TABLE OF CONTENTS

1.0 GOAL ........................................................................................................................................... 1-1
1.1 REGULATORY BACKGROUND ................................................................................................. 1-1
1.2 PURPOSE AND GOALS OF THE SSMP ................................................................................... 1-1
1.3 CLEAN WATER UTILITY WORKING GROUP ........................................................................... 1-2

2.0 ORGANIZATION ........................................................................................................................ 2-1
2.1 THE REGENTS OF THE UNIVERSITY OF CALIFORNIA ............................................................ 2-1
2.2 ADMINISTRATION AND MAINTENANCE ORGANIZATION ................................................... 2-1
2.3 MONITORING SYSTEM AND REPORTING SSOs ................................................................. 2-1
2.4 FACILITY DESCRIPTION ........................................................................................................... 2-1
2.5 SANITARY SEWER SYSTEM DESCRIPTION ........................................................................... 2-2
2.6 FIGURE 2-1: ORGANIZATIONAL CHART ................................................................................. 2-3
2.7 FIGURE 2-2: CHAIN OF COMMUNICATION FOR REPORTING SSOs ........................................... 2-4

3.0 LEGAL AUTHORITY ..................................................................................................................... 3-1

4.0 OPERATION AND MAINTENANCE PROGRAM ...................................................................... 4-1
4.1 MAPPING OF SEWER SYSTEM ................................................................................................. 4-1
4.2 PREVENTATIVE MAINTENANCE PROGRAM ......................................................................... 4-1
4.2.1 Routine Inspections .................................................................................................................. 4-1
4.2.2 Routine Maintenance ................................................................................................................. 4-1
4.3 REHABILITATION AND REPLACEMENT PLAN ......................................................................... 4-1
4.3.1 Ranking of Deficiencies ........................................................................................................... 4-2
4.3.2 Short Term ................................................................................................................................. 4-2
4.3.3 Long Term ................................................................................................................................. 4-2
4.3.4 Capital Improvement ............................................................................................................... 4-2
4.3.5 Training .................................................................................................................................. 4-2
4.3.6 Equipment and Replacement Parts ......................................................................................... 4-3

5.0 DESIGN AND PERFORMANCE PROVISIONS ........................................................................ 5-1
5.1 STANDARDS FOR INSTALLATION, REHABILITATION AND REPAIR ...................................... 5-1
5.2 STANDARDS FOR INSPECTION AND TESTING OF NEW AND REHABILITATED FACILITIES ... 5-1

6.0 OVERFLOW EMERGENCY RESPONSE PLAN ..................................................................... 6-1
6.1 OBJECTIVE AND PURPOSE ...................................................................................................... 6-1
6.2 ROLES AND RESPONSIBILITIES ............................................................................................... 6-1
6.3 ENVIRONMENT, HEALTH & SAFETY-ENVIRONMENTAL AFFAIRS (EH&S) ......................... 6-1
6.4 FACILITIES MANAGEMENT (FM) ........................................................................................... 6-1
6.5 OVERFLOW EMERGENCY RESPONSE PLAN ......................................................................... 6-2
6.6 RECEIPT OF INFORMATION REGARDING AN OVERFLOW ................................................... 6-2
6.7 DISPATCH RESPONSIBILITY ...................................................................................................... 6-2
6.8 FIRST RESPONDER ASSESSMENT OF OVERFLOW ............................................................. 6-2
6.9 OVERFLOW CORRECTION, CONTAINMENT, AND CLEAN-UP .............................................. 6-3
6.9.1 Contractor List for Additional Response .................................................................................. 6-4
<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.10</td>
<td>REGULATORY NOTIFICATION PROCEDURES</td>
</tr>
<tr>
<td>6.11</td>
<td>OES NOTIFICATION REQUIREMENTS</td>
</tr>
<tr>
<td>6.12</td>
<td>ELECTRONIC REPORTING REQUIREMENTS</td>
</tr>
<tr>
<td>6.13</td>
<td>SANITARY SEWER OVERFLOW RECORD KEEPING REQUIREMENTS</td>
</tr>
<tr>
<td>6.14</td>
<td>ADDITIONAL EXTERNAL NOTIFICATION</td>
</tr>
<tr>
<td>6.15</td>
<td>TRAINING REQUIREMENTS</td>
</tr>
<tr>
<td>6.16</td>
<td>OVERFLOW EMERGENCY RESPONSE PLAN UPDATE</td>
</tr>
<tr>
<td>7.0</td>
<td>FOG CONTROL PROGRAM</td>
</tr>
<tr>
<td>7.1</td>
<td>BACKGROUND</td>
</tr>
<tr>
<td>7.2</td>
<td>POLICIES</td>
</tr>
<tr>
<td>8.0</td>
<td>SYSTEM EVALUATION AND CAPACITY ASSURANCE PLAN</td>
</tr>
<tr>
<td>8.1</td>
<td>SYSTEM EVALUATION</td>
</tr>
<tr>
<td>8.2</td>
<td>SYSTEM FINDINGS AND RECOMMENDATIONS</td>
</tr>
<tr>
<td>8.3</td>
<td>CAPACITY ENHANCEMENT MEASURES</td>
</tr>
<tr>
<td>8.4</td>
<td>CAPITAL IMPROVEMENT PLAN</td>
</tr>
<tr>
<td>8.5</td>
<td>SCHEDULE</td>
</tr>
<tr>
<td>9.0</td>
<td>MONITORING, MEASUREMENT AND PROGRAM MODIFICATIONS</td>
</tr>
<tr>
<td>9.1</td>
<td>RECORD KEEPING REQUIREMENTS</td>
</tr>
<tr>
<td>10.0</td>
<td>SSMP PROGRAM AUDITS</td>
</tr>
<tr>
<td>11.0</td>
<td>COMMUNICATION PROGRAM</td>
</tr>
<tr>
<td>11.1</td>
<td>COMMUNICATING PLAN INFORMATION AND UPDATES</td>
</tr>
<tr>
<td>12.0</td>
<td>REFERENCES</td>
</tr>
</tbody>
</table>

APPENDICES

APPENDIX A - REGENTS OF THE UNIVERSITY OF CALIFORNIA BOARD APPROVAL
APPENDIX B - SEWER MAPS
APPENDIX C - OVERFLOW AND EMERGENCY RESPONSE FIELD GUIDE
APPENDIX D - CAPITAL IMPROVEMENT PROJECTS, REPAIR AND REHABILITATION, AND SYSTEM EVALUATION SCHEDULE
APPENDIX E - STORM DRAIN MAPS
APPENDIX F - CONTINGENCY PLANS FOR UC SAN DIEGO SANITARY SEWER PUMP STATIONS AND FORCE MAINS
APPENDIX G - SEWER SYSTEM MANAGEMENT PLAN CHANGE LOG
1.0 GOAL

1.1 REGULATORY BACKGROUND

This Sewer System Management Plan (SSMP) is required under Waste Discharge Requirements (WDR) Order No. 2006-0003, issued by the State Water Resources Control Board (SWRCB). The WDR stipulates that the permittees, which include the University of California, San Diego (UC San Diego), must develop and implement a Management Plan in order to reduce sanitary sewer overflows. Additionally, the Management Plan provides measures to ensure efficient and effective response to overflows, and implement source control measures to minimize the introduction of grease and oils, and other materials that may cause blockages. This Management Plan satisfies the requirements specified in the WDR Order No. 2006-0003.

The State Water Resources Control Board (SWRCB) adopted WQO No. 2006-0003, Statewide General Discharge Requirements for Sanitary Sewer Overflows, (SSOs) on May 2, 2006 and then later issued the Revised Monitoring and Reporting Program (MRP) WQ 2008-0002-EXEC on February 20, 2008. The SWRCB developed this WDR to promote uniformity in the management of California’s wastewater collection systems and reduce SSOs. The SWRCB found that districts that have implemented SSMPs similar to this have been effective not only in improving spill reporting, but also in mitigating SSO impacts on public health and the environment. Data also supported the conclusion that better collection system management will benefit water quality and prolong the life of sanitary sewer systems. The Revised MRP WQ 2008-002-EXEC was implemented to reduce the time allowed to report an overflow, in order to ensure that first responders are notified in a timely manner of SSOs discharged into state waters and to allow response agencies to take action as soon as possible to protect public health and the waters of state.

The Revised MRP WQ 2008-0002-EXEC was then superseded by the amended requirements set forth in the Revised MRP WQ 2013-0058-EXEC that became effective on September 9, 2013. This Revised MRP 2013-0058-EXEC was written to address compliance and enforceability in the previously existing MRP, and to improve monitoring, reporting, record keeping, and public notification requirements for Order 2006-0003-DWQ.


1.2 PURPOSE AND GOALS OF THE SSMP

This document has been developed to comply with WQO No. 2006-0003 and WQ 2013-0058-EXEC. The goal for the UC San Diego SSMP is to provide a plan and schedule to properly manage, operate, and maintain all parts of the sanitary sewer system, as well as to identify effective notification and response procedures that will be used to address SSOs. This will help to reduce and prevent SSOs and mitigate any SSOs that do occur. Specific goals for the plan include:

- Minimize and prevent sanitary sewer overflows;
- Prevent public health hazards;
- Mitigate SSOs that do occur;
- Preserve Ocean Water Quality;
- Use funds available for sewer operations in the most efficient manner;
- Protect the large investment in collection systems by maintaining adequate capacities and extending useful life;
- Provide adequate capacity to convey peak flows;
- Minimize inconveniences by responsibly handling interruptions in service;
- Perform all operations in a safe manner to avoid personal injury, environmental impact and property damages.

Sanitary sewer overflows are overflows from sanitary sewer systems of domestic, industrial, and/or commercial wastewater. SSOs may cause a public nuisance, particularly when untreated wastewater is discharged to waters designated for contact recreation. Many SSOs can be prevented with adequate and appropriate facilities, source control measures, and operation and maintenance of the sanitary sewer system.

1.3 CLEAN WATER UTILITY WORKING GROUP

UC San Diego has created a Clean Water Utility Working Group (CWUWG) consisting of representatives from key departments to facilitate the implementation, monitoring, and updating of the SSMP. Members of the CWUWG include the following departments and groups:

- Environment, Health and Safety (EH&S);
- Facility, Design and Construction (FD&C);
- Facilities Management (FM);
- Housing, Dining, Hospitality (HDH); and

The CWUWG’s responsibilities for the SSMP include the following:

- Monitor and measure implementation of the plan and make modifications as necessary.
- Annually make recommendations for changes to SSMP based on the assessment of plan implementation.
- Review and evaluate response to overflows. As appropriate, update Overflow Emergency Response Plan.
- Prioritize and create Repair and Rehabilitation projects and Capital Improvement projects.
• Implement a time schedule for reviewing the SSMP and ensure communication between all parties involved in the review and implementation of the SSMP.
2.0 ORGANIZATION

2.1 THE REGENTS OF THE UNIVERSITY OF CALIFORNIA

The University of California is governed by The Regents, a 26-member board, as established under Article IX, Section 9 of the California Constitution. The President of the Regents is the Governor of California. The Board of Regents appoints the President of the University and the Officers of The Regents: the General Counsel; the Treasurer; the Secretary and Chief of Staff; and the Chief Compliance and Audit Officer.

2.2 ADMINISTRATION AND MAINTENANCE ORGANIZATION

The administrative responsibility for the UC San Diego sanitary sewer system is shared among several departments including EH&S, FM, and FD&C. The responsibilities of each department are summarized below, and an organizational chart is included as Figure 2-1.

EH&S: The Director of EH&S is considered the permittee for the sanitary sewer system. The Environmental Affairs Division Manager is the signatory authority. The implementation of permit requirements and reporting to regulatory agencies is the responsibility of the EH&S Environmental Affairs program manager, which includes tracking of all SSOs.

FM: The Assistant Director of Facilities Building Operations is responsible for the overall operation and maintenance of the system including oversight of any contractor making repairs on the system.

FD&C: The Associate Vice Chancellor of FD&C is responsible for the management of the design and construction of additions, rehabilitations, or modifications to the sanitary sewer system.

2.3 MONITORING SYSTEM AND REPORTING SSOs

Members of the University community who observe an SSO may call the campus emergency dispatch phone line at 858-534-4357 to report the incident. Campus dispatch immediately notifies FM as the campus first responder for SSOs.

The campus first responder is responsible for immediately investigating any overflow and determining the appropriate response. All overflows are reported to EH&S, which is the department responsible for reporting the overflows to the appropriate regulatory agency. The response to SSOs is described in Section 6: Overflow Emergency Response Plan.

2.4 FACILITY DESCRIPTION

The UC San Diego campus is one of 10 University of California campuses governed by the Regents of the University of California and is an internationally recognized public teaching and research institution. Founded in 1960, the University of California, San Diego is one of the nation’s most accomplished research universities, widely acknowledged for its local impact, national influence and global reach. Ideally located near the Pacific Ocean, the U.S.-Mexico border and at the edge of the Pacific Rim, UC San Diego is renowned for its collaborative, diverse and cross-disciplinary ethos that transcends traditional boundaries in science, arts and the humanities. The university’s award-winning scholars are experts at the forefront of their fields with an impressive track record for achieving scientific, medical and technological breakthroughs. A leader in climate science research, UC San Diego is one of the greenest
universities in the nation and promotes sustainability solutions throughout the region and the world. A map of the campus, including Scripps Institution of Oceanography (SIO) is provided in Appendix B.

2.5  SANITARY SEWER SYSTEM DESCRIPTION

The UC San Diego sanitary sewer system provides sewage disposal for the campus via a gravity flow system, with some minor exceptions. Two smaller sewer pumps are located on campus to serve the UC San Diego Extension Center and the Campus Services Complex. In addition, a large wastewater lift station is installed at the Eleanor Roosevelt College Housing along North Torrey Pines Road. Wastewater from the West Campus typically flows from north to south in the UC San Diego collection system into four major trunk sewer lines that connect to a City main line in La Jolla Village Drive. The four trunk sewer lines are identified as the Gilman Drive Trunk, Villa La Jolla Drive Trunk, Matthews Lane/I-5 Trunk and the Mesa Housing Trunk. The system ultimately feeds to the City of San Diego Point Loma wastewater treatment plant.

There are no upstream or northerly connections to the sewer before serving the campus. The sewer lines total just over 25 miles and are constructed with either vitrified clay pipe or plastic, ranging from six to fifteen inches in diameter. Original pipe has been replaced as upgrades or repairs have been required or new facilities have been constructed.

Sanitary and industrial sewage is collected from campus buildings that house administration, classroom, research, residential, restaurant, and dining hall facilities. An estimated 60 percent of the potable water flow to the campus is discharged to the sewers. The remaining 40 percent is lost to irrigation, industrial and other miscellaneous uses.

The UC San Diego campus and the areas served by the UC San Diego sanitary sewer system are shown on the map provided in Appendix B.
2.6 FIGURE 2-1: ORGANIZATIONAL CHART

Updated May 8, 2014
FIGURE 2-2: CHAIN OF COMMUNICATION FOR REPORTING SSOs

UC San Diego
Sewer System Management Plan
SSO Chain of Communication

- Alarm
  - Plant Operator
    - Staff, Students, Faculty
      - FM Customer Relations Help Desk
        - On Call Technician
          - Maintenance and Plumbing Crew
            - Contain Spill, Fix Problem, Report to EH&S Specialist
              - EH&S Specialist
                - San Diego County Department of Environmental Health
                  - SWRCB Electronic Reporting CIWQS
                    - CalOES
                      - RWQCB
                        -瑞

- Public
  - Police Dispatch
    - EH&S
      - CalOES
        - RWQCB
          - EH&S Specialist
            - San Diego County Department of Environmental Health
              - SWRCB Electronic Reporting CIWQS

Revised: May 8, 2014
3.0 LEGAL AUTHORITY

The Regents of the University of California is a Constitutional Corporation, organized under Article IX, Section 9 of the California Constitution, with full authority over governance and management of the University operations. Under this authority, the University of California has legal authority to:

- Prevent illicit or illegal discharges into its system (e.g., storm water or chemical dumping).
- Control infiltration and connections from inflow sources, including satellite systems.
- Require that sewers and connections be properly designed and constructed.
- Ensure access for maintenance, inspection, or repairs of all portions of the system operated by UC San Diego.
- Ensure proper installation, testing, and inspection of new and rehabilitated sewers (such as new or rehabilitated collector sewers and new or rehabilitated laterals).
- Limit fats and greases and other debris that may cause blockages in the collection system.
- Enforce any violations of its sewer maintenance and operation policies.
4.0 OPERATION AND MAINTENANCE PROGRAM

In order to reduce and prevent SSOs the SSMP establishes measures and activities to facilitate the proper management, operation, and maintenance of all parts of the sanitary sewer system. Measures and activities include maintaining system maps, scheduling routine maintenance, identifying, and addressing system deficiencies, providing public education, and describing fiscal resources and training.

4.1 MAPPING OF SEWER SYSTEM

The maps of the sewer system and storm water conveyance system are in AutoCAD, ArcMap (GIS) and hard copy. This information is hosted on UC San Diego’s Facilities Information System webpage http://facilities.ucsd.edu/Default.htm. EH&S coordinates with Facilities Information System staff, FD&C, and FM to track map updates, changes, repairs, and new construction. A catalog of these maps is planned to be hosted at the UC San Diego Supercomputer Center or similar server on campus. The sewer system and storm water conveyance system maps are located in Appendix B and E of this SSMP.

4.2 PREVENTATIVE MAINTENANCE PROGRAM

UC San Diego has measures in place to keep the system in good repair and prevent excessive infiltration/inflow, service interruptions, and system failures. This is done through regular, scheduled maintenance and cleaning of the collection system, which is summarized below. The routine maintenance is tracked through the FM work order system.

4.2.1 Routine Inspections

Each year selected segments of the system will be inspected using video technology. FD&C also inspects sewer lines that will be affected during new construction. Lift stations are inspected monthly for proper operation and repair as necessary. This includes motors, piping and alarms. Inspections are documented through our Computer Maintenance Management System (CMMS) Maximo.

4.2.2 Routine Maintenance

Root Control: Maintenance from root intrusion is conducted on an as-needed basis, from the results of routine inspections.

Overall System: The system is cleaned using a hydro jet or vacuum in selected targeted areas based on the information obtained through routine inspections.

4.3 REHABILITATION AND REPLACEMENT PLAN

Environment, Health & Safety is responsible for maintaining a detailed record of all Sanitary Sewer Overflows on campus. Wastewater overflows of any amount are reported to EH&S, where the frequency and volumes of overflows are tracked. This information is used to coordinate with FM and FD&C to prioritize maintenance needs, reduce and prevent SSOs, as well as prepare plans for repair and rehabilitation.

UC San Diego’s Capital Improvement Plan, Rehabilitation and Repair, and System Evaluation Schedule can be found in Appendix D of this SSMP.
4.3.1 **Ranking of Deficiencies**

The CWUWG prioritizes the noted deficiencies from the routine inspections at the regularly scheduled meetings. Information from FD&C’s construction inspections is also used to create a priority list of project areas. SSOs that have occurred are prioritized and scheduled by the CWUWG for repair.

4.3.2 **Short Term**

Short-term actions are taken on an as-needed-basis depending on information gathered during routine inspections. Work orders are set up through FM or FD&C depending on the type of project. The appropriate department will develop a scope and subsequently implement the project. Short-term actions implemented through this method include the following:

- Identification and replacement of laterals
- Manhole replacement
- Reverse grade and root intrusion corrections
- Relining and repair of lines

Work Orders are used to schedule rehabilitations and repair projects and to track activities, schedule, and completion. See Appendix D for the schedule.

4.3.3 **Long Term**

UC San Diego is in the process of evaluating the utility infrastructure of the campus, including the sanitary sewer as part of the Campus Executive Engineering Utility Mapping and Modeling Project. Phase 1, Mapping, Field Surveys and Video was completed in the fall of 2013. Phase II will include the modeling and capacity portions of the System. The sanitary sewer system was evaluated by Boyle Engineering Corporation in 1991. *(UCSD University of California, San Diego Sewer System Analysis Boyle Engineering 1991).* At that time no deficiencies were found.

4.3.4 **Capital Improvement**

Capital Improvement projects for existing infrastructure are determined by the CWUWG and added to the project schedule. Information gathered from the Campus Executive Engineering project will be used to prioritize needed Capital Improvement projects. New sewer infrastructure for Repair and Rehabilitation projects are included in the Clean Water Utility Operations and Maintenance Budget (CWU O&M). The CWU O&M budget is distributed each fiscal year.

4.3.5 **Training**

Training is conducted by both EH&S and FM. These two departments are responsible for training staff in the following areas:

**EH&S**

- Provides yearly exposure control training for applicable FM staff.
• Provides yearly technical training for applicable FM staff responding to sewer spills.

FM

• Provides technical training to operators of new systems when they are installed.

4.3.6 Equipment and Replacement Parts

A stock room of appropriate parts and equipment, including emergency pumps, lights, and generators is maintained by FM. Repairs that require equipment or materials beyond existing capabilities are executed by an outside contractor via a service agreement contract. Current contractors with service agreements are:

Newest Construction (858) 537-0774
Barrett Engineered Pumps (619) 232-7867
Sancon Engineering Inc. (714) 891-2323 (800) 726-2664
Pro-Pipe (800) 784-7473
J&M Keystone Inc. (800) 368-2757
Affordable Pipeline Services (858) 689-4000
Atlas Pumping (800) 491-7867
5.0 DESIGN AND PERFORMANCE PROVISIONS

UC San Diego has adopted the Sewer Design Guide (2013) (SDG) prepared by the City of San Diego Metropolitan Wastewater Department. These guidelines are located on the web at http://www.sandiego.gov/mwwd/pdf/sewerdesign.pdf. UC San Diego also has project specific guidelines for sewerage and packaged pump stations as part of the Master Specifications sections 02530 and 02532, respectively.

FD&C is responsible for ensuring the design and performance standards are implemented on campus. There are two categories of design and performance provisions specified in WDR No. 2006-0003, discussed below.

5.1 STANDARDS FOR INSTALLATION, REHABILITATION AND REPAIR

The City of San Diego Sewer Design Guide outlines construction specifications for installing new sewer systems, pump stations, and other appurtenances; and for rehabilitation and repair of existing sewer systems. Design criteria include specifications for items such as pipe materials, minimum sizes, minimum cover, strength, minimum slope, trench and backfill, structure standards, and other factors. Any new construction, rehabilitation, or repair of the sanitary sewer system will adhere to the FD&C specifications and the City of San Diego SDG.

5.2 STANDARDS FOR INSPECTION AND TESTING OF NEW AND REHABILITATED FACILITIES

Inspection and testing of new or rehabilitated facilities ensures that the established standards are being implemented in the field. These standards are included in the FD&C and City of San Diego Standards. Testing for gravity sewers can include: low pressure air test or water test to identify leakage, mandrel test to identify deflection of flexible pipe, water or vacuum test of manholes to identify leakage, and television inspection to identify grade variations or other construction defects. UC San Diego adheres to the standards for inspection and testing of new or rehabilitated facilities that are outlined in the SDG.
6.0         OVERFLOW EMERGENCY RESPONSE PLAN

The Overflow and Emergency Response Plan (OERP) is an integral part of the UC San Diego SSMP to establish guidelines and measures to protect public health and the environment in case of an accidental overflow. The UC San Diego OERP Field Guide, containing information about notification, spill response, volume estimation, spill clean-up, and sampling procedures can be found in Appendix C of this SSMP.

6.1         OBJECTIVE AND PURPOSE

The OERP is developed as part of the UC San Diego Sewer System Management Plan. The purpose of the plan is to establish guidelines and measures to protect public health and the environment in case of an accidental overflow.

In the case of an overflow, UC San Diego shall dispatch the appropriate crews to investigate, identify the cause, and provide appropriate service to minimize the effects of the overflow on public health and quality of surface waters. The OERP further specifies the required notification and reporting that is necessary for local and state agencies.

All Clean Water Utility personnel will be required to read the OERP and familiarize themselves with the procedures. The OERP should be kept in an easily available location for all utility personnel and public access reference. Detailed information regarding the OERP, notification procedures and emergency contacts can be found in Appendix C - Overflow and Emergency Response Field Guide.

6.2         ROLES AND RESPONSIBILITIES

The departments of Environment Health & Safety – Environmental Affairs Division (EH&S), and Facilities Management (FM) are the campus entities responsible for implementing the OERP. The responsibilities of the departments are specified below.

6.3         ENVIRONMENT, HEALTH & SAFETY-ENVIRONMENTAL AFFAIRS (EH&S)

EH&S is responsible for:
   a) External agency notification,
   b) Exposure/hazard assessment & control, and
   c) Interface with external regulatory agencies.

6.4         FACILITIES MANAGEMENT (FM)

FM is responsible for:
   a) Acting as first responder;
   b) Providing and coordinating the operational aspects of the emergency in order to control and mitigate the overflow;
   c) Coordinating the cleanup and disinfection, if needed, of the overflow including streets and storm drains; and,
   d) Establishing preventive measures in order to minimize future accidental releases.
6.5 **OVERFLOW EMERGENCY RESPONSE PLAN**

The OERP presents a strategy for UC San Diego to respond to potential overflows with appropriate personnel, materials, tools and equipment. An appropriate response will help to correct or repair any condition, which may cause or contribute to an un-permitted discharge from the sanitary sewer. Appendix C includes a detailed response guide and procedures that are used to respond to sanitary sewer overflows in a timely and effective manner.

6.6 **RECEIPT OF INFORMATION REGARDING AN OVERFLOW**

Overflows are typically detected and reported in one of two ways:

1. By FM personnel during daily routines - FM personnel who discover a potential overflow during their daily operations are responsible for immediately notifying the proper supervisor and taking appropriate action

2. By the campus - Members of the university community who observe a sanitary sewer overflow (SSO) may also call the campus emergency dispatch phone line at 534-HELP (4357). Emergency response is available 24 hours per day, every day.

6.7 **DISPATCH RESPONSIBILITY**

When the dispatch personnel receive calls from the campus, they will obtain, if possible, all relevant information available regarding the possible overflow including:

1. Time and date the call was received,
2. Specific location of possible overflow,
3. Time when the caller first noticed the overflow,
4. Description of the problem, and
5. Caller’s name and call back phone number if possible.

Campus dispatch immediately notifies the designated campus first responder for SSOs, who is a member of the FM staff. Response time to a SSO will be less than an hour after the first call.

6.8 **FIRST RESPONDER ASSESSMENT OF OVERFLOW**

The failure of any element of the sanitary sewer system that threatens to cause or causes a SSO will be responded to by the FM first responder. The first responder’s responsibility is to isolate and correct the problem.

The first responder will:

1. Assess the failure of equipment or overflow release,
2. Call for assistance (if needed) including additional personnel, materials, supplies, and equipment. If the spill is larger than they can adequately respond to, an outside contractor will be called,
3. Use appropriate Personal Protective Equipment,

4. Use appropriate safety precautionary measures including Lockout/Tagout protocol,

5. Obtain necessary equipment to respond to spill. FM maintains a supply of materials to mitigate spills. Available equipment includes sand bags, waddles, by pass pumps, hoses, emergency generators, and heavy equipment,

6. Assess if the overflow occurred onto private property. Be aware that UC San Diego could face increased liability for further damages inflicted to private property during such instances, and

7. Coordinate with EH&S hazardous materials response if there is a suspicious substance (e.g. oil sheen, foam) observed on the ground surface. Additionally, if there is a suspicious odor (e.g. gasoline) not common to the sewer system, the hazardous materials response team should be contacted.

**Internal Notification Procedures**

Based on the professional judgment of the FM staff, other parties are notified. EH&S is notified for all spills by the first responder or their supervisor.

Internal contact phone numbers:

**EH&S**
8:00 am to 4:00 pm, Monday - Friday: (858) 534-3660  
After hours: 534-HELP (4357) Police Dispatch will alert proper after-hours responders

**FM**
8:00 am to 4:00 pm, Monday - Friday: (858) 534-2930  
After hours: (858) 534-2930 (Dispatch non-emergency line)

**6.9 OVERFLOW CORRECTION, CONTAINMENT, AND CLEAN-UP**

Blocked sewers, pipe failures, or mechanical malfunctions can cause SSOs. The following are specific actions to be performed by the response crews during an SSO.

1. Protect water bodies or the storm drain; divert the flow away from streets and paved areas; stop the overflow. If the failure is at a lift station, take the malfunctioning pump off line,

2. If necessary secure the affected area and post warning signs,

3. Contain the wastewater discharged to the maximum extent possible by utilizing spill containment devices,

4. Determine the location and cause of the overflow. Assessment will include a check of the lift station pumps and upstream and downstream manholes,
5. Implement appropriate corrective actions. This may include the use of vacuum trucks, emergency pumps, stand-by force main, emergency generators,

6. Clean and sanitize the affected area(s),

7. Finalize the incident documentation,

8. Review overall response with the Responding Parties, and

9. Sample as necessary and when spills of 50,000 gallons or greater reach surface waters. Any sampling performed will be coordinated with the San Diego County Department Environmental Health Services. The sampling methodology will be consistent with the sampling requirements outlined in the RWQCB’s Sewage Spill Reporting Guidance.

Overflow correction, response, and documentation requirements have been compiled in the Overflow and Emergency Response Field Guide (Appendix C).

A contingency plan for overflows that occur at sanitary sewer pump stations can be found in Appendix F-Contingency Plans for UC San Diego Sanitary Sewer Pump Stations and Force Mains.

6.9.1 **Contractor List for Additional Response**

<table>
<thead>
<tr>
<th>Contractor</th>
<th>Phone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>J&amp;M Keystone Inc.</td>
<td>(800) 368-2757</td>
</tr>
<tr>
<td>Affordable Pipeline Services</td>
<td>(858) 689-4000</td>
</tr>
<tr>
<td>NRC Environmental Services</td>
<td>(800) 337-7455</td>
</tr>
<tr>
<td>Clean Harbors Environmental, Inc.</td>
<td>(800) 645-8265</td>
</tr>
<tr>
<td>Atlas Pumping</td>
<td>(800) 491-7867</td>
</tr>
</tbody>
</table>

6.10 **REGULATORY NOTIFICATION PROCEDURES**

If a SSO occurred, it is required that certain regulatory agencies be contacted. The following reporting criteria explain when notifications should be sent, and the various forms that are required. Regulatory notification procedures are administered by EH&S-Environmental Affairs.

6.11 **OES NOTIFICATION REQUIREMENTS**

Sewage spills greater than or equal to 1,000 gallons that result in a discharge to surface waters or that have entered and are not recovered from a storm drain must be reported to the California Office of Emergency Services (Cal OES) at (800)852-7550 within 2 hours from the initial spill discovery. Cal OES will notify the local agencies such as the San Diego Regional Water Quality Control Board and the San Diego Department of Environmental Health Services.
6.12 ELECTRONIC REPORTING REQUIREMENTS

A draft report must be entered into the CIWQS Online SSO Database within 3 business days for any spill volume that reached surface waters, was not recovered from a storm drain or was greater than 1,000 gallons (Category 1 and Category 2 spills). These draft reports must be certified within 15 calendar days of the end date of the SSO.

Spills that are 50,000 gallons or greater require a technical report, including water quality results from samples that were taken within the first 48 hours of the spill, to be submitted to CIWQS within 45 days of the end of the spill.

All other spills (Category 3) need to be reported and certified in the CIWQS Online SSO Database within 30 days from the end of the month in which the spill occurred.

6.13 SANITARY SEWER OVERFLOW RECORD KEEPING REQUIREMENTS

Environment, Health & Safety is required to maintain detailed documentation of SSOs for at least five years. Maintaining these records will help EH&S track the number of spills and their volumes, as well as measure the effectiveness of the OERP. Based on the information collected EH&S can determine which areas of the sewer system need to be prioritized and if the OERP needs to be updated in order to improve response activities.

For each SSO these records must include, but are not limited to:

- Records documenting each sanitary sewer overflow event;
- Complaint records documenting how FM and EH&S responded to all notifications of possible or actually sanitary sewer overflows, both during and after business hours, including complaints that do not result in a sanitary sewer overflow;
- Records documenting steps and/or remedial actions taken. Spill response activities taken;
- Records documenting how all estimate(s) of volume(s) discharged and, if applicable, volume(s) recovered were calculated;
- Electronic monitoring records relied upon for documenting sanitary sewer overflow events and/or estimating the sanitary sewer overflow volume discharged.
- Whether or not health warnings were posted;
- Steps that have, and will be, taken to prevent the SSO from recurring and a schedule to implement those steps;
- Work orders, work completed, and any other maintenance records that are associated with responses and investigations of system problems related to SSOs;
- Record of Certified report, as submitted to the online SSO database;
- Historical maintenance records for the failure location;
- Records of samples taken and the regulatory agency that received samples if applicable;

6.14 ADDITIONAL EXTERNAL NOTIFICATION

The following agencies should also be notified when an overflow has occurred:
The Department of Fish and Wildlife is notified if there is a spill to any waterway. The Department of Fish and Wildlife will investigate the spill and make a determination if there are any deleterious effects of the spill.

California Department of Fish and Wildlife (South Coast Region, Region 5)
4949 Viewridge Avenue
San Diego, CA 92123
858-467-4201

The Regional Water Quality Control Board and the San Diego County Department of Environmental Health Services will be notified if there is any violation of a discharge prohibition.

Regional Water Quality Control Board
9174 Sky Park Ct # 100
San Diego, CA 92123
(858) 637-5581
(858) 822-8344

San Diego Department of Environmental Health Services
1600 Pacific Highway
San Diego, CA 92101
(858) 495-5579
(858) 565-5255 after hours

Any discharge of sewage into or onto waterway must be reported to Cal OES:

California Office of Emergency Services (Cal OES)
800-852-7550

6.15 TRAINING REQUIREMENTS

Training will be conducted for members of the departments that are responsible for implementing the OERP which includes applicable EH&S and FM staff. EH&S is responsible for providing exposure control training for FM staff. FM is responsible for providing technical training for FM staff responding to sewer spills.

6.16 OVERFLOW EMERGENCY RESPONSE PLAN UPDATE

OERP is reviewed on an annual basis by EH&S and FM. Interim changes are incorporated into the document by EH&S as needed. Comments, updates, and other relevant information should be submitted to EH&S for review, consideration, and incorporation into OERP and the Overflow and Emergency Response Field Guide (Appendix C).
7.0 FOG CONTROL PROGRAM

The UC San Diego campus has minimal problems with respect to fats, oil and grease (FOG). There have been no reported SSOs from buildup of fats, oils or grease since the WDR was executed. Therefore an extensive FOG Control Program is not necessary.

7.1 BACKGROUND

UC San Diego requires vendors to have a grease and oil source control program in place. The purpose of the program is to reduce the amount of fats, oils, and grease discharged to the wastewater collection system.

Grease blockages will be identified through routine inspections of the sanitary sewer system. The inspections are conducted as part of the regular scheduled maintenance and cleaning of the sewer system, which is outlined in Section 4.

7.2 POLICIES

UC San Diego requires all restaurants and dining areas to have outside grease interceptors installed.

BMPs are in place to prevent the introduction of grease and fats into the sanitary sewer and include training. Training occurs by the kitchen manager upon hiring new employees.

Kitchen staff is trained on bulk grease practices to ensure it is not washed into the sanitary sewer. Additionally, grease in pans or fryers when cleaned are not washed down the drain. Excess grease that is generated from grilling or frying is collected in a dedicated container. A grease rendering company collects the container contents on a scheduled frequency.
SYSTEM EVALUATION AND CAPACITY ASSURANCE PLAN

Background

The first sewer master plan undertaken by UC San Diego was part of a comprehensive infrastructure assessment in 1991 (Boyle Engineering Corporation - 1991) to ensure adequate infrastructure capacity to support the expected increase in student and staff populations. The assessment focused on observations of existing conditions, estimations of future loads, and proposed capital improvements necessary for the sanitary sewer system to meet future loads. The University has since then undertaken more specific evaluations of the sanitary sewer systems and are documented in the following studies that address several “neighborhoods or sewer basins” on the campus.

- University of California, San Diego, Sewer System Analysis (Boyle Engineering Corporation - May 1991)
- Sewer Flow Calculations for Repair and Replacement of 8-in Sewer Within Discovery Way at UC San Diego-SIO (Boyle Engineering Corporation - April 2000)
- UCSD East Campus Master Infrastructure Plan (Latitude 33 Planning and Engineering - May 2010)
- University of California, San Diego Revelle-Muir College Sewer Study (Nasland Engineering - June 2010)
- Sewer Flow Calculations for 8-in Sewer Mains in Kennel Way (Discovery Way) & in Seaweed Canyon at Scripps Institution of Oceanography (Nasland Engineering - September 2009, revised January 2011)
- University of California, San Diego, North Campus Sewer Study (Latitude 33 Planning and Engineering – November 2011)
- UCSD West Campus Master Infrastructure Plan (Latitude 33 Planning and Engineering – Phase I - completed Fall 2013)

The following sections provide brief descriptions of each study.

Description of Studies

University of California, San Diego Sewer System Analysis

UC San Diego had a Sewer System Analysis prepared by Boyle Engineering Corporation in May of 1991. The report evaluated the entire campus, both east and west side, with the primary purpose to evaluate UC San Diego’s existing sewage collection system at the time and to define improvements required to accommodate planned growth for the next 20 years.

Sewer Flow Calculations for Repair and Replacement of 8-in Sewer within Discovery Way at UC San Diego-SIO
This Study was prepared at the City of San Diego’s (City’s) request to show the ultimate flows in an eight inch sewer pipe in Discovery Way, located in the University of California, San Diego’s (UC San Diego’s) Scripps Institution of Oceanography (SIO) campus. This city-owned sewer serves the SIO campus and private properties located in the Scripps Estates area including Ellentown Street, Poole Street and La Jolla Shores Drive.

Clean Water Utility Initiative Projects for State Water Revolving Fund

This request for funds from the State includes several projects. The first is a Clean Water Utility Master Plan that consists of preparing a comprehensive Clean Water Utility Master Plan of UC San Diego’s wet utility systems. This covers potable water, recycled water, sewer, storm water and seawater. The sewer component will include location, size, materials and age of the existing pipeline collection network including manholes, meters, and connection points to the City of San Diego’s sewer system. The plan will include as-needed sewer televising and flow monitoring program to assess current condition and flows and will determine if the infrastructure can support future development relative to hydraulic criteria conforming to municipal standards. The remaining projects are for sewer rehabilitation and replacement.

- The Revelle Sewer Rehabilitation will update the 40 year old clay pipe system and correct slopes and remove root intrusion. The work will consist of design and construction to rehabilitate the existing sewer.

- The Pepper Canyon Trunk Sewer Replacement will include design and construction to replace the existing pipeline.

- The Muir College Replacement needs to be replaced due to its age and condition. Flow velocities are slower than standard minimum velocities. The work will consist of design and construction of a new sewer to replace the existing pipeline.

- Gilman Drive Trunk Sewer Replacement needs to be replaced due to its age and condition. The work will consist of design and construction of a new trunk sewer to replace the existing pipeline. *This project has been completed.*

- Mesa Housing Sewer Replacement also needs to be replaced due to its poor condition. The work will consist of design and construction of a new sewer to replace the existing pipeline.

University of California, San Diego, East Campus Master Infrastructure Plan

The East Campus Sewer Study analyzed existing conditions for the east campus facilities, provided guidance for design and construction of infrastructure and site development to serve the projected near-term building projects, and ensure that facilities constructed will be adequate to support ultimate development anticipated on the East Campus Medical site. Due to the amount of existing development on the campus, the constrained site conditions, and the anticipated close-phasing of the near-term buildings, this report proposed a phasing plan for the installation of the backbone utility systems. In addition, the study identified an order of magnitude cost for the required infrastructure systems.

University of California, San Diego Revelle-Muir College Sewer Study

The Revelle-Muir College sewer study covers the area north of and adjacent to La Jolla Village Drive, east of North Torrey Pines Road, west of Gilman Drive, and South of Muir College Drive. The 10-inch Gilman trunk sewer main is being evaluated as well as sewer mains feeding this 10-inch trunk sewer. The
10-inch Gilman trunk sewer runs southerly from approximately Eucalyptus Grove Lane and Gilman Drive intersection to join a 21-in City of San Diego trunk sewer in La Jolla Village Drive. The 10-in main has multiple laterals that collect wastewater from four zones. The purpose of this study is to evaluate the sewer system for the south west portion of the main campus and verify capacity and availability for the Muir College, Revelle College, Housing & Dining Administration Building, Revelle Housing Building – Phase 1, the new Science Building at the intersection of Torrey Pines Road and La Jolla Shores Drive, and the full future build-out that is planned for this part of campus. The objective of this study is to determine where UC San Diego will need to upgrade sewer mains to meet the existing and future wastewater needs of this area of campus. These upgrades include sewer lining, re-routing, and upsizing.

Sewer Flow Calculations for 8-in Sewer Mains in Kennel Way (Discovery Way) & in Seaweed Canyon at Scripps Institution of Oceanography

The UC San Diego/Scripps Institution of Oceanography (SIO) has two existing 8-in sewer mains that collect flow from various building types and uses. This study is being prepared to evaluate the existing future flows anticipated for the two 8-in sewer mains through SIO. The west main is owned and maintained by the City of San Diego. The east main is owned and maintained by UC San Diego. Both east and west mains feed into Pump Station #27 which is located near the intersection of Paseo del Ocaso and Avenida de La Playa. The 8-in sewer main running through the east side of SIO originates in the Coast Apartments near the intersection of La Jolla Shores Drive and Horizon Way. It discharges southward towards Seaweed Canyon where it connects to the City sewer in the residential area on Ruette Nice. The 8-in City-owned sewer main west of La Jolla Shores Drive, collects wastewater from the residential neighborhood, Scripps Estates and from a large portion of SIO. This study is being prepared for the following reasons:

- To re-evaluate and update the Boyle Sewer Report (2000) based on the new buildings being added and to ensure the mains through SIO have capacity.

- The City officially requested UC San Diego to provide updated SIO sewer flows to be included in their hydraulic modeling of the entire La Jolla sewer system. The results in this report will be used for their calculations to upgrade their sewer mains and pump station downstream of SIO.

- To determine the impact of sewer discharges from the addition of the National Oceanic Atmospheric Administration (NOAA) South West Fisheries replacement facility. This discharge has not been included in previous sewer analyses, and is projected to by 18-gpm.

- Seawater with chemicals from NOAA aquaria are not allowed to be discharged onto the beach and must be discharged into the sewer.

University of California, San Diego North Campus Sewer Study

The North Campus Sewer System serves a large portion of the main university campus including the North Campus, Eleanor Roosevelt College, Thurgood Marshall College, University Center, Warren College, Sixth College, and the Campus Services Complex. This basin includes student dorms, offices, laboratories, maintenance, restaurants and classrooms.

The majority of the North Campus and the Eleanor Roosevelt College discharges into a wetwell at the ERC Pump Station located on the west side of the development. The 12-in force main from this pump station connects to the upstream end of the main gravity trunk sewer. The main trunk then flows east
within Thurgood Marshall Lane and Voigt Lane, south at Hopkins Lane, then east, just north of the Geisel Library. The trunk sewer continues east till Warren Mall, than south into Matthews Lane, then southeast within Artists Lane continuing until it connects with the City’s sewer system in Caltrans Right of Way.

University of California, San Diego West Campus Master Infrastructure Plan

SCOPE OF WORK

Phase I: Data-gathering

I-1: Gather Existing Systems Information: from UC San Diego database, including sensitive resources on-site, existing building inventory, infrastructure facilities buildings, and components.

- Conduct interviews with appropriate facilities department representatives, document results, follow-up and confirm latest utilities information and prepare a consolidated updated base plan with existing site development, buildings and topographic information, future buildings and each utility system isolated on separate drawing layers
- Develop known deficiencies and infrastructure needs list for immediate action plan assessment
- Assess capacities of:
  - City of San Diego points of connection for:
    - domestic water
    - reclaimed water
    - sewer main
    - storm drain and water quality facilities
  - Campus utility systems including:
    - storm drain, and water quality infrastructure
    - sewer mains

I-2: Review existing utility system reports and analysis: Provide engineering services to review existing utilities analysis to be made available to the UC San Diego. Prepare consolidated summary of project recommendations for each of the reports. Review summary with UC San Diego and confirm conclusions and follow-up actions resulting from report recommendations as they influence, or provide background information for the proposed master utilities analysis.

I-3: Conduct field investigations

- Provide field utility mark out and location services including:
  - field reconnaissance and photo surveys of existing utility systems and structures
  - Field survey mark out for underground services
  - pothole or ground penetrating location services
  - GPS location of backbone systems and structures

- Optional Service: consolidated three-dimensional “BIM” model base plans on a Utility Corridor basis where required, isolating individual utility systems and structures on separate layers.
I-4: Analysis and Cost Estimates:

Based upon known system deficiencies, and analysis of capacities of on-site systems, prepare recommended solutions to repair significant or urgent system upgrades (to serve existing and near-term projects anticipated to start prior to July 2012) including an analysis of required environmental permitting, potential impacts to the University's ability to provide services, or potential liabilities associated with system failures as a result of inability to correct deficiencies in a timely manner. Based upon University's determination of appropriate solutions, prepare cost estimates for design, construction, and operation of proposed infrastructure system.

8.1 SYSTEM EVALUATION

The sewer capacity assessment completed as part of each study was based on the results of the hydraulic modeling performed for the collection system in each report and is summarized in the following sections. These evaluations identify additional future needs and assist in undertaking a concept design and cost estimate for future funding.

University of California, San Diego Sewer System Analysis (Boyle Engineering Corporation - May 1991)

In this study, some research was done on non-sewer discharges such as storm water and campus drainage (inflow) or from groundwater (infiltration), but the sewer system showed no evidence of any storm water influencing flows. For this reason, the Study did not look at inflow or infiltration flows. The flows carried in the campus sewers are therefore solely a function of the size of the building and building water use factors which were derived from a previous utilities study. To properly estimate the sewer capacity required to carry flow from different areas, it was necessary to establish a relationship between average daily flow and peak flow. Boyle Engineering used a sewer analysis computer program to analyze the capacities in UC San Diego’s sewage collection system. Using sewer data provided, the capacity of each individual pipe section, the average and peak flows, and the flow velocity was computed. In the event there was a deficiency, the program recommended a parallel relief pipe or a replacement pipe.

Sewer Flow Calculations for Repair and Replacement of 8-in Sewer within Discovery Way at UC San Diego-SIO (Boyle Engineering Corporation - April 2000)

Two methods were used to determine the sewage flows. Flows for Scripps Estates were determined using the City of San Diego’s methodology. Flows for the SIO campus were determined using methodologies adopted by the University in their campus-wide sewer master plan. The City’s area zoning was established based on the San Diego Zoning Map. Equivalent population, sewer flow and peaking factor were calculated using the method provided in the City’s Sewer Planning and Designing Guide. Flow from SIO was determined based on sewer flow calculations that were based on a percentage of the water use. Peak water demands were calculated by multiplying Assignable Square Feet of the building by the UC San Diego Water Use Factor. Sewer peak flow was estimated that 70-percent of water used is discharged to the sewer. Estimated “built out” sewer peak flow is 109 gpm. Estimated existing sewer peak flow is 65 gpm. This coincides with flow monitoring results conducted in 1989.


The projects selected for the State Water Revolving Fund (SWRF) were compiled by UC San Diego construction and maintenance departments from other studies and videoing of sewer lines condition. This
project list was submitted for ARRA funding administered through the SWRF. The request is on the SWRF Project Priority List.

University of California, San Diego East Campus Master Infrastructure Plan

A network of 8-in and 12-in sewer lines serves the East Campus development. The lines drain south to Medical Center Drive where the line size increases to 15-in. The system continues westerly in Medical Center Drive South, including flows from Science Research Park, Shiley Eye Care, Preuss School, Thornton Hospital, and Perlman Building, to a connection with the existing 18-in PVC sewer main that has been placed in a 42” steel sleeve under Interstate-5. Land uses include school, offices, medical laboratories and a hospital. The equivalent population is based upon the total square footage of the building. This method was used for all projects except for the Central Plant.

Future building and the new Central Plant project were included in the study. The Center Plant is proposed to utilize reclaimed water or potable water for cooling and therefore has been provided with a sewer connection for by-pass water, back-washing, and process water.

University of California, San Diego Revelle-Muir College Sewer Study

The approach taken with this sewer study is to account for actual water usage data that was provided for each of the buildings. The University has private water meters installed for each building. In order to be conservative, the average of the six highest months of the twelve month period metered were used to generate the average daily flow. The existing buildings were separated by usage type and an average gallons per day (GPD) per square foot (SF) was derived for each usage type. An average number of floors were also established for each building type. Utilizing the existing GPD/SF for each building and the Revelle/Muir 2006 Neighborhood Build-Out Plan, the proposed flows were estimated for future buildings.

The age of this system and where clay pipe is predominantly used indicates that there could be a potential for other inflows into the sewer system such as groundwater and storm water. Therefore, videoing was utilized for the major lateral from the west zone to determine if there was some root intrusion at the joints. There was little evidence to date that shows any non-sewer water is entering the system.

In order to estimate the sewer capacity needed to carry the flows from the different zones, it is necessary to establish a relationship between the average daily flows and the peak flow. Utilizing the existing flows, the as-built drawings, field survey information, and previous reports, an existing sewer system tabulation was developed to check the status of the current conditions prior to the development of the proposed buildings.

Sewer Flow Calculations for 8-in Sewer Mains in Kennel Way (Discovery Way) & in Seaweed Canyon at Scripps Institution of Oceanography

Sewer flow estimates were calculated for the west main with conveys SIO and offsite flows. The main collects wastewater from various types of development. The 8-in City-owned sewer main that crosses through SIO has steep slopes on the north and milder slopes towards the south. This mild slope area is the controlling factor for SIO since this limits the system capacity. Upstream flows are generated from the Scripps Estate area, north of SIO. Since limited information is currently available for the Scripps Estates, flows were estimated based on the 2004 Metropolitan Wastewater Department/City of San Diego’s Sewer Design Guide. Zoning information is used to obtain the peaking factor from the City’s density conversion information. The onsite flows are generated from three different areas on SIO. Sewer
calculations for the onsite portion of the system utilized flow usage factors developed by UC San Diego studies. Peak demand water use factors for various types of buildings were used with known building sizes and uses to estimate the water usage for each of the different building types. Sewer flow calculations are generated by first calculating the building peak water use. The peak water demand was calculated by multiplying the assignable square feet (ASF) by the building type peak demand water use factor. A 70% return rate to the sewer was assumed for the water that was being used for each building.

In order to verify the validity of the estimated sewer flows, sewer flow meters were installed in strategic locations to isolate three areas: Upstream – Scripps Estate, SIO Onsite – combined flow for SIO North, SIO South, & SIO Hillside, and Onsite – East main combined flows for SIO. The metering data validated the estimations in the Study.

University of California, San Diego North Campus Sewer Study

The flow analysis was limited to the main trunk sewer. Field survey was performed to verify and correct the University’s utility base map. An initial analysis was performed, using the City’s design criteria, to identify locations to place flow meters. The resulting information from the flow meters was then used in the subsequent analysis. The results from this flow capacity analysis were used in conjunction with known areas of concern from video inspections to identify problem areas and recommend remedies.

University of California, San Diego West Campus Master Infrastructure Plan

Evaluation will be completed in Phase II.

8.2 SYSTEM FINDINGS AND RECOMMENDATIONS

University of California, San Diego Sewer System Analysis (Boyle Engineering Corporation - May1991)

This study found there were no major deficiencies in the existing UC San Diego collection system. Future flows from the planned additions at the time were found to require improvement of some portions of the existing system, and new sewer line extensions would be needed to serve most of the future development. Over the years since that study was conducted, UC San Diego has implemented the recommended improvements and the system expansion as the new development was constructed.

Sewer Flow Calculations for Repair and Replacement of 8-in Sewer within Discovery Way at UC San Diego-SIO (Boyle Engineering Corporation - April 2000)

This study concluded that peak sewer flow generated by the areas served by the proposed section of pipe (an 8-in sewer line) to replace the existing 8-in clay was adequate and did not need upsizing.

University of California, San Diego East Campus Master Infrastructure Plan (Latitude 33 Planning and Engineering - May 2010)

The sewer report has concluded that the existing and proposed sewer mains within the UC San Diego East Campus meets the City of San Diego’s design standards and that the proposed system improvements will fully support anticipated future development identified in the development plan for the east campus. The design intent for all proposed on-site private sewer systems serving more than one building is to meet public standards as required by the City of San Diego.
The analysis showed the existing system was adequate but made recommendations on lining the 8-in clay pipe to keep out the roots. This will allow for maintenance to occur and for future growth. Flow rates in the sewer should have a minimum velocity of 2-feet per second (fps). This velocity is designed to aid with cleansing of the pipe system. The maximum spacing between manholes is 400-feet to enable use of conventional cleaning equipment.

Sewer Flow Calculations for 8-in Sewer Mains in Kennel Way (Discover Way) & Seaweed Canyon at Scripps Institution of Oceanography (Nasland Engineering – September 2009, revised January 2011)

The hydraulic analysis for the west main indicates the flow will exceed the capacity in about 10 years’ time with future development. This is currently being studied.

The hydraulic analysis for the east main shows there is plenty of capacity in this sewer system.

University of California, San Diego North Campus Sewer Study

From the study and videoing of this line, a number of projects were identified and placed onto the capital improvements list. There were areas with some sagging problems and capacity issues. The blockages seen in the videoing were removed and the lines have been cleaned. The lines which need replacement are identified below.

UCSD West Campus Master Infrastructure Plan

Phase I has been completed. Project analyses and systems evaluation is to be completed in Phase II.

8.3 CAPACITY ENHANCEMENT MEASURES

UC San Diego’s capital improvement projects (Buildings, Housing, etc.) include sewer enhancements that are assessed during the project design phase. Additional sewer projects were identified for ARRA funding and the SWRF project list. These projects were submitted on March 5, 2009, for economic stimulus funding through the Clean Water State Revolving Loan Fund. UC San Diego’s application, which included a total of $9.6 million of Clean Water Utility sewer projects, was assigned a project manager from the State Water Resources Control Board (SWRCB).

The SWRCB identified $35.5 million in projects from the March 5th, 2009 list that meet their funding criteria (all related to waste water discharges and storm water pollution prevention).

Revelle/Muir Study

Other Capacity Enhancement measures include a new 8-inch sewer lateral extension. The projected wastewater peak discharge rates will provide sufficient flow to achieve a velocity of 5.6 fps. This is greater than the desired 2 fps, and meets the City of San Diego 2004 Sewer Design Guide.

East Campus Study

With the Medical Center Drive West road project, a new sewer line will be built. This proposed line will be deep (approximately 40 feet below grade) in order to serve subterranean floors on the proposed CTRI
buildings without pumping. This line will be designed as a dual 8” PVC line. Later connections to this deep line will only be permitted at the proposed manholes.

The Office of the President (UCOP) Capital Planning manages review and approval processes for the university's capital program, serving as a central point of contact for the state, campuses, other units and the regents on issues related to development, coordination, justification and funding of capital projects. We provide guidance on the rationale of project proposals and work with other units to ensure that projects comply with state and university policy and procedures.

8.4 CAPITAL IMPROVEMENT PLAN

The University of California Capital Financial Plan for 2013-23 can be found at http://www.ucop.edu/capital-planning/_files/capital/201323/_UC-Capital-Financial-Plan-2013.pdf. This plan includes ten year plans for the campuses. UC San Diego’s capital improvement plan balances new construction, renovation, building system upgrades, and the renewal and expansion of infrastructure. Private gifts and grants, industry partnerships, and federal grants and contracts will continue to provide important capital funding to complement State funding.

Capital Improvement Plans for Sewer Capacity Assurance that are not part of the Consolidated State – Non-State Capital Projects list are funded through the CWU Budget. Repair and Rehabilitation projects are also funded by the CWU Budget. The CWU Budget is funded annually through the Campus Budget office.

8.5 SCHEDULE

The CWUWG meets regularly to schedule and prioritize sewer system projects for repair, rehabilitation and capacity. The CWU Program’s current sewer system project list can be found in Appendix D- CIP, Repair and Rehabilitation, and System Evaluation Schedule.
9.0  MONITORING, MEASUREMENT AND PROGRAM MODIFICATIONS

The CWUWG will monitor the effectiveness and implementation of the SSMP by reporting updates to the group through meetings, conference calls, or by email. This communication will allow the CWUWG to gauge how well the SSMP is working and being executed on campus. Each element of the SSMP will be reviewed by CWUWG biannually in order to evaluate if all elements of the SSMP are effective and are being implemented. Program elements will be updated, as appropriate, based upon monitoring or performance evaluation. The plan will be available for audit at all times.

9.1  RECORD KEEPING REQUIREMENTS

UC San Diego is required to maintain relevant information that can be used to establish and prioritize appropriate SSMP activities, as well as identify SSO trends, including: frequency, location, and volume of spills. These records can be used to determine the effectiveness of preventative maintenance and to create a maintenance schedule to prevent future SSOs.
10.0 SSMP PROGRAM AUDITS

The CWUWG will assess the effectiveness of the SSMP by conducting periodic internal audits. These audits will occur every two years at a minimum. EH&S will conduct the audits. Through this review, the CWUWG will evaluate the SSMP, including its deficiencies, and recommend steps to correct them.
11.0 COMMUNICATION PROGRAM

11.1 COMMUNICATING PLAN INFORMATION AND UPDATES

Environment, Health & Safety will communicate with the campus community regarding the development, implementation, and performance of the SSMP. The Sewer System Management Plan is posted on the UC San Diego EH&S website http://blink.ucsd.edu/safety/environment/outdoor/SSMP.html and the campus community is encouraged to review and provide comments on the plan.

The SSMP will be updated at least biannually to describe any significant changes in proposed actions or implementation schedules. The update will include available information on the performance of measures that have been implemented. UC San Diego will communicate with interested parties regarding implementation and performance of the SSMP. Interested parties include:

- Campus Population,
- City of San Diego,
- County of San Diego, and
- SWRCB.
12.0 REFERENCES


Environmental Protection Agency

City of San Diego

Sewer Construction and Development

Regional Water Quality Control Board

State Water Resources Control Board


University of California, San Diego (UCSD)
UCSD 2004 Long Range Development Plan [http://physicalplanning.ucsd.edu/plans/lrdp.html]


2008 FD&C Master Design Specifications Sanitary Sewerage (Section 02530)
2008 FD&C Master Design Specifications Packaged Pumping Stations (Section 02532)

Boyle Engineering Corporation
1991 UCSD University of California, San Diego, Sewer System Analysis
APPENDIX A

SEWER SYSTEM MANAGEMENT PLAN BOARD APPROVAL
COMMITTEE ON GROUND AND BUILDINGS
July 17, 2014

TO THE REGENTS OF THE UNIVERSITY OF CALIFORNIA

1. **APPROVAL OF NEW AND UPDATED SEWER SYSTEM MANAGEMENT PLANS**


2. **APPROVAL OF PRELIMINARY PLANS AND WORKING DRAWINGS BUDGET, APPROVAL OF PROJECT SCOPE AND APPROVAL OF DESIGN FOLLOWING ACTION PURSUANT TO THE CALIFORNIA ENVIRONMENTAL QUALITY ACT, CLINICAL SCIENCES BUILDING SEISMIC RETROFIT AND RENOVATION PROJECT, SAN FRANCISCO CAMPUS**

A. The Committee recommends that:

   (1) The 2014-15 Budget for Capital Improvements and the Capital Improvement Program be amended as follows:

   From: San Francisco: Clinical Sciences Building Seismic Retrofit and Renovation – preliminary plans – $2.4 million funded from campus funds.

   To: San Francisco: Clinical Sciences Building Seismic Retrofit and Renovation – preliminary plans and working drawings – $8,016,000 to be funded from campus funds ($5,216,000), and external financing serviced by State appropriations under the AB 94 mechanism ($2.8 million).
(2) The scope of the Clinical Sciences Building (CSB) Seismic Retrofit and Renovation project shall include:

a. Seismic retrofit and replacement of the building systems.

b. Renovation of 107,600 gross square feet (GSF) of existing CSB, and minor additions totaling 3,000 GSF to CSB at the sixth and seventh floors because of the seismic retrofit work.

B. Following review and consideration of the environmental consequences of the proposed Clinical Sciences Building Seismic Retrofit and Renovation project as required by the California Environmental Quality Act, including any written information addressing this item received by the Office of the Secretary and Chief of Staff no less than 24 hours in advance of the beginning of this Regents meeting, testimony or written materials presented to the Regents during the scheduled public comment period, and the item presentation, the Committee reports its:

(1) Determination that the project qualifies for both a Class 1 and Class 31 categorical exemption in accordance with the California Environmental Quality Act.

(2) Approval of the design of the Clinical Sciences Building Seismic Retrofit and Renovation Project, San Francisco campus.

3. AMENDMENT OF THE BUDGET AND SCOPE AND APPROVAL OF DESIGN FOLLOWING ACTION PURSUANT TO CALIFORNIA ENVIRONMENTAL QUALITY ACT, SAN JOAQUIN APARTMENTS, SANTA BARBARA CAMPUS

A. The Committee recommends that:

(1) The 2014-15 Budget for Capital Improvements and the Capital Improvement Program be amended as follows:

From: Santa Barbara: San Joaquin Apartments – preliminary plans, working drawings, and construction – $175 million to be funded from housing auxiliary reserves ($7.76 million) and external financing ($167.24 million).

To: Santa Barbara: San Joaquin Apartments – preliminary plans, working drawings, and construction – $182,544,000 to be funded from housing auxiliary reserves ($15,304,000) and external financing ($167.24 million).

(2) The additional scope of the San Joaquin Apartments project augmentation shall include construction of a new dining commons, general site
improvements, landscaping, recreation courts, and approximately nine service and accessibility parking spaces and approximately 760 bicycle parking spaces.

B. Following review and consideration of the environmental consequences of the proposed San Joaquin Apartments project, as required by the California Environmental Quality Act, including any written information addressing this item received by the Office of the Secretary and Chief of Staff no less than 24 hours in advance of the beginning of this Regents meeting, testimony or written materials presented to the Regents during the scheduled public comment period, and the item presentation, the Committee reports its:

(1) Finding that the project’s Environmental Impact Report and Mitigation Monitoring and Report Program and Findings certified in January 2014 included the dining commons and site improvements, and thus no additional analysis is required pursuant to the California Environmental Quality Act.

(2) Approval of the design of the dining commons and site improvements in the San Joaquin Apartments project, Santa Barbara Campus.

(3) Authorization of the President of the University or her designee to modify the design, if required, in response to comments received from the California Coastal Commission, provided that any substantial changes in design as described in the approval would be brought to the Regents for consideration.

C. The Committee recommends that the President be authorized to execute all documents necessary in connection with the above.

4. AMENDMENT OF THE BUDGET AND SCOPE, JACOBS MEDICAL CENTER, SAN DIEGO CAMPUS

The Committee recommends that:

A. The 2014-15 Budget for Capital Improvements and the Capital Improvement Program be amended as follows:

From: San Diego: UCSD East Campus Bed Tower – preliminary plans, working drawings, construction and equipment – $839.36 million to be funded from external financing ($500 million), gifts ($131 million), hospital reserves ($104.36 million), Children’s Hospital bonds ($69 million), and capitalized leases ($35 million).

To: San Diego: UCSD Jacobs Medical Center – preliminary plans, working drawings, construction and equipment – $859.36 million to be funded from external financing ($500 million), gifts ($131 million), hospital
reserves ($124.36 million), Children’s Hospital bonds ($69 million), and capitalized leases ($35 million).

B. The additional scope of the UCSD Jacobs Medical Center project augmentation shall include building out approximately 8,220 assignable square feet (ASF) of shelled space in the new bed tower and renovating approximately 1,700 ASF of space in the existing Thornton Hospital.

C. The President of the University be authorized to execute all documents necessary in connection with the above.
APPENDIX B

SEWER MAPS
Overflow Notification Procedures

When an overflow is detected:

- Immediately notify proper supervisor
- 8:00 am to 4:00 pm, Monday-Friday: Notify EH&S for all spills at 858-534-3660
  After hours: Call 858-534-HELP (4357) and Police Dispatch will alert proper after-hours responders

Determine extent of spill—see definitions on page 8

- Category 1 SSOs that are 1,000 gallons or greater that result in a discharge to a surface water, and Category 1 SSOs that are 1,000 gallons or greater that result in a discharge to, and are not fully recovered from, a storm drain
- Spill occurs where public contact is likely
- Category 1 and Category 2 SSOs
- Category 3 SSOs and all other spills
- SSOs that have 50,000 gallons or greater spilled to surface waters

Notify the California Office of Emergency Services (OES) at 800-852-7550 within the first 2 hours

Draft reports shall be submitted to the CIWQS Online SSO Database within 3 business days of becoming aware of the SSO

Enter an electronic certified report to CIWQS† within 30 calendar days from the end of the month in which the spill occurred

Final reports shall be certified through the CIWQS Online SSO Database within 15 calendar days the end date of the SSO

Category 3 SSOs and all other spills

Enter an SSO Technical Report to CIWQS within 45 calendar days of the SSO end date

Continue with Category 1 spill protocol.

†California Integrated Water Quality System – If CIWQS is not available, you must FAX to San Diego Regional Water Quality Control Board: Fax 858-571-6972

If you have any questions about the contents of this OERP Field Guide, please contact Valerie Fanning at (858) 534-9695 or vfanning@ucsd.edu
Date of Spill: _______________________________________________________________________
What time was FM Notified: ________________________________________ AM/PM
What time did FM Arrive on the Scene: ____________________________ AM/PM
What time was the SSO Cleared: ________________________________ AM/PM
Who Initially Reported the Spill (name): ______________________________
Telephone Number: ___________________________________________ (NA if information is not available)
Who is filling out this SSO Report Form (name and phone): ______________________________

Exact Location of Spill: _______________________________________________________________________
Exact Latitude: __________________________ Exact Longitude: __________________________

Estimated spill start date/time: ____________ (MM/DD/YY) ________ (AM/PM)
Estimated spill end date/time: ____________ (MM/DD/YY) ________ (AM/PM)
Estimated spill volume: _________________ gal Spill rate: _________________ gal/min
Estimated volume of spill recovered: _________________ gal

How was recovered volume determined? ________________________________________________
Was a picture taken? YES NO

Spill Dimensions: _______________________________________________________________________

What method was used to estimate spill volume? (circle all that apply)
Eyeball Method Calculations from Spill Dimensions Duration and Flow Rate
Open Channel Spill Estimation Drop Bucket Method Calculations Based on Pipe Size
Flow from Vent or Pick Holes Flow around Manhole Cover Flow from Manhole w/o a Cover

Refer to Volume Estimation forms to document spill dimensions, shapes and other information.

Cause of spill (options on back): _________________________________________________
Where are the spill appear points? (options on back): ______________________________________

Where did the failure occur? (options on back): ______________________________________
Did spill discharge to surface waters? YES NO
If yes, what volume? __________________________ Gal
Estimated spill volume recovered from surface water _________________ Gal

Did the spill reach a storm drain system? YES NO
If yes, was the volume fully recovered? YES NO
If the volume was not fully recovered, what volume was recovered? _________________ Gal

Did the spill discharge to land? YES NO
Estimated spill volume recovered from discharge to land (do not include water for clean-up): ____ Gal

Final spill destination (circle all that apply):
Beach Building/Structure Paved Surface Unpaved Surface
Storm Drain Street Curb/Gutter Surface Water
Other: ____________________________________________________________________________

Spill response and corrective actions taken (circle all that apply/ more on back side):
Cleaned up Contained all or portion of spill Inspected sewer using CCTV
Restored Flow Returned all or portion of spill to sanitary sewer system Mitigated Effects of Spill
Other: ____________________________________________________________________________
Work Order Numbers:

Additional Notes and Documentation

Were any surface waters or drinking water sources impacted? If so, which ones? (please describe any other discharge points associated with the SSO event including how many there were and the locations of each):

Cause of spill:
- Air relief valve (ARV) Failure
- Blow-off Valve (BOV) Failure
- Construction Diversion Failure
- CS Maintenance Caused Spill/ Damage
- Damage by others not related to CS
- Construction/ Maintenance (specify type below)
- Debris from Construction
- Debris from Lateral
- Debris- General
- Debris- Rags
- Flow exceeded capacity (Separate CS only)
- Grease Deposition (FOG)
- Inappropriate discharge to CS
- Natural Disaster
- Non-Dispersibles
- Operator Error
- Other (specify)
- Pipe Structural Problem/ Failure Installation
- Pump Station Failure- Controls
- Pump Station Failure- Mechanical
- Pump station Failure- Lower
- Rainfall Exceeded Design, I and I (Separate CS Only)
- Root Intrusion
- Siphon Failure
- Surcharged Pipe (Combined CS Only)
- Vandalism

Where did failure occur:
- Air relief valve (ARV)
- Blow- off Valve (BOV)
- Force Main
- Gravity Mainline
- Lower Lateral (Public)
- Manhole
- Other (specify below)
- Pump Station- Controls
- Pump Station- Mechanical
- Pump Station- Power
- Siphon
- Upper Lateral (public)

Spill Response Activities Taken (circle all that apply):
- Cleaned- Up
- Mitigated Effects of Spill
- Contained all or Portion of Spill
- Other (specify below)
- Restored Flow
- Returned all of Spill to Sanitary Sewer System
- Property Owner Notified
- Other Enforcement Agency Notified

Spill Corrective Action Taken (circle all that apply):
- Added Sewer to Preventative Maintenance Program
- Adjusted Schedule/ Method of Preventative Maintenance
- Enforcement Action Against FOG Source
- Inspected Sewer Using CCTV to Determine Cause
- Other (specify below)
- Plan rehabilitation or replacement of sewer
- Repaired Facilities or Replaced Defect
Overflow Emergency Response Plan

Dispatch Responsibility

When a call is received from the public, dispatch personnel obtain:

- Time and date of call
- Specific location of possible overflow
- Description of problem
- Caller’s name and call back number

First Responder Assessment of Overflow

**Always Remember…**

- Use appropriate **Personal Protective Equipment**
- Use appropriate **safety precautionary measures**

<table>
<thead>
<tr>
<th>When?</th>
<th>Assessment Steps</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immediately</td>
<td>Assess failure of equipment or overflow release</td>
</tr>
<tr>
<td>Immediately</td>
<td>Assess if overflow left UC San Diego property</td>
</tr>
<tr>
<td>If needed</td>
<td>Call for assistance</td>
</tr>
<tr>
<td>After primary assessment</td>
<td>Obtain necessary equipment to respond to spill (e.g. sandbags, waddles, bypass pumps, emergency generators, etc.)</td>
</tr>
<tr>
<td>If spill too large to be adequately controlled</td>
<td>Call outside contractor</td>
</tr>
<tr>
<td>If there is a suspicious substance (e.g. oil sheen, foam)</td>
<td>Coordinate with UCSD EH&amp;S hazardous materials response</td>
</tr>
<tr>
<td>If there is a suspicious odor (e.g. gasoline)</td>
<td>Coordinate with UCSD EH&amp;S hazardous materials response</td>
</tr>
</tbody>
</table>
Overflow Correction, Containment, and Clean-up

<table>
<thead>
<tr>
<th>Always…</th>
<th>If applicable…</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protect water bodies and storm drains by diverting flow away from streets and paved areas</td>
<td>If failure is at a lift station, take the malfunctioning pump off line</td>
</tr>
<tr>
<td>Determine location and cause of overflow</td>
<td>Secure the affected area and post warning signs (also see “Traffic and Crowd Control” below)</td>
</tr>
<tr>
<td>Implement appropriate corrective actions (e.g. sandbags, waddles, emergency generators, bypass pumps, etc.)</td>
<td>Sample as necessary (coordinate with the San Diego County Department Environmental Health Services)*</td>
</tr>
<tr>
<td>Clean and sanitize affected area(s)</td>
<td></td>
</tr>
<tr>
<td>Finalize the incident documentation</td>
<td></td>
</tr>
<tr>
<td>Review overall response with Responding Parties</td>
<td></td>
</tr>
</tbody>
</table>

*Sampling methodology needs to be consistent with the requirements outlined in the SSO Sampling Protocol

Traffic and Crowd Control

If spill happens in an area with a public access road or where the spill may come into contact with the public:

**Traffic/ Crowd Control Recommendations**

- Set up cones and warning signs
- Set up warning signs to inform public of hazards
- Close affected entrances and exits from facilities
- Perform lane closures as necessary
- Use caution tape and barricades to prevent public access
- Inform UCSD Police of any law enforcement necessary for roadway closures/ traffic control
Overflow Notification Procedures

When an overflow is detected:

1. **Immediately notify proper supervisor**
2. **8:00 am to 4:00 pm, Monday - Friday:** Notify EH&ES for all spills at 858-534-3660
   After hours: Call 858-534-HELP (4357) and Police Dispatch will alert proper after-hours responders
3. **Determine extent of spill—see definitions on page 8**
4. **Category 1 SSOs that are 1,000 gallons or greater** that result in a discharge to a surface water, and Category 1 SSOs that are **1,000 gallons or greater** that result in a discharge to, and are not fully recovered from, a storm drain
   - Notify the California Office of Emergency Services (OES) at 800-852-7550 within the **first 2 hours**
   - Continue with Category 1 spill protocol.

5. **Category 1 and Category 2 SSOs**
   - Spill occurs where **public contact** is likely
   - Draft reports shall be submitted to the CIWQS Online SSO Database **within 3 business days** of becoming aware of the SSO
   - Final reports shall be certified through the CIWQS Online SSO Database **within 15 calendar days** the end date of the SSO

6. **Category 3 SSOs and all other spills**
   - Enter an **electronic certified report** to CIWQS within 30 calendar days from the end of the month in which the spill occurred
   - Enter an SSO Technical Report to CIWQS **within 45 calendar days** of the SSO end date

7. **SSOs that have 50,000 gallons or greater** spilled to surface waters

---

*California Integrated Water Quality System – If CIWQS is not available, you must FAX to San Diego Regional Water Quality Control Board: Fax 858-571-6972

If you have any questions about the contents of this OERP Field Guide, please contact Valerie Fanning at (858) 534-9695 or vfanning@ucsd.edu
## Emergency Contact List

<table>
<thead>
<tr>
<th>Agency/ Official</th>
<th>Agency Contact</th>
<th>Reason(s) to Notify</th>
<th>When to Notify</th>
</tr>
</thead>
<tbody>
<tr>
<td>UCSD Environment, Health, and Safety</td>
<td>858-534-3660</td>
<td>Any sewage spill</td>
<td>Immediately</td>
</tr>
<tr>
<td>California Office of Emergency Services (OES)</td>
<td>800-852-7550 Or 916-845-8911</td>
<td>Category 1 SSOs that are <strong>1,000 gallons or greater</strong> that result in a discharge to a surface water, and Category 1 SSOs that are <strong>1,000 gallons or greater</strong> that result in a discharge to, and are not fully recovered from, a storm drain</td>
<td>Within 2 hours of detection</td>
</tr>
<tr>
<td>California Department of Fish and Wildlife</td>
<td>858-467-4201</td>
<td>Sewage spill entered waterway(s)</td>
<td>As soon as practicable</td>
</tr>
<tr>
<td>Regional Water Quality Control Board</td>
<td>858-637-5581</td>
<td>Violation of discharge prohibition</td>
<td>As soon as practicable</td>
</tr>
<tr>
<td>San Diego County Department of Environmental Health</td>
<td>858-495-5579</td>
<td>Violation of discharge prohibition</td>
<td>As soon as practicable</td>
</tr>
</tbody>
</table>

## Contractor List for Additional Response

- J&M Keystone Inc. (800) 368-2757
- Affordable Pipeline Services (858) 689-4000
- NRC Environmental Services (800) 337-7455
- Clean Harbors Environmental, Inc. (800) 645-8265
- Atlas Pumping (800) 491-7867
SSO Category Definitions

Category 1- Discharges of untreated or partially treated wastewater of any volume resulting from an enrollee’s sanitary sewer system failure or flow condition that:

   a. Reach surface water and/or reach a drainage channel tributary to a surface water; or
   b. Reach an MS4 (Storm Drain System) and are not fully captured and returned to the sanitary sewer system or not otherwise captured and disposed of properly. Any volume of wastewater not recovered from the MS4 is considered to have reached surface water unless the storm drain system discharges to a dedicated storm water or groundwater infiltration basin (e.g., infiltration pit, percolation pond).

Category 2- Discharges of untreated or partially treated wastewater greater than or equal to 1,000 gallons resulting from an enrollee’s sanitary sewer system failure or flow condition that does not reach a surface water, a drainage channel, or the MS4 (if the entire SSO volume discharged to the storm drain system is fully recovered and disposed of properly, then a Category 3).

Category 3- All other discharges of untreated or partially treated waste water resulting from an enrollee’s sanitary sewer system failure or flow condition.
Water Quality Monitoring Requirements

The SSO Water Quality Monitoring Program is meant to assess impacts from SSOs to surface waters in which 50,000 gallons or greater are spilled into surface waters.

- Utilize SSO Sampling Protocol shown below*
- When sampling account for spill travel time in the surface water.
- All samples being tested for indicators are to be analyzed in an accredited or certified laboratory.
- When analyzing samples, only use monitoring instruments and devices that have been properly maintained and calibrated.
- Within 48 hours of the enrollee becoming aware of the SSO, water quality sampling must, at a minimum, test for ammonia and appropriate bacterial indicators.

SSO Sampling Protocol*

For SSOs that reach surface waters, monitoring and testing activities may include:

- Obtaining water quality samples.
- Gathering samples upstream and downstream of any location where SSO reached surface water.
- Logging the sample location, time, and water temperature on the chain of custody form.
- Creating a map of the sample locations so that follow-up testing can be performed.
- Collecting samples at the location where the SSO entered the water. When taking the sample, submerge the bottle below the surface of the water with the cap on. Once the bottle is under the surface, remove the cap and fill the bottle. Gloves should be worn while sampling to avoid infecting any open wounds.
- Analyzing the sample for at least the following constituents:
  - Ammonia Nitrogen;
  - Biochemical Oxygen Demand (BOD);
  - Dissolved Oxygen (DO);
  - Enterococci, Total Fecal Coliform;
  - Total Suspended Solids (TSS); and
  - Additional sampling requirements as imposed by the SDRWQCB (could include VSS, pH, turbidity, Oil & Grease, etc.)

*Sampling protocol taken from SD County SSMP and CA SWRCB website
Estimating Spill Volume

Methods:

1) Eyeball Estimate and Kick Bucket Method

Best for small spills 100 gallons or less, that can be visually approximated

2) Estimating Volume Based on Spill Dimensions

Larger spills that are no longer flowing and can be measured

3) Duration and Flow Rate

Good for large spills where dimensions cannot be measured, but the flow rate can be calculated

4) Open Channel Spill Estimation

Good for large flowing spills where dimensions cannot be measured, but the flow rate can be calculated

5) Drop Bucket Method

Best for small flowing spills where the entire flow can be captured in a bucket

6) Calculating Spill Volume Based on Pipe Size

Best for spills where pipe and flow information is known

7) Determine Spill Volume From Vent or Pick Holes

Best for spills originating from vent or pick holes in the ground/ manhole

8) Determine the Volume of a Spill from Around the Rim of a Manhole Cover

Best for spills originating from a manhole with a cover

9) Determine the Volume of a Spill from a Manhole without a Cover

Best for spills originating from a manhole without a cover
Method 1: Eyeball Estimate
(http://sdcounty.ca.gov/dpw/engineer//engineerpdf/SewerSystemMgtPlan_Jun2010.pdf)

- Imagine amount of water that would spill from bucket or barrel
- Bucket = 5 gal, barrel = 50 gal
- This method is only useful for spills up to 100 gal

- Kick Bucket Method
(http://www.slocity.org/utilities/download/cweapresentations2012/sept2012spillestimating.pptx2.pdf)
  - Can be used to estimate the volume of spills on asphalt, concrete, sloped surfaces, and flat surfaces.
  - One gallon spill on a sloped surface. (left: spill only, right: spill with a point of reference)
  - Two gallon vs. one gallon spill on a slope (two gallons left, one gallon right).
- Two gallon spill on a very slight slope.

- Five gallon spill - forty feet in length.
### Method 1: Eyeball Method and Kick the Bucket Volume Measurement Worksheet

**Manhole/ Pipe Number:**

**Date:**

**Name of Estimator:**

**Telephone:**

**Exact Location of Spill (address):**

**Exact Latitude:**

**Exact Longitude:**

**Picture taken?**

YES  NO

**Dimensions of spill (in ft. or paces):**

<table>
<thead>
<tr>
<th>Length</th>
<th>Width</th>
<th>Depth</th>
</tr>
</thead>
</table>

**Shape of spill:**

RECTANGLE  TRIANGLE  CIRCLE

**Estimated spill volume:**

gal

**Estimated volume of spill recovered:**

gal

**Please sketch spill with dimensions:**

---

**Was the measurement tested?**

YES  NO

**Was a reference image used?**

YES  NO

**Additional Notes and Documentation (please describe how the spill volume was calculated/ measured.):**

---

---

---

---
Method 2: Estimating Volume Based on Spill Dimensions
(http://sdcounty.ca.gov/dpw/engineer//engineerpdf/SewerSystemMgtPlan_Jun2010.pdf)

- If not raining, the shape, dimensions, and depth of spill may be used to estimate volume
  1. Sketch shape of spill
  2. Measure/pace off dimensions
  3. Measure depth in several locations; take average
  4. Convert all dimensions to feet
  5. Calculate area of spill based on approximate shape:
     - Rectangle: Area = length x width
     - Circle: Area = diameter x diameter x 0.785
     - Triangle: Area = base x height x 0.5
  6. Multiply area x depth to get volume
  7. Multiply volume x 7.5 to convert into gallons

- Using a spill footprint to get surface area and sample sketch

- Calculate average depth to get a depth measurement
Method 2: Spill Volume Estimation Worksheet Based on Spill Dimensions

Manhole/ Pipe Number: ______________
Date: ________________________________

Name of Estimator: __________________ Telephone: _____________________________

Exact Location of Spill (address): _________________________________
Exact Latitude: ____________________ Exact Longitude: _________________________

Picture taken? YES NO

Shape of spill: RECTANGLE TRIANGLE CIRCLE

Please sketch spill in zones with dimensions:

Area # 1_____________________________________________________ % Wet__________
Area # 2_____________________________________________________ % Wet__________
Area # 3_____________________________________________________ % Wet__________
Area # 4_____________________________________________________ % Wet__________
Area # 5_____________________________________________________ % Wet__________
Area # 6_____________________________________________________ % Wet__________

Please Calculate Average Depth:

Estimated Spill Surface Area __________________square feet
Number of Depth Measurements Used _____________ Average Depth ________inches
Estimated Spill Volume: ______________________gal
Estimated volume of spill recovered: ____________gal

Additional Notes and Documentation (please describe how the spill volume was calculated/ measured. Please show calculations.):

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
Method 3: Duration and Flow Rate

- If area/depth is impossible to measure, use duration and flow rate estimate.

Duration: time elapsed from start to end of SSO

- To estimate start time, use one of the following methods:
  1. Compare hourly data on a downstream flow meter to find changes in flow. Typically the daily flow peaks are flattened by the loss of flow.
  2. Observe conditions at the SSO site. Initially there will be limited deposits of grease and toilet paper. After a few days to a week, the grease forms a light colored residue. After a few weeks to a month the grease turns dark. In both cases the quantity of toilet paper and other materials of sewage origin increase in amount. These changes with time can be used to estimate the start time in the absence of other information.

- To estimate end time, observe the “blow down” that occurs when blockage is removed or observe “blow down” on flow meters.

Flow Rate: average flow left in sewer system during time SSO stopped, estimated using one of the following three ways:

  1. Use data from flow meter to estimate flow rate for the spill (better for large SSOs).
  2. Estimate based on up-stream connections. Once the location of the SSO is known, the number of upstream connections can be determined from system maps. Multiply the number of connections by 200 to 250 gallons per day per connection, or 8 to 10 gallons per hour per connection, or other flow rates that are consistent with the City’s data for its connections.
    - Example: 22 upstream connections x 9 gallons per hour per connection = 198 gallons per hour / 60 minutes per hour = 3.3 gallons per minute. Multiply the gallons per minute times the number of minutes the spill occurred for the total volume of the spill.
  3. Refer to the Reference Sheet for Estimating Sewer Spills to estimate flow rate based on images obtained from tests below.

Volume of SSO is the product of the duration (in hours or days) x flow rate (in gallons per hour or gallons per day). (ft³ = 7.48 gal)
Method 3: Spill Volume Estimation Based on Duration and Flow Rate

Manhole/ Pipe Number: _______________
Date: __________________________________________________________________

Name of Estimator: _______________ Telephone: ____________________________

Exact Location of Spill (address): __________________________________________
Exact Latitude: _______________ Exact Longitude: ___________________________

Estimated spill start date/time: __________ (MM/DD/YY) ________ (HR:MIN)
Estimated spill end date/time: __________ (MM/DD/YY) ________ (HR:MIN)
Spill duration: __________ min
Flow rate: _______________ gal/min
How was flow rate determined? Flow Meter Upstream Connections Reference Sheet

Estimated spill volume (duration x flow rate): _______________ gal
Estimated volume of spill recovered: _______________ gal

Picture taken? YES NO

Dimensions of spill (in ft. or paces): Length __________ Width ________ Depth ________
Shape of spill: RECTANGLE TRIANGLE CIRCLE

Please Sketch Spill with Dimensions:

Additional Notes and Documentation (please describe how the spill volume was calculated/ measured. Please show calculations.):
_________________________________________________________________________
_________________________________________________________________________
_________________________________________________________________________
_________________________________________________________________________
_________________________________________________________________________
Method 4: Open Channel Spill Estimation
(http://www.ocsd.com/Home/ShowDocument?id=12868)

- For ditches, channels, gutters, etc.
  1. Measure the cross sectional dimensions (to determine the area) of the channel and determine the velocity of the flow.
  2. Velocity can be measured by dropping a floating object into the flow and timing the object over a measured distance.
  3. Flow (Q), ft³/sec = Velocity (V), ft/sec X Area (A), ft²
  4. Flow times duration equals amount of spill
  5. Multiply by 7.48 (number of gallons in one cubic foot) to convert to gallons
Method 4: Spill Volume Estimation Based on Open Channel Spills

Manhole/ Pipe Number: ______________
Date: ______________

Name of Estimator: ______________ Telephone: ______________

Exact Location of Spill (address): __________________________________________

Exact Latitude: ______________ Exact Longitude: ______________

Estimated spill start date/time: ___________ (MM/DD/YY) ________ (HR:MIN)
Estimated spill end date/time: ___________ (MM/DD/YY) ________ (HR:MIN)

Spill duration: ___________ min  Velocity: ___________ ft./min

Cross Sectional Area of Ditch, Channel, or Gutter:
Depth: ___________ ft.  Width: ___________ ft.  Area: ___________ ft²

Flow rate (velocity x Area): ___________ ft³/min

Estimated spill volume (duration x flow rate x 7.48): ___________ gal
Estimated volume of spill recovered: ___________ gal

Picture taken?  YES  NO

Dimensions of spill (in ft. or paces): Length ___________ Width ___________ Depth ___________

Shape of spill:  RECTANGLE  TRIANGLE  CIRCLE

Please Sketch Spill with Dimensions:

Additional Notes and Documentation (please describe how the spill volume was calculated/ measured. Please show calculations.):

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

UC San Diego
Overflow Emergency Response Field Guide  APPENDIX C-21
**Method 5: Drop Bucket Method**

(\url{http://www.ocsd.com/Home/ShowDocument?id=12868})

- Can be used for small spills where the entire flow stream can be captured in a bucket.
  1. Place bucket so that it captures the entire flow stream and time how long it takes to fill the bucket.
  2. Dividing the volume of the bucket (in gallons) by the elapsed time to fill the bucket (in minutes) equals the flow rate in gallons per minute (gpm).
    - Example: If it takes 30 seconds to fill a 5-gallon bucket and the spill has occurred for 20 minutes the total spill volume would be 200 gallons (5gal/.5min = 10gpm \times 20\text{min} = 200\text{gal}).
Method 5: Spill Volume Estimation Based on Drop Bucket Method

Manhole/ Pipe Number: _______________
Date: ________________________________

Name of Estimator: ____________________ Telephone: ____________________________

Exact Location of Spill (address): ________________________________
Exact Latitude: ________________ Exact Longitude: ________________

Volume of bucket used to determine volume: ________________ gal
Time needed for flow to fill bucket: ________________________ min
Flow rate: ________________ gal/min
Spill duration: ________________ min

Estimated spill volume (duration x flow rate): ________________ gal
Estimated volume of spill recovered: ________________ gal

Picture taken? YES NO

Dimensions of spill (in ft. or paces): Length _________ Width _________ Depth _________
Shape of spill: RECTANGLE TRIANGLE CIRCLE

Please Sketch Spill with Dimensions:

Additional Notes and Documentation (please describe how the spill volume was calculated/ measured. Please show calculations.):

_________________________________________________________________________
_________________________________________________________________________
_________________________________________________________________________
_________________________________________________________________________
_________________________________________________________________________
Method 6: Calculating Spill Volume Based on Pipe Size
(http://www.ocsd.com/Home/ShowDocument?id=12868)

- Volume of a spill can be measured using the flow rate in a pipe before and after the blockage is clear.
  1. Need to know the size of the pipe
  2. Need a flow calculation chart
  3. Measure the depth of the flow down-stream of the blockage
  4. Measure the depth of flow again after the blockage has been cleared and flow stabilized
  5. Use flow calculation chart to determine the flow rate of the pipe

<table>
<thead>
<tr>
<th>Flow Depth Inches</th>
<th>8&quot; PIPE</th>
<th>10&quot; PIPE</th>
<th>12&quot; PIPE</th>
<th>15&quot; PIPE</th>
<th>18&quot; PIPE</th>
<th>21&quot; PIPE</th>
<th>24&quot; PIPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>20 GPM</td>
<td>25 GPM</td>
<td>30 GPM</td>
<td>35 GPM</td>
<td>40 GPM</td>
<td>45 GPM</td>
<td>50 GPM</td>
</tr>
<tr>
<td>2</td>
<td>60</td>
<td>70</td>
<td>85</td>
<td>95</td>
<td>105</td>
<td>125</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>110</td>
<td>125</td>
<td>135</td>
<td>150</td>
<td>175</td>
<td>185</td>
<td>210</td>
</tr>
<tr>
<td>4</td>
<td>180</td>
<td>200</td>
<td>225</td>
<td>235</td>
<td>250</td>
<td>285</td>
<td>320</td>
</tr>
<tr>
<td>5</td>
<td>190</td>
<td>240</td>
<td>290</td>
<td>315</td>
<td>380</td>
<td>445</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>260</td>
<td>310</td>
<td>355</td>
<td>415</td>
<td>455</td>
<td>500</td>
<td>555</td>
</tr>
<tr>
<td>7</td>
<td>290</td>
<td>370</td>
<td>425</td>
<td>495</td>
<td>570</td>
<td>620</td>
<td>665</td>
</tr>
<tr>
<td>8</td>
<td>320</td>
<td>430</td>
<td>600</td>
<td>690</td>
<td>800</td>
<td>890</td>
<td>985</td>
</tr>
<tr>
<td>9</td>
<td>490</td>
<td>625</td>
<td>775</td>
<td>905</td>
<td>1005</td>
<td>1120</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>695</td>
<td>870</td>
<td>1020</td>
<td>1135</td>
<td>1260</td>
<td>1410</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>715</td>
<td>935</td>
<td>1150</td>
<td>1230</td>
<td>1415</td>
<td>1580</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>1070</td>
<td>1345</td>
<td>1520</td>
<td>1690</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>1105</td>
<td>1425</td>
<td>1650</td>
<td>1850</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>1495</td>
<td>1760</td>
<td>1990</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>1550</td>
<td>1880</td>
<td>2110</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>1595</td>
<td>1980</td>
<td>2285</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td></td>
<td>2050</td>
<td>2410</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td></td>
<td>2115</td>
<td>2530</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td></td>
<td>2160</td>
<td>2630</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
<td>2270</td>
<td>2700</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td></td>
<td>2375</td>
<td>2755</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: The chart assumes V = 2.0 feet per second and n = 0.013

1. Record the time that spill was reported.
2. Record the flow, in inches, downstream of the spill or blockage. Record the pipe size in inches.
3. Determine flow rate in gallons per minute (GPM) using chart above.
4. Re-establish flow and allow stabilizing. Record the time flow stabilizes and the depth of flow, in inches. Determine flow rate using chart above.
5. Subtract the flow rate calculated in #2 from the flow rate calculated in #3.
6. Multiply the result of #4 by the minutes elapsed from notification to stopping overflow.

- Example: A Spill was reported at 3:50 pm and was corrected at 6:25 pm on the same day. Calculate the volume of the spill for a 10 inch pipeline with 1 inch of downstream flow before correction and 5 inches of flow after correction and stabilization of flow.

Time reported – 3:50 pm
Time Corrected – 6:25 pm
Duration of spill – 2:35 or 155 minutes
Depth of flow before – 1 inch
Depth of flow after – 5 inches

From Chart:
Flow after stabilization = 240 gpm
Flow downstream before = 25 gpm
Net Flow = 240 -25 = 215 gpm
SPILL VOLUME = 215 (gpm) X 155 (m) = 33,325 gallons
**Method 6: Spill Volume Estimation Based on Pipe Size**

Manhole/ Pipe Number: ___________________

Date: _________________________________

Name of Estimator: ____________________ Telephone: _______________________

Exact Location of Spill (address): _____________________________________________

Exact Latitude: ____________________ Exact Longitude: _______________________

Estimated spill start date/time: _______ (MM/DD/YY) _________ (HR:MIN)

Estimated spill end date/time: _______ (MM/DD/YY) _________ (HR:MIN)

Spill duration: _______________ min

Pipe size: __________ inches

Depth of flow before correction: __________ inches

Depth of flow after correction: __________ inches

<table>
<thead>
<tr>
<th>Flow Depth</th>
<th>8” PIPE 25 GPM</th>
<th>10” PIPE 30 GPM</th>
<th>12” PIPE 35 GPM</th>
<th>15” PIPE 40 GPM</th>
<th>18” PIPE 45 GPM</th>
<th>21” PIPE 50 GPM</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>60</td>
<td>80</td>
<td>95</td>
<td>105</td>
<td>125</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>110</td>
<td>125</td>
<td>139</td>
<td>150</td>
<td>165</td>
<td>185</td>
</tr>
<tr>
<td>3</td>
<td>160</td>
<td>200</td>
<td>235</td>
<td>260</td>
<td>286</td>
<td>320</td>
</tr>
<tr>
<td>4</td>
<td>210</td>
<td>240</td>
<td>280</td>
<td>315</td>
<td>350</td>
<td>380</td>
</tr>
<tr>
<td>5</td>
<td>260</td>
<td>310</td>
<td>360</td>
<td>415</td>
<td>455</td>
<td>500</td>
</tr>
<tr>
<td>6</td>
<td>310</td>
<td>370</td>
<td>425</td>
<td>496</td>
<td>570</td>
<td>662</td>
</tr>
<tr>
<td>7</td>
<td>360</td>
<td>430</td>
<td>500</td>
<td>600</td>
<td>680</td>
<td>760</td>
</tr>
<tr>
<td>8</td>
<td>410</td>
<td>490</td>
<td>625</td>
<td>775</td>
<td>905</td>
<td>1006</td>
</tr>
<tr>
<td>9</td>
<td>465</td>
<td>625</td>
<td>850</td>
<td>1020</td>
<td>1135</td>
<td>1275</td>
</tr>
<tr>
<td>10</td>
<td>520</td>
<td>875</td>
<td>1070</td>
<td>1345</td>
<td>1520</td>
<td>1680</td>
</tr>
<tr>
<td>11</td>
<td>585</td>
<td>1105</td>
<td>1425</td>
<td>1740</td>
<td>1920</td>
<td>2110</td>
</tr>
<tr>
<td>12</td>
<td>650</td>
<td>1595</td>
<td>2265</td>
<td>2920</td>
<td>3280</td>
<td>3760</td>
</tr>
<tr>
<td>13</td>
<td>720</td>
<td>2530</td>
<td>3280</td>
<td>4110</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>790</td>
<td>2630</td>
<td>3330</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>860</td>
<td>2730</td>
<td>3430</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>930</td>
<td>2830</td>
<td>3530</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>1000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>1085</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>1170</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>1260</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>1350</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>1440</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>1530</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>1620</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Flow before stabilization (from chart): __________ gpm

Flow after stabilization (from chart): __________ gpm

Net flow (after- before stabilization): __________ gpm

Estimated spill volume (duration x net flow): __________ gal

Estimated volume of spill recovered: __________ gal

Picture taken? YES NO

Dimensions of spill (in ft. or paces): Length ________ Width ________ Depth ________

Shape of spill: RECTANGLE TRIANGLE CIRCLE

Additional Notes and Documentation (please describe how the spill volume was calculated/ measured. Please show calculations.): ____________________________

_________________________________________________________________

_________________________________________________________________

_________________________________________________________________

_________________________________________________________________
Method 7: Determine Spill Volume from Vent or Pick Holes
(http://www.ocsd.com/Home/ShowDocument?id=12868)

- If spill is coming from vent or pick holes:
  1. Count the number of holes
  2. Measure the height of the water exiting from the holes

3. Refer to pick hole chart to determine the volume from each hole (below)
4. Multiply the number of holes times the flow rate times the duration of the spill to determine spill volume

```
Estimated Flows thru Manhole Cover Vent Holes and Pick Holes for SSO estimating

<table>
<thead>
<tr>
<th>Hole Dia.</th>
<th>Area</th>
<th>Coeff. of Vol.</th>
<th>Coeff. Of Cont.</th>
<th>C</th>
<th>Water Ht</th>
<th>Water Ht</th>
<th>Water Ht</th>
<th>Q</th>
<th>Q</th>
<th>Q</th>
</tr>
</thead>
<tbody>
<tr>
<td>inches</td>
<td>sq. ft.</td>
<td>Cv</td>
<td>Cv x Cc</td>
<td>inches</td>
<td>inches</td>
<td>feet</td>
<td>cfs</td>
<td>gpm</td>
<td>gph</td>
<td></td>
</tr>
<tr>
<td>Vent Hole</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.50</td>
<td>0.00136</td>
<td>0.945</td>
<td>0.70</td>
<td>0.662</td>
<td>1/16 in</td>
<td>0.005</td>
<td>0.005</td>
<td>0.005</td>
<td>0.23</td>
<td>14</td>
</tr>
<tr>
<td>0.50</td>
<td>0.00136</td>
<td>0.945</td>
<td>0.70</td>
<td>0.662</td>
<td>1/8 in</td>
<td>0.125</td>
<td>0.010</td>
<td>0.007</td>
<td>0.33</td>
<td>20</td>
</tr>
<tr>
<td>0.50</td>
<td>0.00136</td>
<td>0.945</td>
<td>0.70</td>
<td>0.662</td>
<td>1/4 in</td>
<td>0.250</td>
<td>0.021</td>
<td>0.010</td>
<td>0.47</td>
<td>28</td>
</tr>
<tr>
<td>0.50</td>
<td>0.00136</td>
<td>0.945</td>
<td>0.70</td>
<td>0.662</td>
<td>one half</td>
<td>0.500</td>
<td>0.042</td>
<td>0.015</td>
<td>0.66</td>
<td>40</td>
</tr>
<tr>
<td>0.50</td>
<td>0.00136</td>
<td>0.945</td>
<td>0.70</td>
<td>0.662</td>
<td>3/4 thn</td>
<td>0.750</td>
<td>0.063</td>
<td>0.018</td>
<td>0.81</td>
<td>49</td>
</tr>
<tr>
<td>0.50</td>
<td>0.00136</td>
<td>0.945</td>
<td>0.70</td>
<td>0.662</td>
<td>1 inch</td>
<td>1.000</td>
<td>0.083</td>
<td>0.021</td>
<td>0.94</td>
<td>66</td>
</tr>
<tr>
<td>Vent Hole</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.75</td>
<td>0.00307</td>
<td>0.955</td>
<td>0.67</td>
<td>0.640</td>
<td>1/16 in</td>
<td>0.005</td>
<td>0.005</td>
<td>0.001</td>
<td>0.51</td>
<td>31</td>
</tr>
<tr>
<td>0.75</td>
<td>0.00307</td>
<td>0.955</td>
<td>0.67</td>
<td>0.640</td>
<td>1/8 in</td>
<td>0.125</td>
<td>0.010</td>
<td>0.006</td>
<td>0.72</td>
<td>43</td>
</tr>
<tr>
<td>0.75</td>
<td>0.00307</td>
<td>0.955</td>
<td>0.67</td>
<td>0.640</td>
<td>1/4 in</td>
<td>0.250</td>
<td>0.021</td>
<td>0.023</td>
<td>1.02</td>
<td>61</td>
</tr>
<tr>
<td>0.75</td>
<td>0.00307</td>
<td>0.955</td>
<td>0.67</td>
<td>0.640</td>
<td>one half</td>
<td>0.500</td>
<td>0.042</td>
<td>0.032</td>
<td>1.44</td>
<td>87</td>
</tr>
<tr>
<td>0.75</td>
<td>0.00307</td>
<td>0.955</td>
<td>0.67</td>
<td>0.640</td>
<td>3/4 thn</td>
<td>0.750</td>
<td>0.063</td>
<td>0.039</td>
<td>1.77</td>
<td>106</td>
</tr>
<tr>
<td>0.75</td>
<td>0.00307</td>
<td>0.955</td>
<td>0.67</td>
<td>0.640</td>
<td>1 inch</td>
<td>1.000</td>
<td>0.083</td>
<td>0.045</td>
<td>2.04</td>
<td>122</td>
</tr>
<tr>
<td>Vent Hole</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.00</td>
<td>0.00645</td>
<td>0.960</td>
<td>0.65</td>
<td>0.524</td>
<td>1/16 in</td>
<td>0.005</td>
<td>0.005</td>
<td>0.002</td>
<td>0.88</td>
<td>53</td>
</tr>
<tr>
<td>1.00</td>
<td>0.00645</td>
<td>0.960</td>
<td>0.65</td>
<td>0.524</td>
<td>1/8 in</td>
<td>0.125</td>
<td>0.010</td>
<td>0.008</td>
<td>1.25</td>
<td>75</td>
</tr>
<tr>
<td>1.00</td>
<td>0.00645</td>
<td>0.960</td>
<td>0.65</td>
<td>0.524</td>
<td>1/4 in</td>
<td>0.250</td>
<td>0.021</td>
<td>0.009</td>
<td>1.77</td>
<td>106</td>
</tr>
<tr>
<td>1.00</td>
<td>0.00645</td>
<td>0.960</td>
<td>0.65</td>
<td>0.524</td>
<td>one half</td>
<td>0.500</td>
<td>0.042</td>
<td>0.006</td>
<td>2.50</td>
<td>150</td>
</tr>
<tr>
<td>1.00</td>
<td>0.00645</td>
<td>0.960</td>
<td>0.65</td>
<td>0.524</td>
<td>3/4 thn</td>
<td>0.750</td>
<td>0.063</td>
<td>0.006</td>
<td>3.06</td>
<td>184</td>
</tr>
<tr>
<td>1.00</td>
<td>0.00645</td>
<td>0.960</td>
<td>0.65</td>
<td>0.524</td>
<td>1 inch</td>
<td>1.000</td>
<td>0.083</td>
<td>0.007</td>
<td>3.54</td>
<td>212</td>
</tr>
<tr>
<td>Pick Hole</td>
<td>semicircular area</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.00</td>
<td>0.00273</td>
<td>0.950</td>
<td>0.65</td>
<td>0.224</td>
<td>1/16 in</td>
<td>0.005</td>
<td>0.005</td>
<td>0.001</td>
<td>0.44</td>
<td>27</td>
</tr>
<tr>
<td>1.00</td>
<td>0.00273</td>
<td>0.950</td>
<td>0.65</td>
<td>0.224</td>
<td>1/8 in</td>
<td>0.125</td>
<td>0.010</td>
<td>0.004</td>
<td>0.63</td>
<td>38</td>
</tr>
<tr>
<td>1.00</td>
<td>0.00273</td>
<td>0.950</td>
<td>0.65</td>
<td>0.224</td>
<td>1/4 in</td>
<td>0.250</td>
<td>0.021</td>
<td>0.002</td>
<td>0.89</td>
<td>53</td>
</tr>
<tr>
<td>1.00</td>
<td>0.00273</td>
<td>0.950</td>
<td>0.65</td>
<td>0.224</td>
<td>one half</td>
<td>0.500</td>
<td>0.042</td>
<td>0.002</td>
<td>1.25</td>
<td>75</td>
</tr>
<tr>
<td>1.00</td>
<td>0.00273</td>
<td>0.950</td>
<td>0.65</td>
<td>0.224</td>
<td>3/4 thn</td>
<td>0.750</td>
<td>0.063</td>
<td>0.004</td>
<td>1.53</td>
<td>92</td>
</tr>
<tr>
<td>1.00</td>
<td>0.00273</td>
<td>0.950</td>
<td>0.65</td>
<td>0.224</td>
<td>1 inch</td>
<td>1.000</td>
<td>0.083</td>
<td>0.003</td>
<td>1.77</td>
<td>106</td>
</tr>
<tr>
<td>1.00</td>
<td>0.00273</td>
<td>0.950</td>
<td>0.65</td>
<td>0.224</td>
<td>1-1/2 inch</td>
<td>1.500</td>
<td>0.125</td>
<td>0.004</td>
<td>2.17</td>
<td>130</td>
</tr>
<tr>
<td>1.00</td>
<td>0.00273</td>
<td>0.950</td>
<td>0.65</td>
<td>0.224</td>
<td>2 inches</td>
<td>2.000</td>
<td>0.167</td>
<td>0.006</td>
<td>2.51</td>
<td>150</td>
</tr>
</tbody>
</table>
```
Method 7: Spill Volume Estimation Based on Spill from Vent or Pick Holes

Manhole/ Pipe Number: ______________
Date: ________________________________

Name of Estimator: __________________ Telephone: __________________

Exact Location of Spill (address): _______________________________
Exact Latitude: _______________ Exact Longitude: _______________

Estimated spill start date/time: ___________ (MM/DD/YY) ________ (HR:MIN)
Estimated spill end date/time: ___________ (MM/DD/YY) ________ (HR:MIN)
Spill duration: ________________ min

Number of Pick of Vent Holes: ________________
Size of Pick or Vent Holes (diameter): ______________ inches
Height of water exiting pick or vent holes: __________ inches
Flow rate from each hole (chart): _________________ gal/min

Estimated spill volume (duration x flow rate x number of holes): ________________ gal
Estimated volume of spill recovered: ________________ gal

Picture taken? YES NO
Dimensions of spill (in ft. or paces): Length _________ Width _________ Depth _________
Shape of spill: RECTANGLE TRIANGLE CIRCLE

Please Sketch Spill with Dimensions:

Additional Notes and Documentation (please describe how the spill volume was calculated/ measured. Please show calculations.):

_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
Method 8: Determine the Volume of a Spill from Around the Rim of a Manhole Cover
(http://www.ocsd.com/Home/ShowDocument?id=12868)

- If manhole cover is in place:
  1. Find the area of the gap (diameter of the cover from the diameter of the inside of the ring)
  2. Find the velocity (ft/sec) of the spill by measuring the height of the sewage plume
  3. Area times the velocity (ft/sec) times the duration of the spill times (448.8 for gpm/cfs) equals the total spill volume in gallons

### Table ‘A’

<table>
<thead>
<tr>
<th>Height of spout above M/H rim (H in inches)</th>
<th>SSO Flow Q (gpm)</th>
<th>Min. Sewer size in which these flows are possible</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4</td>
<td>0.001</td>
<td></td>
</tr>
<tr>
<td>3/4</td>
<td>0.004</td>
<td></td>
</tr>
<tr>
<td>1/2</td>
<td>0.008</td>
<td></td>
</tr>
<tr>
<td>3/3</td>
<td>0.013</td>
<td></td>
</tr>
<tr>
<td>1/3</td>
<td>0.018</td>
<td></td>
</tr>
<tr>
<td>1/2</td>
<td>0.024</td>
<td></td>
</tr>
<tr>
<td>3/3</td>
<td>0.030</td>
<td></td>
</tr>
<tr>
<td>1/2</td>
<td>0.037</td>
<td></td>
</tr>
<tr>
<td>3/4</td>
<td>0.045</td>
<td></td>
</tr>
<tr>
<td>1/2</td>
<td>0.054</td>
<td></td>
</tr>
<tr>
<td>3/3</td>
<td>0.063</td>
<td></td>
</tr>
<tr>
<td>1/2</td>
<td>0.077</td>
<td></td>
</tr>
<tr>
<td>3/4</td>
<td>0.092</td>
<td></td>
</tr>
<tr>
<td>1/2</td>
<td>0.107</td>
<td></td>
</tr>
<tr>
<td>3/3</td>
<td>0.125</td>
<td></td>
</tr>
<tr>
<td>4/4</td>
<td>0.145</td>
<td></td>
</tr>
<tr>
<td>1/2</td>
<td>0.168</td>
<td></td>
</tr>
<tr>
<td>3/3</td>
<td>0.189</td>
<td></td>
</tr>
<tr>
<td>1/2</td>
<td>0.214</td>
<td></td>
</tr>
<tr>
<td>3/4</td>
<td>0.240</td>
<td></td>
</tr>
<tr>
<td>1/2</td>
<td>0.266</td>
<td></td>
</tr>
<tr>
<td>3/4</td>
<td>0.284</td>
<td></td>
</tr>
<tr>
<td>1/2</td>
<td>0.308</td>
<td></td>
</tr>
<tr>
<td>3/4</td>
<td>0.322</td>
<td></td>
</tr>
<tr>
<td>1/2</td>
<td>0.352</td>
<td></td>
</tr>
<tr>
<td>3/4</td>
<td>0.382</td>
<td></td>
</tr>
<tr>
<td>1/2</td>
<td>0.412</td>
<td></td>
</tr>
<tr>
<td>3/4</td>
<td>0.444</td>
<td></td>
</tr>
<tr>
<td>1/2</td>
<td>0.470</td>
<td></td>
</tr>
<tr>
<td>3/4</td>
<td>0.509</td>
<td></td>
</tr>
<tr>
<td>1/2</td>
<td>0.543</td>
<td></td>
</tr>
<tr>
<td>3/4</td>
<td>0.588</td>
<td></td>
</tr>
<tr>
<td>1/2</td>
<td>0.613</td>
<td></td>
</tr>
<tr>
<td>3/4</td>
<td>0.649</td>
<td></td>
</tr>
<tr>
<td>1/2</td>
<td>0.686</td>
<td></td>
</tr>
<tr>
<td>3/4</td>
<td>0.723</td>
<td></td>
</tr>
<tr>
<td>1/2</td>
<td>0.761</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Height of spout above M/H rim (H in inches)</th>
<th>SSO Flow Q (gpm)</th>
<th>Min. Sewer size in which these flows are possible</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4</td>
<td>0.002</td>
<td></td>
</tr>
<tr>
<td>3/4</td>
<td>0.012</td>
<td></td>
</tr>
<tr>
<td>1/2</td>
<td>0.019</td>
<td></td>
</tr>
<tr>
<td>3/3</td>
<td>0.028</td>
<td></td>
</tr>
<tr>
<td>1/3</td>
<td>0.035</td>
<td></td>
</tr>
<tr>
<td>1/2</td>
<td>0.044</td>
<td></td>
</tr>
<tr>
<td>3/3</td>
<td>0.054</td>
<td></td>
</tr>
<tr>
<td>1/2</td>
<td>0.065</td>
<td></td>
</tr>
<tr>
<td>3/3</td>
<td>0.079</td>
<td></td>
</tr>
<tr>
<td>1/2</td>
<td>0.096</td>
<td></td>
</tr>
<tr>
<td>3/3</td>
<td>0.113</td>
<td></td>
</tr>
<tr>
<td>1/2</td>
<td>0.134</td>
<td></td>
</tr>
<tr>
<td>3/3</td>
<td>0.157</td>
<td></td>
</tr>
<tr>
<td>1/2</td>
<td>0.173</td>
<td></td>
</tr>
<tr>
<td>3/3</td>
<td>0.193</td>
<td></td>
</tr>
<tr>
<td>1/2</td>
<td>0.211</td>
<td></td>
</tr>
<tr>
<td>3/3</td>
<td>0.229</td>
<td></td>
</tr>
<tr>
<td>1/2</td>
<td>0.243</td>
<td></td>
</tr>
<tr>
<td>3/3</td>
<td>0.260</td>
<td></td>
</tr>
<tr>
<td>1/2</td>
<td>0.275</td>
<td></td>
</tr>
<tr>
<td>3/3</td>
<td>0.292</td>
<td></td>
</tr>
<tr>
<td>1/2</td>
<td>0.309</td>
<td></td>
</tr>
<tr>
<td>3/3</td>
<td>0.327</td>
<td></td>
</tr>
<tr>
<td>1/2</td>
<td>0.346</td>
<td></td>
</tr>
<tr>
<td>3/3</td>
<td>0.364</td>
<td></td>
</tr>
<tr>
<td>1/2</td>
<td>0.383</td>
<td></td>
</tr>
<tr>
<td>3/3</td>
<td>0.401</td>
<td></td>
</tr>
<tr>
<td>1/2</td>
<td>0.420</td>
<td></td>
</tr>
<tr>
<td>3/3</td>
<td>0.438</td>
<td></td>
</tr>
<tr>
<td>1/2</td>
<td>0.456</td>
<td></td>
</tr>
<tr>
<td>3/3</td>
<td>0.474</td>
<td></td>
</tr>
<tr>
<td>1/2</td>
<td>0.493</td>
<td></td>
</tr>
<tr>
<td>3/3</td>
<td>0.512</td>
<td></td>
</tr>
<tr>
<td>1/2</td>
<td>0.530</td>
<td></td>
</tr>
<tr>
<td>3/3</td>
<td>0.548</td>
<td></td>
</tr>
<tr>
<td>1/2</td>
<td>0.566</td>
<td></td>
</tr>
<tr>
<td>3/3</td>
<td>0.585</td>
<td></td>
</tr>
<tr>
<td>1/2</td>
<td>0.603</td>
<td></td>
</tr>
<tr>
<td>3/3</td>
<td>0.621</td>
<td></td>
</tr>
<tr>
<td>1/2</td>
<td>0.639</td>
<td></td>
</tr>
<tr>
<td>3/3</td>
<td>0.657</td>
<td></td>
</tr>
<tr>
<td>1/2</td>
<td>0.675</td>
<td></td>
</tr>
<tr>
<td>3/3</td>
<td>0.694</td>
<td></td>
</tr>
<tr>
<td>1/2</td>
<td>0.713</td>
<td></td>
</tr>
<tr>
<td>3/3</td>
<td>0.731</td>
<td></td>
</tr>
<tr>
<td>1/2</td>
<td>0.749</td>
<td></td>
</tr>
<tr>
<td>3/3</td>
<td>0.768</td>
<td></td>
</tr>
<tr>
<td>1/2</td>
<td>0.786</td>
<td></td>
</tr>
<tr>
<td>3/3</td>
<td>0.805</td>
<td></td>
</tr>
<tr>
<td>1/2</td>
<td>0.823</td>
<td></td>
</tr>
<tr>
<td>3/3</td>
<td>0.841</td>
<td></td>
</tr>
<tr>
<td>1/2</td>
<td>0.859</td>
<td></td>
</tr>
<tr>
<td>3/3</td>
<td>0.877</td>
<td></td>
</tr>
<tr>
<td>1/2</td>
<td>0.896</td>
<td></td>
</tr>
<tr>
<td>3/3</td>
<td>0.914</td>
<td></td>
</tr>
<tr>
<td>1/2</td>
<td>0.932</td>
<td></td>
</tr>
<tr>
<td>3/3</td>
<td>0.950</td>
<td></td>
</tr>
<tr>
<td>1/2</td>
<td>0.968</td>
<td></td>
</tr>
<tr>
<td>3/3</td>
<td>0.987</td>
<td></td>
</tr>
<tr>
<td>1/2</td>
<td>1.005</td>
<td></td>
</tr>
<tr>
<td>3/3</td>
<td>1.023</td>
<td></td>
</tr>
<tr>
<td>1/2</td>
<td>1.040</td>
<td></td>
</tr>
<tr>
<td>3/3</td>
<td>1.058</td>
<td></td>
</tr>
<tr>
<td>1/2</td>
<td>1.076</td>
<td></td>
</tr>
<tr>
<td>3/3</td>
<td>1.093</td>
<td></td>
</tr>
<tr>
<td>1/2</td>
<td>1.111</td>
<td></td>
</tr>
</tbody>
</table>
### Method 8: Spill Volume Estimation Based on Spill Around the Rim of a Manhole Cover that is in Place

**Manhole/ Pipe Number:** ________________

**Date:** ________________

**Name of Estimator:** ________________

**Telephone:** ________________

**Exact Location of Spill (address):** __________________________________________

**Exact Latitude:** ________________ **Exact Longitude:** ________________

**Estimated spill start date/time:** ____________ (MM/DD/YY) ________ (HR:MIN)

**Estimated spill end date/time:** ____________ (MM/DD/YY) ________ (HR:MIN)

**Spill duration:** ____________ min

**Area of gap (diameter of the cover from the diameter of the inside ring):** ________ ft²

**Height of sewage plume:** ____________ inches

**Velocity (chart):** ________________ ft./sec

**Estimated spill volume (duration min x velocity ft./sec x area ft² x 448.8 gpm/cfs):**

_________________________ gal

**Estimated volume of spill recovered:** ________________ gal

**Picture taken?**

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
</table>

**Was reference photo used?**

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
</table>

**Dimensions of spill (in ft. or paces):** Length ____________ Width ____________ Depth ____________

**Shape of spill:** RECTANGLE TRIANGLE CIRCLE

Please Sketch Spill with Dimensions:

---

**Additional Notes and Documentation (please describe how the spill volume was calculated/ measured. Please show calculations.):**

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
Method 9: Determine the Volume of a Spill from a Manhole without a Cover
(https://www.ocsd.com/Home/ShowDocument?id=12868)

- If manhole cover is not in place:
  1. Find the area of the manhole opening (Area = 3.14 R²)
  2. Find the velocity (ft/sec) of the spill by measuring the height of the sewage plume
  3. Area times the velocity (ft/sec) times the duration of the spill times (448.8 gpm/cfs) equals the total spill volume in gallons.

![Diagram of manhole and sewage plume]

<table>
<thead>
<tr>
<th>TABLE 'B' ESTIMATED SSO FLOW OUT OF M/H WITH COVER REMOVED</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>24&quot; FRAME</strong></td>
</tr>
<tr>
<td>Water Height above M/H frame</td>
</tr>
<tr>
<td>M/H frame</td>
</tr>
<tr>
<td>Hi in inches</td>
</tr>
<tr>
<td>1/8</td>
</tr>
<tr>
<td>1/4</td>
</tr>
<tr>
<td>1/2</td>
</tr>
<tr>
<td>5/8</td>
</tr>
<tr>
<td>3/4</td>
</tr>
<tr>
<td>7/8</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>1 1/8</td>
</tr>
<tr>
<td>1 1/4</td>
</tr>
<tr>
<td>1 3/8</td>
</tr>
<tr>
<td>1 1/2</td>
</tr>
<tr>
<td>1 5/8</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>2 1/8</td>
</tr>
<tr>
<td>2 1/4</td>
</tr>
<tr>
<td>2 3/8</td>
</tr>
<tr>
<td>2 1/2</td>
</tr>
<tr>
<td>2 5/8</td>
</tr>
<tr>
<td>2 3/4</td>
</tr>
<tr>
<td>2 7/8</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>3 1/8</td>
</tr>
<tr>
<td>3 1/4</td>
</tr>
<tr>
<td>3 3/8</td>
</tr>
<tr>
<td>3 1/2</td>
</tr>
<tr>
<td>3 5/8</td>
</tr>
<tr>
<td>3 3/4</td>
</tr>
<tr>
<td>3 7/8</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>4 1/8</td>
</tr>
<tr>
<td>4 1/4</td>
</tr>
<tr>
<td>4 3/8</td>
</tr>
</tbody>
</table>
Method 9: Spill Volume Estimation Based on Spill from a Manhole without a Cover

Manhole/ Pipe Number: _______________
Date: _____________________________

Name of Estimator: _______________ Telephone: ___________________________

Exact Location of Spill (address): ___________________________________________
Exact Latitude: _______________ Exact Longitude: ____________________________

Estimated spill start date/time: _____________ (MM/DD/YY) ___________ (HR:MIN)
Estimated spill end date/time: _____________ (MM/DD/YY) ___________ (HR:MIN)
Spill duration: _____________ min

Area of manhole opening (A=3.14 r^2): _____________ ft^2
Height of sewage plume: _____________ inches
Velocity (chart): _______________ ft./sec

Estimated spill volume (duration min x velocity ft./sec x area ft^2 x 448.8 gpm/cfs):
_______________ gal
Estimated volume of spill recovered: _______________gal

Picture taken? YES NO
Was reference photo used? YES NO
Dimensions of spill (in ft. or paces): Length ________ Width ________ Depth ________
Shape of spill: RECTANGLE TRIANGLE CIRCLE

Please Sketch Spill with Dimensions:

__________________________________________________________

Additional Notes and Documentation (please describe how the spill volume was calculated/ measured. Please show calculations.):
_____________________________________________________________________________________
_____________________________________________________________________________________
_____________________________________________________________________________________
_____________________________________________________________________________________
_____________________________________________________________________________________
_____________________________________________________________________________________
CAPITAL IMPROVEMENT PROJECTS, REPAIR AND REHABILITATION, AND SYSTEM EVALUATION SCHEDULE
<table>
<thead>
<tr>
<th>IFIS INDEX</th>
<th>WO NUM</th>
<th>WO OR PO ISSUE DATE</th>
<th>DESCRIPTION</th>
<th>Project Budget for Open Work Orders and Purchase Orders</th>
<th>Maximo Charges (12/5/2013)</th>
<th>Charges against Work Order (last updated 2013)</th>
<th>PM</th>
<th>Project Completed? (Y/N)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CWUSELP W30100803</td>
<td>2/8/2010</td>
<td>Sewer line McGill Hall: Camera, inspect &amp; repair or reline sewer line</td>
<td>200,000.00</td>
<td></td>
<td>200,000.00</td>
<td>FD&amp;C/Fabian</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>CWUSELP W30100804 W4587</td>
<td>2/8/2010</td>
<td>Sewer line Galbraith Hall: Camera, inspect &amp; repair or reline sewer line</td>
<td>100,000.00</td>
<td>100,000.00</td>
<td>100,000.00</td>
<td>FD&amp;C/Fabian</td>
<td>N</td>
<td>In Progress</td>
</tr>
<tr>
<td>3</td>
<td>CWUSELP W30100805 W4586</td>
<td>2/8/2010</td>
<td>Sewer line Matthews Lane: Inspect &amp; camera sewr line. NTE $20K</td>
<td>20,000.00</td>
<td>20,000.00</td>
<td>20,000.00</td>
<td>FD&amp;C/Fabian</td>
<td>N</td>
<td>Requesting another $70,000</td>
</tr>
<tr>
<td>4</td>
<td>CWUSELP 1000161238 FDC01354</td>
<td>4/7/2010</td>
<td>Geisel Library (northeast) sewer re-lining, repair, or replacement</td>
<td>100,000.00</td>
<td>3,783.50</td>
<td>96,217.00</td>
<td>FM/Wilson</td>
<td>N</td>
<td>Will create FD&amp;C JN &amp; Proceed</td>
</tr>
<tr>
<td>5</td>
<td>CWUSELP W9923796</td>
<td>12/18/2012</td>
<td>Upgrade Biology Field Station CSC Pump Station</td>
<td>200,000.00</td>
<td></td>
<td></td>
<td>FM/ Moret</td>
<td>N</td>
<td>In progress</td>
</tr>
<tr>
<td>6</td>
<td>FD&amp;C</td>
<td>4/25/2012</td>
<td>Faculty Club to Price Center Turnaround Sewer Lining</td>
<td>75,000.00</td>
<td></td>
<td></td>
<td>FD&amp;C/Fabian</td>
<td>N</td>
<td>Update Job Number and Proceeding with Project</td>
</tr>
<tr>
<td>7</td>
<td>CWUSELP 100260977</td>
<td>5/29/2012</td>
<td>Pepper Canyon Sewer PM (6 months preventative maintenance)</td>
<td>20,000.00</td>
<td></td>
<td></td>
<td>FM</td>
<td>N</td>
<td>Ongoing PM</td>
</tr>
<tr>
<td>8</td>
<td>CWUSELP W9917789</td>
<td>5/24/2012</td>
<td>Routine CCTV and cleaning of sewer lines and manholes</td>
<td>105,000.00</td>
<td>104,176.50</td>
<td>104,176.50</td>
<td>FM/Wilson</td>
<td>N</td>
<td>In progress. Twelve miles done.</td>
</tr>
<tr>
<td>9</td>
<td>CWUSELP W4786</td>
<td>5/1/2012</td>
<td>Pepper Canyon Sewer Improvement - Repair of segment south of Sixth</td>
<td>100,000.00</td>
<td>72,000.00</td>
<td>72,000.00</td>
<td>FD&amp;C/Moore</td>
<td>N</td>
<td>In Progress</td>
</tr>
<tr>
<td>10</td>
<td>CWUSELP W9915548</td>
<td>3/22/2012</td>
<td>Installation of solar panels for four sanitary sewer meters</td>
<td>20,000.00</td>
<td></td>
<td></td>
<td>FM/ Gibson</td>
<td>N</td>
<td>In progress. Design review board. FM Work order CWUSEEP.</td>
</tr>
<tr>
<td>11</td>
<td>CWUSELP 1000251331</td>
<td>3/6/2012</td>
<td>York Hall acid pit marble chip removal</td>
<td>10,000.00</td>
<td></td>
<td></td>
<td>FM/ Moret</td>
<td>N</td>
<td>In progress</td>
</tr>
<tr>
<td>12</td>
<td>CWUSELP 1000251330</td>
<td>3/6/2012</td>
<td>NSB acid pit marble chip removal</td>
<td>10,000.00</td>
<td></td>
<td></td>
<td>FM/ Moret</td>
<td>N</td>
<td>In progress</td>
</tr>
<tr>
<td>13</td>
<td>CWUSELP W9914771</td>
<td>2/28/2012</td>
<td>Muir Sewer Relining Project</td>
<td></td>
<td></td>
<td></td>
<td>FD&amp;C/Bartsch</td>
<td>N</td>
<td>In progress. Will be combined with Tioga Hall Project.</td>
</tr>
<tr>
<td>14</td>
<td>CWUSELP W9909923</td>
<td>10/5/2011</td>
<td>Rain Water Diversion Accuator for Fleet Services washrack</td>
<td>75,000.00</td>
<td></td>
<td></td>
<td>FM/ Denhart</td>
<td>N</td>
<td>In progress</td>
</tr>
<tr>
<td>15</td>
<td>CWUSELP W4732</td>
<td>11/25/2012</td>
<td>Repair Coast Apartment Sewer Line Sag</td>
<td>90,000.00</td>
<td>15,500.00</td>
<td>15,500.00</td>
<td>FD&amp;C/Bartsch</td>
<td>N</td>
<td>In progress</td>
</tr>
<tr>
<td>16</td>
<td>CWUSELP W4749</td>
<td>1/30/2013</td>
<td>SIO sewer flow study, includes repairs of sewer laterals</td>
<td>45,000.00</td>
<td></td>
<td></td>
<td>FD&amp;C/Fabian</td>
<td>N</td>
<td>In progress. Experimental aquarium done.</td>
</tr>
<tr>
<td>17</td>
<td>CWUSELP W4685</td>
<td>5/1/2012</td>
<td>Video Sewer Lines</td>
<td>50,000.00</td>
<td></td>
<td></td>
<td>FD&amp;C/ Rowland</td>
<td>N</td>
<td>In progress</td>
</tr>
<tr>
<td>18</td>
<td>CWUSELP W9938896</td>
<td>10/26/2013</td>
<td>CMME and NSB Acid PIt Removal</td>
<td>26,542.00</td>
<td></td>
<td></td>
<td>FM/Moret</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>CWUSELP</td>
<td>11/1/2013</td>
<td>York Hall acid pit marble chip removal</td>
<td>30,000.00</td>
<td></td>
<td></td>
<td>FM/Moret</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>CWUSELP 4835</td>
<td>11/6/2013</td>
<td>Economics Building Sewer Repair</td>
<td>93,600.00</td>
<td>93,600.00</td>
<td>93,600.00</td>
<td>FD&amp;C/Eriko</td>
<td>N</td>
<td>In Progress. See Email Sewer and SD repair funding request 11/6/2013</td>
</tr>
<tr>
<td>21</td>
<td>CWUSELP 4836</td>
<td>11/6/2013</td>
<td>Urey Hall Sewer Repair</td>
<td>89,500.00</td>
<td>89,500.00</td>
<td>89,500.00</td>
<td>FD&amp;C/Eriko</td>
<td>N</td>
<td>In Progress. See Email Sewer and SD repair funding request 11/6/2013</td>
</tr>
<tr>
<td>IFIS INDEX</td>
<td>WO NUM</td>
<td>WO OR PO ISSUE DATE</td>
<td>DESCRIPTION</td>
<td>Project Budget for Open Work Orders and Purchase Orders</td>
<td>Maximo Charges (12/5/2013)</td>
<td>PM</td>
<td>Project Completed? (Y/N)</td>
<td>Notes</td>
<td></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>22</td>
<td>CWUSELP</td>
<td>W30089639</td>
<td>3/16/2009 SIO: Installation of backflows, irrigation meters</td>
<td>250,000.00</td>
<td>285,907.49</td>
<td>FM/Moret</td>
<td>N</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>CWUSELP</td>
<td>W4842</td>
<td>1/6/2014 Student Center B Additional Lining for Porter's Pub Project</td>
<td>90,200.00</td>
<td></td>
<td>FM/Moret</td>
<td>N</td>
<td>See Funding request email from 1/6/2014</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>CWUSELP</td>
<td>W9942047</td>
<td>1/29/2014 Acid Pit Cleaning at Stein Clinical Research Building Area</td>
<td>10,000.00</td>
<td></td>
<td>FM/Moret</td>
<td>N</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>CWUSELP</td>
<td>W9942048</td>
<td>1/29/2014 Acid Pit Cleaning and Marble Chip Removal at Urey Hall</td>
<td>20,000.00</td>
<td></td>
<td>FM/Moret</td>
<td>N</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>CWUSELP</td>
<td>W9942049</td>
<td>1/29/2014 Muir Biology Building Manhole Repair</td>
<td>10,000.00</td>
<td></td>
<td>FM/Moret</td>
<td>N</td>
<td></td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>CWUSELP</td>
<td>W9943673</td>
<td>3/4/2014 6131 Engineering Building Unit I (EBU1) Acid Pit Cleaning and Marble Chip Removal</td>
<td>25,000.00</td>
<td></td>
<td>FM/Moret</td>
<td>N</td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>CWUSELP</td>
<td>W9943674</td>
<td>3/4/2014 Warren Lecture Hall Acid Pit Cleaning and Marble Chip Removal</td>
<td>15,000.00</td>
<td></td>
<td>FM/Moret</td>
<td>N</td>
<td></td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>CWUSELP</td>
<td>W9943675</td>
<td>3/4/2014 Center for Magnetic Recording Research Area Acid Pit Cleaning and Marble Chip Removal</td>
<td>15,000.00</td>
<td></td>
<td>FM/Moret</td>
<td>N</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>CWUSELP</td>
<td>W9946053</td>
<td>4/21/2014 Installation of 23 water mizers and replacement of 99 valves</td>
<td>75,000.00</td>
<td></td>
<td>FM/Haines</td>
<td>N</td>
<td></td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>CWUSELP</td>
<td>4868</td>
<td>5/1/2014 Campus Utility CCTV and Cleaning</td>
<td>50,000.00</td>
<td></td>
<td>FD&amp;C/Bartsch</td>
<td>N</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>SUBTOTAL 2,019,842.00</strong></td>
<td><strong>107,960.00</strong></td>
<td><strong>772,724.49</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>FUTURE CAPITAL IMPROVEMENT PROJECTS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>CWUSELP</td>
<td></td>
<td>5/1/2012 North Campus Ridgwalk Sewer Replacement</td>
<td>600,000.00</td>
<td></td>
<td>FD&amp;C/Fabian</td>
<td>N</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>CWUSELP</td>
<td>W30100801 FDC01353</td>
<td>2/8/2010 UCTR Sewer line, SHC to Chancellor's Complex: Camera, inspect &amp; repair. Re-route sewer line</td>
<td>250,000.00</td>
<td></td>
<td>FD&amp;C/Fabian</td>
<td>N</td>
<td></td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>CWUSELP</td>
<td></td>
<td>5/1/2012 Epoxy Coating/Lining Manholes 40 per year $5,000 each (20 year project)</td>
<td>200,000.00</td>
<td></td>
<td>FD&amp;C/Fabian</td>
<td>N</td>
<td></td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>CWUSELP</td>
<td></td>
<td>5/1/2012 North Campus Sewer Trunk Lining</td>
<td>593,000.00</td>
<td></td>
<td>FD&amp;C/Fabian</td>
<td>N</td>
<td></td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>CWUSELP</td>
<td></td>
<td>5/1/2012 H&amp;DH Laterals - Repair Cleanouts and repair laterals</td>
<td>300,000.00</td>
<td></td>
<td>FD&amp;C/Fabian</td>
<td>N</td>
<td></td>
<td></td>
</tr>
<tr>
<td>37</td>
<td>CWUSELP</td>
<td></td>
<td>5/1/2012 Villa La Jolla Sewer Lining Repair</td>
<td>250,000.00</td>
<td></td>
<td>FD&amp;C/Fabian</td>
<td>N</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>SUBTOTAL 2,193,000.00</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Repair and Rehabilitation Projects (Completed)

<table>
<thead>
<tr>
<th>IFIS INDEX</th>
<th>WO NUM</th>
<th>WO OR PO ISSUE DATE</th>
<th>DESCRIPTION</th>
<th>Project Budget for Open Work Orders and Purchase Orders</th>
<th>Maximo Charges (12/5/2013)</th>
<th>Charges against Work Order (last updated 2013)</th>
<th>PM</th>
<th>Project Completed? (Y/N)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CWUSELP</td>
<td>W30100799</td>
<td>2/8/2010 Seaweed Canyon Sewer - T46 Section: Camera, inspect and repair or reline segment</td>
<td>22,322.22</td>
<td>22,322.22</td>
<td>FM/Moret</td>
<td>Y</td>
<td>Manhole Repaired</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>CWUSELP</td>
<td>W30100802 W4584</td>
<td>2/8/2010 Sewer line Sequoyah Hall: Camera, inspect &amp; repair or reline sewer line</td>
<td>100,000.00</td>
<td>100,000.00</td>
<td>FD&amp;C/Kobayash</td>
<td>Y</td>
<td>$40k remaining to be transferred back</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>CWUSELP</td>
<td>W30100806</td>
<td>2/8/2010 Sewer line Gilman to Muir: Inspect &amp; camera/repair/reline sewer line, NTE $20K</td>
<td>20,000.00</td>
<td>10,349.06</td>
<td>9,651.00</td>
<td>FM/Wilson</td>
<td>Y</td>
<td>FD&amp;C request--camera inspect 11/1/10</td>
</tr>
<tr>
<td>4</td>
<td>CWUSELP</td>
<td>W30100902</td>
<td>2/10/2010 Sewer line Old USE Credit Union: Inspect, camera, repair/replace blocked sewer line at old USE</td>
<td>12,909.90</td>
<td>12,909.90</td>
<td>FM/Thompson</td>
<td>Y</td>
<td>Work Completed</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>CWUSELP</td>
<td>1000171179</td>
<td>7/8/2010 ECEC Development Center sanitary sewer system inspection/camera and necessary repairs</td>
<td>20,524.42</td>
<td>20,524.42</td>
<td>FM/Gordon McLaughlan</td>
<td>Y</td>
<td>Work Completed</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>FD&amp;C</td>
<td>W4662</td>
<td>2/18/2012 Sanitary sewer relining project near the new housing building on Muir Campus (Tioga Hall)</td>
<td>130,000.00</td>
<td></td>
<td>FD&amp;C/Fabian</td>
<td>Y</td>
<td>Work Completed</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>FD&amp;C</td>
<td>4480</td>
<td>3/16/2012 Gilman Sanitary Sewer Repair (new cage washing facility)</td>
<td>175,000.00</td>
<td></td>
<td>FD&amp;C/Fabian</td>
<td>Y</td>
<td>Work Completed</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>CWUSELP</td>
<td>W4733</td>
<td>5/14/2012 Pepper Canyon Manhole repair</td>
<td>20,000.00</td>
<td></td>
<td>FD&amp;C/Moore</td>
<td>Y</td>
<td>Work Completed</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>CWUSELP</td>
<td>1000251332</td>
<td>3/6/2012 Bonner Hall acid pit marble chip removal</td>
<td>10,000.00</td>
<td></td>
<td>FM/Morel</td>
<td>Y</td>
<td>Work Completed</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>CWUSELP</td>
<td>1000251329</td>
<td>3/6/2012 Pacific Hall acid pit marble chip removal</td>
<td>10,000.00</td>
<td></td>
<td>FM/Morel</td>
<td>Y</td>
<td>Work Completed</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>CWUSELP</td>
<td>FD&amp;C</td>
<td>7/16/2012 Sewer Manhole at Gilman Drive Parking Structure</td>
<td>12,000.00</td>
<td></td>
<td>FD&amp;C/Bartsch</td>
<td>Y</td>
<td>Work Completed</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>CWUSELP</td>
<td>FD&amp;C</td>
<td>7/16/2012 Muir: Expose and raise two buried manholes</td>
<td>25,000.00</td>
<td></td>
<td>FD&amp;C/Bartsch</td>
<td>Y</td>
<td>Work Completed</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>CWUSELP</td>
<td>FD&amp;C</td>
<td>7/16/2012 Repair manhole trough at Scholars Lane</td>
<td>8,500.00</td>
<td></td>
<td>FD&amp;C/Bartsch</td>
<td>Y</td>
<td>Work Completed</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>CWUSELP</td>
<td>W99207764</td>
<td>8/20/2012 Connect sewer line at Super Computer Center Expansion</td>
<td>50,000.00</td>
<td></td>
<td>FD&amp;C/Bartsch</td>
<td>Y</td>
<td>Work Completed</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>CWUSELP</td>
<td>11/14/2013</td>
<td>Main Sewer Line at Hillcrest (CTF) Repair</td>
<td>46,000.00</td>
<td></td>
<td>FD&amp;C/Roland</td>
<td>Y</td>
<td>Work Completed, Money Transferred Back to FM Jan 2014</td>
<td></td>
</tr>
<tr>
<td>IFIS INDEX</td>
<td>WO NUM</td>
<td>WO OR PO ISSUE DATE</td>
<td>DESCRIPTION</td>
<td>Project Budget for Open Work Orders and Purchase Orders</td>
<td>Maximo Charges (12/5/2013)</td>
<td>Charges against Work Order (last updated 2013)</td>
<td>PM</td>
<td>Project Completed? (Y/N)</td>
<td>Notes</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>21</td>
<td>CWUSELP</td>
<td>W4809 8/23/2013</td>
<td>Installation of new sewerline at Porter’s Pub and replacement of line &amp; 2 manholes</td>
<td>97,330.00</td>
<td>95,700.00</td>
<td>FD&amp;C/Bartsch</td>
<td>Y</td>
<td>Completed</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SUBTOTAL</td>
<td>781,420.54</td>
<td>75,550.50</td>
<td>205,351.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>CAPITAL IMPROVEMENT PROJECTS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>FDC3630</td>
<td>966015 9/6/2013</td>
<td>Gilman Trunk Line</td>
<td>450,000.00</td>
<td>FD&amp;C/Moore</td>
<td>Y</td>
<td>Work Completed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>CWUSELP</td>
<td>W9906387 6/20/2011</td>
<td>Repair to UNIEX Sewer Pump Station - University Extension Area</td>
<td>35,000.00</td>
<td>32,084.00</td>
<td>FM/Moret</td>
<td>Y</td>
<td>Work Completed</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SUBTOTAL</td>
<td>1,266,420.54</td>
<td>107,634.50</td>
<td>205,351.00</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX E

STORM DRAIN MAPS
APPENDIX F

CONTINGENCY PLANS FOR UC SAN DIEGO SANITARY SEWER PUMP STATIONS AND FORCE MAINS
Appendix F

Contingency Plans for UC San Diego Sanitary Sewer Pump Stations and Force Mains

Pump Stations

UC San Diego’s sanitary sewer system has 3 pump stations identified as UNEX, Biology Field Station and ERC Housing. The pump stations have redundant pumps, as well as visual and audible alarms. In the event one pump fails the second unit will energize through controls built in the pump station system. In the event of complete failure of either unit, UC San Diego facilities staff will secure the buildings facilities, rest rooms, and kitchens to keep from discharging into these pump stations. UC San Diego also has a contractor on call or on standby (Affordable Pipelines) to respond in the event of an emergency to assist in pumping out the wet well to keep all discharges contained until repairs can be completed.

In the event of a power outage the ERC Housing and the Biology Field pump stations have stationary emergency backup generators that will be used to power the pumps, and the UNEX pump station will be connected to a portable emergency generator or the facility will be shut down until power can be restored.

In case of a pump station overflow or alarm the campus community should contact:

- Facilities Management Customer Relations Help Desk (858) 534-2930
- UC San Diego Police Department (858) 534-4357

The map on the following page identifies the locations of the three pump stations.

Force Mains

In the event of a force main failing, alarms will notify UC San Diego facilities staff. Impacted buildings will be secured to prevent overflows and any discharges will be contained. UC San Diego also has a contractor on call or on standby (Affordable Pipelines) to respond in the event of an emergency to assist in recovering any overflows and evacuating contents of impacted systems to allow for repairs.
APPENDIX G

SEWER SYSTEM MANAGEMENT PLAN
CHANGE LOG
### Appendix G: Sewer System Management Plan Change Log

<table>
<thead>
<tr>
<th>Section Changed</th>
<th>Subsection Changed</th>
<th>Page Changed</th>
<th>Change Made</th>
<th>Date of Change</th>
<th>Author of Change</th>
<th>Who Authorized Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>SSMP Section 1: Goals</td>
<td>Section 1.1: Regulatory Background</td>
<td>Page 1-1</td>
<td>Information regarding the new Revised MRP WQ 2013-0058-EXEC was added to the regulatory background section of the plan. Also historical information about the Revised MRP WQ 2008-002-EXEC was added.</td>
<td>5/9/2014</td>
<td>Monica Esswein</td>
<td>Valerie Fanning</td>
</tr>
<tr>
<td>SSMP Section 1: Goals</td>
<td>Section 1.2: Purpose and Goals of the SSMP</td>
<td>Page 1-1</td>
<td>Effective SSO notification and response procedures were added to the goals of the SSMP.</td>
<td>5/22/2014</td>
<td>Monica Esswein</td>
<td>Valerie Fanning</td>
</tr>
<tr>
<td>SSMP Section 1: Goals</td>
<td>Section 1.3: Clean Water Utility Working Group</td>
<td>Page 1-2</td>
<td>Updated CWUWG responsibilities to include prioritizing and creating Repair and Rehabilitation projects and Capital Improvement Projects.</td>
<td>5/22/2014</td>
<td>Monica Esswein</td>
<td>Valerie Fanning</td>
</tr>
<tr>
<td>SSMP Section 2: Organization</td>
<td>Section 2.5: Sanitary Sewer System Description</td>
<td>Page 2-2</td>
<td>Statement “The remaining 40 percent is lost to irrigation, industrial and other miscellaneous uses.” was added to address potable water flow.</td>
<td>5/30/2014</td>
<td>Monica Esswein</td>
<td>Valerie Fanning</td>
</tr>
<tr>
<td>SSMP Section 2: Organization</td>
<td>Section 2.6: Organizational Chart</td>
<td>Page 2-3</td>
<td>Updated Figure 2-1: Organizational Chart of the SSMP to reflect changes in campus staff and new contact numbers.</td>
<td>5/9/2014</td>
<td>Monica Esswein</td>
<td>Valerie Fanning</td>
</tr>
<tr>
<td>SSMP Section 2: Organization</td>
<td>Section 2.7: Chain of Communication for Reporting SSOs</td>
<td>Page 2-4</td>
<td>Updated Figure 2-2: Chain of Communication for Reporting SSOs chart of the SSMP to reflect changes in the names and phone numbers or required reporting agencies.</td>
<td>5/9/2014</td>
<td>Monica Esswein</td>
<td>Valerie Fanning</td>
</tr>
<tr>
<td>Section Changed</td>
<td>Subsection Changed</td>
<td>Page Changed</td>
<td>Change Made</td>
<td>Date of Change</td>
<td>Author of Change</td>
<td>Who Authorized Change</td>
</tr>
<tr>
<td>-----------------</td>
<td>-------------------</td>
<td>--------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>--------------</td>
<td>------------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td>SSMP Section 4: Operation and Maintenance Program</td>
<td>Section 4.1: Mapping of the Sewer System</td>
<td>Page 4-1</td>
<td>Facilities Information System webpage link and name were updated.</td>
<td>5/22/2014</td>
<td>Monica Esswein</td>
<td>Valerie Fanning</td>
</tr>
<tr>
<td>SSMP Section 4: Operation and Maintenance Program</td>
<td>Section 4.1: Mapping of the Sewer System</td>
<td>Page 4-1</td>
<td>Information about where sewer system and storm water conveyance system maps can be found was added.</td>
<td>5/22/2014</td>
<td>Monica Esswein</td>
<td>Valerie Fanning</td>
</tr>
<tr>
<td>SSMP Section 4: Operation and Maintenance Program</td>
<td>Section 4.3: Rehabilitation and Replacement Plan</td>
<td>Page 4-1</td>
<td>Information regarding EH&amp;S’s record keeping responsibilities and the application of these records in the coordination with FM and FD&amp;C to prioritize campus needs were added. Also reference to Appendix D (CIP, Rehabilitation and Repair, and System Evaluation Schedule) was added.</td>
<td>5/22/2014</td>
<td>Monica Esswein</td>
<td>Valerie Fanning</td>
</tr>
<tr>
<td>SSMP Section 4: Operation and Maintenance Program</td>
<td>Section 4.3.3: Long Term</td>
<td>Page 4-2</td>
<td>Information about Latitude 33 Phase I completion was updated.</td>
<td>5/22/2014</td>
<td>Monica Esswein</td>
<td>Valerie Fanning</td>
</tr>
<tr>
<td>SSMP Section 6: Overflow Emergency Response Plan</td>
<td>SSMP Section 6: Overflow Emergency Response Plan</td>
<td>Page 6-1</td>
<td>Reference to OERP Field Guide (Appendix C) was added to direct readers to detailed information regarding spill notification, response, volume estimation, clean-up and sampling procedures.</td>
<td>5/22/2014</td>
<td>Monica Esswein</td>
<td>Valerie Fanning</td>
</tr>
<tr>
<td>SSMP Section 6: Overflow Emergency Response Plan</td>
<td>Section 6.1: Objective and Purpose</td>
<td>Page 6-1</td>
<td>Added reference to Appendix C (Overflow and Emergency Response Field Guide) for more information regarding detailed notification procedures and emergency contacts to be used in the event of a sewer spill.</td>
<td>5/9/2014</td>
<td>Monica Esswein</td>
<td>Valerie Fanning</td>
</tr>
<tr>
<td>Section Changed</td>
<td>Subsection Changed</td>
<td>Page Changed</td>
<td>Change Made</td>
<td>Date of Change</td>
<td>Author of Change</td>
<td>Who Authorized Change</td>
</tr>
<tr>
<td>------------------------------------------------------</td>
<td>----------------------------------------------------------</td>
<td>----------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>----------------</td>
<td>-------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>SSMP Section 6: Overflow Emergency Response Plan</td>
<td>Section 6.5: Overflow Emergency Response Plan</td>
<td>Page 6-2</td>
<td>Added reference to Appendix C (Overflow and Emergency Response Field Guide) for information about detailed spill response procedures.</td>
<td>5/9/2014</td>
<td>Monica Esswein</td>
<td>Valerie Fanning</td>
</tr>
<tr>
<td>SSMP Section 6: Overflow Emergency Response Plan</td>
<td>Section: 6.7: Dispatch Responsibility</td>
<td>Page 6-2</td>
<td>Updated the information that dispatch is supposed to collect from callers to meet new requirements outlined in WQ 2013-0058-EXEC.</td>
<td>5/9/2014</td>
<td>Monica Esswein</td>
<td>Valerie Fanning</td>
</tr>
<tr>
<td>SSMP Section 6: Overflow Emergency Response Plan</td>
<td>Section 6.9: Overflow Correction, Containment, and Clean-Up</td>
<td>Page 6-4</td>
<td>Added a reference to Contingency Plans for UC San Diego Sewer Pump Stations and Force Mains (Appendix F) to direct readers to information regarding spills or failures at pump stations or force mains.</td>
<td>5/22/2014</td>
<td>Monica Esswein</td>
<td>Valerie Fanning</td>
</tr>
<tr>
<td>SSMP Section 6: Overflow Emergency Response Plan</td>
<td>Section 6.9: Overflow Correction, Containment, and Clean-Up</td>
<td>Page 6-4</td>
<td>Added additional information regarding sampling protocol for spills of 50,000 gallons or more that reach surface waters. Also added a reference to Appendix C (Overflow and Emergency Response Field Guide) for additional information about spill response protocol.</td>
<td>5/9/2014</td>
<td>Monica Esswein</td>
<td>Valerie Fanning</td>
</tr>
<tr>
<td>SSMP Section 6: Overflow Emergency Response Plan</td>
<td>Section 6.12: Written Report</td>
<td>Page 6-4 to 6-5</td>
<td>Updated SSO written report timeline information to meet the requirements outlined in the WQ 2013-0058-EXEC order.</td>
<td>5/9/2014</td>
<td>Monica Esswein</td>
<td>Valerie Fanning</td>
</tr>
<tr>
<td>SSMP Section 6: Overflow Emergency Response Plan</td>
<td>Section 6.13: Sanitary Sewer Overflow Record Keeping Requirements</td>
<td>Page 6-5</td>
<td>Section 6.13 was added to the SSMP to indicate spill records that EH&amp;S is required to keep about overflows.</td>
<td>5/22/2014</td>
<td>Monica Esswein</td>
<td>Valerie Fanning</td>
</tr>
<tr>
<td>SSMP Section 8: System Evaluation and Capacity Assurance Plan</td>
<td>Section 8.0: System Evaluation and Capacity Assurance Plan: Background</td>
<td>Page 8-1</td>
<td>Updated information on Latitude 33 Phase I completion in the Fall of 2013.</td>
<td>5/30/2014</td>
<td>Monica Esswein</td>
<td>Valerie Fanning</td>
</tr>
<tr>
<td>Section Changed</td>
<td>Subsection Changed</td>
<td>Page Changed</td>
<td>Change Made</td>
<td>Date of Change</td>
<td>Author of Change</td>
<td>Who Authorized Change</td>
</tr>
<tr>
<td>---------------------------------------------</td>
<td>---------------------------------------------------------</td>
<td>--------------</td>
<td>------------------------------------------------------------------------------</td>
<td>----------------</td>
<td>------------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td>SSMP Section 8: System Evaluation and Capacity Assurance Plan</td>
<td>Section 8.2: System Findings and Recommendations</td>
<td>Page 8-7</td>
<td>Updated information on Latitude 33 Phase I completion.</td>
<td>5/22/2014</td>
<td>Monica Esswein</td>
<td>Valerie Fanning</td>
</tr>
<tr>
<td>SSMP Section 8: System Evaluation and Capacity Assurance Plan</td>
<td>Section 8.4: Capital Improvement Plan</td>
<td>Page 8-9</td>
<td>Section 8.4 was added and link for 2013-2023 Capital Financial Plan was updated.</td>
<td>5/22/2014</td>
<td>Monica Esswein</td>
<td>Valerie Fanning</td>
</tr>
<tr>
<td>SSMP Section 9.0: Monitoring Measurement and Program Modifications</td>
<td>Section 9.1: Record Keeping Requirements</td>
<td>Page 9-1</td>
<td>Section 9.1 was added to reference the record keeping requirements, and how these records can be used to determine the effectiveness of the SSMP.</td>
<td>5/22/2014</td>
<td>Monica Esswein</td>
<td>Valerie Fanning</td>
</tr>
<tr>
<td>SSMP Section 11: Communication Program</td>
<td>Section 11.1: Communicating Plan Information and Updates</td>
<td>Page 11-1</td>
<td>Updated the link for the EH&amp;S website where the SSMP is posted.</td>
<td>5/9/2014</td>
<td>Monica Esswein</td>
<td>Valerie Fanning</td>
</tr>
<tr>
<td>Appendix C</td>
<td>Overflow Emergency Response Plan: SSO Category Definitions</td>
<td>Page 8</td>
<td>Updated Field Guide to meet new requirements, addition of SSO Category Definitions in the Overflow Emergency Response Plan.</td>
<td>09/09/13</td>
<td>Monica Esswein</td>
<td>Valerie Fanning</td>
</tr>
<tr>
<td>Appendix C</td>
<td>Overflow Emergency Response Plan: Overflow Notification Procedures Chart</td>
<td>Page 1 &amp; 6 of the Overflow Emergency Response Guide</td>
<td>Updated the Overflow Notification Procedures Chart and inserted it as the first page of the Overflow Emergency Response Plan.</td>
<td>5/27/14</td>
<td>Monica Esswein</td>
<td>Valerie Fanning</td>
</tr>
<tr>
<td>Section Changed</td>
<td>Subsection Changed</td>
<td>Page Changed</td>
<td>Change Made</td>
<td>Date of Change</td>
<td>Author of Change</td>
<td>Who Authorized Change</td>
</tr>
<tr>
<td>-----------------</td>
<td>-------------------</td>
<td>--------------</td>
<td>-------------</td>
<td>----------------</td>
<td>------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>SSMP Appendix F</td>
<td>Contingency Plans for UC San Diego Sanitary Sewer Pump Stations and Force Mains</td>
<td>Appendix F Page 1-2</td>
<td>An Appendix F: Contingency Plans for UC San Diego Sanitary Sewer Pump Stations and Force Mains was added to the SSMP.</td>
<td>5/21/2014</td>
<td>Monica Esswein</td>
<td>Valerie Fanning</td>
</tr>
<tr>
<td>SSMP Appendix G</td>
<td>Change Log</td>
<td>Appendix G Page 1</td>
<td>An Appendix G: Sanitary Sewer Management Plan Change Log was added to the SSMP to meet new regulations outlined in WQ 2013-0058-EXEC.</td>
<td>5/9/2014</td>
<td>Monica Esswein</td>
<td>Valerie Fanning</td>
</tr>
<tr>
<td>Appendix C</td>
<td>Overflow Emergency Response Field Guide: SSO Report Form</td>
<td>Pages 2 and 3 of the OERP Field Guide</td>
<td>Updated SSO Report Form to include work order information</td>
<td>7/31/2014</td>
<td>Monica Esswein</td>
<td>Valerie Fanning</td>
</tr>
</tbody>
</table>