. You can contact a licensed plumber or contractor for more information.

- **Questions?** For questions related to wastewater operations, please contact the City’s Wastewater Division at 310.458.8532 during normal business hours and at 310.825.6712 for after hour emergencies. Further, the Los Angeles County Department of Health Services (310.665.8494) can provide detailed guidance on clean-up/disinfecting procedures for your property and answer other health related questions. For questions related to this sewage overflow incident and/or filing a claim against the City, please contact Risk Management at 310.458.8910.
Authorization for Emergency Clean-up

I, ______________________ (Property Owner or authorized representative) have voluntarily provided the City of Santa Monica and its authorized emergency clean-up representative with permission to enter my property located at ______________________ in Santa Monica California for the sole purpose of mitigating the immediate impacts associated with a sanity sewer overflow (SSO) or water main failure. In this capacity, the City of Santa Monica may temporarily suspend water service to stop further discharge onto the property, and direct and oversee the mitigation and disinfection activities of its authorized emergency clean-up representative. Depending on the nature and scope of the SSO or water main failure, clean-up activities may include: water removal from the property, disinfecting and drying the affected areas to prevent health and safety issues, and carrying out other clean-up tasks necessary to mitigate immediate impacts.

I also understand that the City of Santa Monica will conduct an investigation into the cause of the SSO or water main failure. Should this investigation determine that the SSO or water main failure was caused in whole or in part by a failure or blockage in my private lateral or line, I agree to promptly reimburse the City of Santa Monica for my share of the emergency clean-up expenses. I understand the emergency clean-up activities will be performed by an outside contractor hired by the City and that I will be charged the City's rate for the work.

________________________________________
Signature

________________________________________
Print Name

________________________________________
Date
SPILL VOLUME WORKSHEET

The purpose of this worksheet is to capture the data and method(s) used in estimating the volume of an SSO. Since there are many variables and often unknown values involved, this calculation is just an estimate. Additionally, it is useful to use more than one method, if possible, to validate your estimate.

The following methods and tools are the approved methods in the SOP CS-103 SSO Response. Check all methods and tools that you used:

- Eyeball Estimate Method
- Measured Volume Method
- Duration and Flow Rate Method (Account for diurnal flow pattern for long duration)
- USD SSO Flow Rate Estimating Tool
- Other (explain) i.e.; estimated daily use per capita upstream or meter @ Pump Station.

<table>
<thead>
<tr>
<th>Size of bucket(s) or barrel(s)</th>
<th>How many of this Size?</th>
<th>Multiplier</th>
<th>Total Volume Estimated</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 gal. water jug</td>
<td></td>
<td>X 1</td>
<td></td>
</tr>
<tr>
<td>5 gal. bucket</td>
<td></td>
<td>X 5</td>
<td></td>
</tr>
<tr>
<td>32 gal. trash can</td>
<td></td>
<td>X 32</td>
<td></td>
</tr>
<tr>
<td>55 gal drum</td>
<td></td>
<td>X 55</td>
<td></td>
</tr>
</tbody>
</table>

Eyeball Estimate Method- Imagine a bucket(s) or barrel(s) of water tipped over.
**Measured Volume Method** (this may take several calculation as may have to break down the odd shaped spill to rectangles, circles, and polygons)  It is important when guessing depth to measure, if possible in several locations and use an average depth. Use the SSO Volume Estimate by Area Work Sheet, if necessary, to sketch the shapes and show your work.

1. Draw a sketch of the spill SSO Volume Estimate by Area Work Sheet, or use a photo copy of USD block book to draw on and attach it.
2. Draw shapes and dimensions used on your sketch
3. Use correct formula for various shapes

<table>
<thead>
<tr>
<th>Shape</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rectangle</td>
<td>L x W x D</td>
</tr>
<tr>
<td>Circle</td>
<td>3.14 x R² x D</td>
</tr>
<tr>
<td>Polygons see reference chart</td>
<td>Show formula used</td>
</tr>
</tbody>
</table>

**Duration and Flow Rate Method** worksheet:

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Start Date and Time</td>
</tr>
<tr>
<td>2.</td>
<td>End Date and time</td>
</tr>
<tr>
<td>3.</td>
<td>Total time elapsed of SSO event (subtract line 1 from line 2. Show time in minutes)</td>
</tr>
<tr>
<td>4.</td>
<td>Average flow rate GPM (account for diurnal pattern)</td>
</tr>
<tr>
<td>5.</td>
<td>Total volume estimate using duration and flow rate method (Line 3 x Line 4)</td>
</tr>
</tbody>
</table>
CAUSE OF SPILL

Spill Cause: □ Roots  □ Grease  □ Debris  □ Vandalism  □ Lift Station Fail  □ Other _______________

☐ Spill cause to be determined by CCTV inspection  (Attach TV Report to this form)

Final Cause Determination:
_______________________________________________________________________________
_______________________________________________________________________________
_______________________________________________________________________________

Follow-up or Corrective Action Taken:
_______________________________________________________________________________
_______________________________________________________________________________
_______________________________________________________________________________
_______________________________________________________________________________
_______________________________________________________________________________

SPILL CONTAINMENT

Containment Implemented: ___________ : ___________  □ AM  □ PM  Date: _________/_______/________

Containment Measures: □ Plugged Storm Drain  □ Washed Down  □ Vacuum Up Water/Sewage

☐ Other Measures: ________________________________
_______________________________________________________________________________
_______________________________________________________________________________
_______________________________________________________________________________
_______________________________________________________________________________
_______________________________________________________________________________
CLEAN UP

Clean Up Begin: ________:________ □ AM □ PM Date: _______/______/________

Clean Up Complete: ________:________ □ AM □ PM Date: _______/______/________

Describe Clean Up Operations:
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

__________________Gallons – Estimate Volume of Spill Recovered (do not count wash down water)

OTHER IMPORTANT MILESTONES

Contacted Supervisor: ______:_____ □ AM □ PM Date: _______/______/__________

Requested Additional EE’s/Equip:____:_____ □ AM □ PM Date: _______/______/_________

Requested Additional EE’s/Equip:____:_____ □ AM □ PM Date: _______/______/_________

Requested Additional EE’s/Equip:____:_____ □ AM □ PM Date: _______/______/_________

Departure Time: ______:_____ □ AM □ PM Date: _______/______/__________

_________________________ ______:_____ □ AM □ PM Date: _______/______/_________

_________________________ ______:_____ □ AM □ PM Date: _______/______/_________

________________________    ______:_____ □ AM □ PM Date: _______/______/_________

_________________________    ______:_____ □ AM □ PM Date: _______/______/_________
Response Crew: _____________________,   ______________________,   _____________________

_____________________,  _______________________,  ______________________

_____________________,  _______________________,  ______________________
2.6.7.2 SSO Volume by Area Estimation Work Sheet

Surface: [ ] Asphalt  [ ] Concrete  [ ] Dirt  [ ] Landscape  [ ] Inside Building  Other _____________________

(Draw / Sketch outline of Spill ‘Footprint’ and attach photos)

~~ Breakdown the ‘Footprint’ into Recognizable Shapes and Determine Dimensions of Each Shape ~~

Area #1_______________________________________________________________  % Wet _______

☐ Stain. Depth1_____   Depth2 _____   Depth3 _____   Depth4 _____   Depth5 _____   Depth6 _____

Area #2_______________________________________________________________  % Wet _______

☐ Stain. Depth1_____   Depth2 _____   Depth3 _____   Depth4 _____   Depth5 _____   Depth6 _____

Area #3_______________________________________________________________  % Wet _______

☐ Stain. Depth1_____   Depth2 _____   Depth3 _____   Depth4 _____   Depth5 _____   Depth6 _____

Area #4_______________________________________________________________  % Wet _______

☐ Stain. Depth1_____   Depth2 _____   Depth3 _____   Depth4 _____   Depth5 _____   Depth6 _____

Area #5_______________________________________________________________  % Wet _______

☐ Stain. Depth1_____   Depth2 _____   Depth3 _____   Depth4 _____   Depth5 _____   Depth6 _____
SSO Volume by Area Estimation Work Sheet

Area #6________________________________________________________________ % Wet _______

☐ Stain. Depth1_____ Depth2 _____ Depth3 _____ Depth4 _____ Depth5 _____ Depth6 _____

Area #1       Square Feet: ______________ x % Wet _______ = ____________ Sq/Ft
Ave Depth: ______________  ☐ Concrete 0.0026’  ☐ Asphalt 0.0013’
Volume: ______________ Cu/Ft

Area #2       Square Feet: ______________ x % Wet _______ = ____________ Sq/Ft
Ave Depth: ______________  ☐ Concrete 0.0026’  ☐ Asphalt 0.0013’
Volume: ______________ Cu/Ft

Area #3       Square Feet: ______________ x % Wet _______ = ____________ Sq/Ft
Ave Depth: ______________  ☐ Concrete 0.0026’  ☐ Asphalt 0.0013’
Volume: ______________ Cu/Ft

Area #4       Square Feet: ______________ x % Wet _______ = ____________ Sq/Ft
Ave Depth: ______________  ☐ Concrete 0.0026’  ☐ Asphalt 0.0013’
Volume: ______________ Cu/Ft

Area #5       Square Feet: ______________ x % Wet _______ = ____________ Sq/Ft
Ave Depth: ______________  ☐ Concrete 0.0026’  ☐ Asphalt 0.0013’
Volume: ______________ Cu/Ft

Area #6       Square Feet: ______________ x % Wet _______ = ____________ Sq/Ft
Ave Depth: ______________  ☐ Concrete 0.0026’  ☐ Asphalt 0.0013’
Volume: ______________ Cu/Ft

Total Volume:
#1 ________, #2 ________, #3 ________, #4 ________, #5 ________, #6 ________ = _________ *cu ft

_________ *cu ft x 7.48 gallons = ____________ gallons Spilled.
CONVERSIONS

** To convert inches into feet: Divide the inches by 12.

Example: 27” / 12 = 2.25’

Or Use Chart A

Example: 1 ¾” = ?

1” (0.08’) + ¾” (0.06’) = 0.14’

** One Cubic Foot = 7.48 gallons of liquid.

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<thead>
<tr>
<th>Inches</th>
<th>Feet</th>
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<tbody>
<tr>
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<tr>
<td>12”</td>
<td>1.00’</td>
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</table>
GEOMETRY

For the purposes of this work sheet, the unit of measurement will be in feet for formula examples.

Area is two-dimensional - represented in square feet. (Length x Width)

Volume is three-dimensional - represented in cubic feet. (Length x Width x depth) or (Diameter Squared) $D^2 \times 0.785 \times$ depth.

A Note about Depth

Wet Stain on a Concrete Surface - For a stain on concrete, use 0.0026’. This number is 1/32” converted to feet. For a stain on asphalt use 0.0013’ (1/64”). These were determined to be a reasonable depth to use on the respective surfaces through a process of trial and error by SPUD staff. A known amount of water (one gallon) was poured onto both asphalt and concrete surfaces. Once the Area was determined as accurately as possible, different depths were used to determine the volume of the wetted footprint until the formula produced a result that (closely) matched the one gallon spilled. 1/32” was the most consistently accurate depth on concrete and 1/64” for asphalt. This process was repeated several times.

Sewage “Ponding” or Contained – Measure actual depth of standing sewage whenever possible. When depth varies, measure several (representative) points, determine the average and use that number in your formula to determine volume.

Area/Volume Formulas

Area is two dimensional and is represented as Square Feet (Sq. Ft.)

Volume is three dimensional and is represented as Cubic Feet (Cu. Ft.)

One Cubic Foot = 7.48 gallons
**AREA/VOLUME OF A RECTANGLE OR SQUARE**

Formula: \textbf{Length x Width x Depth} = Volume in Cubic Feet

\[ \text{Volume in Cubic Feet} = \text{Length} \times \text{Width} \times \text{Depth} \]

Depth = 1 ¾”

Length (25’) x Width (12’) x Depth (0.14’)

25’ x 12’ x 0.14’ = 42 Cubic Feet.

Now the Volume in Cubic Feet is known.

There are 7.48 Gallons in one Cubic Foot

So, 42 Cubic Feet x 7.48 gallons/cubic feet = 314 Gallons

<table>
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<tr>
<td>8” = 0.67’</td>
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<tr>
<td>9” = 0.75’</td>
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</tbody>
</table>
AREA/VOLUME OF A RIGHT TRIANGLE

Base \times \text{Height} \times 0.5 \times \text{Depth} = \text{Volume in Cubic Feet}

\begin{align*}
\text{Base (45')} \times \text{Height (10')} \times 0.5 \times \text{Depth (0.05')} \times 7.48 \text{ gallons/cubic foot} &= 84 \text{ gallons}
\end{align*}

For Isosceles Triangles (two sides are equal lengths), Break it down into two Right Triangles and compute area as you would for the Right Triangle above.

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<thead>
<tr>
<th>Inches</th>
<th>Feet</th>
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<td>4”</td>
<td>0.33’</td>
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<tr>
<td>5”</td>
<td>0.42’</td>
</tr>
</tbody>
</table>
AREA/VOLUME OF A CIRCLE/CYLINDER

\[ D^2 \times 0.785 \times d \]

Diameter Squared x 0.785 x Depth = Volume in cubic feet.

Diameter = Any straight line segment that passes through the center of a circle.

For our purposes, it is the measurement across the widest part of a circle.

\[ D^2 \times 0.785 \times \text{depth} = \text{Volume in cubic feet} \]

Example:

27’ x 27’ x 0.785 x 0.03 = 17.17 cubic feet

17.17 cubic feet x 7.48 gallons/cubic feet = 128 gallons

---

**Chart - A**

<table>
<thead>
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<th>Conversion:</th>
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<td>Inches to Feet</td>
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<td>3” = 0.25’</td>
<td></td>
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<tr>
<td>4” = 0.33’</td>
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</tbody>
</table>
Find the geometric shapes within the shape. If this was the shape of your spill, break it down, as best you can, with the shapes we know.

1. Determine the volumes of each shape.

   *In this example, after the volume of the circle is determined, multiply it by 55% (+/-) so that the overlap area won’t be counted twice.*

2. Add all the volumes to determine total spill volume.

If the spill depth is of varying depths, take several measurements at different depths and find the average.
2" + 1.5" + 1.25" + 1" + 1" + 0.75" + 0.5" + 0.25" = 8.25"

8.25" / 8 measurements = 1.03"

Average Depth = 1.03"
Step 1

If the spill affects a dry, unimproved area such as a field or dirt parking lot, determine the area of the wetted ground in the same manner as you would on a hard surface. Using a round-point shovel, dig down into the soil until you find dry soil. Do this in several locations within the wetted area and measure the depth of the wet soil. Average the measurement/thickness of the wet soil and determine the average depth of the wet soil. If the area of the spill was determined to be 1.28 sq ft:

\[
\frac{1.28 \text{ sq ft} \times 0.194'}{6 \text{ measurements}} = 2.33' \\
\]

Average Depth = 2.33' (0.194')

\[
14.0' + 1.5' + 1.25' + 3.0' + 5.0' + 1.25' = 14.0' \\
2 + 1.5' + 1.25' + 3.0' + 5.0' = 14.0' \\
24.83 \text{ cu ft} \times 7.48 \text{ gal/cu ft} = 185.74 \text{ gallons} \\
128 \text{ sq ft} \times 0.194' = 24.83 \text{ cu ft} \\
\]

Step 2

Take a Test Sample

NOTE: This can be used in a (Dry) dirt or grassy area that is not regularly irrigated or

EXAMPLE: If the Area of the spill was determined to be 128 sq ft and the average depth of the wet soil is 2.33

\[
128 \text{ sq ft} \times 0.194' = 24.83 \text{ cu ft} \\
24.83 \text{ cu ft} \times 7.48 \text{ gal/cu ft} = 185.74 \text{ gallons} \\
185.74 \times 18\% = 33 \text{ gallons (water in soil)} \\
\]

NOTE: This can be used in a (Dry) dirt or

EXAMPLE: If the spill affects a dry, unimproved area such as a field or

interference:

Wet soil would make this method difficult or a dirt parking lot.

NOTE: This can be used in a (Dry) dirt or

EXAMPLE: If the spill affects a dry, unimproved area such as a field or
Element 7 – Fats, Roots, Oils, and Grease (FROG) Control Program

This section of the SSMP discusses the City’s FROG control measures, including identification of problem areas, focused cleaning, and source control.

Santa Monica serves as a seaside recreational destination for the inland residents of Los Angeles, Riverside, Ventura and San Bernardino Counties. The three main shopping areas of downtown Santa Monica, Third Street Promenade and Montana Avenue, have an abundance of restaurants, hotels and other food-related businesses that contribute their waste streams to the sanitary sewer. In addition, the microclimatic conditions of Santa Monica encourage and sustain heavily landscaped private properties. To address the potential impacts to the sanitary sewer from grease and roots the City has developed and implemented a multi-pronged approach for the control of FROG related sources that contribute to sanitary sewer overflows.

7.1 FROG Control Elements

The City’s FROG source control program includes the following elements:

- A public education outreach program that promotes proper disposal of FROG;
- The legal authority to issue permits, prohibit discharges to the system (article 5.20.040 (a)(16) SMMC) and identify measures to prevent SSOs and blockages caused by FROG;
- Requirements (article 5.20.080 SMMC) to install grease removal devices (such as traps or interceptors) design standards for the grease removal devices, maintenance requirements, BMP requirements, record keeping and reporting requirements;
- Authority to inspect grease producing facilities and enforce requirements (article 5.20.500 SMMC);
- Operations and Maintenance and operations (O& M) procedures which assist in the identification of sewer system sections subject to FROG blockages, based on operational history and inspection, and;
- Other source control measures, as appropriate, for all sources of FROG discharged to the sewer system.

7.2 FROG Control Program

The City has determined that a FROG control program is necessary per SSMP requirements. There are 474 food service facilities located within City limits and discharge to City sewers. Operations and maintenance staff have also noted the tendency for grease buildup in specific sewer lines due to proximity to sources or hydraulic conditions. This section discusses measures the City takes to control FROG.

The City’s FROG control program consists of focused cleaning and maintenance as well as source control. The following subsections discuss identification and cleaning of grease-prone areas, legal authority to prohibit grease discharge or require a grease removal device, facility inspection, and public outreach.
Water Resources Protection Program

The City of Santa Monica Water Resources Protection Program (WRPP) ensures compliance with federal, state and local regulations for wastewater pre-treatment standards prior to discharge into the City’s wastewater collection system. WRPP Staff oversees all industrial and business customers that have the potential to adversely affect the CSM wastewater system by the issuance of Industrial Wastewater permits every year, inspections, and applicable unannounced sampling events for approximately 870 businesses requiring pre-treatment and/or regular monitoring for toxic substances, such as inorganic toxic substances, such as acids & metals, fats from grease and oil producing food-related operations, and other oil and grease producing operations, such as automotive uses, prior to connection and discharge to the wastewater system. For FOG control, there are 474 permittees subject to inspection. For instances of non-compliance with sewer limitations and prohibited discharge standards as specified in the Santa Monica Municipal Code, the WRPP relies on various escalating enforcement actions such as the issuance of Notices of Correction (NOC), Notices of Violation (NOV), administrative citations, and referral to the City Attorney’s office for prosecution. Every permittee inspection is stored in a Hansen 8 computer database as well as a hard copy file. WRPP is also in constant contact with CSM Wastewater staff with regard to any significant findings in the collections system. The WRPP also advises residential customers through outreach information and in tandem with the City’s Household Hazardous Waste Program, the proper disposal methods for toxic materials (such as mercury), waste cooking oil, and other household hazardous waste. In addition, the WRPP has distributed education material on the importance of preventing FOG from entering the sanitary sewer system and brochures on roots and how they adversely affect the wastewater system to the residents of Santa Monica. This information is also distributed to residents at the City of Santa Monica Festival, which is held yearly.

The City also requires the installation of pre-treatment devices such as clarifier and grease interceptors for new and remodeled facilities and requires pre-treatment devices to be installed in other older facilities that have caused SSOs.

The City also has an annual inspection and random sampling program and keeps records of all permits with proof of regular maintenance of all pre-treatment devices by the permit holder.

Wastewater Operations Program

The Wastewater Operations Staff is responsible for the cleaning, monitoring and maintenance of the City’s wastewater collection system. Maintenance consists of four (4) full-time crews, five to six days a week jetting and cleaning the local collection system and the CIS. Wastewater Operations also maintains the City’s Moss Avenue Pumping Station (MAPS), end of line diversions into the sewer system. The City completed replacing and/or lining 80% of its sewer mains and manholes in 2002. Areas of concern based previous experience are tracked on the City GIS system and are cleaned more frequently. Together with the CSM Civil Engineering & Architecture Division problem-prone pipelines having both structural and flow capacity issues are prioritized for replacement to minimize the potential for serious SSO incidents.
Urban Forestry Management

In 1999, the City adopted its Community Forest Management Plan 2000. The urban forest is comprised of approximately 33,000 trees located in public areas throughout the City and is supplemented by the rich and varied landscapes on private property. The Community Forest Management Plan has strict guidelines for the urban forest as far as root barrier placement, root pruning, new planting procedures so that hardscape areas under which most sewer mains are buried are not adversely affected.

As the public landscape ages and needs new replanting, new street trees are selected for their non-invasive root properties and are installed with appropriate root barriers in order to avoid entry into the wastewater collection system. When blockages are caused by root infestation, the Urban Forrester is called in to consult with staff so that roots may be pruned or the specimen may be relocated and replaced with a more non-invasive variety. The following Figure 3 shows the urban forest street trees within Santa Monica:

Figure 3

[Map of City of Santa Monica Street Trees]
7.2 Element Appendix E

Supporting information for Element 7 is included in Appendix F. This appendix includes the following documents:

1. Example Restaurant Inspection form
2. Example Public Outreach Brochure
Appendix E
Element 7.0
WASTEWATER/STORMWATER INSPECTION REPORT

Date: __________  Time In: __________  Time Out: __________  Permit #: __________  Permit Expiration: __________

Business: ____________________________________________ Category: _____  SIC #: __________

Address: ____________________________________________ Phone #: ____________________________ Purpose of Inspection: ____________________________

Responsible Party or Business: ____________________________________________ Title: ____________________________

Authorized Representative: ____________________________________________ Title: ____________________________

Contact Person: ____________________________________________

INSPECTION CHECKLIST: INSPECTED VIOLATIONSREFERENCE/COMMENTS:

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<tr>
<td><strong>Manifests/Records/Conditions:</strong></td>
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</table>

Oil/Transmission Fluid                         |     |    |     |     |    |             |                    |
Battery Storage/Disposal                       |     |    |     |     |    |             |                    |
Coolant/Brake Fluid                            |     |    |     |     |    |             |                    |
MSDS on File                                   |     |    |     |     |    |             |                    |
Clarifier/Interceptor/Trap Size Gal.: ________ |     |    |     |     |    |             |                    |
Grease Container Capacity: _________           |     |    |     |     |    |             |                    |

Inspection Summary: __________________________

I certify that I have submitted to this inspection.

(Print Name)  (Signature)

Received By: __________________________________________________________________________

Inspector: __________________________________________________________________________
WATER RESOURCES PROTECTION PROGRAMS

The City of Santa Monica's Water Resources Protection Programs monitors discharges into the sanitary sewer and storm drain systems to ensure the overall health of Santa Monica Bay is maintained.

For more detailed information regarding our programs, go to our website at http://www.water.smgov.net

City of Santa Monica
Wastewater Operations ............................................ (310) 458-8322
After hours ......................................................... (310) 826-6772

The City of Santa Monica and the City of Los Angeles for their generosity and deep commitment of resources and information to this brochure

WATER RESOURCES PROTECTION PROGRAMS
City of Santa Monica, 1212 5th Street, 3rd Floor
Santa Monica, CA 90401  Tel: 310-458-8235
www.water.smgov.net

WATER POLLUTION PREVENTION

KEEP ROOTS OUT OF YOUR SEWER LATERAL

70% - 80% of sewage overflows are caused by tree roots.

www.water.smgov.net

TYPICAL HOME SEWER CONNECTION

WHAT IS A LATERAL?
The City of Santa Monica operates and maintains its own wastewater collection system. An important contributor to our system is a network of laterals. Laterals are small underground sewer pipes, sometimes called sewer service lines (usually four inches, or less, in diameter) that carry wastewater from homes and businesses to the public sewer in the street. If you own your home, you also own the lateral from the end of your property's internal plumbing to its connection with the City's sewer main. Property owners are responsible for the proper operation and maintenance of their laterals.

THOUGHTFUL LANDSCAPING CAN MINIMIZE THE RISK OF ROOT SYSTEMS CREEPING INTO YOUR LATERAL SEWER LINE

MAINTENANCE OF THE SEWER LATERAL IS THE RESPONSIBILITY OF THE PROPERTY OWNER

SEWER LATERAL OR HOUSE CONNECTION

THE SEWER MAIN IS MAINTAINED BY THE CITY

YOUR HOME PLUMBING DRAINS INTO THE LATERAL

CLEAR-OUT

SEWER LATERAL OR HOUSE CONNECTION

SEWER MAIN

SIDEWALK

STREET
WHAT CAUSES ROOTS TO GROW IN PIPES?

Roots are attracted to water and nutrients in sewage that escape through cracks or loose joints in sewer laterals. This means roots will move towards and penetrate through cracks, loose joints or any openings in sewer pipes. This happens even in the winter when trees appear to be dormant. The main point is that leaky laterals invite roots and roots cause blockages.

Once inside, roots will continue to grow and fill the pipe to create a root mass, commonly referred to as a “root ball,” which may become matted with grime, paper, and other solids. A root ball will eventually plug your lateral. Continued growth of the root ball in a private lateral can eventually affect the City’s sewer system.

As roots continue to grow within a pipe, they begin to expand and exert pressure at their point of entry and throughout the pipe. This can result in a ruptured pipe. A ruptured sewer pipe can be costly to fix or replace.

Signs that a sewer is blocked include slow moving drains, gurgling sounds from a toilet bowl, and sewage coming up from a clean-out. A pipe that is not cleaned will become completely blocked and may rupture.

WHY IS IT IMPORTANT TO MAINTAIN LATERALS?
The majority of all lateral blockage occurrences are from private homes. Your lateral is particularly susceptible to root intrusion, especially if it is over ten years old. About half of the roots in the City’s sewer system enter through defective private laterals. Root intrusion can damage your lateral and cause it to collapses over time. Earthquakes and settlement of soils are sometimes the cause of cracking or separation of joints that allow roots to intrude on your lateral. Another common cause of lateral blockages is from excessive buildup of grimes (a result of pouring cooking oil and fat down the kitchen sink). Properly maintaining your lateral will increase its useful life, help prevent sewage from backing into your home and minimize Sanitary Sewer Overflows (SSOs) into the streets, which lead into the storm drain system and into the Santa Monica Bay. It will also help you to avoid costly repairs or replacements of your lateral. Moreover, failure to properly maintain your lateral may result in you being liable or responsible to your neighbors or the City for damages caused by your lateral.

The City maintains public sewers by periodically removing and cleaning roots using mechanical equipment; systematically inspecting street sewers using Closed Circuit Television (CCTV) technology to identify structural defects; and by planning and implementing capital improvement projects to repair, rehabilitate or replace structurally deficient sewers.

It is important that property owners inspect, maintain, repair and/or replace private laterals to help reduce sewage overflow and protect private and public sewers from further damage.

WHAT CAN YOU DO TO PREVENT SEWER BACKUP PROBLEMS?

As a homeowner, you need to know where your lateral is and how it runs across your property into the main sewer system. When planting trees or shrubs, consider the location of your lateral and try not to plant near it. Do some basic research when selecting a tree to plant on your property and consider where to plant a tree in relation to a lateral.

BE PROACTIVE:

- Maintain and repair your sewer lateral.
- Never pour grease or put solids down your drains.
- Know where the clean-outs (access points) to your sewer line are for quick access to clear blockages. A clean-out is a vertical access pipe from an underground lateral to the surface.
- Keep your clean-out cap on and in good shape to keep out debris.
- Never remove your clean-out cap. This may cause sewage discharge into the street storm drain.
- Regularly snare or rod your lateral. Snaking your lateral often removes blockages. A licensed plumber can help you address these problems. A plumber often will thread a flexible cable with a cutting tool or rod attached to the end of it into your sewer line. If the cable meets resistance, then there is a good chance that there is a blockage. However, a broken or collapsed pipe may require digging up the line and replacing portions of the pipe. You are responsible for keeping the entire length of your lateral clear of roots and blockages.

HOW DO I FIX A BLOCKED OR COLLAPSED LATERAL?

Call our Wastewater Division first regarding overflows, backups or any sewer related questions at (310) 458-8532. If you have a sewer backup or root intrusion problem, contact a licensed plumber or sewer contractor before deciding on a remedy. Consult the Yellow Pages under the heading “Sewer” or “Plumbing” for information on companies that perform CCTV pipe inspection and root control. It is always a good idea to get multiple quotes for any substantial amount of work.

DO I NEED A SEWER BACKWATER VALVE?

Your property is connected to the public sewers. Some properties have been built so that an obstruction in the public sewer should not cause a sewage backup. In other areas, plumbing fixtures may be set at a lower elevation than the upper most manhole in the street. In these areas, a sewage backup is more likely, and a backwater valve can help prevent one from occurring. Additionally, if you have experienced a sewage backup or tree root intrusion at your property, you should consider having a backwater valve installed. A backwater valve only allows sewage to flow one way — into the sewer mainline in the street and not back into your home. A licensed plumber can address these issues and properly install a backwater valve if necessary and provide tips to ensure the longevity of its operation.

HOW DOES A SEWER BACKWATER VALVE WORK?

A properly installed backwater valve allows household wastewater to flow into the sanitary sewer.

And it prevents sewage from entering your home from your lateral or the main sewer line.

WHO CAN ANSWER YOUR QUESTIONS?

We are pleased to provide you with the practical and technical information you need to protect the public’s health and the environment. Call the City of Santa Monica’s Wastewater Operations at: (310) 458-8532, or visit our website at www.water.smgov.net.
Element 8 – Capacity Assurance Plan

This section of the SSMP discusses the City’s capacity management measures, including the most recent Master Plan and recommended capital improvement projects.

8.1 Capacity Management Elements

The City has prepared and implemented a capital improvement plan (CIP) that provides and ensures continued hydraulic capacity of key sanitary sewer system elements for dry weather peak flow conditions, as well as for appropriate design for storm or wet weather events. Elements that contribute to the CIP as it relates to the collection system include, but are not limited to, the following:

- Evaluation of peak flows (including flows from SSOs that escape from the system), estimates of the capacity of key system components, hydraulic deficiencies, if any and the major sources that contribute to the peak flows;
- Identification and implementation of appropriate system design criteria and;
- Establishment of short and long-term capital improvement goals and schedules.

8.2 Capacity Evaluation

The City of Santa Monica (CSM) collection and pumping system contains approximately 152 miles of sewer pipe ranging in diameter from 6-inches to 72-inches, two flow-monitoring and sampling stations and one 26-mgd pumping station. Sewage enters Santa Monica from the City of Los Angeles through one metered location and from three unmetered locations and leaves Santa Monica for treatment at the City of Los Angeles Hyperion Plant through one metered and six unmetered locations. The City of Santa Monica’s 72-inch Coastal Interceptor Sewer (CIS) system connection to the City of Los Angeles was designed for the development sunset year of 2090 and has a capacity of approximately 52 mgd. Presently, the maximum peak instantaneous flow approaches 32.665 mgd with the average yearly flows of approximately 14.54 mgd. This flow rate includes all dry weather runoff diversions to the sanitary sewer systems. Based on current long-term estimates of population density and sewer demand at maximum build out, the City will have adequate capacity to meet all anticipated demand. Because the City recognizes the importance of planning for all aspects of future development, water and sewer capacity and demand forecasts are reviewed regularly and updated as needed to keep abreast of changing conditions.

The present CIS capacity within the City of Santa Monica was installed in 2002. Prior to construction, calculations were performed in accordance with the City of Los Angeles Department of Public Works standards for sewer flow pipe capacities to ensure adequate capacity well into the future. In addition, Santa Monica’s local sewer collection system was 80% rehabilitated/replaced with FEMA/OES funding following the 1994 Northridge Earthquake. At that time, mains, manholes and junction structures were
lined and/or replaced for structural integrity and to prevent infiltration. Adequate capacity was designed into the CIS for dry weather urban runoff upstream in the City of Los Angeles and for planned diversions into the sewer system within Santa Monica.

Treatment capacity is planned for under the Amalgamated Sewerage System of which the City Santa Monica, the City of Los Angeles and twenty-two other agencies or point source discharges are members. The majority of the flow (over 98%) treated by the Amalgamated System at the Hyperion Plant is from the City of Los Angeles, so that complete treatment capacity is studied under the City of Los Angeles’ SSMP.

**Design Criteria**

The CSM wastewater construction standards are maintained by the Civil Engineering Division of the Public Works Department. These standards are updated as required by CSM staff and are made available to the public by the Civil Engineering Division upon request so that all engineering contractors and civil engineers are aware of the CSM standards for wastewater construction. Presently, public wastewater projects are designed by the Civil Engineering Division and each project’s contract documents contain all wastewater specification standards, construction notes and details for the project. They are modified to be site-specific on a project by project basis. Contract documents are prepared in-house using consultant civil engineers for the plans and technical specifications. Specifications are Construction Standards Institute (CSI) based and are modified as applicable by the Standard Specifications for Public Works Construction (GREENBOOK), latest edition, which is jointly produced by representatives of the American Public Works Association (APWA), the Associated General Contractors of California, the Engineering Contractors Association, the Southern California Contractors Association and BNI Publications, Inc.

**Capital Improvement Goals and Schedules**

As part of the City’s collection system CIP, land use and flow modeling are utilized to develop and prioritize five-year and 30-year CIP goals and schedules for consideration and approval by the City Council. The approved CIP projects are prioritized by the City’s asset management team and are implemented as funds become available through a combination of Council-adopted incremental development financing (for increases in land use), Council-approved rate increases (for rate payers) and Council-approved increased Wastewater Capital Facility Fees.

The City of Santa Monica pays the City of Los Angeles an Amalgamated Sewerage System Facilities Charge (ASSFC) for upward changes in land use by building permit. Until July 2008, Santa Monica paid Los Angeles by utilizing the Santa Monica Wastewater Capital Facilities Fee collected at the time of permit issuance. This has left Santa Monica’s CIP program at the same monetary level and funded through a combination of rates collected from rate payers and developers’ buy-in to the system at
building permit issuance. In July 2008, Santa Monica began collecting the ASSFC as a “pass-through” fee directly from developers leaving the City’s capital facility fee unfettered and for use in Santa Monica. Recently, density levels have started to outpace fee collection, and have left the City with fewer funds for capital improvements to the system. To correct this trend, the City is considering code changes that will allow for charging developments directly for adverse incremental land use changes that may affect the flow capacity of the system, either by the collection of a sewer impact in-lieu fee or by development-funded wastewater projects increasing downstream capacity.

**Sanitary Sewer Master Plan – FY 16/17**

The City will be embarking on development of a comprehensive Sanitary Sewer Master Plan during FY 2016/2017. As part of the plan, the City will be completing the sewer hydraulic model by reviewing dry and wet weather loadings (peak and average loading, weekday/weekend diurnal patterns, system operational setting etc.), completing extensive flow monitoring, review of unit loading factors from the current water billing data and include any capacity findings from sewer maintenance operations. Also, the plan will look at future demands by taking into account land use patterns, the City’s new Downtown Specific Plan, Land Use and Circulation Element (LUCE), Sustainable Water Master Plan and the Urban Water Management Plan. The Sanitary Sewer Master Plan will review the entire system design and identify a 5 year CIP program that will address any capacity issues.

**8.3 Element 8 Appendix F**

1. 2010 Santa Monica Water Resources Asset Management Plan

   (This document can be found at F:\WaterResources\Share\Asset Management Plan\GHD Deliverables – Documents)
Element 9 – Monitoring, Measurement, and Program Modifications

This section of the SSMP discusses the parameters utilized by the City to track and monitor the effectiveness of the SSMP and the procedures for revising and updating the SSMP, as needed.

9.1 Monitoring, Measurement, and Program Elements.

The monitoring, measuring and modification component includes the following elements:

- Documenting relevant information that can be used to establish and prioritize appropriate SSMP activities;
- Monitoring the implementation and, where appropriate, measuring the effectiveness of each element of the SSMP;
- Assessing the success of the sanitary sewer preventative maintenance program; and
- Updating program elements and the SSMP, as appropriate, based on monitoring or performance evaluations.

9.2 Monitoring and Measurement

Over the past three years the City’s commitment to asset management and preventative O & M activities has resulted in fewer FOG related SSO incidents. The City regularly tracks and monitors the general effectiveness of preventative maintenance measures through work orders/service requests, number and location of reportable SSO reports, and required annual regulatory reports. Information collected includes, cause and location of stoppages; number, cause, location, and volume of SSOs; stoppage response time; number and reason for customer complaints; and type of debris found. The City has selected these certain, specific parameters because they can be documented and compared on an annual basis in a simple format. In addition, experience has shown that these parameters are straightforward, quantitative, and are focused on results.

In addition to the City tracking and monitoring measures, all documented SSO events are reported through the California Integrated Water Quality System (CIWQS) database within the required timeframe. SSO’s are also reported, as appropriate and required, to other regulatory agencies.

9.3 SSMP Modification

The effectiveness of the SSMP will be tracked through an annual internal audit and reported in an annual summary report (see Element 10). Updates, if any, including changes in procedures, will be based on the findings of the annual audit conducted by WRPP Inspector Staff and assisted by other Wastewater Staff as appropriate.
9.4 Element 9 Appendix G

Supporting information for Element 9 is included in Appendix G. This appendix includes the following documents:

1. Graph of SSO incidents
Appendix G
Element 9.0
**CSM SSO Incidents**

*By calendar year

**Through October 2015

- **Total SSOs**
- **CSM Main Line SSOs**
- **SSOs attributed to FOG**

---

*By calendar year

**Through October 2015

---
Element 10 – SSMP Program Audit

This section of the SSMP discusses the City’s SSMP auditing program. The audit system is a tool for measuring the success and relevancy of the individual elements of the SSMP.

10.1 SSMP Audit Elements

The City utilizes the following elements for its audit process:

- Completion of an annual internal audit to gauge the effectiveness of existing O & M measures, review any new regulations related to the operation of the collection system, identify SMPP deficiencies, if any, and identify corrective actions.
- Preparation of an audit summary report that memorializes for the file the findings and recommendations of the SSMP audit process, including any deficiencies in the SSMP and steps to correct them.

10.2 SSMP Audits

Internal audits will be conducted by Water Resources Protection Program staff, with assistance from wastewater operations staff on an annual basis to determine the relevance and effectiveness of each element of the SSMP. The audits will be conducted in June of each year and a report will be prepared for filing by the Water Resources Protection Program staff. In addition to reviewing each element of the SSMP, the audits will also include a review of schedule progress for measures implemented to correct any identified deficiencies from the prior year. Based on the findings of the audit process, the SSMP will be updated or modified accordingly. A copy of the audit report checklist and findings report will be retained in the file.

10.3 Element 10 Appendix H

1. SSMP Audit Checklist
Appendix H
Element 10.0
<table>
<thead>
<tr>
<th>10.0 SSMP PROGRAMMATIC AUDIT CHECKLIST</th>
<th>Yes</th>
<th>No</th>
<th>NA</th>
<th>Comments</th>
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<tr>
<td><strong>Document Control</strong></td>
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<tr>
<td>Are there document control procedures to ensure current and historical documentation recovery?</td>
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<tr>
<td>Are all documents located in a single place electronically? Hard copy?</td>
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<td>Are documents reviewed on a regular or periodic basis to ensure accuracy and relevance?</td>
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<tr>
<td>Are staff trained based upon documented programs?</td>
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<tr>
<td>Are document cross references easily obtained and revised as new documents/procedures are created? Are all documents legible, dated (with revisions) and readily identifiable?</td>
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<tr>
<td>Do documents have an expiration date or reissuance date?</td>
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<td>Are appropriate records available to the appropriate staff?</td>
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<tr>
<td><strong>Training</strong></td>
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<td>Does staff have a documented and mandatory training program including coursework title and content requirements?</td>
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<td>Is staff given adequate resources (time and budget) to ensure familiarity with documented procedures as well as industry standards?</td>
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<td>Is staff rewarded for certification or increased proficiency?</td>
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<td>Are training records reviewed and kept by supervisory or other appropriate departments?</td>
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<tr>
<td><strong>Targets and Objectives</strong></td>
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<td>Is there a strategic plan that lays out both short and long-term objectives?</td>
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<td>Are there set annual objectives and targets with defined outcomes and measures assigned responsibilities?</td>
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<tr>
<td><strong>Data Management</strong></td>
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<tr>
<td>Are there performance reports and progress tracking systems that are reviewed by appropriate management on a regular basis?</td>
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<td>Is data easily transferable or compared to historical data in order to relate to baseline performance?</td>
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<tr>
<td>Can performance data be benchmarked to other similar agencies for comparison?</td>
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<tr>
<td><strong>Documented Procedures</strong></td>
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<td>Are roles and responsibilities clearly identified throughout the organization?</td>
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<tr>
<td>Does the organization have set procedures for reviewing performance data for the time period in question?</td>
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<td>Is there an assigned individual (or group) with sufficient authority to conduct regular performance reviews?</td>
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<tr>
<td>Are audits done internally or externally by a neutral third party?</td>
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<td>Are audits conducted on a systematic basis for both good and bad outcomes?</td>
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<tr>
<td>Are audits conducted on activities?</td>
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<tr>
<td>Are audits conducted on programs?</td>
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<td>Are there certain thresholds that trigger audits?</td>
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<td>Are triggers clearly identified and adhered to?</td>
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<tr>
<td>Is there an established or set time period for conducting audits?</td>
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</table>
### 10.0 SSMP AUDIT CHECKLIST (Cont.)

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>NA</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Does the organization have procedures for defining responsibility and authority for handling and investigating nonconformance?</strong></td>
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<tr>
<td><strong>Are audits used as a training tool?</strong></td>
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<tr>
<td><strong>Is the organization’s top management involved with the analysis of performance data and program audits?</strong></td>
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</tbody>
</table>

**Outcomes**

| **Does the organization act appropriately to nonconformance and consider magnitude of problems and commensurate with environmental impact and industry standards?** |     |    |    |          |
| **Are outcomes or recommendations from performance data review and audits findings documented?** |     |    |    |          |
| **Are audit findings ultimately considered in the budgetary process for both CIP and Program resources?** |     |    |    |          |

**Recommendations:**

---

**Auditor Signature:**

______________________________

**Date:** ________________
# Sewer System Operations Systematic Audit Checklist

Date: _____________________

<table>
<thead>
<tr>
<th>Element</th>
<th>Title</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Goals</td>
<td>Reduce, prevent, &amp; mitigate SSOs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Prevent public health hazards</td>
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<tr>
<td></td>
<td></td>
<td>Meet all applicable regulatory notification, monitoring, and reporting requirements</td>
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<td>Minimize the frequency and magnitude of SSOs</td>
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<td>Prevent damage to public and private property that could result from SSOs</td>
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<td>Ensure funds available for sewer operations are utilized in the most efficient manner</td>
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<td>Convey wastewater to treatment with a minimum of I/I and exfiltration</td>
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<td>Provide adequate capacity to convey peak wastewater flows</td>
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<td>Control corrosion and minimize odor releases</td>
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<td></td>
<td>Perform all operations in a safe manner to avoid personal injury and property damage</td>
</tr>
<tr>
<td>2</td>
<td>Organization</td>
<td>Designate Legally Responsible Official (LRO)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Organization Chart</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Names &amp; phone numbers of key personnel</td>
</tr>
<tr>
<td>3</td>
<td>Legal Authority</td>
<td>Prevent illicit discharges to sanitary sewer system</td>
</tr>
<tr>
<td>Element</td>
<td>Title</td>
<td>Requirement</td>
</tr>
<tr>
<td>---------</td>
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</tr>
<tr>
<td>2</td>
<td></td>
<td>Ensure access for maintenance, inspection, or repairs for portions of the lateral owned or maintained by the City</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>Limit the discharge of fats, oils, and grease and other debris that may cause blockages</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>Enforce any violation of sewer ordinances</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>Other relevant, appropriate, and applicable rules and regulations</td>
</tr>
<tr>
<td>4</td>
<td>O&amp;M Program</td>
<td>Maintain up-to-date maps of the sanitary sewer system</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>Adequate planning, resources and budget to support effective sewer system management and long term goals</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>Describe routine preventative maintenance program</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>Document completed preventative maintenance program</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>Adequate I/I monitoring</td>
</tr>
<tr>
<td>Element</td>
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<td>Rehabilitation and replacement plan that identifies and prioritizes sanitary sewer system defects</td>
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<td>Provide regular technical training for sewer system staff</td>
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<td>Require contractors to provide training for their workers who work in the City’s sewer system facilities</td>
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<td>Maintain equipment inventory</td>
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<td>Maintain critical spare part inventory</td>
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<td>5</td>
<td>Design &amp; Performance Provisions</td>
<td>Design and construction standards for new sanitary sewer system facilities</td>
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<td>Design and construction standards for repair and rehabilitation of existing sanitary sewer system facilities</td>
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<td>Procedures for the inspection and acceptance of new sanitary sewer system facilities</td>
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<td>Procedures for the inspection and acceptance of repaired and rehabilitated sanitary sewer system facilities</td>
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<td>6</td>
<td>Overflow Emergency Response Plan (OERP)</td>
<td>Procedures for the notification of primary responders</td>
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<td>Procedures for the notification of regulatory agencies</td>
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<td>Proper reporting of all SSOs</td>
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<td>Procedure to ensure City Staff are aware of and follow OERP</td>
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<td>Element</td>
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<td>Procedure to ensure City staff are trained in the OERP</td>
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<td>Procedures to address emergency operations such as traffic and crowd control</td>
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<td>Program to prevent the discharge of sewage to surface waters</td>
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<td>Program to minimize or correct the impacts of any SSOs that occur</td>
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<td>Program of accelerated monitoring to determine the impacts on surface waters of any SSOs that occur</td>
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<td>7</td>
<td>FOG Control Program</td>
<td>Identification of “hot spots” with FOG related problems</td>
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<td>Public outreach program that promotes the proper disposal of FOG</td>
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<td>Plan for the disposal of FOG generated within the City’s service area</td>
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<td>Demonstrate that the City has allocated adequate resources for FOG control</td>
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<td>Program of preventative maintenance for sanitary sewer system facilities that have FOG related problems</td>
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<tr>
<td>8</td>
<td>System Evaluation and Capacity Assurance Program</td>
<td>Identification of elements of the sanitary sewer system that experience or contribute to SSOs caused by hydraulic deficiencies</td>
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<td></td>
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<td>Establish design criteria that provide adequate capacity</td>
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<td>Short term CIP that addresses known hydraulic deficiencies</td>
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<td>Long term CIP that provides for future capacity needs</td>
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<td>Procedures that provide for the analysis, evaluation, and prioritization of hydraulic deficiencies</td>
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<td>The short and long term CIPs include schedules for the correction of each identified hydraulic deficiency</td>
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<tr>
<td>9</td>
<td>Monitoring, Measurement and Program Modifications</td>
<td>Maintain relevant information to establish, evaluate, and prioritize SSMP activities</td>
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<tr>
<td></td>
<td></td>
<td>Monitor implementation of the SSMP</td>
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<td>Measure, where appropriate, performance of the elements of the SSMP</td>
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<td>Access success of the preventative maintenance program</td>
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<td>Update SSMP program elements based on monitoring or performance</td>
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<td>Identify and illustrate SSO trends</td>
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<tr>
<td>10</td>
<td>SSMP Audits</td>
<td>Conduct periodic audits</td>
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<td></td>
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<td>Record results of the audit in a report</td>
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<td>Element</td>
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<td>Record changes made and/or corrective actions taken</td>
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<tr>
<td>11</td>
<td>Communication Program</td>
<td>Communicate with the public regarding the preparation of the SSMP</td>
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<td></td>
<td>Communicate with the public regarding SSMP performance</td>
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<tr>
<td></td>
<td>Communicate with satellite sewer systems</td>
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<tr>
<td>12</td>
<td>MAPS Emergency Power Station</td>
<td>Describe routine preventative maintenance program</td>
</tr>
<tr>
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<td>Document completed preventative maintenance program</td>
<td></td>
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<tr>
<td></td>
<td>Describe emergency response procedures</td>
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<td></td>
<td>Names and contact numbers of key personnel</td>
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</tr>
<tr>
<td>13</td>
<td>Water Quality Monitoring Plan</td>
<td>Describe sampling procedures, field documentation, and equipment cleaning</td>
</tr>
</tbody>
</table>
Element 11 – Communication Program

This section of the SSMP discusses the City’s communications with the public and satellite agencies.

11.1 Communication Program Elements

As an integral part of the SSMP, the City continues to communicate and conduct outreach on a regular basis with the community of Santa Monica and surrounding agencies. Key elements include:

- Regular communication with key stakeholders to relay relevant information on the financing, development, implementation, and performance of the collection system.
- The City also maintains close communication with other collection systems that are tributary and/or satellite to those of the City.

11.2 Communication Program Discussion

The CSM maintains active public outreach and communication efforts with all of its customers, the public-at-large and surrounding agencies to provide timely information on City projects, improvements and emergency situations.

Communication outlets range from public meetings and hearings, representation at community groups, to time-critical posting of signage in emergency situations and updates, posting to the CSM public website (http://www.smgov.net/) and 24-hour telephone reporting systems. Additionally, newsletters and brochures are developed and distributed community-wide and staff regularly meets with other area agencies. Informational flyers are often included with customer bills to update the rate payers on system operations, proposed City projects and programs, and the City has public information staff and inter-governmental management staff to maintain routine contact with news and media outlets in a timely manner.

Specific SSMP-Related Public Communications and Outreach

The following efforts are in place or are proposed to be in place as funds become available, to further support community outreach efforts:

- Posting of the SSMP on the City’s website with contact information to facilitate questions and comments;
- Emergency response posting in the field backed up by a telephone hotline and web posting of advisories. The City’s hotline provides access to the City’s representatives that can address questions and provide additional information;
- Participation in a regional and/or statewide effort to reach contractors and plumbers;
• Development of specific public outreach plans for all master plan efforts including the CSMWRD’s asset management plan. Project-specific outreach is already developed in advance of design of all projects; and,
• Continued participation in the contract cities group, technical advisory boards and groups that include other wastewater agencies in order to coordinate systems issues such as flow monitoring, wet weather flow management, SSMP issues and system improvements.
• Informational posters on City trash trucks and buses.

The City of Santa Monica communicates regularly with the City of Los Angeles which accepts and treats flow from the City. The City of Santa Monica and other satellite agencies that have their flow treated by Los Angeles attend quarterly contract Cities meetings at which treatment plant, collections system and pretreatment issues are discussed and coordinated.

11.3 Communication Program Appendix I

1. Copy of Public Notification Posted on City of Santa Monica’s website
2. Sanitary Sewer Overflow Response Contact List
Appendix I
Element 11.0
# SANITARY SEWER OVERFLOW

## RESPONSE CONTACT LIST

<table>
<thead>
<tr>
<th>Name</th>
<th>Office</th>
<th>Cell</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>WASTEWATER</strong></td>
<td>310-458-8532</td>
<td></td>
</tr>
<tr>
<td>Assistant Manager</td>
<td>310-458-8508</td>
<td>310-901-8413</td>
</tr>
<tr>
<td>Danny Gomez</td>
<td>310-458-8533</td>
<td>310-629-9436</td>
</tr>
<tr>
<td>Val Guzman</td>
<td>310-458-8532</td>
<td>310-629-9419</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Name</th>
<th>Office</th>
<th>Cell</th>
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<tbody>
<tr>
<td><strong>WRPP</strong></td>
<td>310-458-8235</td>
<td></td>
</tr>
<tr>
<td>Tom Watson</td>
<td>ext. 5688</td>
<td>323-823-2324</td>
</tr>
<tr>
<td>George Rodriguez</td>
<td>ext. 5230</td>
<td>310-901-7069</td>
</tr>
<tr>
<td>Chris Aguillon</td>
<td>ext. 5687</td>
<td>310-912-9776</td>
</tr>
<tr>
<td>David Tu</td>
<td>ext. 5689</td>
<td>310-901-8145</td>
</tr>
<tr>
<td>Corey Bracken</td>
<td>ext. 5690</td>
<td>310-490-3184</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Name</th>
<th>Office</th>
<th>Cell</th>
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<tbody>
<tr>
<td><strong>RISK MANAGEMENT</strong></td>
<td>310-458-8910</td>
<td></td>
</tr>
<tr>
<td>Michael Mack</td>
<td>ext. 5944</td>
<td>310-993-3557</td>
</tr>
<tr>
<td>Deb Hossli</td>
<td>ext. 4907</td>
<td>310-463-4580</td>
</tr>
</tbody>
</table>
OUTSIDE AGENCY CONTACT INFORMATION

Office of Emergency Services 800-852-7550
LA County Dept. of Health Services 213-974-1234
Regional Water Quality Control Board 213-576-6657
LA County Flood Control 800-675-4357
City of Los Angeles 800-974-9794

CITY OF SANTA MONICA INFORMATION

POLICE – Dispatch 310-458-8491
Fire – Dispatch 310-458-8671
Parking (Traffic Services) 310-458-2226
Element 12 - MAPS EMERGENCY POWER SYSTEM

As a critical component of the City’s sanitary sewer system, the Moss Avenue Pump Station (MAPS) has been designed with redundant operating systems including an emergency electrical power system in the event of a City power outage or other natural disaster. The MAPS is located adjacent to the Santa Monica Pier and the Santa Monica Urban Runoff Recycling Facility (SMURRF) at 1625 Appian Way. As designed, the MAPS is capable of pumping approximately 26 mg/d of sewage in the Coastal Interceptor Sewer System (CIS) up 60 feet of elevation where the sewage then flows by gravity to the City of Los Angeles Hyperion Treatment Plant. At present, MAPS has an adequate number of redundant pumps to minimize potential operational impacts from a partial malfunction of the pump system. Additionally, pumps placed in service are rotated to extend operational life. This Element describes the MAPS emergency electric power system, its activation procedures, and staff contacts in the event of a power outage or MAPS emergency.

12.1 MAPS Emergency Power Plan Elements

The emergency power plan described in this Element includes the following:

- A description of the emergency power generator and its location within the MAPS facility;
- A description of the various emergency generator controls and operating systems;
- A description of staff training;
- A description of potential activation events and;
- A list of emergency contacts for the MAPS facility

12.2 MAPS Emergency Power Generator

The emergency power generator is located below grade within MAPS (Figure 12-1). It serves as back-up power to both MAPS and the adjacent SMURRF water recycling plant.

- The emergency generator is sized to provide the required power to maintain the operation of all electrical equipment critical to MAPS.
- When a power failure occurs, facility sensors automatically start the generator within 30 seconds to provide power. Once triggered, the generator will continue to operate until the normal power source is restored, or the generator is manually shut down.
- The engine generator consists of a diesel engine drive and an AC generator. The generator is rated for 1000 KVA at 1800 rpm of engine drive.
12.2.1 Generator Technical Specifications and Operating Systems

- The generator is rated for 1000 KVA, 0.8 PF lagging, 3-phase, 277/480-volt, 70 degrees C rise, 60-hertz, and 1800 rpm. The generator excitation system consists of three-phase alternating current (AC) exciter with the output directly connected to the main generator field through silicone rectifiers. The generator also has a 115-volt AC space heater connected to energize the heater only when the generator is idle.

- An automatic control panel for the engine and generator is mounted on the generator end of the unit (see Figure 12-2). It provides automatic starting of the engine upon power failure and to activate the electric solenoid valve which operates the fuel line. The automatic controls consist of relays for cycle cranking, HAND/OFF/AUTO switch, indicating lights (for conditions shown below), and an audible alarm with reset.

- Upon starting, the engine generator will operate at increasing speed until synchronous speed is reached. The engine generator should start and pick up full-rated load within 30 seconds after receiving its signal to start. The voltage generated at synchronous speed will activate the automatic transfer switch to the emergency generator for the power to equipment.
When the primary power service (i.e. grid power) is restored, the automatic transfer switch is activated when normal power reaches 90 percent of full voltage and re-transfers the load to normal supply. As the re-transfer is made, the automatic control system continues to keep the engine generator in operation at no load for a period of up to 3 minutes, at which time the engine and generator set will shut down. The generator unit may also be shut down manually at the control panel.

Figure 12-2

12.2.2 Cooling System

The diesel engine cooling system (Figure 12-3) is a radiator type system with a forced circulation fluid, and is complete with a cooling fan and water-circulating pump. The system is capable of permitting up to 110 percent of full load operation at an ambient temperature of 120 degrees.
• The radiator duct flange has a flexible coupling to the rectangular galvanized sheet metal duct beneath the Generator Room concrete steps (see Figure 11-4). The engine's radiator fan draws Generator Room air along the engine block and exhausts it through the radiator and an exhaust duct to the station exterior aboveground.

![Image](image-url)

Figure 12-3

12.2.3 Exhaust System

• The diesel engine is equipped with a water cooled exhaust manifold and a 16-inch diameter stainless steel (SS) exhaust pipe through the station top slab and into the cylindrical concrete "turret", which houses the muffler/resonators (see Figure 12-4 below).

• The exhaust piping is 316SS for corrosion protection from heated exhaust gases and condensate. Two critical, hospital-type SS exhaust silencers in series, are located above the station, within this cylinder turret enclosure.

• The exposed exhaust pipe within MAPS and the silencer/mufflers inside the equipment turret have high-temperature insulation with aluminum exterior cover jacket.
12.2.4 Cooling, Lubrication and Fueling Systems

- The diesel engine cooling system is a radiator type system with a forced circulation fluid, and is complete with a cooling fan and water-circulating pump. The system is capable of permitting up to 110 percent of full load operation at an ambient temperature of 120 degrees.
- The diesel engine also has a positive gear type lubricating oil pump and a full flow lubricating oil filter system, which filters all oil before entering the main bearing galleries and other lubricated areas.
- The crankcase has an inspection cover plate to permit easy inspection and access to the oil pump and oil pump screen. The engine oil is automatically held at a constant oil level by the use of a level regulator mounted on the engine. A 1-inch quick fill bypass line has been provided around the level regulator for initial filling.
- Diesel fuel is provided to the engine generator from a 1000-gallon diesel fuel storage tank installed beneath the diesel engine within the steel base frame. Additional components to the system consist of a fuel transfer pump, a primer pump, and fuel oil filters and injectors. Diesel fuel is transferred automatically from the fuel injection...
system and excess fuel (if any) is returned to the tank. A 2-inch diameter steel remote fuel fill line extends from the below grade fuel tank to ground level for truck delivery of diesel fuel to the MAPS site.

12.3 Operations and Maintenance

Operations and maintenance (O & M) activities at MAPS are conducted by the City of Santa Monica Water Resources Division staff. Special emphasis of regular scheduled maintenance is placed on the following critical components: SCADA systems, diesel generator, electrical transfer switch gear, variable frequency drives, centrifugal pumps, Programmable Logic Control (PLC), computer battery back-up systems, gas monitoring detectors and wet well. A detailed description of O & M routines for all MAPS electrical and mechanical systems is provided in Chapter 13 of the Moss Avenue Pump Station (MAPS) Operations & Maintenance Manual.

12.4 Emergency Response

MAPS is staffed by a certified City of Santa Monica Wastewater Treatment Plant Operator during usual business hours. The MAPS is also connected via a Supervisory Control and Data Acquisition (SCADA) system to the Arcadia City Water Treatment Plant, located near the intersection of Bundy Drive and Wilshire Boulevard in the City of Los Angeles. The Arcadia Water Treatment Plant is staffed 24 hours a day, 365 days a year. The SCADA System has a battery backup in the event of power loss.

Potential MAPS emergency power system activation events include a temporary loss of primary grid power through third party or facility specific repairs or malfunctions, loss of power due to local or regional earthquake, or other disasters capable of interrupting grid power.

In the event of an emergency where only the primary grid power to MAPS is interrupted, the automatic generator activation system will trigger and the SCADA System will notify water treatment staff at the Arcadia Plant, who will mobilize an operator crew to MAPS to assess conditions and take the actions necessary to repair or maintain MAPS operations.

In the event of a major earthquake or other city-wide disaster, the City will implement its general emergency response plan. As a critical infrastructure facility, City staff will be dispatched to MAPS to inspect the integrity of the structure and all electrical and mechanical systems. As above, if an earthquake or other disaster interrupts the primary grid power, automatic backup systems will activate to restore power and provide operational function status via the onsite SCADA System to water treatment
staff located at the Arcadia Plant. Mobile generator resources and other equipment, which could be used to provide redundant or replacement services in the event of a malfunction of the onsite generator, have been identified and are stored offsite. Emergency Pumps and related equipment stored offsite can be mobilized in the event of an emergency.

12.5 Staff Contacts

Critical staff in the event of an emergency at the MAPS includes the following individuals:

- Jeffrey Grooms, Wastewater Treatment Plant Operator, Cell: (310) 883-8350
- Gary Welling, Assistant Manager Water/Wastewater Operations, Cell: (310) 901-8413
- Danny Gomez, Wastewater Supervisor, Cell: (310) 629-9436
- Myriam Cardenas, Arcadia Plant Manager, Cell: (310) 621-8835
- Tom Watson, Water Resources Protection Coordinator, Cell: (323) 823-2324
- City of Santa Monica Fire Department Dispatch: (310) 458-8671
- Arcadia Water Treatment Plant-After hours: (310) 826-6712
Element 13 – Water Quality Monitoring Plan

SECTION 1.0: GENERAL SAMPLING PROCEDURES

This section provides basic procedures for wastewater sampling used for assessing inspection, compliance, and for monitoring the quality of sewage flows in City sewer main lines or accidental discharges to the ocean or other surface water (i.e. SSOs) with a volume of 50,000 gallons or more. The procedures outlined here are based on the U.S. EPA sampling procedures titled: Operating Procedure Number SESDPROC-306-R2. It is important to remember that the monitoring at the City’s outfalls ONLY needs to be implemented if the City’s diversions are not working AND the discharge (single event) exceeds 50,000 gallons. If the diversions are working, all discharges will either be diverted to the Hyperion Treatment Plant or to the City’s SMURRF treatment plant. In these cases, there would be NO discharge to surface waters or the ocean. All water quality sampling will be conducted by Water Resources Protection Programs (WRPP) staff unless after hours or in the event of a City-wide emergency.

In the unlikely event that an SSO or sewer break occurs and the release volume to the storm drain is 50,000 gallons or more and none of the City’s diversion structures are operable, grab samples for water quality will be collected at the appropriate storm drain outfall to receiving waters (i.e. the ocean). There are seven drainage areas in the City that have outfalls at the beach, each with their own City or County operated diversion structure. These drainage area outfalls include:

- Montana Outfall
- Wilshire Outfall
- Santa Monica Pier Outfall,
- Pico-Kenter Outfall,
- Ashland Outfall,
- Rose Outfall, and
- Sunset Canyon Outfall
- Westside Water Quality BMP (filters flows).

A figure showing the location of outfalls within City boundaries is provided in the Element 13 Appendix. Sampling of subject discharges at the Sunset Canyon or Rose Outfalls will be coordinated with LA County.

1.1 – Standard Sampling Equipment

At a minimum, the following list of equipment should be on hand for typical wastewater sampling activities. Because all sampling is site specific, it is important that knowledge of the site or file
information be utilized to ensure any necessary specialized equipment is also identified and added to this basic list. Typical sampling equipment includes:

- Chain-of-custody (COC) forms
- Gas monitor
- Clean Stainless Steel Sampling Bailer With Chain
- Clean Teflon Beaker—for transferring liquid to sample bottles
- Cooler with double-bagged ice or “blue ice”—to maintain sample temperature at approximately 4°C
- pH Meter and pH Paper
- Thermometer
- Appropriate Laboratory Cleaned Sample Bottles with applicable preservatives—be sure to have spares for selected key analytes in case of field breakage.
- Distilled Water—for small volume field decontamination of sampling equipment or person
- Personal Protective Equipment (PPE)—goggles, gloves, steel toe shoes, safety vest and hard hat
- Gallon-size Plastic Bags—for sample bottles
- Plastic Garbage Bags—for sampling waste—e.g. used PPE, etc.
- Traffic Control Equipment—cones/delineators, caution tape
- Sledgehammer and Pick—for opening manholes
- Digital Camera(charged batteries)
- Cell phone
- Paper Towels

1.2 – Parameters Field Measurements

During sampling, parameters such as temperature, pH, and EC may be measured in the field. Water quality measurements and instrument calibration details will be recorded in field books and in sampling notebooks.

1.2.1 – Field Equipment Calibration

To ensure that data are representative of the actual field conditions, field equipment will be routinely calibrated. For each calibration, the time and date of the procedure, equipment identification number, the calibration procedure and type of standards used will be recorded on field forms and in notebooks accompanying the equipment.
1.2.2 – Temperature Measurements

Temperature measurements will be made with a mercury-filled thermometer or an electronic thermistor, and all measurements will be recorded in degrees Fahrenheit.

1.2.3 – pH Measurement

The pH measurement will be made as soon as possible after collection of the sample, generally within a few minutes. The pH will be measured by immersing the pH probe into an aliquot of the sample. The pH meter will be calibrated per manufacturer specifications. Two buffer solutions (either pH-4 and pH-7, or pH-7 and pH-10, whichever most closely bracket the anticipated range of sample conditions) will be used for instrument calibration.

1.2.4 – Specific Electrical Conductance (EC) Measurement

In the event EC parameters are necessary, the EC will be measured by immersing the conductivity probe into an aliquot of the sample. The probes used should automatically compensate for the temperature of the sample. Measurements will be reported in units of micro-Siemens (µS) per square centimeter (equivalent to micromhos or µmhos) at 25 degrees Celsius (77 degrees Fahrenheit).

The EC meter will be calibrated in accordance with the equipment manufacturer’s specifications and as outlined in the instruction manual for the EC meter used. The EC meter will be calibrated with a standard potassium chloride (KCl) solution recommended by the instrument manufacturer.

1.3 – Safety

Proper safety procedures must be observed at all times when collecting wastewater/water samples. It is incumbent on the sampling staff to be aware of potential hazards that may be encountered, and any special safety conditions (e.g. traffic, confined space, etc.) before planning or implementing the field sampling activity. Independent sampling consultants working for the City’s Water Resources Protection Programs (WRPP) must have a site specific Health and Safety Plan (HASP) signed by a Certified Industrial Hygienist or other qualified professional. Sampling conducted by WRPP staff shall be pursuant to all relevant, applicable and most current City health and safety plan (HASP) guidelines.

1.4 – General Sampling Precautions

In order to collect representative and defensible data, field sampling must be conducted with a defined goal in mind (e.g. is the data for compliance, scheduled monitoring, or an enforcement action), and be conducted in an organized and repeatable fashion. Some general sampling precautions are:
• Store samples in a clean secure location in order to avoid contamination.
• Do not overflow bottles that contain preservatives while sampling.
• Maintain proper custody procedures at all times (i.e. do not leave samples unattended).
• Document all field activities in ink in a field notebook.
• To the extent possible, sample collection should progress from the least contaminated location to the most contaminated location in order to minimize the potential for significant cross-contamination from sampling equipment.
• If possible, segregate suspected high level contamination samples while storing and transporting from those with potentially lower levels of contamination.
• Always use a new pair of clean gloves for each sample location.
• Always use new laboratory-cleaned sample bottles.
• Always strictly observe laboratory sample preservative requirements and analytical method holding times.

1.5 – General Sampling Considerations

Because field, operational, or sampling conditions usually vary from one site to the next, the complexity of sampling at a particular site can also be markedly different from another. Key to any sample activity considerations are the specific pollutant limitations for the CSM. These can be found in CSM Municipal Code Section 5.20.040. In addition, the most recent bacterial Total Maximum Daily Load (TMDL) for Santa Monica Bay (receiving waters for our outfalls) is also relevant and applicable.

1.6 – Water Quality Samples

Grab samples will be collected to assess the water quality. The sampler will wear clean chemically resistant gloves as specified in the HASP while collecting the sample. Samples will be collected directly from the sampling device into laboratory-prepared bottles. Gloves will be changed at each individual sample location.

If known, each sampling episode should generally begin with the location having the lowest concentration of target compounds. Successive samples should generally be sampled in sequence of increasing concentration. Field QA/QC samples including equipment blanks, field blanks, trip blanks, and duplicates will be collected as necessary during each sampling event.

If a bladder pump or electric submersible pump is being used to sample, the flow rate will be adjusted to 1) approximately 100 milliliters per minute (mL/min); 2) a rate specifically selected based on discharge flow rates; or 3) as low as possible. This rate will be maintained until the discharge line has been purged and the sample collected.
All samples will be sent to a State-certified testing laboratory for analysis. Sample analysis will, at minimum, include the following methodologies:

- All outfall samples will be tested for Fecal Coliform by Method SM 9221B, Total Coliform by Method SM 9221E, Enterococcus and Fecal Streptococcus by Method SM 9230B, and in situ pH and field temperature.
- Additional analytes may be added based on knowledge of the discharge source.

1.7 – Sample Containers and Preservation

Appropriate pre-cleaned sample containers and preservatives for the analyses to be performed will be obtained from the subcontracted analytical laboratory. Appropriate sample containers, volumes, preservation, and holding time requirements are prioritized on Table 1 located in the Element 13 Appendix.

1.8 – Sample Labeling

Sample containers will be labeled before or immediately after sampling with self-adhesive tags having the following information written in waterproof ink:

- Project number;
- Sample identification number (unique);
- Date and time sample was collected;
- Initials of sample collector; and
- Preservatives used

1.9 – Quality Control Samples

To evaluate the precision and accuracy of analytical data, quality control samples, such as duplicates and blanks, will be periodically collected and/or prepared (e.g. one per location). These samples will be analyzed for the same analytes using unique (i.e. blind) sample identification number.

1.10 – Sample Handling, Storage, and Transportation

Efforts will be made to handle, store, and transport supplies and samples safely. Exposure to dust, direct sunlight, high temperature, adverse weather conditions, and possible contamination will be avoided. Immediately following collection, sample bottles will be sealed within a Ziploc bag and placed in a clean chest that contains ice (if cooling is required), and will be transported to the subcontracted laboratory as soon as practical. Samples may only be held in the dedicated sample refrigerator at the WRPP offices.
2.0 – Field Activity Documentation

The WRPP and Wastewater Division maintain all of its analytical data in an automated data system. In order to maximize the efficiency and accuracy of the data system, all laboratory data is transmitted from the laboratory to the WRRP in an electronic format (WRPP will handle all lab interactions). The responsible party on the COC will receive a copy of the data (including the accompanying COC) in a PDF format. The PDF format provides certainty that the data has not been altered after being generated by the laboratory. Another copy of the data is transmitted directly to the WRPP/Wastewater Division information and technology manager for direct downloading into the data system. It is recommended that if the PDF format is retained, that it be disposed of after three years or pursuant to the most current City document retention guideline. Both the laboratory and the data system will have possession of an approved copy of the data. The current analytical laboratory for the WRRP is the Weck Laboratories Inc., located in the City of Industry, California, 91745, www.wecklabs.com. The laboratory contact is Kim Tu, telephone: (626) 336-2139 and fax: (626) 336-2634, kim@wecklabs.com. As the contract manager, WRPP is aware of the most current contract laboratory and contact information. If you have any questions, please contact WRPP directly.

Field activities will be documented through field notes, electronic records and/or photographic records. Field personnel will be responsible for maintaining field logs and more specific records for individual tasks being performed. Information recorded in field logs will include, but may not be limited to, the following:

- Description of field activities;
- Personnel and companies represented at the sample location or source of the discharge;
- Field and weather conditions;
- Calibration records;
- Deviations from accepted work or sampling plans, accompanied by a justification for the deviation; and
- Description of equipment problems.

Entries to field logs and task-specific data forms will be made in indelible ink and signed and dated by the personnel making the entry. If changes to entries are necessary, the person making the change will cross out the item to be changed with a single line and initial and date the change. An explanation of the change should be recorded, if necessary.

Photographs of field activities, events of conditions will be supplemented with written records of the subject, date and time of the photographs. All sample location specific information collected electronically by computerized or automated measurement devices will be kept on file at the City’s
Water Division. Copies of results and records will remain within the Water Division’s project files for a minimum period of three years.

2.1 – Field Data Sheets

A field record will be kept for each day of fieldwork or sampling. A sampling record will be used for each sample location to record the information collected during water quality sampling.

Water quality sampling forms will record the following information:

- Sample identification;
- Duplicate identification, if applicable;
- Date and time sampled;
- Sample location (i.e. outfall name & GIS coordinates);
- Owner’s name of site of discharge source;
- Extraordinary circumstances (if any);
- Results of instrument calibration/standardization and field measurements (temperature, pH, EC) and observed relative turbidity;
- Depth from which sample was obtained (if from a diversion structure);
- Number and type of sample container(s); and
- Times and volumes corresponding to water quality measurement.

2.2 – Chain-of-Custody Procedures

The methodology described within this section is in general accordance with the procedures described in ASTM Standard D4840-88 (1993) (Practice for Sampling Chain-of-Custody Procedures) (ASTM, 1993b).

After samples have been collected and labeled, they will be maintained under chain-of-custody (COC) procedures. These procedures document the transfer of custody of samples from the field to the laboratory. Each sample sent to the laboratory for analysis will be recorded on a COC record, which will include instructions to the laboratory for analytical services.

Information contained on the triplicate COC record will include:

- Project number;
- Signature of sampler(s);
- Date and time sampled;
- Sample identification;
- Number of sample containers;
• Sample matrix (water);
• Analyses required;
• Remarks, including preservatives, special conditions, or specific quality control measures;
• Turnaround time and person to receive laboratory report;
• Method of shipment to the laboratory (i.e. hand delivered, courier, etc.);
• Release signature of sampler(s), and signatures of all people assuming custody; and
• Condition of samples when received by the laboratory.

Blank spaces on the COC record will be crossed out between the last sample listed and the signatures at the bottom of the sheet.

The field sampler will sign the COC record and will record the time and date at the time of transfer to the laboratory or to an intermediate person. A set of signatures is required for each relinquished/reserved transfer, including transfer within the City Water Division. The original imprint of the COC record will accompany the sample containers. A duplicate copy will be placed in the project file.

If the samples are to be shipped to the laboratory, the original COC record will be sealed inside a plastic Ziploc bag within the ice chest, and the chest will be sealed with custody tape, which has been signed and dated by the last person listed on the chain-of-custody. U.S. Department of Transportation (USDOT) shipping requirements will be followed and the sample shipping receipt will be retained in the project files as part of the permanent COC document. It is required that the shipping company not sign the COC forms as a receiver; instead the laboratory will sign as a receiver when the samples are delivered at the laboratory.

**Note:** The standard operating procedure is to hand deliver the samples to the lab, or use a lab provided courier.
3.0 – Equipment Cleaning

Equipment or sampling apparatus that contacts a sample will be decontaminated prior to use unless it is pre-cleaned during manufacture and has remained in its sanitary seal or other original packaging (i.e. disposable equipment). The purpose of decontamination is to minimize the potential for cross contamination during investigation activities.

Bailers, sampling pumps, and other non-dedicated purging or sampling apparatus will be cleaned before and after sampling each location. Factory new and sealed disposable bailers may be used for sampling, but may not be reused. Thermometers, pH electrodes, and EC probes that will be used repeatedly, will be cleaned before and after each sampling and at any time during sampling if the object comes in contact with foreign matter.

Cleaning of reusable equipment (water level probe, submersible pump, etc.) that is not dedicated to a particular sample location will consist of the following:

- **Bailers** – the inside and outside of bailers will be cleaned in a solution of biodegradable detergent and potable water, followed by a rinse with deionized (DI) water. The bailers may also be steam cleaned, followed by a DI water rinse;
- **Pumps** – downhole, reusable portions of purge pumps will be steam cleaned on the outside or washed with laboratory-grade detergent followed by a potable water rinse. If the pump does not have a backflow check valve, the inside of the pump and tubing should also be steam cleaned. For a purge pump with a backflow check valve, the interior of the pump and tubing may be cleaned by pumping a laboratory grade detergent and potable water solution through the system followed by a potable water rinse, or by steam cleaning; and
- **Water Quality Meters** – meters will be cleaned by rinsing the portion of the probe that was in contact with the groundwater sample in DI water, and allowing it to air dry.

Sample bottles and bottle caps will be provided by the subcontracted laboratory using standard U.S. EPA approved protocols. Sample bottles and bottle caps will be protected from contact with solvents, dust, or other contamination. Sample bottles will not be reused.
4.1 – Element 13 Appendix

- Table 1: Sample Containers, Methods, and Holding Times
- Figure 1: City Outfall Locations
- Sample COC
<table>
<thead>
<tr>
<th>Test Name</th>
<th>Matrix</th>
<th>Bottle Type</th>
<th>Bottle size</th>
<th>Unchlorinated Water (Raw)</th>
<th>Chlorinated Water (Treated)</th>
<th>Soil/Solid</th>
<th>Holding Time until start of analysis</th>
<th>Analytical Technique</th>
<th>Analytical Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,2,3-TCP</td>
<td>Water</td>
<td>Amber Glass</td>
<td>2 x 40 mL</td>
<td>HCl</td>
<td>Ascorbic/HCl</td>
<td>Soil/Solid</td>
<td>14 days</td>
<td>GC/MS Isot. Dil.</td>
<td>EPA 524.2SIM</td>
</tr>
<tr>
<td>1,4-Dioxane</td>
<td>Water</td>
<td>Amber Glass</td>
<td>2 x 1 L (*)</td>
<td>None</td>
<td>None</td>
<td></td>
<td>7 days</td>
<td>GC/MS Isot. Dil.</td>
<td>EPA 8270M</td>
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<tr>
<td>Acrolein/Acrylonitrile</td>
<td>Water</td>
<td>Glass</td>
<td>2 x 40 mL</td>
<td>None</td>
<td>Thiosulfate</td>
<td></td>
<td>3 Days</td>
<td>GC/MS</td>
<td>EPA 624/8260B</td>
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<tr>
<td>Alcohols</td>
<td>Water</td>
<td>Glass</td>
<td>1 x 40 mL</td>
<td>None</td>
<td>None</td>
<td></td>
<td>14 days</td>
<td>Dir. Inj./FID</td>
<td>EPA 8015B</td>
</tr>
<tr>
<td>Aldehydes</td>
<td>Water</td>
<td>Amber Glass</td>
<td>2 x 40 mL</td>
<td>CuSO₄</td>
<td>NH₂Cl/CuSO₄</td>
<td></td>
<td>7 Days</td>
<td>GC/ECD</td>
<td>EPA 556</td>
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<td>Aldehydes</td>
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<td>Glass</td>
<td>1 L (*)</td>
<td>None</td>
<td>None</td>
<td></td>
<td>3 days</td>
<td>HPLC-UV</td>
<td>EPA 8315</td>
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<td>Glass</td>
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<td>None</td>
<td>None</td>
<td></td>
<td>3 days</td>
<td>HPLC-UV</td>
<td>EPA 8315</td>
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<tr>
<td>Alkalinity, Total</td>
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<td>Poly</td>
<td>250 mL</td>
<td>None</td>
<td>None</td>
<td></td>
<td>14 Days</td>
<td>Titration</td>
<td>SM2320B</td>
</tr>
<tr>
<td>Anions by IC (F, Cl-, SO₄²⁻)</td>
<td>Water</td>
<td>Poly</td>
<td>250 mL</td>
<td>None</td>
<td>None</td>
<td></td>
<td>28 days</td>
<td>IC</td>
<td>EPA 300.0</td>
</tr>
<tr>
<td>Anions by IC (NO₂⁻, NO₃⁻, PO₄³⁻)</td>
<td>Water</td>
<td>Poly</td>
<td>250 mL</td>
<td>None</td>
<td>None</td>
<td></td>
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<td>IC</td>
<td>EPA 300.0</td>
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<td>Arsenic speciation</td>
<td>Water</td>
<td>Poly</td>
<td>250 mL</td>
<td>EDTA/acidic acid</td>
<td>EDTA/acidic acid</td>
<td></td>
<td>14 Days</td>
<td>Resin-ICP/MS</td>
<td>EPA 200.8</td>
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<td>Poly</td>
<td>1 L</td>
<td>None</td>
<td>None</td>
<td></td>
<td>48 Hours</td>
<td>TEM</td>
<td>EPA 100.17.2-Sub</td>
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<tr>
<td>Bacteria-Coliform - solid/sludge/soil</td>
<td>Soil/solid</td>
<td>Glass-Sterile</td>
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<td>None</td>
<td>None</td>
<td>N/A</td>
<td>MTF</td>
<td>SM 9221B</td>
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</tr>
<tr>
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<td>Poly-Sterile</td>
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<td>Thiosulfate</td>
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<td></td>
<td>6 hours</td>
<td>MTF</td>
<td>SM 9221B</td>
</tr>
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<td>Poly-Sterile</td>
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<td>24 Hours</td>
<td>Colilert P/A or enumeration</td>
<td>SM 9223B</td>
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<td>Poly-Sterile</td>
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<td>Thiosulfate</td>
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<td>Thiosulfate</td>
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<td>Pour Plate Method</td>
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<td>None</td>
<td></td>
<td>48 Hours</td>
<td>DO Probe</td>
<td>SM 5210B</td>
</tr>
<tr>
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<td>1 L</td>
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<td>None</td>
<td></td>
<td>48 Hours</td>
<td>DO Probe</td>
<td>SM 5210</td>
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<td>EDA</td>
<td>EDA</td>
<td></td>
<td>28 Days</td>
<td>IC</td>
<td>EPA 300.1</td>
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<tr>
<td>Bromate-Low Level</td>
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<td>40 mL</td>
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<td></td>
<td>28 Days</td>
<td>IC</td>
<td>EPA 326</td>
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<td>Bromide</td>
<td>Water</td>
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<td>None (7)</td>
<td></td>
<td>28 Days</td>
<td>IC</td>
<td>EPA 300.0</td>
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<td>Bromide-Low Level</td>
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<td>IC</td>
<td>EPA 300.1</td>
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<td>Carbamates</td>
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<td>EPA 531.1</td>
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<td>Water</td>
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<td>250 mL</td>
<td>H₂SO₄</td>
<td>H₂SO₄</td>
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<td>28 Days</td>
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<td>Chloral Hydrate</td>
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<td>Glass</td>
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<td>Sulfite/buffer</td>
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<td>GC/ECD</td>
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<td>40 mL</td>
<td>EDA</td>
<td>EDA</td>
<td></td>
<td>28 Days</td>
<td>IC</td>
<td>EPA 300.1</td>
</tr>
<tr>
<td>Chloride</td>
<td>Water</td>
<td>Poly</td>
<td>250 mL</td>
<td>None (7)</td>
<td>None (7)</td>
<td></td>
<td>28 Days</td>
<td>IC</td>
<td>EPA 300.0</td>
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<tr>
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<td>None</td>
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<td>40 mL</td>
<td>EDA</td>
<td>EDA</td>
<td></td>
<td>14 Days</td>
<td>IC</td>
<td>EPA 300.1</td>
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<tr>
<td>Chlorophyll-a</td>
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<td>Amber Poly</td>
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<td>pH 9.3-9.7</td>
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<td>SM 3500CR-D</td>
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<td>Test Name</td>
<td>Matrix</td>
<td>Bottle Type</td>
<td>Bottle size</td>
<td>Unchlorinated Water (Raw)</td>
<td>Chlorinated Water (Treated)</td>
<td>Soil/Solid</td>
<td>Holding Time until start of analysis</td>
<td>Analytical Technique</td>
<td>Analytical Method</td>
</tr>
<tr>
<td>-----------------------</td>
<td>---------------</td>
<td>-------------</td>
<td>-------------</td>
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</tr>
<tr>
<td>Chromium, Hexavalent</td>
<td>Water</td>
<td>Poly</td>
<td>250 mL</td>
<td>(NH₄)₂SO₄ buffer pH 9.3-9.7</td>
<td>(NH₄)₂SO₄ buffer pH 9.3-9.7</td>
<td>None</td>
<td>24 Hours</td>
<td>IC</td>
<td>EPA 7199</td>
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<td>Chromium, Hexavalent</td>
<td>Soil/solid</td>
<td>Glass</td>
<td>4 oz</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>30 days</td>
<td>Spectrophotometric</td>
<td>EPA 3060/7196</td>
</tr>
<tr>
<td>Chromium, Hexavalent (low-level)</td>
<td>Water</td>
<td>Poly</td>
<td>250 mL</td>
<td>(NH₄)₂SO₄ buffer pH 9.3-9.7</td>
<td>(NH₄)₂SO₄ buffer pH 9.3-9.7</td>
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<td>24 Hours (DW) 28 days (WW)</td>
<td>IC</td>
<td>EPA 218.6</td>
</tr>
<tr>
<td>Chromium, Hexavalent (low-level)</td>
<td>Soil/solid</td>
<td>Glass</td>
<td>4 oz</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>30 days</td>
<td>IC</td>
<td>EPA 3060/7199</td>
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<td>Color</td>
<td>Water</td>
<td>Glass</td>
<td>500 mL</td>
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<td>None</td>
<td>None</td>
<td>48 Hours</td>
<td>Visual</td>
<td>SM2120B</td>
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<tr>
<td>Conductivity (Specific Conductance)</td>
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<td>Poly</td>
<td>250 mL</td>
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<td>None</td>
<td>28 Days</td>
<td>Electrometric</td>
<td>SM2510B</td>
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<td>Cyanide</td>
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<td>NaOH</td>
<td>NaOH/ascorbic</td>
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<td>14 Days</td>
<td>FIA-Colorimetric</td>
<td>EPA 335.2/335.4</td>
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<td>Water</td>
<td>Glass</td>
<td>2 x 1 L</td>
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<td>None</td>
<td>None</td>
<td>1 year</td>
<td>HR GC/ MS</td>
<td>EPA 1613/8290</td>
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<tr>
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<td>Glass</td>
<td>4 oz</td>
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<td>None</td>
<td>None</td>
<td>1 year</td>
<td>HR GC/ MS</td>
<td>EPA 8280/8290</td>
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<td>Diquat/Paraquat</td>
<td>Water</td>
<td>Amber poly</td>
<td>1 L</td>
<td>None</td>
<td>Thiosulfate</td>
<td>None</td>
<td>7 Days</td>
<td>HPLC</td>
<td>EPA 549.2</td>
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<tr>
<td>Disinfection by- products</td>
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<td>2 x 60 mL</td>
<td>Sulfite/buffer</td>
<td>Sulfite/buffer</td>
<td>None</td>
<td>14 days</td>
<td>GC/ECD</td>
<td>EPA 551.1</td>
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<tr>
<td>Diquor</td>
<td>Water</td>
<td>Amber Glass</td>
<td>1 L (*)</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>7 days</td>
<td>HPLC/UV</td>
<td>EPA 632</td>
</tr>
<tr>
<td>Diquor-UCMR</td>
<td>Water</td>
<td>Amber Glass</td>
<td>1 L (*)</td>
<td>CuSO₄/Trizma</td>
<td>CuSO₄/Trizma</td>
<td>None</td>
<td>14 days</td>
<td>HPLC/UV</td>
<td>EPA 532</td>
</tr>
<tr>
<td>EDB and DBCP</td>
<td>Water</td>
<td>Glass</td>
<td>2 x 40 mL</td>
<td>None</td>
<td>Thiosulfate</td>
<td>None</td>
<td>14 Days</td>
<td>GC/ECD</td>
<td>EPA 504.1</td>
</tr>
<tr>
<td>Endothall</td>
<td>Water</td>
<td>Amber Glass</td>
<td>250 mL</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>7 days</td>
<td>GC/MS</td>
<td>EPA 548.1</td>
</tr>
<tr>
<td>Ethanol</td>
<td>Water</td>
<td>Glass</td>
<td>1 x 40 mL</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>14 Days</td>
<td>Dir. Inj./FID</td>
<td>EPA 8015B</td>
</tr>
<tr>
<td>Explosives</td>
<td>Water</td>
<td>Amber Glass</td>
<td>1 L (*)</td>
<td>None</td>
<td>Thiosulfate</td>
<td>None</td>
<td>7 days</td>
<td>HPLC/UV</td>
<td>EPA 8330A</td>
</tr>
<tr>
<td>Explosives</td>
<td>Soil/Solid</td>
<td>Amber Glass</td>
<td>4 oz</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>14 days</td>
<td>HPLC/UV</td>
<td>EPA 8330A</td>
</tr>
<tr>
<td>Fluoride</td>
<td>Water</td>
<td>Poly</td>
<td>250 mL</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>28 Days</td>
<td>IC</td>
<td>EPA 300.0</td>
</tr>
<tr>
<td>General Minerals (excluding metals)</td>
<td>Water</td>
<td>Poly</td>
<td>1 L</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>Various</td>
<td>Wet Chem methods</td>
<td>various</td>
</tr>
<tr>
<td>General Minerals (metals only)</td>
<td>Water</td>
<td>Poly</td>
<td>250 mL</td>
<td>HNO₃⁽³⁾</td>
<td>HNO₃⁽³⁾</td>
<td>None</td>
<td>6 Months</td>
<td>ICP-AES</td>
<td>EPA 200.7</td>
</tr>
<tr>
<td>General Physical (Color, Odor, Turbidity)</td>
<td>Water</td>
<td>Glass</td>
<td>500 mL</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>24 Hours</td>
<td>Wet Chem methods</td>
<td>various</td>
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<tr>
<td>Glyphosate</td>
<td>Water</td>
<td>Amber Glass</td>
<td>1 x 40 mL</td>
<td>None</td>
<td>Thiosulfate</td>
<td>None</td>
<td>14 Days</td>
<td>HPLC</td>
<td>EPA 547</td>
</tr>
<tr>
<td>HAAs-Formation Potential</td>
<td>Water</td>
<td>Amber Glass</td>
<td>1 L</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>14 days</td>
<td>GC/ECD</td>
<td>SM 5710B/EPA 552.2</td>
</tr>
<tr>
<td>Herbicides-DW</td>
<td>Water</td>
<td>Amber Glass</td>
<td>250 mL (*)</td>
<td>None</td>
<td>Thiosulfate</td>
<td>None</td>
<td>14 days</td>
<td>GC/ECD</td>
<td>EPA 515.3</td>
</tr>
<tr>
<td>Herbicides-DW</td>
<td>Water</td>
<td>Amber Glass</td>
<td>2 x 1 L (*)</td>
<td>None</td>
<td>Thiosulfate</td>
<td>None</td>
<td>7 Days</td>
<td>GC/ECD</td>
<td>EPA 8151A</td>
</tr>
<tr>
<td>Herbicides-Soil</td>
<td>Soil/solid</td>
<td>Glass</td>
<td>4 oz</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>14 Days</td>
<td>GC/ECD</td>
<td>EPA 8151A</td>
</tr>
<tr>
<td>Mercury</td>
<td>Water</td>
<td>Glass jar</td>
<td>250 mL</td>
<td>HNO₃</td>
<td>HNO₃</td>
<td>None</td>
<td>28 Days</td>
<td>Cold Vapor AAS</td>
<td>EPA 245.117470</td>
</tr>
<tr>
<td>Mercury in soil/solid/sludge</td>
<td>Soil/Solid</td>
<td>Glass jar</td>
<td>4 oz</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>28 Days</td>
<td>Cold Vapor AAS</td>
<td>SW 7471</td>
</tr>
<tr>
<td>Metals</td>
<td>Water</td>
<td>Poly</td>
<td>250 mL</td>
<td>HNO₃⁽³⁾</td>
<td>HNO₃⁽³⁾</td>
<td>None</td>
<td>6 Months</td>
<td>ICP/MS or ICP-AES</td>
<td>EPA 200.8/200.7</td>
</tr>
<tr>
<td>Test Name</td>
<td>Matrix</td>
<td>Bottle Type</td>
<td>Bottle size</td>
<td>Unchlorinated Water (Raw)</td>
<td>Chlorinated Water (Treated)</td>
<td>Soil/Solid</td>
<td>Holding Time until start of analysis</td>
<td>Analytical Technique</td>
<td>Analytical Method</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>-------------------------------</td>
<td>---------------</td>
<td>-------------</td>
<td>----------------------------</td>
<td>-----------------------------</td>
<td>------------</td>
<td>--------------------------------------</td>
<td>-----------------------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>Metals</td>
<td>Soil/solid</td>
<td>Glass/Poly</td>
<td>4 oz</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>6 Months</td>
<td>ICP/MS or ICP-AES</td>
<td>EPA 6010B/6020</td>
</tr>
<tr>
<td>Methanol</td>
<td>Water</td>
<td>Glass/Poly</td>
<td>1 x 40 mL</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>14 Days</td>
<td>Dir. Inj./FID</td>
<td>EPA 8015B</td>
</tr>
<tr>
<td>NDMA</td>
<td>Water</td>
<td>Amber Glass</td>
<td>2 x 1 L (*)</td>
<td>None</td>
<td>Thiosulfate</td>
<td>None</td>
<td>7 days</td>
<td>GC/MS/CI SIM</td>
<td>EPA1625M</td>
</tr>
<tr>
<td>Nitrate</td>
<td>Water</td>
<td>Poly</td>
<td>250 mL</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>48 Hours</td>
<td>IC or FIA</td>
<td>EPA 300.0/353.2</td>
</tr>
<tr>
<td>Nitrite</td>
<td>Water</td>
<td>Poly</td>
<td>250 mL</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>48 Hours</td>
<td>IC or FIA</td>
<td>EPA 300.0/353.2</td>
</tr>
<tr>
<td>Nitrite+Nitrate as N</td>
<td>Water</td>
<td>Poly</td>
<td>250 mL</td>
<td>H2SO4</td>
<td>H2SO4</td>
<td>None</td>
<td>28 Days</td>
<td>FIA-Colorimetric</td>
<td>EPA353.2</td>
</tr>
<tr>
<td>Nitrogen, Total Kjeldahl (TKN)</td>
<td>Water</td>
<td>Poly</td>
<td>250 mL</td>
<td>H2SO4</td>
<td>H2SO4</td>
<td>None</td>
<td>28 Days</td>
<td>FIA-Colorimetric</td>
<td>EPA351.2</td>
</tr>
<tr>
<td>Nitrogen-Ammonia</td>
<td>Water</td>
<td>Poly</td>
<td>250 mL</td>
<td>H2SO4</td>
<td>H2SO4</td>
<td>None</td>
<td>28 Days</td>
<td>FIA-Colorimetric</td>
<td>EPA350.1</td>
</tr>
<tr>
<td>Nitrogen-Ammonia in vv with distillation</td>
<td>Water</td>
<td>Poly</td>
<td>250 mL</td>
<td>H2SO4</td>
<td>H2SO4</td>
<td>None</td>
<td>28 Days</td>
<td>FIA-Colorimetric</td>
<td>EPA350.1</td>
</tr>
<tr>
<td>Nitrosamines</td>
<td>Water</td>
<td>Amber Glass</td>
<td>2 x 1 L (*)</td>
<td>None</td>
<td>Thiosulfate</td>
<td>None</td>
<td>14 days</td>
<td>GC/MS/CI SIM</td>
<td>EPA 521</td>
</tr>
<tr>
<td>Odor</td>
<td>Water</td>
<td>Glass</td>
<td>500 mL</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>24 Hours</td>
<td>Odor</td>
<td>SM 215B</td>
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<tr>
<td>Oil and Grease</td>
<td>Water</td>
<td>Glass/Poly</td>
<td>1 L</td>
<td>HCl</td>
<td>HCl</td>
<td>None</td>
<td>28 Days</td>
<td>Gravimetric</td>
<td>EPA1664</td>
</tr>
<tr>
<td>Organotins (tributyltin)</td>
<td>Water</td>
<td>Glass</td>
<td>1 L (*)</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>7 Days</td>
<td>GC/MS/CI SIM</td>
<td>SM 4500-O2</td>
</tr>
<tr>
<td>Oxygen, Dissolved</td>
<td>Water</td>
<td>Glass</td>
<td>BOD bottle</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>15 Minutes (2)</td>
<td>O2 Probe</td>
<td>SM 4500-O2</td>
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<tr>
<td>PBDEs</td>
<td>Water</td>
<td>Amber Glass</td>
<td>2 x 1 L (*)</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>14 days</td>
<td>GC/MSIM</td>
<td>EPA 1614M</td>
</tr>
<tr>
<td>Perchlorate</td>
<td>Water</td>
<td>Poly</td>
<td>250 mL</td>
<td>None(7)</td>
<td>None(7)</td>
<td>None</td>
<td>28 Days</td>
<td>LC/MS/MS</td>
<td>EPA 331/332</td>
</tr>
<tr>
<td>Perchlorate - Low Level by LC/MS/MS</td>
<td>Water</td>
<td>Poly Sterile</td>
<td>125 mL</td>
<td>Sterile field filtration</td>
<td>Sterile field filtration</td>
<td>None</td>
<td>28 Days</td>
<td>LC/MS/MS</td>
<td>EPA 331/332</td>
</tr>
<tr>
<td>Perchlorate in soils</td>
<td>Soil</td>
<td>Glass jar</td>
<td>4 oz</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>28 Days</td>
<td>IC</td>
<td>EPA 314</td>
</tr>
<tr>
<td>PCBs - GW</td>
<td>Water</td>
<td>Amber Glass</td>
<td>2 x 1 L (*)</td>
<td>None</td>
<td>Thiosulfate</td>
<td>None</td>
<td>7 Days</td>
<td>GC/ECD</td>
<td>EPA 8082</td>
</tr>
<tr>
<td>Pesticides- Organophosphorus</td>
<td>Water</td>
<td>Amber Glass</td>
<td>2 x 1 L (*)</td>
<td>None</td>
<td>Thiosulfate</td>
<td>None</td>
<td>7 Days</td>
<td>GC/NPD</td>
<td>EPA8141</td>
</tr>
<tr>
<td>Pesticides- Chlorinated (DW)</td>
<td>Water</td>
<td>Amber Glass</td>
<td>2 x 1 L (*)</td>
<td>None</td>
<td>Thiosulfate</td>
<td>None</td>
<td>7 Days</td>
<td>GC/ECD</td>
<td>EPA 508</td>
</tr>
<tr>
<td>Pesticides- Chlorinated WW/GW</td>
<td>Water</td>
<td>Amber Glass</td>
<td>2 x 1 L (*)</td>
<td>None</td>
<td>Thiosulfate</td>
<td>None</td>
<td>7 Days</td>
<td>GC/ECD</td>
<td>EPA 608/8081</td>
</tr>
<tr>
<td>Pesticides- N/P -DW</td>
<td>Water</td>
<td>Amber Glass</td>
<td>2 x 1 L (*)</td>
<td>None</td>
<td>Thiosulfate</td>
<td>None</td>
<td>14 days</td>
<td>GC/ NPD</td>
<td>EPA 507/8141</td>
</tr>
<tr>
<td>Pesticides- All &amp; PCBs</td>
<td>Soil/solid</td>
<td>Glass jar</td>
<td>4 oz</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>14 days</td>
<td>GC/ ECD or NPD</td>
<td>EPA 8081/8141/8082</td>
</tr>
<tr>
<td>pH</td>
<td>Water</td>
<td>Poly</td>
<td>250 mL</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>15 Minutes (2)</td>
<td>Electrometric</td>
<td>SM4500H</td>
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<tr>
<td>Phenolics</td>
<td>Water</td>
<td>Amber Glass</td>
<td>500 mL</td>
<td>H2SO4</td>
<td>H2SO4</td>
<td>None</td>
<td>28 Days</td>
<td>Spectrophotometric</td>
<td>EPA 420.1</td>
</tr>
<tr>
<td>Phosphate, Ortho</td>
<td>Water</td>
<td>Poly</td>
<td>250 mL</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>48 hours</td>
<td>FIA-Colorimetric</td>
<td>EPA 365.1</td>
</tr>
<tr>
<td>Phosphate, Total</td>
<td>Water</td>
<td>Poly</td>
<td>250 mL</td>
<td>H2SO4</td>
<td>H2SO4</td>
<td>None</td>
<td>28 Days</td>
<td>FIA-Colorimetric</td>
<td>EPA 365.1</td>
</tr>
<tr>
<td>Polynuclear Aromatics (PNAs) Low level</td>
<td>Water</td>
<td>Amber Glass</td>
<td>2 x 1 L</td>
<td>None</td>
<td>Thiosulfate</td>
<td>None</td>
<td>7 Days</td>
<td>GC/MS SIM mode</td>
<td>EPA 625/8270SIM</td>
</tr>
<tr>
<td>Polynuclear Aromatics (PNAs) Low level</td>
<td>soil/solid</td>
<td>Glass jar</td>
<td>4 oz</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>14 Days</td>
<td>GC/MS SIM Mode</td>
<td>EPA 625/8270SIM</td>
</tr>
<tr>
<td>PPCP Alkyl Phenols</td>
<td>Water</td>
<td>Amber Glass</td>
<td>1 L (*)</td>
<td>H2SO4</td>
<td>H2SO4</td>
<td>None</td>
<td>28 Days</td>
<td>GC/MS SIM</td>
<td>In-house</td>
</tr>
<tr>
<td>Test Name</td>
<td>Matrix</td>
<td>Bottle Type</td>
<td>Bottle size</td>
<td>Preservative (chill all unless noted)</td>
<td>Unchlorinated Water (Raw)</td>
<td>Chlorinated Water (Treated)</td>
<td>Soil/Solid</td>
<td>Holding Time until start of analysis</td>
<td>Analytical Technique</td>
</tr>
<tr>
<td>------------------------------------------</td>
<td>--------------</td>
<td>-------------</td>
<td>---------------</td>
<td>--------------------------------------</td>
<td>---------------------------</td>
<td>-----------------------------</td>
<td>------------</td>
<td>--------------------------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>PPCP Hormones, Morphine, Pharma-Neg, Pharma-Pos</td>
<td>Water</td>
<td>Amber Glass</td>
<td>2 x 1 L (*)</td>
<td>Sodium azide, Ascorbic acid</td>
<td>Sodium azide, Ascorbic acid</td>
<td>28 Days</td>
<td>LC/MS/MS</td>
<td>EPA 1694M</td>
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<tr>
<td>Radiological-Gross Alpha</td>
<td>Water</td>
<td>Poly</td>
<td>1 L</td>
<td>None (5)</td>
<td>None (5)</td>
<td>6 Months</td>
<td>GPC</td>
<td>EPA 900.0</td>
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</tr>
<tr>
<td>Radiological-Gross Alpha high TDS</td>
<td>Water</td>
<td>Poly</td>
<td>1 L</td>
<td>None (5)</td>
<td>None (5)</td>
<td>6 Months</td>
<td>Coprecipitation-GPC</td>
<td>SM7110C</td>
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<tr>
<td>Radiological-Gross Beta</td>
<td>Water</td>
<td>Poly</td>
<td>1 L</td>
<td>None (5)</td>
<td>None (5)</td>
<td>6 Months</td>
<td>GPC</td>
<td>EPA 900.0</td>
<td></td>
</tr>
<tr>
<td>Radiological-Radium 226-Sub</td>
<td>Water</td>
<td>Poly</td>
<td>2 x 1 L (*)</td>
<td>HNO₃</td>
<td>HNO₃</td>
<td>6 Months</td>
<td>EPA 903.0/903.1 Sub</td>
<td></td>
<td></td>
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<tr>
<td>Radiological-Radium 228-Sub</td>
<td>Water</td>
<td>A-Poly</td>
<td>2 x 1 L</td>
<td>HNO₃</td>
<td>HNO₃</td>
<td>6 Months</td>
<td>RA-05 Sub</td>
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<tr>
<td>Radiological-Radon 222-Sub</td>
<td>Water</td>
<td>Glass</td>
<td>2 x 40 mL</td>
<td>None</td>
<td>None</td>
<td>4 Days (DW), 8 Days (WW)</td>
<td>LSC</td>
<td>SM7500-RN</td>
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<tr>
<td>Radiological-Strontium 90-Sub</td>
<td>Water</td>
<td>Poly</td>
<td>1 L</td>
<td>HNO₃</td>
<td>HNO₃</td>
<td>6 Months</td>
<td>EPA 905.0 Sub</td>
<td></td>
<td></td>
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<tr>
<td>Radiological-Tritium-Sub</td>
<td>Water</td>
<td>Amber Glass</td>
<td>2 x 125 mL</td>
<td>None</td>
<td>None</td>
<td>6 Months</td>
<td>LSC</td>
<td>EPA 906.0 sub</td>
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</tr>
<tr>
<td>Radiological-Uranium-226-Sub</td>
<td>Water</td>
<td>Poly</td>
<td>250 mL</td>
<td>HNO₃</td>
<td>HNO₃</td>
<td>6 Months</td>
<td>ICP-MS</td>
<td>EPA 200.8</td>
<td></td>
</tr>
<tr>
<td>Semivolatile Organics (BNA) - GW or WW</td>
<td>Water</td>
<td>Amber Glass</td>
<td>2 x 1 L</td>
<td>None</td>
<td>Thiosulfate</td>
<td>7 Days</td>
<td>GC/MS</td>
<td>EPA 625/8270C</td>
<td></td>
</tr>
<tr>
<td>Silica by ICP</td>
<td>Water</td>
<td>Poly</td>
<td>250 mL</td>
<td>None</td>
<td>None</td>
<td>28 Days</td>
<td>ICP</td>
<td>EPA 200.7</td>
<td></td>
</tr>
<tr>
<td>SOCs - Drinking Water</td>
<td>Water</td>
<td>Amber Glass</td>
<td>2 x 1 L</td>
<td>HCl</td>
<td>Sulfite/HCl</td>
<td>14 days</td>
<td>GC/MS</td>
<td>EPA 525.2</td>
<td></td>
</tr>
<tr>
<td>SOCs - Special Analytes</td>
<td>Water</td>
<td>Amber Glass</td>
<td>2 x 1 L</td>
<td>HCl</td>
<td>Asc., EDTA, Diazol., Urea, Buffer</td>
<td>14 days</td>
<td>GCMS</td>
<td>EPA 526</td>
<td></td>
</tr>
<tr>
<td>SOCs - Phenolics</td>
<td>Water</td>
<td>Amber Glass</td>
<td>2 x 1 L</td>
<td>HCl</td>
<td>Sulfite/HCl</td>
<td>14 days</td>
<td>GCMS</td>
<td>EPA 528</td>
<td></td>
</tr>
<tr>
<td>Solids, Settlerable</td>
<td>Water</td>
<td>Poly</td>
<td>1 L</td>
<td>None</td>
<td>None</td>
<td>48 Hours</td>
<td>Gravimetric</td>
<td>EPA 160.5</td>
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</tr>
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<td>Solids, TDS</td>
<td>Water</td>
<td>Poly</td>
<td>500 mL</td>
<td>None</td>
<td>None</td>
<td>7 Days</td>
<td>Gravimetric</td>
<td>SM2540C</td>
<td></td>
</tr>
<tr>
<td>Solids, Total</td>
<td>Water</td>
<td>Poly</td>
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<td>None</td>
<td>None</td>
<td>7 Days</td>
<td>Gravimetric</td>
<td>SM2540B</td>
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<tr>
<td>Solids, TSS</td>
<td>Water</td>
<td>Poly</td>
<td>500 mL</td>
<td>None</td>
<td>None</td>
<td>7 Days</td>
<td>Gravimetric</td>
<td>EPA 160.2</td>
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</tr>
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<td>Solids, TVS</td>
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<td>Poly</td>
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<td>None</td>
<td>None</td>
<td>7 Days</td>
<td>Gravimetric</td>
<td>EPA 160.4</td>
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</tr>
<tr>
<td>Solids, VSS</td>
<td>Water</td>
<td>Poly</td>
<td>500 mL</td>
<td>None</td>
<td>None</td>
<td>7 Days</td>
<td>Gravimetric</td>
<td>SM 2540E</td>
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<tr>
<td>Sulfate</td>
<td>Water</td>
<td>Poly</td>
<td>250 mL</td>
<td>None</td>
<td>None</td>
<td>28 Days</td>
<td>IC</td>
<td>EPA 300.0</td>
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<td>Sulfide, Dissolved</td>
<td>Water</td>
<td>Poly</td>
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<td>ZnAcNaOH</td>
<td>ZnAcNaOH</td>
<td>7 Days</td>
<td>Colorimetric</td>
<td>SM4500S2D</td>
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<td>Surfactants (MBAS)</td>
<td>Water</td>
<td>Poly</td>
<td>500 mL</td>
<td>None</td>
<td>None</td>
<td>48 Hours</td>
<td>Colorimetric</td>
<td>SM5540C</td>
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<td>t-Butyl Alcohol</td>
<td>Water</td>
<td>Glass</td>
<td>2 x 40 mL</td>
<td>none</td>
<td>None</td>
<td>14 Days</td>
<td>GC/MS</td>
<td>EPA 524.2</td>
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<td>THMs</td>
<td>Water</td>
<td>Amber Glass</td>
<td>2 x 40 mL</td>
<td>Thiosulfate</td>
<td>Thiosulfate</td>
<td>14 Days</td>
<td>GC/MS</td>
<td>SM5710/EPA 524.2</td>
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<td>THMs-Formation Potential</td>
<td>Water</td>
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<td>1 L</td>
<td>None</td>
<td>None</td>
<td>14 Days</td>
<td>GC/MS</td>
<td>SM5710/EPA 524.2</td>
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<td>Total Organic Carbon</td>
<td>Water</td>
<td>Amber Glass</td>
<td>250 mL</td>
<td>H₃PO₄</td>
<td>H₃PO₄</td>
<td>28 Days</td>
<td>UV-Persulfate</td>
<td>SM5310C</td>
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<td>Test Name</td>
<td>Matrix</td>
<td>Bottle Type</td>
<td>Bottle size</td>
<td>Unchlorinated Water (Raw)</td>
<td>Chlorinated Water (Treated)</td>
<td>Soil/Solid</td>
<td>Holding Time until start of analysis</td>
<td>Analytical Technique</td>
<td>Analytical Method</td>
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<td>---------------------------</td>
<td>------------</td>
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<td>-----------------------------</td>
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</tr>
<tr>
<td>Total Organic Halides</td>
<td>Water</td>
<td>Amber Glass</td>
<td>500 mL</td>
<td>H₂SO₄</td>
<td>Sulfite/H₂SO₄</td>
<td>Soil/Solid</td>
<td>14 Days</td>
<td>Pyrolysis/ Coulometric</td>
<td>SM5320B/EPA 9020</td>
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<td>Turbidity</td>
<td>Water</td>
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<td>None</td>
<td>None</td>
<td>None</td>
<td>48 Hours</td>
<td>Nephelometric</td>
<td>EPA 180.1</td>
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<td>UCMR2-PBDEs</td>
<td>Water</td>
<td>Amber Glass</td>
<td>2 x 1 L</td>
<td>Ascorbic, EDTA, Citrate</td>
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<td>None</td>
<td>14 days</td>
<td>GCMS</td>
<td>EPA 527</td>
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<td>UCMR2-Explosives</td>
<td>Water</td>
<td>Amber Glass</td>
<td>2 x 1 L</td>
<td>CuSO₄/Trizma Buffer</td>
<td>CuSO₄/Trizma Buffer</td>
<td>None</td>
<td>14 days</td>
<td>GCMS</td>
<td>EPA 529</td>
</tr>
<tr>
<td>UCMR2-Acetanilide Degradates</td>
<td>Water</td>
<td>Amber Glass</td>
<td>2 x 500 mL</td>
<td>NH₄Cl</td>
<td>NH₄Cl</td>
<td>None</td>
<td>14 days</td>
<td>LC/MS/MS</td>
<td>EPA 535</td>
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<td>UCMR2-Acetamide Pesticides</td>
<td>Water</td>
<td>Amber Glass</td>
<td>2 x 1 L</td>
<td>Sulfite/HCl</td>
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<td>None</td>
<td>14 days</td>
<td>GCMS</td>
<td>EPA 525.2</td>
</tr>
<tr>
<td>UCMR2-Nitrosamines</td>
<td>Water</td>
<td>Amber Glass</td>
<td>1 x 1 L</td>
<td>Thiosulfate</td>
<td>Thiosulfate</td>
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<td>14 days</td>
<td>GCMS</td>
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<td>UV254</td>
<td>Water</td>
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<td>None</td>
<td>None</td>
<td>None</td>
<td>48 Hours</td>
<td>Spectrophotometric</td>
<td>SM 5910B</td>
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<td>Volatile Organics-DW</td>
<td>Water</td>
<td>Glass</td>
<td>3 x 40 mL</td>
<td>HCl</td>
<td>Ascorbic/HCl</td>
<td>None</td>
<td>14 Days</td>
<td>GC/MS</td>
<td>EPA 524.2</td>
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<td>Volatile Organics-Aromatic only</td>
<td>Water</td>
<td>Glass</td>
<td>2 x 40 mL</td>
<td>HCl</td>
<td>Thiosulfate/HCl</td>
<td>None</td>
<td>14 Days</td>
<td>P&amp;T/PID</td>
<td>EPA 602</td>
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<td>Volatile Organics-WW/GW</td>
<td>Water</td>
<td>Glass</td>
<td>2 x 40 mL</td>
<td>HCl</td>
<td>Thiosulfate/HCl</td>
<td>None</td>
<td>14 Days</td>
<td>GC/MS</td>
<td>EPA 624/8260B</td>
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<tr>
<td>Volatile Organics-Sol/Solid</td>
<td>Soil/solid</td>
<td>Glass Jar/other</td>
<td>4 oz/other(6)</td>
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<td>14 Days</td>
<td>GC/MS</td>
<td>EPA 8260B</td>
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<tr>
<td>Gasoline -TPH</td>
<td>Water</td>
<td>Glass</td>
<td>2 x 40 mL</td>
<td>HCl</td>
<td>Thiosulfate/HCl</td>
<td>None</td>
<td>14 Days</td>
<td>P&amp;T/FID</td>
<td>EPA 8015B</td>
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<tr>
<td>Gasoline -TPH soil/solid</td>
<td>Soil/solid</td>
<td>Glass Jar/other</td>
<td>4 oz/other(6)</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>14 Days</td>
<td>P&amp;T/FID</td>
<td>EPA 8015B</td>
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<tr>
<td>Diesel/Oil-TPH</td>
<td>Water</td>
<td>Amber Glass</td>
<td>1 L (*)</td>
<td>HCl</td>
<td>Thiosulfate/HCl</td>
<td>None</td>
<td>7 Days</td>
<td>GC/FID</td>
<td>EPA 8015B</td>
</tr>
<tr>
<td>Diesel/Oil-TPh</td>
<td>Soil/Solid</td>
<td>Glass Jar</td>
<td>4 oz</td>
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<td>None</td>
<td>None</td>
<td>14 Days</td>
<td>GC/FID</td>
<td>EPA 8015B</td>
</tr>
</tbody>
</table>

Notes:

1. Formaldehyde and acetaldehyde only
2. This is field test; if requested to be performed at the lab it will be done ASAP
3. Samples can be received unpreserved and preserved at the lab at least 24 hours before analysis
4. Al, Sb, As, Ba, Be, B, Cd, Ca, Na, Mg, K, Cr, Co, Cu, Fe, Pb, Li, Mn, Mo, Ni, Se, Ag, Sr, Ti, Ti, V, Zr
5. Preserve at the lab with Nitric acid to pH < 2 and wait 24 hours before analysis start
6. No headspace required or preferably EPA Method 5035 sample collection. Consult the laboratory for special requirements
7. No cooling required
8. Chill samples to < 6°C, but above freezing.
9. Needs extra bottles for QA/QC for certain projects

Effective as of 7/15/11