

UNIVERSITY OF CALIFORNIA, SANTA BARBARA

SEWER SYSTEM MANAGEMENT PLAN



June 2014 Revision



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1.0 GOAL

1.1 REGULATORY BACKGROUND

The State Water Resources Control Board (SWRCB) adopted Statewide Waste Discharge Requirements for Sanitary Sewer Systems Water Quality Order No. 2006-0003-DWQ (WDR) on May 2, 2006. The SWRCB developed this WDR to promote uniformity in the management of California's sanitary sewer systems and reporting of Sanitary Sewer Overflows (SSOs).

This Sewer System Management Plan (SSMP) is required by the WDR, which stipulates that permittees must develop and implement a management plan in order to reduce SSOs. Additionally, the SSMP must provide measures to ensure efficient and effective response to overflows, and implement fat, oil, and grease (FOG) control measures to minimize the introduction of grease and oils. The WDR defines enrolled permittees as "a public entity having legal authority over the operation and maintenance of, or capital improvements to, a sanitary sewer system greater than one mile in length". The University of California, Santa Barbara (UCSB) received formal enrollment notification on November 8, 2006.

The SWRCB adopted Order No. 2013-0058-EXEC, effective September 9, 2013, which amended the Monitoring and Reporting Program (MRP) for the WDR. The amended MRP established new notification requirements, spill categories, reporting requirements, and record-keeping requirements for Order No. 2006-0003-DWQ.

The SWRCB gains their authority to regulate SSOs under the federal Clean Water Act (EPA 2002) and the Porter-Cologne Water Quality Control Act, Section 13263 (California Water Code of Regulation 2006).

1.2 PURPOSE AND GOALS OF THE SSMP

This document has been developed to comply with WDR No. 2006-0003-DWQ (as amended by Order No. 2013-0058-EXEC), which is included in **Appendix A, Waste Discharge Requirements Order No. 2006-0003-DWQ and Amended Monitoring and Reporting Program Order No. 2013-0058-EXEC**, and sets specific sanitary sewer system requirements for all permittees and upholds state water quality standards. The WDR requires permittees to prepare and implement a SSMP in order to:

- Provide a plan and schedule to properly manage, operate, and maintain all parts of the sanitary sewer system in order to provide reliable service in the future;
- Minimize infiltration/inflow (I/I) and provide adequate sewer capacity to accommodate design storm flows;
- Reduce and prevent SSOs; and
- Help mitigate any SSOs that do occur.

Sanitary sewer overflows are overflows from sanitary sewer systems of untreated or partially treated 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 facilities, appropriately sized infrastructure, FOG control measures, operational best management practices, and routine maintenance of the sanitary sewer system.

1.3 WATER QUALITY WORKING GROUP

The University of California, Santa Barbara has created a water quality working group (WQWG) consisting of representatives from key departments and facilities to facilitate the implementation, evaluation, and updating of the SSMP. Members of the WQWG include the following departments and groups:

- Campus Planning: Physical and Environmental;
- Environmental Health and Safety (EH&S);
- Facilities Management: Design & Construction Services (FM/D&CS)
- Facilities Management: Physical Facilities (FM/PF);
- Housing and Residential Services (HRS); and
- University Center (UCen).

The WQWG's responsibilities include the following:

- Evaluate effectiveness and measure implementation of the plan and make modifications as necessary (addressed in Section 9 of this plan).
- Conduct biennial internal audits of the SSMP and make recommendations for changes based on the assessment of the implementation of the plan (addressed in Section 10).
- Review and evaluate response to overflows. As appropriate, update Overflow Emergency Response Plan (addressed in Section 6).
- Implement a time schedule for reviewing the SSMP and ensure communication between all parties involved in the review and implementation of the SSMP (addressed in Section 11).

2.0 ORGANIZATION

2.1 ADMINISTRATION AND MAINTENANCE ORGANIZATION

The administrative responsibility for the UCSB sanitary sewer system is shared among several departments including EH&S, FM/D&CS, FM/PF, HRS, and UCen operations. The responsibilities of each department are summarized below, and an organizational chart is included as **Figure 2-1, Administrative Responsibilities for UCSB Sanitary Sewer System.**

EH&S: The Director of EH&S is considered the permittee for the sanitary sewer system. The implementation of permit requirements and reporting to regulatory agencies is the responsibility of the EH&S Environmental Health Program Manager (EHP), including the reporting of all SSOs.

FM/D&CS: The Associate Director of Design & Construction Services is responsible for the management of the design and construction of additions, rehabilitations, or modifications to the sanitary sewer system.

FM/PF: The Area Manager, Mechanical and Electrical Plumbing is responsible for the overall operation and maintenance of the system including oversight of any contractor making repairs on the system.

HRS and UCen Operations: Grease traps and interceptors are located within several housing facilities and at the UCen. The managers of HRS and the UCen are responsible for the maintenance of the grease traps or interceptors located at their respective facilities

2.2 MONITORING SYSTEM AND REPORTING SSOs

The UCSB Johnson Controls Incorporated Metasys system monitors flows, motor speeds, standby power systems, pressures, and wet well levels at the main campus pump station. This SCADA (Supervisory Control and Data Acquisition) system allows for immediate notification to the campus emergency dispatch center when there is an equipment failure. Additionally, members of the University community who observe an SSO may call the campus emergency dispatch phone line at 805-893-8300 during business hours and 805-451-9914 after hours to report the incident. In both cases, campus dispatch immediately notifies the FM/PF staff member who is designated as the campus first responder for SSOs.

The campus first responder is responsible for immediately investigating any overflow and determining the appropriate response. Overflows are reported to EH&S, which is responsible for reporting the overflows to the appropriate regulatory agency. The response to SSOs is described in Section 6.0 Overflow Emergency Response Plan.

2.3 FACILITY DESCRIPTION

The Santa Barbara 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. The University is located on a coastal mesa and on adjacent lowlands that form part of the region known as the Goleta Valley, which is situated along the South Coast of Santa Barbara County, California. UCSB is made up of four primary campuses: (1) Main Campus, comprising the academic, administrative and support facilities, student housing, athletic facilities, and various natural areas such as the Campus Lagoon; (2) Storke Campus, which includes student housing, additional athletic facilities, and natural areas such as Storke Campus Wetlands; (3) West Campus, which includes administrative and support facilities, faculty housing, Devereux facility, and natural areas such as Devereux Slough and Coal Oil

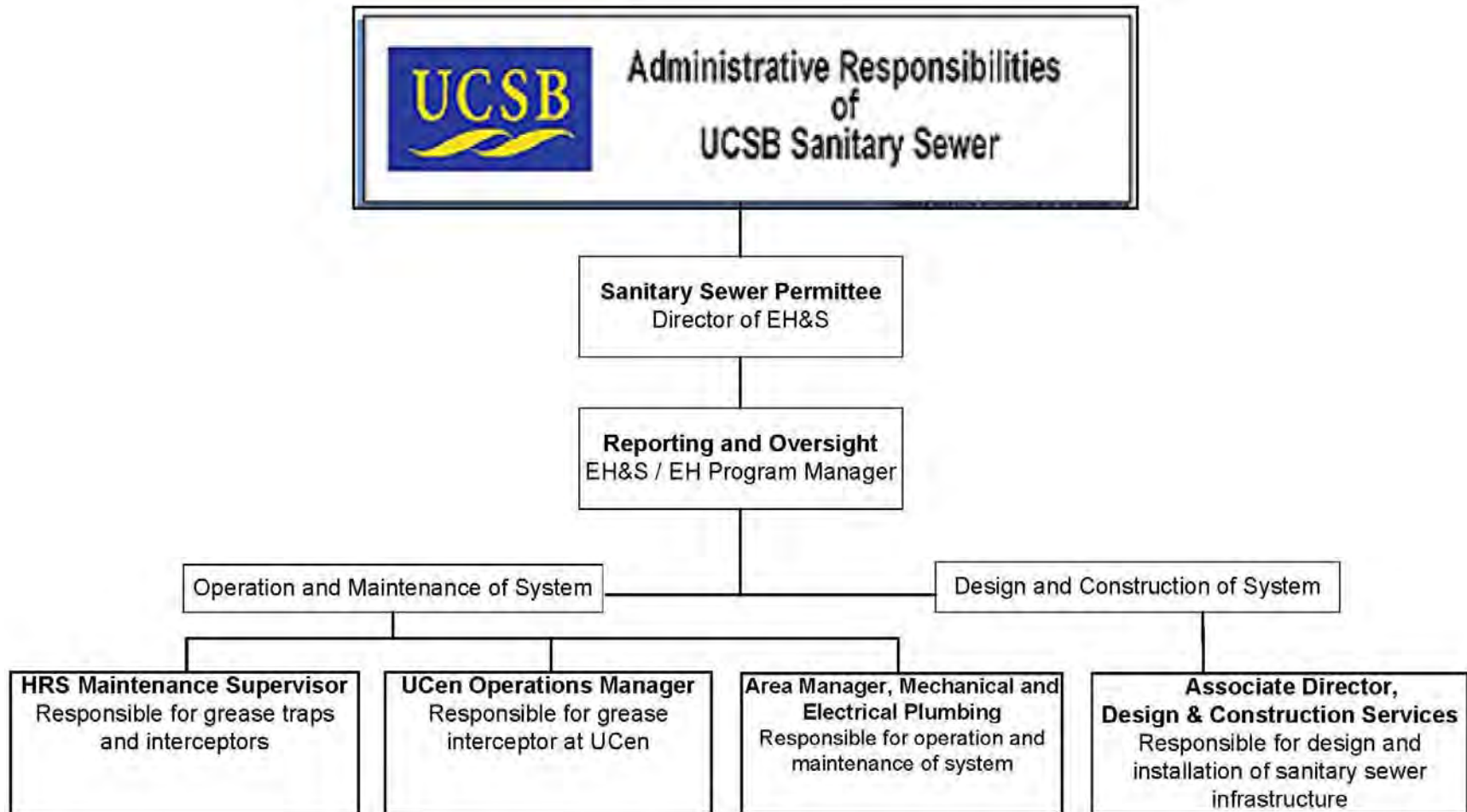
UNIVERSITY OF CALIFORNIA, SANTA BARBARA

Point Reserve; and (4) North Campus, which includes faculty housing, and natural areas such as the planned open space restoration site of the former Ocean Meadows Golf Course. The UCSB main sewer system covers Main Campus and the majority of Storke Campus. The sewer systems that serve North Campus, West Campus, and a portion of Storke Campus discharge directly to the Goleta West Sanitary District (GWSD) main sewer lines and do not tie into the UCSB main sewer system, therefore, these systems are considered auxiliary sewer systems and have not been included as part of this SSMP.

The university is situated on a promontory (Goleta Point) that is bordered by four surface water bodies: Goleta Slough, the Campus Lagoon, Devereux Slough, and the Pacific Ocean. The average annual rainfall for the Santa Barbara area is approximately 15.6 inches.

The 2012-2013 population, which included full-time students, faculty, and staff was approximately 26,857. The population projection for 2025-2026 is 31,601.

Figure 2-1
Administrative Responsibilities for UCSB Sanitary Sewer System



2.4 SANITARY SEWER SYSTEM DESCRIPTION

The UCSB sanitary sewer system serves the Main Campus and the majority of Storke Campus (with the exception of Santa Catalina residence hall). The areas of the UCSB campus that are served by the main sanitary sewer system are shown on **Figure 2-2, UCSB Sanitary Sewer System**.

The sanitary sewer system at UCSB has been in use since 1968 and is comprised of over 98,000 linear feet of collection pipe ranging from 4 to 18 inches in diameter. Original pipe has been replaced as upgrades or repairs have been required or new facilities have been constructed. The piping that makes up the sewer system consists of a combination of vitrified clay, cast iron, polyvinyl chloride, asbestos and cement. Sanitary sewage is collected from campus buildings that house administrative, maintenance, classroom, research, residential, and dining hall facilities. The system ultimately feeds to the Goleta Sanitary District (GSD) wastewater treatment plant, for which UCSB is a 7% stakeholder.

The UCSB sewer system includes four pump stations and twelve building lift stations located at the facilities listed below:

**Table 2-1
Pump and Building Lift Stations**

Location	Size and Type	Responsible Organization
Main Gate Pump Station, Bldg 529	Pump Station	FM/PF
South Pump Station, Bldg 559	Pump Station	FM/PF
West Pump Station, Bldg 579	Pump Station	FM/PF
Lagoon Pump House, Bldg 550	Pump Station	FM/PF
Mesa Parking Structure, Bldg 250	Building Lift Station	FM/PF
Psychology East, Bldg 251	Building Lift Station	FM/PF
Events Center, Bldg 505	Building Lift Station	FM/PF
Multi-Activity Center, Bldg 511	Building Lift Station	FM/PF
Humanities and Social Science Buidling, Bldg 515	Building Lift Station	FM/PF
Rec Center, Bldg 516	Building Lift Station	FM/PF
Music, Bldg 531	Building Lift Station	FM/PF
Cheadle Hall, Bldg 552	Building Lift Station	FM/PF
Marine Biotechnology Lab, Bldg 555	Building Lift Station	FM/PF
Ucen, Bldg 558	Building Lift Station	UCen Operations
Broida Hall, Bldg 572	Building Lift Station	FM/PF
Aviary, Bldg 583	Building Lift Station	FM/PF
Storke Tower, Bldg 589	Building Lift Station	FM/PF

Figure 2-2
UCSB Sanitary Sewer System Map



The university has odor control systems at lift stations 529 and 559. The system consists of a filter of mushroom compost, woodchips, and water. The filtration system prevents the buildup of hydrogen sulfide gas, which can lead to the deterioration of the system.

There are currently five grease interceptors and three grease traps located on the main campus. **Table 2-2, Grease Interceptors and Traps**, summarizes the grease interceptor or trap sizes and the departments that are responsible for their maintenance. The only other food service facility on the main campus is the Faculty Club Restaurant, which currently does not have a grease trap. An addition and renovation project for the Faculty Club is planned to begin in the fall of 2014. This project will include the installation of a 1,500 gallon grease interceptor.

**Table 2-2
Grease Interceptors and Traps**

Location	Size and Type	Cleanout Frequency	Cleanout Vendor	Responsible Organization
Carrillo Dining Commons	15,000-gallon grease interceptor	4 times/year	Lee and Neal	HRS
De La Guerra Dining Commons	8,000-gallon grease interceptor	4 times/year	Lee and Neal	HRS
Ortega Dining Commons	8,000-gallon grease interceptor	4 times/year	Lee and Neal	HRS
Harder Stadium	500-gallon grease interceptor	4 times/year	Lee and Neal	HRS
CNSI (Nano Café)	1,000-gallon grease interceptor	2 times/year	Lee and Neal	UCen Operations
UCen Dining Services	8,000-gallon grease interceptor	3 times/year	Lee and Neal	UCen Operations
The Arbor	100-pound grease trap	2 times/year	Lee and Neal	UCen Operations
Panda Express	(2) 100-pound grease traps	Biweekly	ETS Plumbing	UCen Operations
Coral Tree Café	50-pound grease trap	Weekly	Lee and Neal	UCen Operations
Planned to be installed in 2014:				
Faculty Club	1,500-gallon grease interceptor	To be determined	To be determined	Faculty Club

Additionally, sewage from the facilities at Goleta Beach discharges into the UCSB sanitary sewer system. Accordingly, UCSB required Goleta Beach Park to submit an Emergency Sewer Overflow Response Plan. The Plan is included in **Appendix B, Goleta Beach Emergency Sewer Overflow Response Plan**. Facilities at Goleta Beach consist of public restrooms, a park ranger residence, and a restaurant, the Goleta Beach Café. According to Jim Isaac, the Deputy Park Director, infrastructure at the park includes a grease interceptor for the Café and two lift stations. There is a lift station by the Café which pumps wastewater toward the lift station for the park.

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:

- Control infiltration and connections from inflow sources, including satellite systems.
- Require that sewers and connections be properly designed and constructed.
- Ensure proper installation, testing, and inspection of new and rehabilitated sewers (such as new or rehabilitated collector sewers and new or rehabilitated laterals).
- Maintain full control over all discharges to the sanitary sewer collection system
- Limit fats, greases, and other debris that may cause blockages in the collection system.
- Prevent illicit discharges into its system (e.g., stormwater or chemical dumping).
- Ensure access for maintenance, inspection, or repairs of all portions of the system operated by UCSB.

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.

Table 4-1, Measures and Activities, presents the required elements for the SSMP. The table identifies each element and the person and position at UCSB that is responsible for that element.

Table 4-1
Measures and Activities

UCSB Measures and Activities for General Permit Required Elements	Responsible Party	Telephone
A. Operations and Maintenance		
<p><i>“Provide adequate operations and maintenance of facilities and equipment.”</i></p> <p>Operation and maintenance of the sanitary sewer is the responsibility of the UCSB Facilities department. This includes maintaining all lines, lift stations, force mains, and alarm systems. The department is also the first responder to sanitary sewer overflows.</p>	<p>Area Manager, Mechanical and Electrical Plumbing</p>	<p>805-893-8300</p>
B. Update Maps		
<p><i>“Maintain an up-to-date map of the collection system showing all gravity line segments and manholes, pumping facilities, pressure pipes and valves, and stormwater conveyance systems.”</i></p> <p>The maps of the sanitary sewer system are either in GIS or hard copy format.</p> <ul style="list-style-type: none"> • The main campus is in GIS database format. The information contained in the database includes sewer line diameter, line material type, main or lateral designation, and gravity or forced main designation. The map also has information regarding the location of all manholes, cleanouts, and pump stations associated with the main sewer system. • Sanitary sewer system maps for Santa Catalina, West Campus, and North Campus are in either GIS or hard copy format. <p>The maps of the main sewer system will be maintained as specified WDR No. 2006-0003-DWQ.</p>	<p>Associate Director, Design & Construction Services</p>	<p>805-893-6987</p>
C. Maintain Information for Establishing Priorities		
<p><i>“Maintain relevant information to establish and prioritize appropriate SSMP (Sewer System Management Plan) activities such as the elimination of overflows and identify and illustrate trends in overflows.”</i></p> <p>EH&S is responsible for maintaining records regarding SSOs. Overflows of any amount of wastewater are reported to EH&S. EH&S tracks overflows and assesses the frequency and volume of overflows and works with facilities to reduce and prevent SSOs.</p>	<p>EH&S/EHP Manager</p>	<p>805-893-7534</p>

Table 4-1, page 1 of 8

Table 4-1 Continued
Measures and Activities

UCSB Measures and Activities for General Permit Required Elements	Responsible Party	Telephone
D. Preventative Maintenance		
<p><i>“Routine preventative maintenance O&M activities by staff and contractors.”</i></p> <p>UCSB has measures in place in order to keep the system in good repair and prevent excessive infiltration/inflow, service interruptions, and system failures. This is done through scheduled regular maintenance and cleaning of the collection system, which is summarized below.</p>	<p>Area Manager, Mechanical and Electrical Plumbing</p>	<p>805-893-8300</p>
<p><i>Routine Inspections:</i></p> <ul style="list-style-type: none"> • Lift stations: visually inspected weekly, at the minimum. The campus main lift station (Bldg No. 529) is also continuously monitored via the Metasys system. • Emergency standby generators: No-load runs are conducted for 30 minutes every month. Load tests are conducted annually and require 1 to 2 hours plus additional time if repairs are necessary. • Manholes: A portion of the sewer system is inspected through the system's manholes weekly. The weekly rotating inspections targets specific portions of the system, prioritizing high demand areas and identified problem areas. Therefore, throughout the course of a year the majority of the system is examined at least once. • Overall system: Identified problem areas and main collection lines are periodically inspected using video technology. Main collection lines are considered anything over 8 inches. Where possible, 6-inch lines are also inspected. <p><i>Routine Maintenance:</i></p> <ul style="list-style-type: none"> • Root control: Maintenance from root intrusion is conducted on an as-needed basis, based on the results of routine inspections. • Odor control: UCSB has odor control systems at lift stations 529 and 579. The system consists of a filter of mushroom compost, wood chips, and water. The filtration system prevents the buildup of hydrogen sulfide gas, which can lead to the deterioration of the system. • Overall System: Every six months high demand residential areas are cleaned using a hydrojet. Academic, administrative, and support areas are cleaned periodically based on the information obtained through routine inspections. 		

Table 4-1, page 2 of 8

Table 4-1 Continued
Measures and Activities

UCSB Measures and Activities for General Permit Required Elements	Responsible Party	Telephone
E. Scheduled Inspections and Condition Assessment		
<p>“Identify and prioritize structural deficiencies and implement short-term and long-term rehabilitation actions to address each deficiency.”</p>	<p>Area Manager, Mechanical and Electrical Plumbing</p>	<p>805-893-8300</p>
<p>Long term planning:</p> <p>UCSB is updating the infrastructure of the campus, including the sanitary sewer. The sanitary sewer system was evaluated and long-term planning recommendations made by Winzler and Kelly are presented in <i>University of California, Santa Barbara, Infrastructure Assessment, Final Report</i> (Winzler and Kelly 2004). UCSB is implementing the upgrades in phases. The first phase is outlined in the report <i>UCSB Planning Guide: Infrastructure and Renewal – Phase I</i> (UCSB 2005). The sanitary sewer infrastructure renewal project addresses rehabilitation and replacement of sewer pipes which are at risk of collapse or are prone to more frequent blockages due to pipe deficiencies.</p>	<p>And Associate Director, Design & Construction Services</p>	<p>805-893-6987</p>
<p>The fiscal resources for UCSB are discussed in Item K.</p>		
<p>Short term actions:</p> <p>Short term actions are taken on an as-needed basis depending on information gathered during routine inspections. FM/PF Mechanical and Electrical Plumbing Services will communicate the information to Design & Construction Services; the two departments will develop a scope and subsequently implement the project. Short term actions implemented through this method include the following:</p> <ul style="list-style-type: none"> • Grease interceptor or trap installation, • Identification and replacement of laterals, • Manhole replacement, and • Reverse grade and root intrusion corrections. 		

Table 4-1, page 3 of 8

Table 4-1 Continued
Measures and Activities

UCSB Measures and Activities for General Permit Required Elements	Responsible Party	Telephone
F. Training		
<i>“Provide training on a regular basis for staff collection system operations, maintenance and monitoring, and determine if contractors’ staffs are properly trained.”</i>		
Training is conducted by both EH&S and FM/PF. The two departments are responsible for training staff in the following areas:		
<i>EH&S-EHP:</i> <ul style="list-style-type: none"> • Provides ongoing exposure control training for FM/PF staff. 	EH&S/EHP Manager	805-893-7534
<i>Facilities Management/PF:</i> <ul style="list-style-type: none"> • Provides ongoing technical training for FM/PF staff responding to sewer spills. • Provides technical training when new systems are installed to operators of system. • Responsible for overseeing operations of contractors. UCSB utilizes a service agreement contract for outside contractors to perform maintenance on the sewer system. The service agreement contract stipulates that contractor’s staff must be properly trained. 	Area Manager, Mechanical and Electrical Plumbing	805-893-8300
G. Equipment		
<i>“Provide equipment and replacement parts inventories, including identification of critical replacement parts.”</i>		
A stock room of parts and equipment, including emergency pumps, lights, and generators is maintained. 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:		
<ul style="list-style-type: none"> • Tierra Construction, • Stewart De-rooting, • Rain for Rent, and • Granite Construction. 	Area Manager, Mechanical and Electrical Plumbing	805-893-8300

Table 4-1, page 4 of 8

Table 4-1 Continued
Measures and Activities

UCSB Measures and Activities for General Permit Required Elements	Responsible Party	Telephone
H. Public Education Outreach Program		
<p>“Establish an implementation plan and schedule for public education outreach program that promotes the proper disposal of grease and fats.”</p> <p>Since the sewer system at UCSB is not a public system, the university has direct control over any facility that disposes of grease and fats into the sanitary sewer. Policies adopted in this plan, specifically in Section 7, FOG Control Program, are adopted by all entities on campus. The additional items below comprise the outreach program to the campus community.</p> <p>The following measures are adopted in order to foster the successful implementation of the SSMP and disposal of grease and fats by organizations on campus:</p> <ul style="list-style-type: none"> • A copy of the UCSB SSMP will be posted on the UCSB EH&S website. • Signs will be posted in the work areas of employees who use the grease traps or interceptors on campus. • An email distribution list will be created to inform interested parties about the status of the UCSB-SSMP. The list will include the following members: <p>Internal: Associated Students, Environmental Affairs Board; Bren School of Environmental Science and Management; Campus Planning: FM/PF; EH&S; Graduate Students Association; Housing and Residential Services; and the University Center.</p> <p>External: City of Goleta; Community Environmental Council; County of Santa Barbara, Public Works Department; GSD; and the Goleta West Sanitary District.</p>	EH&S/EHP Manager	805-893-7534

Table 4-1, page 5 of 8

**Table 4-1 Continued
Measures and Activities**

UCSB Measures and Activities for General Permit Required Elements	Responsible Party	Telephone
I. Private Property Overflow Plan		
<p><i>“Establish a plan for responding to overflows from private property that discharge to public right of ways and stormdrains, to prevent discharges from overflows to surface waters and stormdrains.”</i></p> <p>The UCSB sanitary sewer system is located on University property except for a portion by Goleta Beach. This is the only area that would be considered "private property" through which the UCSB sanitary sewer system passes. Goleta Beach has provided UCSB with an Emergency Response Plan (Section 6.0). UCSB will respond to any other overflow from the system. Response to overflows is addressed in the Overflow Emergency Response Plan, discussed in Section 6. All overflows will be responded to in the same manner.</p>	EH&S/EHP Manager	805-893-7534
J. Greases and Fats Disposal		
<p><i>“Plan and schedule for providing an analysis of alternative methods of disposal for grease and fats, and an implementation plan and schedule for providing adequate disposal capacity for grease and fats generated within the sewer system service area.”</i></p> <p>UCSB has met this requirement through its FOG control program which is discussed in Section 7. The plan has two methods for collecting and disposing of grease:</p> <ul style="list-style-type: none"> • All grease-bearing discharge lines have grease interceptors or traps and comply with GSD standards, which require facilities to have grease interceptors sized according to Appendix H of the Uniform Plumbing Code, with a minimum capacity of 500 gallons. The locations and sizes of grease interceptors and traps on the main campus are presented in Table 2-1 and shown on Figure 2-2. • Excess grease from fryers at UCen facilities and the Faculty Club is collected in a container and disposed of through a grease rendering company. 	EH&S/EHP Manager	805-893-7534

Table 4-1, page 6 of 8

Table 4-1 Continued
Measures and Activities

UCSB Measures and Activities for General Permit Required Elements	Responsible Party	Telephone
K. Fiscal Resources		
<p><i>“Describe fiscal resources necessary to ensure system operation, including fee structure, fiscal resources, actual and projected five-year budget expenses for staffing, operation, capital improvement projects, and reserves.”</i></p> <p>UCSB does not receive revenues from a fee structure. Monetary funding for UCSB operations and capital improvements approved by the University of California Regents and is managed by the UCSB office of Budget and Planning. Funds are annually appropriated for the sewer system operation and maintenance.</p> <p>Currently, UCSB has appropriated approximately \$220,000 annually for maintenance of sanitary sewer utilities for the 2014-2015 fiscal year. Accounting and Purchasing estimated that the sewer operations and maintenance expenditures for the 2012-2013 fiscal year were approximately \$209,700. In addition to the maintenance budget, there is a utility energy cost of approximately \$40,000 annually for operation of pumping equipment.</p> <p>Additionally, UCSB pays the Goleta Sanitary District for accepting wastewater for processing. GSD bills costs out to Goleta West Sanitation District, UCSB, and the Santa Barbara Municipal Airport. Each agency is billed a percentage of the total cost according to the amount of wastewater the agency has contracted to send to the GSD. UCSB percentage is approximately 7% of the total cost. The Goleta Sanitary District began a full plant renewal in 2004 and completed the upgrade in 2013. The estimated total cost is \$40 million, of which UCSB is funding approximately \$3 million.</p> <p>UCSB has initiated an infrastructure renewal project, including the sanitary sewer. There are two phases to the project; Phase 1A was completed in September 2011 and Phase 1B is currently planned for the fall of 2014. The budget expenditure plan for the project is included in the Project Planning Guide (UCSB 2005). The infrastructure renewal project will expand the sanitary sewer system to ensure adequate capacity to convey base flows and peak flows, including wet weather events. The second phase of the infrastructure renewal project is currently awaiting state funding.</p>	<p>Area Manager, Mechanical and Electrical Plumbing</p>	<p>805-893-8300</p>

Table 4-1, page 7 of 8

Table 4-1 Continued
Measures and Activities

UCSB Measures and Activities for General Permit Required Elements	Responsible Party	Telephone
L. Staffing for System Operations		
<p><i>“Describe staffing available to ensure system operation including developing, implementing and revising the SSMP.”</i></p> <p>The responsibility for system operation is shared among five departments and is summarized in Figure 2-1, Administrative Responsibilities for UCSB Sanitary Sewer System.</p> <p>There are approximately eighteen journey level, two supervisory level, and two managerial level FM/PF staff members that assist with the operation of the system. Staff is available 24 hours a day, 365 days a year to operate the system.</p> <p>The implementation of the SSMP along with ongoing evaluation and revision of the plan will be accomplished by the WQWG members identified in Section 1.3. Together, these departments ensure the operation of the sanitary sewer system.</p>	<p>WQWG contact: EH&S/ EHP Manager</p>	<p>805-893-7534</p>

Table 4-1, page 8 of 8

5.0 DESIGN AND PERFORMANCE PROVISIONS

The University has adopted the Goleta Sanitary District design and performance standards, which are documented in the Procedural Manual and Standard Specifications for the Construction of Sanitary Sewers (GSD 2008). UCSB Design & Construction Services evaluated the design and performance standards of both the Goleta West Sanitary District (2001) and Goleta Sanitary District (2008). After evaluation, the GSD standards were adopted by UCSB, specifically Section 7 Design Criteria, Section 9 Construction Materials, Section 10 Open Trench Construction Methods, Section 11 Inspection and Testing, and Section 12 Manhole Rehabilitation. These parts of the GSD standards are included in **Appendix C, Goleta Sanitary District standards, Sections 7, 9, 10, 11, and 12.**

Design & Construction Services is responsible for ensuring that design and performance standards are implemented on campus. There are two categories of design and performance provisions specified in WDR No. 2006-0003-DWQ, which are discussed below.

5.1 STANDARDS FOR INSTALLATION, REHABILITATION, AND REPAIR

The GSD standards outline 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 GSD standards.

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. Acceptance 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. UCSB will adhere to the standards for inspection and testing of new or rehabilitated facilities that are outlined in the GSD standards.

6.0 OVERFLOW EMERGENCY RESPONSE PLAN

6.1 OBJECTIVE AND PURPOSE

The Overflow and Emergency Response Plan (OERP) was developed as part of the UCSB SSMP. 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 case of an overflow, UCSB 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 utility personnel should 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.

6.2 ROLES AND RESPONSIBILITIES

The following campus departments are responsible for implementing the OERP: EH&S-EHP, FM/PH, and Transportation & Parking Services (TPS). The responsibilities of the departments are specified below.

6.2.1 Environmental Health & Safety-Environmental Health Program (EH&S-EHP)

EH&S-EHP is responsible for:

- a) External agency notification;
- b) Exposure/hazard assessment & control;
- c) Preparation of the annual report and other regulatory related documents
- d) Retention of all SSO related documents (copies of SSO Incident Report Forms, submitted reports, photographic documentation, etc.); and
- e) Interface with external regulatory agencies.

6.2.2 Facilities Management / Physical Facilities (FM / PH)

FM/PH is responsible for:

- a) Acting as first responder;
- b) Conducting immediate internal notifications;
- c) Providing and coordinating the operational aspects of the emergency in order to control and mitigate the overflow
- d) Complete SSO Incident Report Forms (including spill volume calculation forms for the two spill volume estimation methods selected). A copy of the incident report forms to be used are included in **Appendix D, SSO Incident Report Forms**; and
- e) Establishing preventive measures in order to minimize future accidental releases.

6.2.3 Transportation & Parking Services (TPS)

TPS is responsible for:

- a) Site security;
- b) Traffic; and
- c) Crowd control measures on an as needed basis.

6.3 OVERFLOW RESPONSE PLAN

The OERP presents a strategy for UCSB 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.

6.3.1 Receipt of Information Regarding an Overflow

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

1. By the sewer alarm system. The UCSB metasys system monitors flows, motor speeds, standby power systems, pressures, and wet well levels at the main campus lift station (Bldg. 529). The metasys system allows for immediate notification of any equipment failure to the campus emergency dispatch center.
2. 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.
3. By the public. Members of the university community who observe an SSO may also call the campus emergency dispatch phone line at 805-893-8300 during business hours and 805-451-9914 after hours to report the incident. Section 6.3.2 details dispatch responsibility.

Emergency response is available 24 hours per day, every day.

6.3.2 Dispatch Responsibility

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

1. Time and date the call was received,
2. Specific location of possible overflow,
3. Description of the problem, and
4. Caller's name and call back phone number.

Campus dispatch immediately notifies the designated campus first responder for SSOs, who is a member of the FM staff. Response to an SSO will be immediate.

6.3.3 First Responder Assessment of Overflow

The failure of any element of the sanitary sewer system that threatens to cause or causes an 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 the spill. FM maintains a supply of materials to mitigate spills. Available equipment includes gravel bags, bypass pumps, hoses, emergency generators, and heavy equipment;
6. Assess if the overflow migrated onto private property. Be aware that UCSB could face increased liability for further damages inflicted to private property during such instances; and
7. Coordinate with hazardous materials response if there is a suspicious substance (e.g. oil sheen, foam) found on the ground surface. Additionally, if there is a suspicious odor (e.g. gasoline) not common to the sewer system, hazardous materials should be contacted.

Internal Notification Procedures

EH&S will be notified for any category of SSO.

Internal contact phone numbers:

EH&S

8:00 am to 5:00 pm, Monday - Friday: 805-893-3194

After hours: 805-448-4089 (Mobile)

Based on the professional judgment of the FM/PF staff, other party(ies) are notified.

Internal contact phone numbers:

FM/PF

8:00 am to 5:00 pm, Monday - Friday: 805-893-8300

After hours: 805-451-9914 (FM primary pager)

805-893-3446 (Police dispatch non-emergency line)

TPS

8:00 am to 5:00 pm, Monday – Friday: 805-893-7275

After hours: 805-893-3446 (Police dispatch non-emergency line)

6.3.4 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. Stop the overflow. If the failure is at a lift station, take the malfunctioning pump off line;
2. If necessary, call TPS to secure the affected area and post warning signs. TPS has barricades, cones, and fencing available to secure the site;
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. Complete the documentation for the incident;
8. Review overall response with the Responding Parties; and
9. Sample as necessary. Any sampling performed will be coordinated with the Santa Barbara County Public Health Department/Environmental Health Services. The sampling methodology will be consistent with the sampling requirements outlined in the RWQCB's Sewage Spill Reporting Guidance.

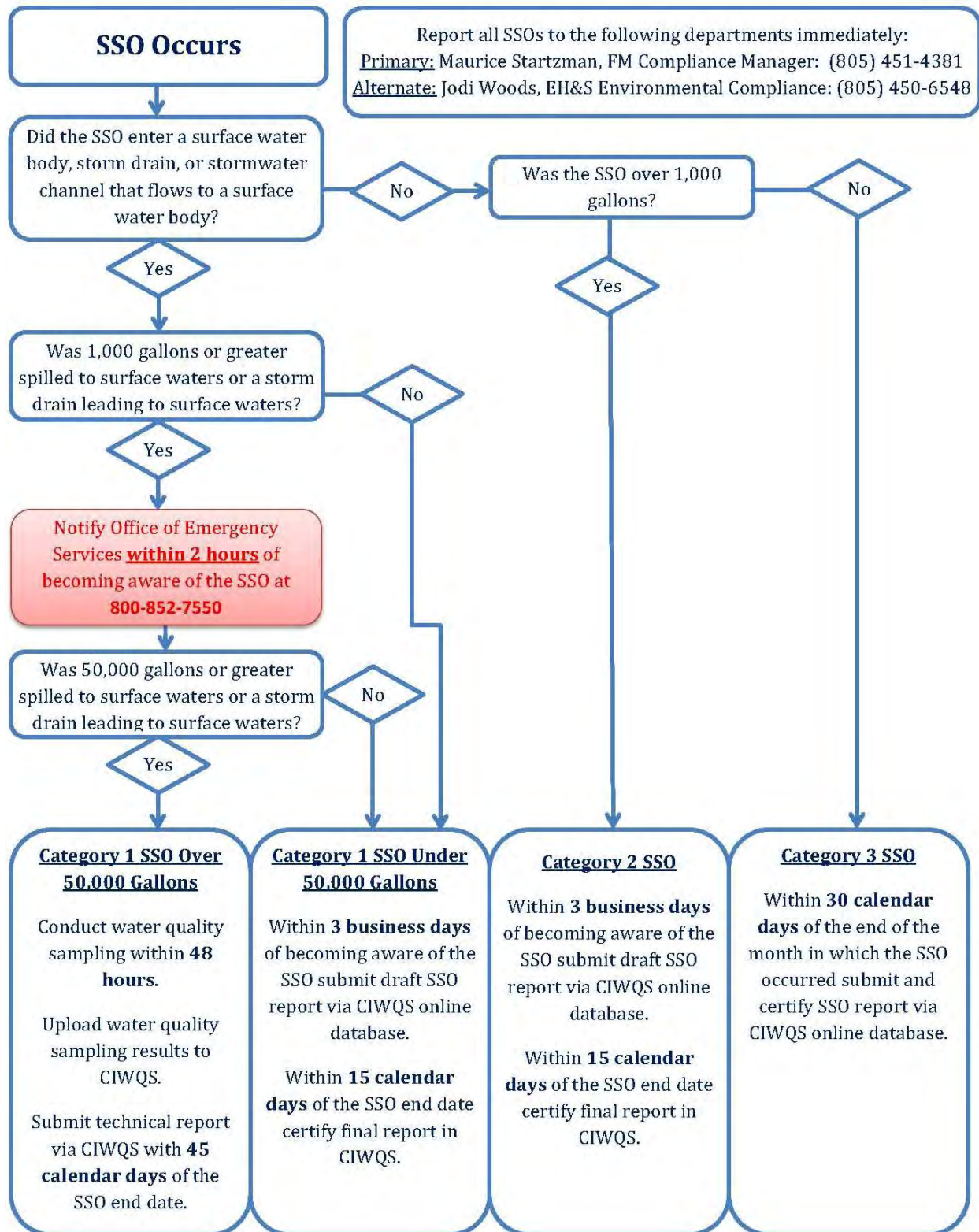
6.4 REGULATORY NOTIFICATION PROCEDURES

The amended MPR (Order No. 2013-0058-EXEC), effective September 9, 2013, established new notification requirements, spill categories, reporting requirements, and record-keeping requirements for the WDR (Order No. 2006-0003-DWQ). The newly established spill categories are detailed below.

- Category 1: Discharge of untreated or partially treated wastewater of **any volume** resulting from an SSO that **reaches surface water** and/or reaches a drainage channel tributary to surface water.
- Category 2: Discharge of untreated or partially treated wastewater of **1,000 gallons or greater** resulting from an SSO that **does not** reach surface water or a drainage channel tributary to surface water.
- Category 3: All other discharges of untreated or partially treated wastewater resulting from an SSO.

The sections below discuss the notification and reporting requirements that will be followed for each category of SSO. In addition, a flowchart identifying the notification and reporting requirements for any type of SSO is included as **Figure 6-1, SSO Notification and Reporting Flowchart**. Regulatory notification and reporting procedures are administered by EH&S – EHP.

**Figure 6-1
SSO Notification and Reporting Flowchart**



6.4.1 Immediate Notification

Per the requirements of the MRP, the California Office of Emergency Services (Cal OES) must be notified within two hours of becoming aware of any Category 1 SSO.

Office of Emergency Services (OES)

800-852-7550 or 916-845-8911 (OES Warning Center)

Santa Barbara County Office of Emergency Services (SBC-OES)

105 East Anapamu Street, Suite 3

Santa Barbara, CA 93101

805-560-1081/Fax: 805-560-1032

6.4.2 Written Report and Online Reporting

An electronic report must be submitted to the SWRCB via the California Integrated Water Quality System (CIWQS) Online SSO Database for all SSO categories. The timeline required for CIWQS reports are detailed below.

- Category 1 (over 50,000 gallons): Conduct water quality sampling within 48 hours. Submit a technical report via CIWQS within 45 calendar days of the SSO end date. Additionally, submit a draft report via CIWQS within 3 business days and certify the report within 15 calendar days from the SSO end date.
- Category 1 (less than 50,000 gallons): Submit a draft report via CIWQS within 3 business days and certify the report within 15 calendar days from the SSO end date.
- Category 2: Submit a draft report via CIWQS within 3 business days and certify the report within 15 calendar days from the SSO end date.
- Category 3: Submit and certify a report via CIWQS within 30 calendar days from the SSO end date.

Additionally, an annual certification of the UCSB sewer system management program and a No Spill Certification for every month that an SSO does not occur are required to be generated via the CIWQS reporting database.

6.4.3 Additional External Notification

At the discretion of EH&S-EHP, courtesy notification may also be made to the following agencies when an overflow has occurred:

The Department of Fish and Game may be notified if there is a spill to a water way. The Department of Fish and Game will investigate the spill and make a determination if there are any deleterious effects of the spill.

California Department of Fish and Game (South Coast Region, Region 5)

4949 Viewridge Avenue

San Diego, CA 92123

858-467-4201

Caltrans may be notified if an overflow affects traffic along State Route 217.

California Department of Transportation (Caltrans, District 5)

50 Higuera Street
San Luis Obispo, CA 93401-5415
805-568-0858 (Santa Barbara area)

The GSD and/or GWSD will be notified if there is any violation of a discharge prohibition.

Goleta Sanitary District (GSD)

One William Moffett Place
Goleta, CA 93117
805-967-4519/Fax: 805-964-3583

Goleta West Sanitary District (GWSD)

P.O. Box 4
Goleta, CA 93116-0004
805-968-2617/Fax: 805-562-8987

If there is a public health concern or a release to a waterway, Santa Barbara County Public Health Department/Environmental Health Services (SBEHS) is notified within 24 hours.

Santa Barbara County Public Health Department/Environmental Health Services

225 Camino Del Remedio
Santa Barbara, CA 93110
805-681-4900/Fax: 805-681-4901

6.4.4 Water Quality Monitoring

Enrollees are required to conduct water quality monitoring with 48 hours of any Category 1 SSO greater than 50,000 gallons. Water quality results are required to be uploaded into CIWQS and an SSO Technical Report submitted within 45 calendar days of the SSO end date.

6.5 TRAINING REQUIREMENTS

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

The OERP will be distributed to designated staff members of the departments as indicated below:

- EH&S-EHP: Environmental Health Program Manager.
- FM: Area Manager.
- TPS: Director.

6.6 OVERFLOW EMERGENCY RESPONSE PLAN UPDATE

The OERP is reviewed on an annual basis by EH&S-EHP and FM. Interim changes are incorporated into the document by EH&S-EHP on an as-needed basis.

Comments, updates, and other relevant information should be submitted to the EH&S-EHP for review, consideration, and incorporation into the OERP.

7.0 FATS, OILS, AND GREASE (FOG) CONTROL PROGRAM

This FOG control program has been developed as part of the UCSB SSMP and builds upon the ongoing FOG Control Program that UCSB has in place. The purpose of the program is to reduce the amount of fats, oils, and grease discharged to the sanitary sewer system.

7.1 CURRENT INFRASTRUCTURE

There are eight grease traps or interceptors on the main campus and a ninth planned to be installed in the fall of 2014. UCSB has been upgrading the FOG Control Program in response to requests from GSD and an evaluation of the sewer system for the infrastructure rehabilitation initiative.

GSD notified UCSB in a letter dated April 27, 2000, that each of the food service facilities at UCSB needed to install a grease interceptor capable of controlling oil and grease discharged from the facility and having a minimum capacity of 750 gallons. Additionally, a comprehensive infrastructure assessment was completed in 2004 (Winzler and Kelly 2004). The assessment reported identified deficiencies, including the lack of grease traps. Since UCSB received the notice from GSD and the assessment report, additional grease interceptors or traps have been installed on campus.

The locations of these grease traps or interceptors are listed in Table 2-2. These systems are:

- **Carrillo Dining Commons (15,000-gallon grease interceptor);**
- **De La Guerra Dining Commons (8,000-gallon grease interceptor);**
- **CNSI (Nano Café) (1,000-gallon grease interceptor);**
- **Ortega Dining Commons (8,000-gallon grease interceptor);**
- **UCen Dining Services (8,000-gallon grease interceptor);**
- **The Arbor (100-pound grease trap);**
- **Panda Express (two 100-pound grease traps); and**
- **Coral Tree Café (50-pound grease trap).**
- **Planned for fall 2014: Faculty Club (1,500-gallon grease interceptor)**

Although the Santa Catalina dormitory and West Campus are owned by UCSB, the wastewater from the residential facilities discharges to the Goleta West Sanitary District system. The facilities adhere to FOG control measures established by the Goleta West Sanitary District and are not included as part of this SSMP.

7.2 ELEMENTS OF FOG CONTROL PROGRAM

The elements of the FOG Control Program include identification of grease blockages, maintenance, BMPs, record keeping practices, and inspections. The details are provided in **Table 7-1, FOG Control Program**.

Table 7-1
FOG Control Program

FOG Control Measures	Responsible Party	Telephone
A. Identification of Grease Blockages and Maintenance Requirements		
<p>The accumulation of grease is visually inspected at the University main lift station building 529 weekly, at a minimum. The inspections are conducted as part of the regular scheduled maintenance and cleaning of the system, which is outlined in Table 4-1, Measures and Activities, Parts D and E. When grease is observed necessary steps are taken to break down the grease and if a higher concentration of grease is observed, prior notification is given to GSD staff before the grease reaches their facility. Staff from various University departments will then work together to determine the cause and make necessary adjustments.</p> <p>System maintenance includes both preventive maintenance and maintenance of parts of the system determined to be in need of cleaning during routine inspections. See Table 4-1, Part D.</p>	Area Manager, Mechanical and Electrical Plumbing	805-893-8300
B. Installation of New Grease Traps or Interceptors		
<p>Installation of a new grease trap or interceptor may be recommended based on inspection and maintenance of the system. Design and construction of any new food facility will include the installation of a grease trap or interceptor. Installations of new grease traps or interceptors will conform to the GSD’s design specifications. Design plans for new grease traps and interceptors will be reviewed by FM Design and Construction, and FM/PF Area Management.</p>	Area Manager, Mechanical and Electrical Plumbing Associate Director, Design & Construction Services	805-893-8300 805-893-6987
C. Best Management Practices		
<p>BMPs are in place to prevent the introduction of grease and fats into the sanitary sewer and consist of training. Many employees are students, and therefore there is a high turnover. Training occurs upon hiring by the kitchen manager.</p> <ul style="list-style-type: none"> • Kitchen staff are trained upon hiring on BMPs to ensure that they are implemented. • Kitchen staff are trained upon hiring on bulk grease practices. Bulk grease is not washed into the sanitary sewer. Additionally, grease in pans is not washed down the drain. • Excess grease that is generated from grilling or frying at the UCen or Coral Tree Café is collected in a dedicated container at the UCen. The grease is disposed of by a grease rendering company. 	Residential Operations, Energy and Environmental Manager UCen Operations Faculty Club Manager	805-893-3092 805-893-4064 805-893-3096

Table 7-1, page 1 of 2

Table 7-1 Continued
FOG Control Program

FOG Control Measures	Responsible Party	Telephone
C. Best Management Practices (continued)		
<ul style="list-style-type: none"> Grease traps are cleaned weekly (located at the Arbor Main Store, Subway, and Coral Tree Café). If a grease interceptor is not working properly, facilities management is contacted (Housing and Residential Services contacts FM/FP Area Maintenance Services, UCen contacts UCen Operations Manager). 	UCen Operation And Faculty Club Manager	805-893-4064 805-893-3096
D. Record Keeping		
<p>Grease Interceptors</p> <p>Invoice records for pumping of grease interceptors are kept by the Residential Operations Manager. They are reviewed to ensure the contractor is maintaining the inspection schedule and pumping out the grease interceptors when necessary.</p>	Residential Operations Manager	805-893-3312
<p>Grease Traps</p> <p>The grease traps on campus are managed by UCen operations. The UCen Operations manager maintains a checklist indicating when the grease traps at the facilities were cleaned.</p>	UCen Operations	805-893-4064
E. Inspection		
<p>Grease Interceptors</p> <p>UCSB has hired an outside contractor to maintain the grease interceptors on campus. The contractor is responsible for routine inspections to ensure proper maintenance of the grease interceptors. Grease interceptors are inspected quarterly and cleaned at least twice a year as needed. All interceptors are located outside buildings, per GSD requirements, so they may be accessed for inspection.</p>		

Table 7-1, page 2 of 2

7.3 OFF CAMPUS FOOD FACILITY THAT DISCHARGES TO THE UCSB SANITARY SEWER SYSTEM

The UCSB sanitary sewer accepts waste from off campus at one location, Goleta Beach County Park. The wastewater from the facilities at Goleta Beach County Park flows into the UCSB force main. The facilities at the park include the Beach Side Café, which has a grease interceptor. The Café was contacted and the operation of the grease interceptor for the Café and the Café's best management practices were reviewed.

The Beach Side Café implements measures to eliminate grease and fats from entering the sanitary sewer line. The Café has a 3,000-gallon grease interceptor which is inspected four times a year by an outside contractor. The grease interceptor is pumped out three to four times a year as needed. Additionally, the Café kitchen staff is trained to collect any excess grease from frying or grilling and dispose of it in a 55-gallon drum outside of the kitchen. A grease rendering company picks up the collected grease two times a week. If there is any blockage of the sewer lines, staff has been directed to contact the Beach Side Café manager.

The GSD monitors activities at the Beach Side Café, as evident by an April 6, 2006, letter. The letter from GSD requested monitoring, inspecting, and BMP information for the grease interceptor located at the Café.

8.0 SYSTEM EVALUATION AND CAPACITY ASSURANCE PLAN

The University is currently managing a large-scale infrastructure rehabilitation initiative that will address shortfalls and deficiencies within the sanitary sewer system and upgrade key components as necessary.

8.1 SYSTEM EVALUATION

As part of its plan to ensure adequate infrastructure capacity to identify deficiencies in the system, UCSB executed a comprehensive infrastructure assessment in 2004 (Winzler and Kelly 2004). The assessment focused on key areas of concern identified by UCSB staff and included observations of existing conditions, and proposed capital improvements necessary for the sanitary sewer system. The following deficiencies and shortfalls were identified:

- Several manholes are inaccessible or could not be located.
- The network is bottlenecked in several areas, and some pipes are sloped counter to the direction of flow.
- Root intrusion is pervasive throughout the system.
- Grease traps were not present (this deficiency has been addressed).
- Metering devices were not installed (this deficiency has been addressed).
- Although the network itself is structurally sound (minimal longitudinal cracking), many of the manholes are in poor condition.
- No hydraulic model of the sanitary sewer system exists.

8.2 DESIGN CRITERIA

Undertake the evaluation identified in the system evaluation above to establish appropriate design criteria.

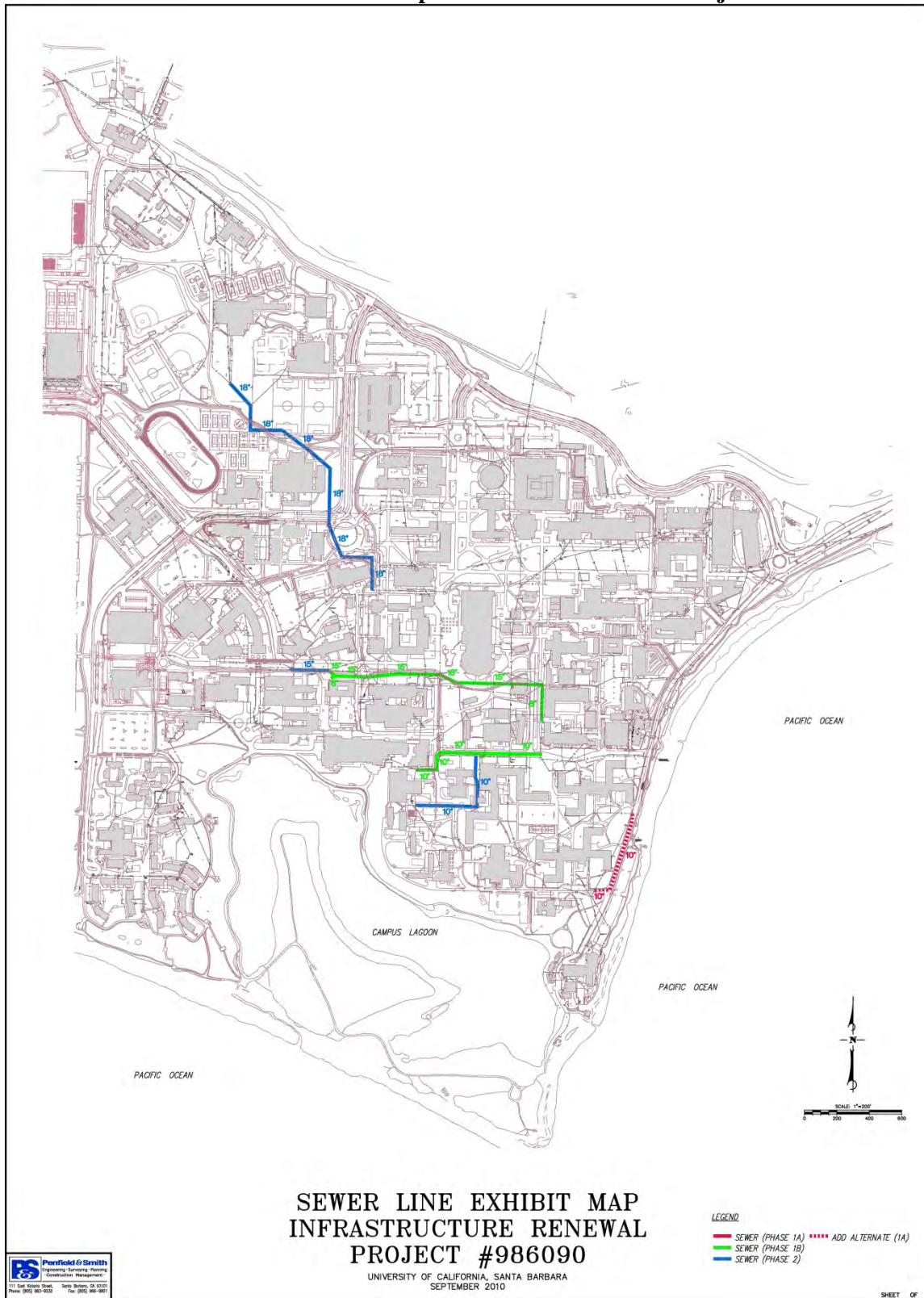
8.3 CAPACITY ENHANCEMENT MEASURES

Although two of the above deficiencies were corrected under UCSB's ongoing facility maintenance programs, most will require comprehensive planning, design, and construction to address. UCSB has adapted the findings of the infrastructure assessment and developed a three-phased, multi-system rehabilitation project to address all of the shortfalls and deficiencies identified by the 2004 report (Winzler and Kelley 2004). The areas of the UCSB main sewer system that will be upgraded by Phase 1A, Phase 1B, and Phase 2 of the Infrastructure Renewal Project are highlighted on **Figure 8-1, Sewer Line Exhibit Map Infrastructure Renewal Project**. The following objectives will be met as part of the project:

- Complete a 100% video inspection of the sanitary sewer lines.
- Develop a hydraulic model of the sanitary sewer system to enable detailed capacity analyses and facilitate system design.
- Replace and/or install sewer lines and manholes as necessary to correct root intrusion and corrosion problems, address bottlenecks, and meet future load requirements. Sizes will be determined by hydraulic modeling.

Phase 1A of the infrastructure renewal project was completed in September of 2011 and Phase 1B is currently scheduled for the fall of 2014. Phase 2 of the infrastructure renewal project is currently awaiting state funding.

Figure 8-1
Sewer Line Exhibit Map Infrastructure Renewal Project



9.0 MONITORING, MEASUREMENT, AND PROGRAM MODIFICATIONS

The WQWG will monitor the effectiveness and implementation of the SSMP. Members of the WQWG will communicate with each other in order to monitor plan implementation. This can occur with a meeting, conference call, or by email. The purpose of the communication is to monitor how efficiently the SSMP is being implemented.

Every two years, the WQWG will evaluate the effectiveness of each element of the SSMP. During this review, the WQWG will utilize the SSMP Checklist, which is included in **Appendix E, Annual Checklist**. The Checklist will assist the WQWG in determining if all elements of the SSMP are effective and are being implemented. Program elements will be updated, as appropriate, based on monitoring or performance evaluation. The plan will be available for audit at all times.

10.0 SSMP PROGRAM AUDITS

As required by Section D.13(x) of the WDR, enrollees must conduct periodic internal audits, appropriate to the size of the system and the number of SSOs, at a frequency of no less than two years. This audit, to be conducted jointly by the WQWG, will focus on evaluating the effectiveness of the SSMP and the compliance with SSMP requirements identified in the WDR. Updates to the SSMP will be made as needed.

The WQWG will evaluate any SSOs and make recommendations to prevent them from reoccurring. As part of the update, the WQWG will utilize a checklist of the SSMP requirements, which is included in Appendix E. The checklist will assist the WQWG in evaluating all the components of the Plan. Through this review, the WQWG will evaluate the SSMP, including its deficiencies, and recommend steps to correct them.

11.0 COMMUNICATION PROGRAM

11.1 COMMUNICATING PLAN INFORMATION AND UPDATES

Environmental Health and Safety will communicate with the campus community regarding the development, implementation, and performance of the SSMP. The Plan will be posted on the UCSB EH&S website for the campus community to review and comment on.

The SSMP will be updated regularly 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. UCSB will communicate with interested parties regarding implementation and performance of the SSMP. Interested parties include:

- Associated Students Environmental Affairs,
- City of Goleta,
- County of Santa Barbara,
- Goleta Sanitary District (GSD), and
- Central Coast Regional Water Quality Control Board.

11.2 RECORDKEEPING AND REPORTING

Environmental Health and Safety will maintain records and provide the required reports as specified in the MRP for WDR No. 2006-0003-DWQ. This includes applicable records for SSOs, sampling and monitoring records, and spill reports. UCSB will maintain information pertinent to the SSMP. Records will be kept for a minimum of 5 years from the date of any reported SSO. All records will be available for review upon request from the SWRCB. UCSB is also responsible for reporting to regulatory agencies, as required.

12.0 REFERENCES

California Water Code of Regulations, Division 7. Porter-Cologne Water Quality Control Act.
January 1, 2006. http://www.swrcb.ca.gov/water_laws/docs/portercologne.pdf

Environmental Protection Agency
2002 Clean Water Act. November 27, 2002. <http://epw.senate.gov/water.pdf>

Goleta Sanitary District
1994 Procedure Manual and Standard Specifications for the Construction of Sanitary Sewers.
January 12, 1994.

Goleta West Sanitary District
2001 Standard Specifications for the Construction of Sewer Facilities, Goleta West Sanitary
District. February. http://www.goletawest.com/Images/stan_specs.pdf

State Water Resources Control Board
2006 Order No. 2006-0003-DWQ, Statewide General Waste Discharge Requirements for
Sanitary Sewer Systems. May 2, 2006.

State Water Resources Control Board
2013 Order No. 2013-0058-EXEC, Amending Monitoring and Reporting Program for
Statewide General Waste Discharge Requirements for Sanitary Sewer Systems. September 9,
2013.

University of California, Santa Barbara (UCSB)
2005 Project Planning Guide, Infrastructure Renewal - Phase I. June 2005.

Winzler and Kelly
2004 University of California, Santa Barbara, Infrastructure Assessment, Final Report.
December 21, 2004.

APPENDIX A

**WASTE DISCHARGE REQUIREMENTS (WDR)
ORDER NO. 2006-0003-DWQ AND AMENDED MONITORING AND
REPORTING PROGRAM ORDER NO. 2013-0058-EXEC**

APPENDIX B
GOLETA BEACH EMERGENCY
SEWER OVERFLOW RESPONSE PLAN

Goleta Beach Emergency Sewer Overflow Response Plan

**Goleta Beach Lift Station
5986 Sandspit Road, Goleta, CA. 93117**

Reporting of Sewage Spills:

Major Spill:

The Porter-Colonge Water Quality Control Act, Section 13271, states all sewage spills greater than 1000 gallons and/or all sewage spills that enter a water body of the state, or occur where public contact may be likely, regardless of the size, shall be reported by phone as soon as possible, and within 24 hours of the incident. A follow up written report will be sent to the RWQCB within 5 days of the incident, using the Sewage Spill Report Form.

Contact the following offices:

Central Coast Region

Regional Water Quality Control Board (RWQCB)

895 Aerovista Pl. Suite 101, San Luis Obispo, CA 93401

Notify by telephone ASAP, no later than 24 hrs. Submit written report within 5 days.

Telephone (805) 549-3147
Fax (805) 543-0397

County of Santa Barbara Environmental Health Services

Notify by telephone within 24 hrs. Submit a written report within 72 hrs.

Telephone (805) 681-4900
Fax (805) 681-4901

Office of Emergency Services

Notify if spill enters waters of the state, by telephone ASAP.

Telephone (800) 352-7550

California Department of Fish and Game

Notify if spill enters waters of the state.

Telephone (805) 964-8849

Minor Spill:

Sewage spills of less than 1,000 gallons that do not enter a water body, and/or where public contact is not likely, must be reported, in writing, to the RWQCB within 30 days after the incident. Submit the Sewage Spill Report Form.

As a courtesy, report the spill to the County of Santa Barbara Environmental Health Services by telephone.

Telephone# (805) 681-4900

Goleta Beach Emergency Sewer Overflow Response Plan

Responding, Containing, and Cleaning Up Sewage Overflows

Responding:

A High Level Alarm System is installed in the lift station located between the GLB Resident Rangers houses. Response time is within 5 minutes. If other staff need to be notified their response time can be within 10 minutes during work hours. After hours, if Goleta Beach Rangers are not able to respond, a call out could take 20 to 30 minutes.

When a sewage spill/overflow occurs, the first people to be notified are the Goleta Beach Resident Park Rangers.

Paul Voyer	Work: 967-1300 Cell: 896-7013
Larry Austin	Work: 967-1300 Cell: 896-6520

If Resident Rangers are not in the park, contact:

Deputy Park Director	Jim Isaac	Work: 681-5651 Cell: 896-6519 Home: 685-2391
Park Operations Manager		Work: 681-5653
Maintenance Leader	Richard Lindley	Work: 681-5656 Cell: 896-6518 Home: 688-1448
Maintenance Plumber		Work: 681-5656

Response Contact Agencies

Marborg Disposal	963-1852 24hr. 896-8047 cell
RJ Carroll and Sons	963-8711 24hr
Goleta Sanitary District	967-4519 24hr.
UCSB	896-3557 24hr.

Goleta Beach Emergency Sewer Overflow Response Plan

Containment of spill:

- **It is the responsibility of the County Park Department personnel to contain the spill on site, and safeguard all bodies of water from pollution.**
- **All park restrooms should be shut down and locked. The ranger residences and the restaurant need to be notified to prevent any further water flow.**
- **Call for a vacuum truck to remove sewage.**
- **All personal protective safety equipment should be used. Standard safety procedures should be followed: such as confined space entry procedures, and restricting public access.**
- **Containment will be accomplished by sandbagging, building dikes or berms, or digging a sump pit to collect wastewater. All equipment and materials needed will be located in the Goleta Beach Maintenance yard.**
- **Implement Sewer Lift Station Emergency Procedures. (Attached).**

Clean up of spill:

- **After containment is accomplished, cleanup of the affected area is to begin immediately. Restrict public access to area by using barricades, caution tape or rope.**
- **All personal protective safety equipment shall be used and safety procedures should be followed.**
- **The vacuum truck will remove the debris. The dry well should be flushed with a 50/50 solution of household bleach and water. All contaminated areas and tools should be disinfected with a backpack sprayer of a 50/50 solution of household bleach.**
- **Public access must be restricted for at least an hour or longer (depending on the size of the spill) after the disinfectant is applied.**
- **If sewage spills into a state body of water, the clean up of sewage will be done with the advice of County Environmental Health, and the Regional Water Quality Board, see contact information above.**

GOLETA BEACH SEWER LIFT STATION EMERGENCY PROCEDURE

IF THE ALARM GOES OFF INDICATING HIGH WATER IN THE TANK:

- Turn off the alarm.
- Check pump switches, both should be on "automatic".
- Push the red reset button to see if the situation has corrected itself.
- If the light in the reset button goes out the system should function properly, but check the main vault through one complete cycle to make sure it pumps down.
- If not, check the breakers inside of switch control panel – push the grey buttons in.
- If pumps don't come on get the 220v submersible pump and extension cord from the generator shed.
- Connect hose to the fitting on the outside of the lift station vault.
- Remove the manhole cover and lower the pump into the manhole.
- Open valve on the fitting.
- Close in-coming valve in the bottom of the vault.
- Plug submersible pump into the 220v receptacle in the pump control shed. Make sure the inline switch on the electrical cord is in the "on" position. Put switch on "automatic" (toggle switch above receptacle). Water will automatically be pumped out of the manhole, bypassing the main pumps and into the pressure line to UCSB.
- NOTE: If the 220v pump fails, connect the 110v submersible pump, plug it into the white 110v receptacle and follow the above procedure. If the red warning buzzer sounds, there is a malfunction with the back-up system.
- Turn the alarm switch back on when the main pump system is reactivated.

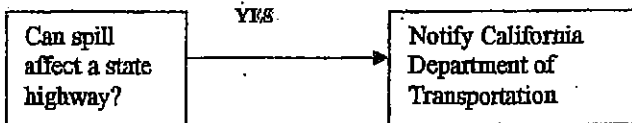
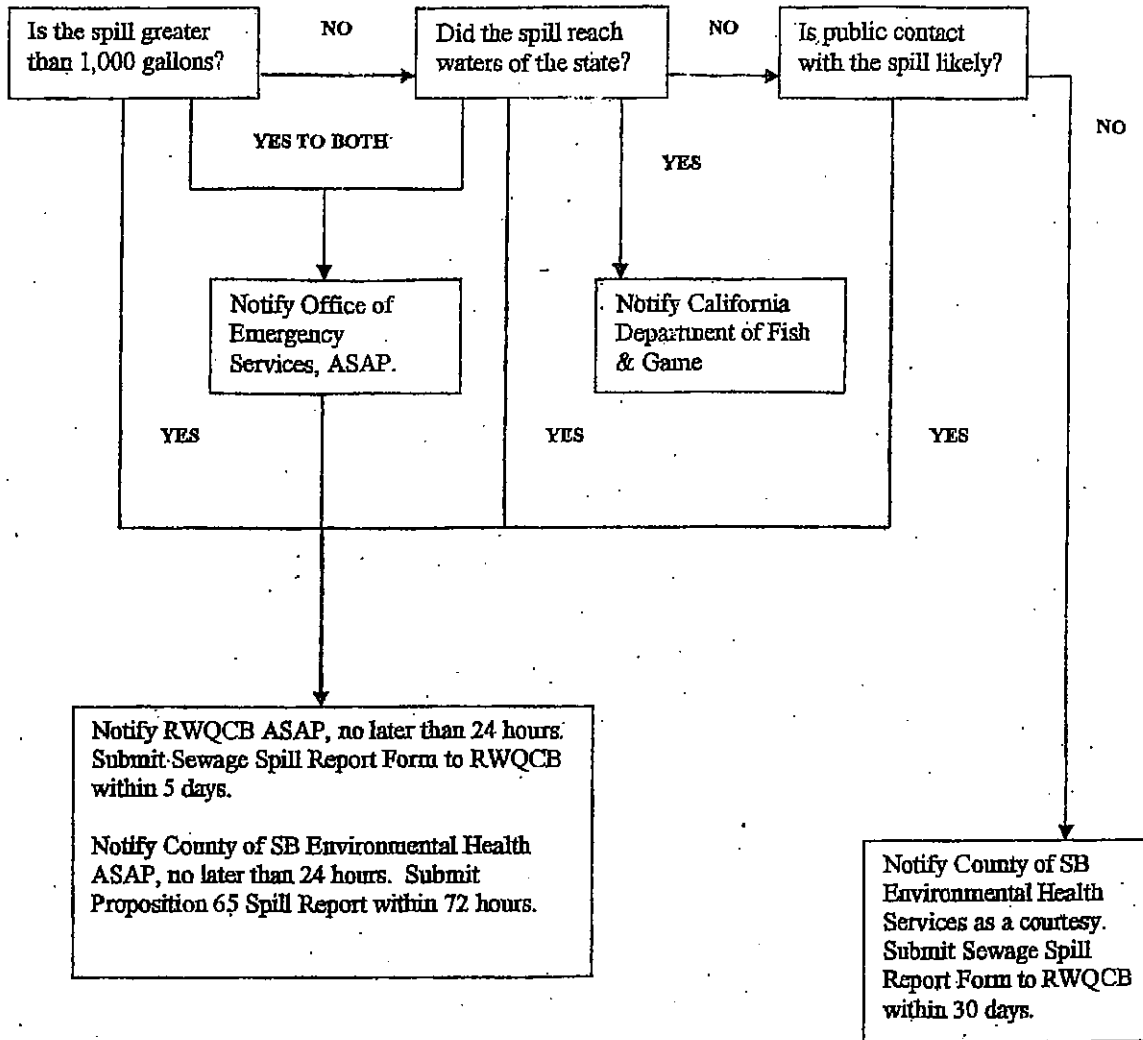
IF THERE IS A POWER OUTAGE

- Shut off the three main electrical breakers next to the meter in the control shed.
- Use the 220v electric generator in the storage shed at Goleta Beach or the Welding truck generator from the South Co. Park Maintenance Yard and plug the backup submersible pump into it and operate manually; (Rent a generator from a local rental yard if necessary.)
- If you are not able to resume pumping with the main or backup system, close the park restrooms and inform the restaurant that they must stop using water. Call Marborg Ind., 963-1852 and order chemical toilets for the park.

IF THE ALARM SOUNDS, INDICATING HIGH WATER IN THE MANHOLE

- Turn off the alarm.
- Check the water level in the manhole and in the lift station.
- If the water level is high in the manhole and not in the lift station, get the sewer snake from the Goleta Beach Yard.
- Remove the manhole cover (if necessary).
- Put the grey 3" curved PVC pipe in the manhole so the curved end goes into the downstream hole. (The pipe is located behind the control shed).
- Run the sewer snake through the PVC pipe until the line is cleared and the water level goes down. The influx of water may cause the bell alarm to sound, if so reset the red light button.

Spill Reporting Requirements Flow Chart



**California Regional Water Quality Control Board, Central Coast Region
SEWAGE SPILL REPORT**

Reporting Party		Phone	
Address		City	
Discharger		Phone	

Date Of Overflow		Time Overflow Began		Time Overflow Stopped	
Overflow Location (street address or lat. & long.)					
Volume Of Overflow (Gallons)		Path Of Overflow			
Waterbody/Bodies Affected.					
Cause Of Overflow (grease, roots, vandalism, pump station failure, etc.)					

Action Taken To Stop Overflow					
Time Cleanup Began		Time Cleanup Complete			
Discussion Of Cleanup					
Were Public Health Warnings Posted, And If So, Where?		Number Of Overflows In Same Location In Last Three Years			
Discussion Of Measures Taken To Prevent Overflows At This Location					

Agencies Notified (Please Check)	County Health	Office of Emergency Services	Fish and Game	County Board Of Supervisors	Other (List)
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SIGNATURE		DATE	
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**PROPOSITION 65
WASTEWATER SPILL REPORT**

Date _____

Reported by _____ Title _____

Facility/Site name (if applicable) _____

Address _____ City Goleta Zip Code 93117

APN# _____ Contact _____ Phone# _____

Responsible Party _____ Phone# _____

Address _____ City _____ Zip Code _____

Date and Time Incident Occurred _____

Date and Time of Response _____

Staff and Equipment Responding _____

Volume of Wastewater Spill _____ gallons

Injuries/Symptoms _____

Environment Affected _____

Locale residential / commercial / agricultural / open space / public / private

Verbal Notification:

RWQCB -- Date _____ Time _____ Contact _____

EHS -- Date _____ Time _____ Contact _____

Was public access restricted? YES/NO

Notes _____

APPENDIX C
GOLETA SANITARY DISTRICT
STANDARDS, SECTIONS 7, 9, 10, 11, AND 12

SECTION 7: DESIGN CRITERIA

7.1 DESIGN METHODOLOGY

Sanitary sewer capacity is typically determined from an analysis of existing and probable future quantities of domestic, commercial and industrial wastewater, as well as anticipated groundwater infiltration and extraneous inflow. Sanitary sewers are typically sized to convey peak wastewater flow, infiltration and inflow.

Pipe capacity and velocity shall be based upon the Chezy-Manning formula:

$$Q = VA = \frac{1.49}{n} A (r_h)^{2/3} (S)^{1/2}$$

Where

- Q = flow in cubic feet per second (ft³/s)
- v = velocity in feet per second (ft/s)
- A = cross section of flow in square feet (ft²)
- r_h = hydraulic radius is the ratio of cross-sectional area of flow to wetted perimeter (A/P_w)
- S = slope of the pipe in feet per feet (ft/ft)
- n = coefficient of roughness

Wetted perimeter is defined as the cross-sectional portion of the channel that has water contact. The coefficient of roughness ("n") shall equal 0.013 or the pipe manufacturer's recommendation, whichever is greater.

7.2 SLOPE AND VELOCITY

Sewage velocity shall be equal to or greater than two feet per second (2 fps), when flowing at the design flow. Where design velocities exceed fifteen feet per second (15 fps) ductile iron pipe conforming to District standards shall be used. The minimum acceptable slope for sewer pipe sizes listed in Table 1 below are based upon a self-cleaning velocity of 2 feet per second in the sewer.

Table 1 – Minimum Pipe Slopes

8 inch	0.0040 ft/ft
10 "	0.0032 ft/ft
12 "	0.0024 ft/ft
15 "	0.0016 ft/t
18 "	0.0014 ft/ft
21 "	0.0012 ft/ft
24 "	0.0010 ft/ft
27 "	0.0008 ft/ft

Slopes of sewers shall be computed using the difference between the outlet flow line elevation of the upstream manhole and the inlet flow line elevation of the next downstream manhole. Flow line elevations at the inlet and outlet of each manhole shall be shown on plans.

7.3 SEWAGE GENERATION FLOW RATES

7.3.1 AVERAGE SEWAGE FLOW RATES

The average flow rate shall be determined by the Project Engineer based on good engineering practice. Sewage flows shall be determined from the potential land use of the tributary area. Average flow rates for various land use and anticipated population density in terms of cubic feet per second per acre are tabulated in Table 2. The flow rates shall be used for new development and determining the effects of future land use per approved General Plan(s). The acreage in the table is gross acreage including roads, yards, parking, etc.

Table 2 - Sewage Generation Flow Rates

Residential –Single Family:

1 unit/3 acres	0.0002 cfs/acre
1 unit/ acre	0.0005 cfs/acre
1.8 units/acre	0.0009 cfs/acre
3.3 units/acre	0.0016 cfs/acre
4.6 units/acre	0.0022 cfs/acre

Residential – Multi-Family:

6.0 units/acre	0.0021 cfs/acre
8.0 units/acre	0.0028 cfs/acre
10 units/acre	0.0035 cfs/acre
12.3 units/acre	0.0043 cfs/acre
18 units/acre	0.0063 cfs/acre
20 units/acre	0.0070 cfs/acre
30 units/acre	0.0105 cfs/acre

Commercial:

General Commercial	0.0023 cfs/acre
Neighborhood Commercial.....	0.0093 cfs/acre
Highway Commercial	0.0046 cfs/acre
Office and Professional.....	0.0023 cfs/acre

Manufacturing/Industrial:

Light Industrial.....	0.0050 cfs/acre
General Industrial.....	0.0046 cfs/acre

The minimum depth of a sewer main is the depth necessary to obtain five feet (5') of cover over the lateral sewer at the property line, typically six feet (6'). The District may require greater depths when it is necessary to extend the main line sewer to serve other areas to provide for future improvements.

Sewer designs with depths not in accordance with the above shall be submitted to the District Engineer for approval along with evidence that the design complies with the basic requirements above.

7.8 SPECIAL DESIGNS – NON-GRAVITY SEWER

Buildings sewers that are too low for gravity flow to the public sewer main will require conveyance by a pump via a force main. The pump, force main and connection to the public sewer shall be owned and operated by the Applicant. See Section 7.17.2 for additional information.

7.9 PIPE CLEARANCES

All sewer mains and structures shall be designed and constructed to have a minimum of three (3) feet horizontal clearance and one (1) foot vertical clearance from other utilities and/or improvements, unless approved otherwise by the District Engineer.

Utility, conduit, or pipelines crossing or running parallel to lateral and building sewers must be separated vertically and/or horizontally by a minimum of 12" from the outside edge of the pipe.

The "California Water Works Standards" set forth the minimum separation requirements for water mains and sewer lines. These standards, contained in Section 64630, Title 22 of the California Administrative Code specify:

- Parallel Construction: The horizontal distance between pressure water mains and sewer lines shall be at least 10 feet.
- Perpendicular Construction (Crossings): Pressure water mains shall be at least 12 inches (12") above sanitary sewer lines where these lines must cross.
- Separation distances specified above shall be measured from the nearest edges of the facilities.
- Common Trench: Water mains and sewer lines shall not be installed in the same trench.

When local conditions such as available space, limited slope, existing structures, etc. create a situation where there is no alternative but to install water mains and sewer lines at a distance less than that required by these standards alternative construction criteria shall apply. State Department of Health requirements shall be met for water sewer separation. See Standard Drawings 19-23. Sewer designs that do not meet State Department of Health clearance requirements shall be approved by the Santa Barbara County Health Department. Said approval shall be shown on the plans with the date and signature of the authorized County Health representative.

7.10 SEWER MAIN CLEARANCE OF WATER WELLS

Sewer lines and related structures shall not to be installed within 50 feet of water wells in accordance with State and County Health regulations. The Applicant must obtain approval from the County Health Department for sewer installations proposed within fifty feet (50') of a water well. Said approval shall be shown on the plans with the date and signature of the authorized County Health representative.

7.11 SEWER MAIN LOCATION

7.11.1 SEWERS IN STREETS

Wherever possible sewers shall be located in public road right of ways, alleys or other paved accessible areas. Sewer alignments and easements proposed across private property shall be approved by the District.

Sewers in streets shall be constructed along street centerlines in straight lines where possible. Sewer lines and manholes shall not be constructed within two feet of concrete gutters.

7.11.2 SEWERS IN ALLEYS

Sewer mains shall be located in the center of alleys, except where concrete ribbon gutters are to be constructed in the center of the alley. Where ribbon gutters are used, the sewer mains shall be offset 2 feet clear from the edge of the concrete ribbon gutter. Sewer mains and manholes shall not be located closer than five feet to the adjacent property line or edge of traveled way.

7.12 EASEMENTS

Easements provided for sewer facilities across private property shall be shown on the plans. Sewers that are located outside of public right of ways shall be located in areas that are accessible by maintenance vehicles. An all-weather access road at least twelve (12) feet wide and with fifteen (15) feet of vertical clearance shall be provided to all manholes. The access road grade shall not exceed 15% in unpaved areas and 20% in paved areas. Truck turnarounds may be required. At said manholes twenty-five (25) feet of vertical clearance is required.

Where easements follow common lot lines, the full easement width shall be on one lot, in such a manner that access to the manholes will not be obstructed by walls, trees or permanent improvements. Where this requirement cannot be met without interfering with existing buildings easements may straddle lot lines.

Easements shall not be obstructed by permanent overhead structures. Deeds for easements shall provide for restrictions of permanent construction within the easement to allow ingress and egress for maintenance.

The minimum width for easements shall be as shown in the following table:

Table 3: Easement Widths

SEWER SIZE	DEPTH FROM SURFACE TO SEWER (IN FEET)				
	0' to 10'	10' to 15'	15' to 20'	20' to 25'	25' Plus
8" –12"	15	15	20	25	-
15"-21"	20	20	20	25	30
24"-36"	20	20	25	30	35

7.13 ALIGNMENT

Sewer mains shall be laid on a straight alignment and grade between manholes.

Horizontal and vertical curves require the approval of the District Engineer. Curved sewers where allowed, shall meet the minimum radii of curvature specified by the pipe manufacturer. Curves shall be accomplished by bending the pipe rather than deflecting the joints. Horizontal curves shall be concentric with the street centerline where possible. No more than one curve shall be used between manholes. Manholes are required at points of reverse curvature and points of compound curvature. The sum of the horizontal curve deflection between consecutive structures shall not exceed 60 degrees (60°).

Minimum grade of horizontally curved sewer shall be at least the same as straight sewers and preferably greater.

7.14 SIDE SEWERS

Definition: That portion of the sewer system between the main sewer and the structure being served including the building sewer, lateral sewer and wye connection, which are private and installed and maintained by property owners.

7.14.1 SEPARATE SEWERS

A separate side sewer shall be provided for each individual building site. Multiple buildings located on the same legal property may be served with the same lateral or building sewer. The District shall render a single bill to the Property Owner, or Applicant of record that shall include the sewer service charge for the entire property. Upon subdivision of said property, separate sewers shall be installed to each property.

7.14.2 SINGLE RESIDENTIAL SEWER SIZE AND GRADE

The minimum inside diameter of a lateral sewer pipe shall be four inches (4") and shall be equal to or greater than the building plumbing stub diameter. The pipe slope shall not be less than 1/4" per foot (approximately 2%) from the sewer main to the building connection.

7.14.3 MULTIPLE RESIDENTIAL SEWER SIZE AND GRADE

The minimum inside diameter of a lateral sewer pipe shall be six inches (6") and shall be equal to or greater than the building plumbing stub diameter. The pipe slope shall not be less than 1/8" per foot (approximately 1%) from the sewer main to the terminal cleanout. The pipe slope

shall be installed on an even slope from the main sewer line to the connection with the building drain.

Each building or unit to be served shall connect to the 6" sewer pipe with a separate 4" building sewer with a minimum slope of 1/4" per foot. The 4" building sewer shall have a cleanout located eighteen (18) inches from the building.

7.14.4 COMMERCIAL/INDUSTRIAL SEWER SIZE AND GRADE

The minimum inside diameter of a lateral sewer pipe shall be six inches (6") and shall be equal to or greater than the building plumbing stub diameter. The pipe slope shall not be less than 1/8" per foot (approximately 1%) from the sewer main to the building connection or terminal cleanout.

7.14.5 EXISTING BUILDING SEWERS

Existing building sewers may be used for new building connections when they are found, upon evaluation by the District, to meet District standards. The fee for examination and testing shall be determined by the District and shall be paid by the Applicant.

Sewers to be abandoned must be capped with a water tight plug and encased in concrete at the property line or at the easement line where sewer mains are in off road easements. Abandoned sewers shall be inspected by the District.

7.14.6 DEPTH

The lateral sewer shall have a minimum cover of five feet (5') at the property line or at a point five feet (5') outside of the curb face or edge of paving, which ever is greater. Laterals shall be installed deep enough to provide service to the most remote and lowest point of the site's buildable area, while providing the required pipe slope and cover.

Minimum cover for laterals in driveways, parking and other traffic areas within properties other than single family residential, from the property line to a point within eight feet (8') of the building drain connection, shall be three feet (3').

Minimum cover for laterals outside of traffic areas, from the property line to a point within eight feet (8') of the building drain connection, shall be twenty four inches (24") unless otherwise approved by the District.

Minimum cover for laterals at the point of connection to the building sewer shall be eighteen inches (18")

Depth of service laterals shall be at sufficient depth to provide adequate coverage and service to the lowest point and the farthest point to be served on each lot. At no place shall the depth of a service lateral be less than 5 feet at the property line, nor less than 2 feet below grade surface at any point on private property unless otherwise approved by the District Engineer.

7.14.7 BENDS

Lateral sewers shall be designed and constructed to provide the most direct route from the sewer main to the building connection. All bends 45 degrees and greater shall have a cleanout.

22.5 degree bends shall not be used in lieu of 45 degree or greater bends to avoid the need of cleanouts.

7.14.8 CLEANOUTS

General: Cleanout construction shall conform to Standard Drawing No. 6. Cleanout shall consist of a wye and one-eighth bend and a riser pipe extended just below grade and sealed with a threaded plug or cap that can be removed through the cleanout access cover. Cleanouts shall be protected with a concrete cleanout box. The cleanout box lid shall be cast iron and embossed with "sewer" on the lid.

7.14.8.1 LOCATIONS

Cleanouts shall be installed on laterals at the following locations:

- the property line or sewer easement line
- vertical grade breaks
- horizontal alignment changes of 45 degrees or greater
- straight run intervals of not more than 100 feet
- the connection of the lateral to the building plumbing - eighteen (18) inches from the wall drain.

7.14.9 BACKWATER VALVES

A backwater valve is required when the elevation of the lowest floor that has plumbing fixtures is located below the elevation of the next upstream manhole cover of the public or private sewer serving the piping. The backwater valve shall be installed at the junction of the lateral sewer and building sewer, generally eighteen (18) inches from the wall, in place of a standard cleanout, and shall be accessible from a concrete vault with a cast iron cover embossed with "Sewer". (See Standard Drawing No. 15)

7.14.10 SAMPLING MANHOLE

A sampling manhole, when required, shall be shown on the plans and be constructed and installed at the property line in accordance with Standard Drawing 14.

7.14.11 SAMPLING WELL

A sampling well in lieu of a standard building sewer cleanout, when required, shall be shown on the plans and constructed and installed in accordance Standard Drawing 13.

7.15 MANHOLES

7.15.1 GENERAL

Manholes shall be constructed in accordance with Standard Drawing 10 and these specifications.

7.15.2 DROP ACROSS STRUCTURE

The vertical drop across manholes from the inlet pipe to the outlet pipe shall be one-tenth of a foot (0.1') where the deflection between the upstream pipe and downstream pipe is less than 30 degrees (30°).

The vertical drop across manholes from the inlet pipe to the outlet pipe shall be two-tenths of a foot (0.2') where the deflection between the upstream pipe and downstream pipe is greater than 30 degrees (30°).

7.15.3 ALLOWABLE DEFLECTION ACROSS STRUCTURE

The angle of deflection between the upstream pipe and downstream pipe shall not be greater than 90 degrees (90°).

7.15.4 SPACING AND LOCATIONS

Manholes shall be located at all abrupt changes in alignment or grade and at all junctions. Manholes are required at the following locations:

- Pipe grade changes
- Vertical or horizontal angle points
- Points of reverse curves and compound curves
- Pipe size changes
- Junctions of sewer mains
- At intervals not greater than 350 feet
- and at pipe terminuses.

Manholes located at intervals greater than 350 feet shall be approved by the District.

Unless approved otherwise by the District manholes shall be constructed:

- Within six feet (6') of the street centerline.
- The last manhole on through streets shall be a minimum of eight feet (8') upstream from the lateral of the last lot served.
- Manholes at the end of cul-de-sac streets shall end (depending on available space) 10 to 15 feet before the curb face at the end of the street.

Sewers with steep grades may require manholes at closer intervals.

When a proposed sewer connects to an existing manhole, the invert elevation of the inlet and outlet pipes shall be shown in profile as determined by field survey.

If a new manhole is proposed on an existing sewer line, the elevation of the existing sewers in the manhole on each side of the proposed manhole shall be determined by field survey. The Applicant should be prepared to submit the field notes of the survey if requested to do so.

7.15.5 SIZE

Manholes for sewer mains 8 inches to 15 inches in diameter shall have a 48-inch inside diameter shaft with a 24-inch diameter entry.

Manholes for sewer mains 18 inches to 27-inches in diameter shall have a 60-inch inside diameter shaft with a 36-inch diameter entry.

Manholes for sewer mains 30 inches or greater in diameter shall have a 72-inch inside diameter shaft with a 36-inch diameter entry.

The frame and cover for 36-inch diameter entry shall be constructed of three pieces consisting of a frame with a 36-inch clear opening with a standard 24-inch cover nested within a 36-inch cover. See Standard Drawing No. 7.

7.15.6 MANHOLE CONES

Cones shall be eccentric and centered over the outlet of the manhole. Under certain circumstances concentric cones may be required by the District. Flat tops shall not be allowed.

7.15.7 RIM ELEVATIONS

In paved areas, the manhole rim elevation shall match finished grade.

In areas outside of the traveled way, the manhole rim shall be 18 inches above finished adjacent grade, 100-year flood elevation, or the top of future fill, whichever is greater.

In maintained landscaped areas, manhole rims shall be 6 inches above finished grade.

Manholes not in travel areas shall be protected from damage per Standard Drawing No. 8.

7.15.8 REMODELING MANHOLES

Existing manhole bottoms to be remodeled shall be removed a minimum depth of three inches (3") to allow construction of new channels and shelves with an approved concrete/mortar material. Sewage in new and remodeled manholes shall be bypassed or controlled across the manhole in a manner that sewage does not flow over the concrete channels until they have cured for a minimum of twenty four (24) hours.

7.15.9 DROP MANHOLES

Drop manholes require special approval by the District. Drop manholes, when approved, shall conform to the Standard Drawing 11.

7.16 INTERCEPTORS (GREASE AND/OR SAND)

"Interceptors" shall be defined as a device of at least 500 gallon capacity designed and installed so as to separate and retain deleterious, hazardous, or undesirable matter such as grease and oil from wastes and permit normal sewage or liquid wastes to discharge into the disposal terminal by gravity.

Grease interceptors, shall be provided on side sewers that discharge wastewater containing grease, oil or other ingredients detrimental to the sewer system. Grease interceptors are typically required at restaurants, grocery stores and other food preparation facilities.

Sand/Oil Interceptors shall be provided when, in the judgment of the District, they are necessary for the proper handling of sand, grit and/or petroleum-based liquid waste which may be harmful to, or cause obstruction of the publicly owned wastewater collection system, interfere with the operation of the publicly owned treatment works, or as otherwise required. Sand/Oil Interceptors are typically required at gasoline stations, car washes, automobile repair shops, etc.

Interceptors shall be sized in accordance with the Uniform Plumbing Code, latest edition. The interceptors shall be designed, sized, installed, maintained and operated so as to accomplish its intended purpose of intercepting the sand/oil/grease from the customer's wastewater and preventing the discharge of such undesirable matter to the District's wastewater treatment plant. The use of larger capacity Sand/Oil Interceptors is encouraged whenever possible in that larger interceptors work more efficiently. In resolving any question of capacity of Sand/Oil Interceptors, any uncertainties shall be resolved in favor of the larger capacity interceptor.

The volume of grease interceptors shall be determined based on the maximum number of drainage fixture units (DFUs) allowed for the pipe size connected to the inlet of the interceptor. The minimum pipe size allowed to be connected to an interceptor is six inch (6") diameter. Drainage Fixture Unit values are defined in Uniform Plumbing Code Table 7-3. UPC Table 10-3, "Gravity Grease Interceptor Sizing" is partially reproduced here for reference.

UPC Table 10-3, "Gravity Grease Interceptor Sizing"

DFUs	Interceptor Volume (gallons)
8	500
21	750
35	1,000
90	1,250
172	1,500
216	2,000
307	2,500
342	3,000
428	4,000
576	5,000

The size, type and location of each interceptor shall be approved by the District, in accordance with this Regulation. A sampling manhole shall be located at the outlet end of all gravity grease interceptors for effluent quality sampling.

Except where otherwise specifically permitted, no wastes other than those requiring separation shall be discharged into any Interceptor. Toilets, urinals and other similar fixtures shall not drain through an interceptor. Waste lines not connected to the interceptor shall enter the sewer lateral after the interceptor and before the sampling manhole.

Interceptors shall be constructed in accordance with Standard Drawing No. 25. The interceptor shall be located outside the building, within the private property, and shall be accessible at all times for inspection, cleaning and removal of intercepted grease, sand, oil, etc. Interceptors shall be placed as close as practical to the fixtures they serve.

The interior of interceptors shall be coated and water tested. The coating shall be a 100% solvent-free two-component epoxy resin system or approved equal. A water leakage test shall be conducted by filling the unit with water for a period of 24-hours and verifying that the structure does not leak.

One set of plans, including complete mechanical and plumbing sections shall be submitted to the District for approval prior to construction. Such plans shall include the size, type and location of each interceptor. Approval shall not exempt the user from compliance with any applicable code, ordinance, rule, regulation or order of any governmental authority. Such approval shall not be construed as or act as a guarantee or assurance that any discharge is or will be in compliance with any applicable code, ordinance, rule, regulation, or order or any governmental authority. Any subsequent alterations or additions to such facilities shall not be made without due notice to and prior approval of the District.

7.17 LIFT STATIONS AND FORCE MAINS

7.17.1 CRITERIA FOR APPLICATION

Wherever practicable, all plumbing fixtures shall be drained to the public sewer by gravity. Lift stations and force mains will not be allowed if an option for providing gravity sewer service exists. Any deviation from this requirement is subject to the approval of the District. Sewage ejector pumps and force mains shall be designed in accordance with Section 710 of the California Uniform Plumbing Code, latest edition.

7.17.2 SEPARATE LIFT STATIONS

Each building site shall be connected by a separate ejector pump and force main. Lift stations and force mains required for sewage service to a property shall be the responsibility of the property owner. The Applicant shall be responsible for the design, construction, operation and maintenance of the required facilities.

7.18 STANDARD DRAWINGS

The following is a list of District Standard Drawings. The Standard Drawings establish the performance, quality requirements and general arrangement of materials and equipment and establish the minimum standards for quality of workmanship and appearance. Standard Drawings applicable to the work shall be listed on the title sheet of the construction plans.

- No. 1 - Standard Plan Size & Layout
- No. 2 - Sewer Location in Public Roads
- No. 3 - Symbols and Abbreviations
- No. 4 - Trench Backfill Requirements
- No. 5 - Cased Crossing
- No. 6 - Side Sewer Cleanout
- No. 7 - 36" Manhole Frame and Cover
- No. 8 - Remote Area Manhole Jacket
- No. 9 - Sampling Manhole Less Than 3' Deep
- No. 10 - Standard Manhole
- No. 11 - Standard Drop Manhole
- No. 12 - Manhole Frame & Cover
- No. 13 - Sampling Well
- No. 14 - Sampling Manhole
- No. 15 - Backwater Valve
- No. 16 - Wye Installation in Existing Sewer Main
- No. 17 - Lateral Sewer
- No. 18 - New Building and Lateral Sewer "As Constructed" Layout Sketch Example
- No. 19 - Water-Sewer Separation (Text)
- No. 20 - Water-Sewer Separation (Text)
- No. 21 - Water-Sewer Separation (Detail)
- No. 22 - Water-Sewer Separation (Detail)
- No. 23 - Pipe Anchors and Backfill Stabilizers Type 1
- No. 24 - Pipe Anchors and Backfill Stabilizers Type 2
- No. 25 - Grease Interceptor

END OF SECTION

SECTION 9: CONSTRUCTION MATERIALS

9.1 SEWER PIPE MATERIALS

The following are the acceptable pipe materials for construction of public sewers in the District:

- Vitrified Clay Pipe (VCP) – VCP and fittings shall conform to ASTM C700 and shall be Extra Strength. Joints shall be plain end or bell and spigot.
- Polyvinyl Chloride Pipe (PVC) - PVC pipe and fittings with nominal diameters between four inches (4”) and fifteen inches (15”) shall conform to ASTM D3034 SDR 35. PVC pipe and fittings with nominal diameters between eighteen inches (18”) and thirty inches (30”) shall conform to ASTM F679 SDR 26.
- Ductile Iron Pipe (DIP) – DIP and fittings shall conform to ANSI A21.51 / AWWA C151. Pipe joints shall be mechanical or bell and spigot utilizing an elastomeric gasket per AWWA C111.
- High Density Polyethylene Pipe (HDPE) – HDPE pipe and fittings shall be manufactured of material conforming to conform to Cell Classification of PE 345444E. HDPE pipe shall be provided in steel pipe sizes (IPS) based on outside pipe dimensions and shall have a minimum dimension ratio of DR17 in conformance with the requirements of ASTM F714. HDPE pipe and fittings shall be joined by butt fusion.

In addition to the above, the following is an acceptable pipe material for construction of private sewers in the District:

- Acrylonitrile-butadiene-styrene Pipe (ABS) - ABS pipe and fittings shall conform to Schedule 40 ASTM F 628 or ASTM D 2661. All products shall bear the seal of a nationally-recognized listing or certifying agency.

The same manufacturer, type and class of pipe shall be used throughout the work. Materials shall be new and undamaged.

VCP, PVC, ABS and DIP pipe products shall be specified by the nominal inside pipe diameter. HDPE pipe shall be specified in steel pipe sizes (IPS) based on outside pipe dimensions

9.1.1 FITTING AND JOINT MATERIALS

Fittings shall be the same material and class as the sewer pipe. Fittings and accessories shall be manufactured by the pipe supplier and shall have a bell and/or spigot configurations compatible with that of the pipe. Fittings shall be stored, prepared and installed per manufacturer's printed requirements.

Plugs shall be watertight butyl rubber and shall be equipped with an expansion bolt to hold plug in end of pipe.

The Contractor shall use stainless steel banded rubber couplings when connecting replacement pipe to existing pipe. When approved by District and where connections involve joining PVC pipe to vitrified clay pipe (VCP) or other dissimilar material, the Contractor shall use "reducer"

(as appropriate) flexible sewer couplings such as Mission Rubber Company Flex-Seal Couplings or equal. Installation shall be per manufacturer's instructions and recommendations.

9.1.2 REPLACING OR REPAIRING PIPE SECTIONS

Repairs to existing sewers shall use the same type and class of pipe of the pipeline being repaired.

9.2 MANHOLE MATERIALS

Base: Cast in place Class 560-C-3250 Portland Cement Concrete per Standard Specifications for Public Works Construction, latest edition.

Shaft and Cone: Precast reinforced concrete in accordance with ASTM C478 using Type II Portland Cement per ASTM C150 and Federal Specification SS-C-1960/3, Type I/II Low Alkali, with a minimum compressive strength of 4000 psi at 28 days. Reinforcing shall be in accordance with ASTM A185.

Joint Gaskets: Joints between shaft sections shall be set with butyl rubber preformed gaskets for manhole joint application in accordance with ASTM C923.

Frame and Cover: Frame and cover castings shall be in accordance with Standard Drawing 12 or 27. Castings shall be of gray iron conforming to the requirements of AASHTO M105 / ASTM A48 Class 35B. Castings shall be of uniform quality, free from blow holes, porosity, hard spots, shrinkage, distortion or other defects. The finish shall meet industry standards and be cleaned by shot blasting. The cover and frame seat shall be machined so that the cover will sit evenly and firmly and not rock in the frame. Covers that rock will be rejected. Frames and covers shall be dipped in black bituminous paint.

9.3 PIPE BEDDING AND PIPE ZONE MATERIALS

Pipe bedding and pipe zone shall be defined as the area containing the material supporting, surrounding and extending to twelve inches (12") above the top of the pipe. The minimum depth of bedding materials shall be four inches (4").

Bedding and pipe zone material shall be Class I (angular crushed stone or rock, 3/4 inch gradation) material conforming to the requirements of ASTM D 2321, Section 5. The 3/4-inch gradation requirements are reproduced in Table 4. The pipe zone material shall have an installed density of at least 90% Relative Density.

Table 4: 3/4 -Inch Gradation

Sieve Size	Percent Passing
1-inch	100
3/4 inch	90-100
1/2-inch	30-60
3/8- inch	0-20
No. 4	0-5
ASTM C131 Test Grading	B

For private side sewers - pipe bedding and pipe zone material may be a granular material with a Sand Equivalent greater than 50 and shall have 100 percent passing the 2-inch sieve.

9.4 TRENCH BACKFILL MATERIAL

Trench backfill shall be defined as the area above the pipe zone and below the bottom of the structural section of paved areas. In unimproved areas the trench backfill extends to the finished surface.

- Class I Backfill material shall have a Sand Equivalent greater than 50 and shall have 100 percent passing the 2-inch sieve.
- Cement Slurry shall be a mixture of cement, sand and water and shall meet the requirements of the County of Santa Barbara and/or City of Goleta Public Works Department Standards.
- Native Material may be used for trench backfill in private road and unpaved areas unless the material is unsuitable. Unsuitable material being defined by Unified Soil Classifications:

OL – Organic silts and organic silty clays of low plasticity

MH – Inorganic silt, micaceous or diatomaceous fine sandy or silty soils, elastic silts

CH – Inorganic clays of high plasticity, fat clays

OH – Organic Clays of medium to high plasticity

Pt – Peat and other high organic soils

- or soil that cannot be compacted to 90 percent relative density.

Within Public Road Right-of-Way:

Above the pipe zone and up to the bottom of the asphalt concrete surfacing shall be one (1) sack cement slurry in accordance with County of Santa Barbara and/or City of Goleta Public Works Department Standards. Asphalt concrete pavement shall not be placed over the slurry cement backfill until the following day (24 hours), with or without cement accelerators.

Outside Public Road Right-of-Way:

Above the pipe zone to the bottom of the pavement section shall be native material from the trench excavation or with select imported material with a sand equivalent greater than 20 meeting County of Santa Barbara Class I Backfill requirements per County Standard Detail 1-020.

9.5 CRUSHED AGGREGATE BASE

Road base material shall be crushed aggregate and shall contain an individual sieve segregation at least 25 percent of particles having their entire surface area composed of faces resulting from fracture due to mechanical crushing.

Quality Requirements shall conform to the following:

<u>Test</u>	<u>Test Method No.</u>	<u>Requirement</u>
R Value	Calif. 301	78 min.
Sand Equivalent	Calif. 217	28 min.
Durability Index	Calif. 229	35 min.

Recycled aggregate base may be used in place of Crushed Aggregate Base. Recycled aggregate base shall conform to the provisions of Section 200-2.4, "Crushed Miscellaneous Base" of the Standard Specifications. Gradation shall conform to coarse gradation. The aggregate shall not be treated with lime, cement, or other chemical materials before the Durability Index test is performed. Untreated recycled asphalt and portland cement concrete will not be considered to be treated with lime, cement, or other chemical materials for the purposes of performing the Durability Index test.

9.6 HDPE PIPE MATERIAL AND FITTING REQUIREMENTS

Materials used for the manufacture of polyethylene pipe and fittings shall be extra high molecular weight, high density PE 3408 polyethylene resin. The polyethylene pipe and fittings shall be made from virgin resins exhibiting a minimum cell classification of PE 345444E as defined in ASTM D3350 and ASTM D1248 with an established hydrostatic design basis of 1600 psi for water at 73°F. The resin shall be listed by the PPI (Plastic Pipe Institute, a division of the Society of the Plastics Industry) in its pipe-grade registry Technical Report (TR) 4, "Listing of Plastic Pipe Compounds". The pipe color shall be gray. The intent of the gray color is to provide increased visibility during CCTV inspection. Alternatively, a coextruded HDPE pipe with a black exterior and soft white interior may be used.

Polyethylene plastic pipe shall meet the applicable requirements of ASTM F714. Pipe shall be provided in steel pipe sizes (IPS) based on outside dimensions. The wall thickness shall have Dimension Ratio of DR17 as prescribed in ASTM F714. The pipe shall be homogeneous throughout and free of visible cracks, holes, voids, foreign inclusions, or other defects that may affect the wall integrity.

HDPE fittings shall be in accordance with ASTM D 3261 and shall be manufactured by injection molding, a combination of extrusion and machining, or fabrication from HDPE pipe conforming to this specification. The fittings shall be fully pressure rated and provide a working pressure equal to that of the pipe with an included 2:1 safety factor. The fittings shall be manufactured from the same resin type and cell classification as the pipe itself. The fittings shall be homogeneous throughout and free from cracks, holes, foreign inclusions, voids, or other injurious defects.

Pipe and fittings must be marked as prescribed by ASTM F714. During extrusion production, the HDPE pipe shall be continuously marked with durable printing including the following information:

1. ASTM Basis
2. PE Cell Classification
3. Nominal Pipe Size
4. Dimensional Ratio/Pressure Rating
5. Manufacturer Name
6. Production Code (Location & Date of Manufacture)
7. Pipe Test Category
8. Resin Supplier Code

Sections of pipe with cuts or gouges in excess of 10% of the pipe wall thickness shall be cut out and removed. The undamaged portions of the pipe shall be rejoined using the heat fusion joining method.

Sections of polyethylene pipe shall be joined by the butt fusion process into continuous lengths at the job site. The joining method shall be the heat fusion method and shall be performed in strict accordance with the pipe manufacturer's recommendations. The heat fusion equipment used in the joining procedures should be capable of meeting all conditions recommended by the pipe manufacturer. Extrusion welding or hot gas welding of HDPE shall not be used. Refer to the manufacturer's recommendations.

1. The polyethylene pipe shall be assembled and joined at the site using the butt-fusion method to provide a leak-proof joint. Threaded or solvent-cement joints and connections are not permitted.
2. All equipment and procedures used shall be used in strict compliance with the manufacturer's recommendations. Fusing shall be accomplished by personnel certified as fusion technicians by the manufacturer of the polyethylene pipe and/or fusing equipment.
3. The butt-fused joint shall be true to alignment and shall have uniform roll-back beads resulting from the use of proper temperature and pressure. The joint shall be allowed adequate cooling time before removal of pressure. The fused joint shall be watertight and shall have tensile strength equal to or greater than that of the pipe. All joints shall be subject to acceptance by the District prior to installation. When required by the District the roll-back bead shall be removed from the interior of the pipe.
4. Defective joints shall be cut out and replaced at no cost to the District. Any section of the pipe with a gash, blister, abrasion, nick, scar or other deleterious fault greater in depth than ten percent (10%) of the wall thickness, shall not be used and shall be removed from the site. However, a defective area of the pipe may be cut out and the joint fused in accordance with the procedures stated above. In addition, any section of the pipe having other defects such as concentrated ridges, discoloration, excessive spot roughness, pitting, variable wall thickness or any other defect of manufacturing or handling as determined by the Engineer and/or his representative, shall not be used and shall be removed from the site.
5. The installed pipe shall be allowed the manufacturer's recommended amount of time, but not less than twenty-four (24) hours, for cooling and relaxation due to tensile stressing prior to connection of sewer lines, sealing of the annulus or backfilling of manholes. Sufficient excess length of new pipe, but not less than six (6) inches, shall be allowed to protrude into the manhole.
6. Following the relaxation period, the annular space may be sealed. Sealing shall be made with material approved by the District and shall extend a minimum of eight (8) inches into the manhole wall in such a manner as to form a smooth, uniform, watertight joint.

SECTION 10: OPEN TRENCH CONSTRUCTION METHODS

10.1 STANDARD SPECIFICATIONS

Standard Specifications shall be the "Standard Specifications for Public Works Construction" (Greenbook), latest edition.

Caltrans Specifications govern pavement materials and methods; and pavement delineation and markings in public road right-of-ways. See Section 8.6 for traffic control requirements.

10.2 TRENCH EXCAVATION

Trench Excavation shall conform to Section 306-1.1, "Trench Excavation", of the Standard Specifications.

The Contractor shall furnish all tools, equipment and supplies, and shall perform all labor necessary in connection with all earthwork and incidental appurtenant work, complete, as specified herein and as indicated on approved drawings.

The work of this section includes all earthwork operations necessary to excavate trenches for pipe and appurtenances, excavation for structures and foundations, all as indicated on the drawings and specified herein. Excavated material shall be immediately placed in trucks and removed from the site. Stockpiling material is not allowed.

All paved surfaces to be removed for excavation shall be neatly saw cut in straight lines to the limits of surface removal. Saw cuts in asphalt concrete pavement shall have a minimum depth of 3 inches. Uneven, rough or damaged pavement edges shall be saw cut again to neat, square, straight lines before placing permanent surface restoration.

Where pavement is to be removed near the edge of existing pavements, at least 2 feet of pavement shall be maintained. If 2 feet of pavement cannot be maintained, then all pavement to the edge of the road shall be removed and replaced.

Adjacent Pavement and Improvements

Existing asphalt pavement adjoining concrete improvements to be removed and replaced shall be removed two feet outside of the limits of the concrete improvements to be installed. Concrete or concrete base shall be removed only with specific approval of the Engineer.

Removed asphalt concrete, unsuitable earth materials, debris, loose fill, organic material, roots, and other rubbish shall be removed and disposed of in an approved and legal manner. These materials shall become the property of the Contractor and shall be disposed of off-site at Contractor's expense in accordance with applicable laws and regulations.

Trenches excavated to depths exceeding 5 feet shall be shored in accordance with the CAL/OSHA Trench Construction Safety Orders of the Division of Industrial Safety requirements.

The bottom of the trench shall be graded and prepared to provide a firm and uniform bearing throughout the entire length of the pipe barrel. Suitable excavations shall be made to receive the bell of the pipe and the joint shall not bear upon the bottom of the trench. All adjustment to line and grade shall be made by excavating or filling with gravel bedding material under the body of the pipe and not by wedging or blocking.

If the trench is excavated below the required grade, the part of the trench excavated below grade shall be corrected by filling with bedding materials as specified herein at no additional cost to the Owner. Bedding material shall be placed over the full width of trench in compacted layers not exceeding 6 inches in depth to the established grade with allowance for the pipe base.

When subgrade is encountered that, in the opinion of the District, is unsuitable for pipe support, the District may order the excavation to be carried to an approved depth below the bottom of the pipe and backfilled with crushed aggregate, or an engineered stabilization method, to the lines and grades shown on the plans and/or specified by the District. Excess and unsuitable fill materials shall be disposed of at an appropriate location secured by the Contractor at his expense.

The minimum width of the trench at the top of the pipe zone shall be the outside diameter of the pipe plus sixteen (16) inches plus the thickness of required shoring and bracing.

The minimum trench width for service connection piping may be reduced to three times the outside diameter of the service pipe. This reduced requirement shall be used from the outside of the main trench near the wye or service connection at the main line to the point of connection to the existing service.

Minimum separation distances and requirements between water and sewer pipes shall be as established by the State of California Department of Health Services.

The maximum width at the top of the trench will not be limited, except where excess width of excavation would cause damage to adjacent structures or property. Slope trench walls or provide shoring and sheeting as required for construction and safety.

Open trenches during non-construction hours are not allowed unless specifically authorized by the District. Where trench walls and adjacent soils are sufficiently stable for the use of plate bridging, the Contractor may use steel traffic plates to cover open trenches during non-construction hours. Plate bridging shall be accomplished in accordance with the State of California Department of Transportation "Manual of Traffic Controls – For Construction and Maintenance – Work Zones", latest edition. The plates shall extend a minimum of 12 inches beyond the edge of the trench. The plate edges shall have a minimum 4-inch premixed asphalt concrete grade transition. Trench plates placed by the Contractor in the traveled way (both vehicular and pedestrian) shall have a slip resistant surface.

10.3 TRENCH STABILIZATION

Where unstable, spongy, or otherwise unsuitable foundation soils are encountered they shall be removed to firm soils and replaced with compacted bedding material.

10.4 HANDLING AND TRANSPORTATION OF PIPE

During loading, transportation, unloading, storage, and laying, every precaution shall be taken to prevent damage to the pipe, linings, and coatings. Pipe that is damaged shall be removed from the site of the work and replaced.

Heavy canvas or nylon slings of suitable strength shall be used for lifting and supporting materials. Chains, cables or other products that may cause damage to the pipe shall not be used to handle the pipe.

Pipe gaskets shall be stored in a cool, well ventilated place and not exposed to direct sunlight. Do not allow contact with oils, fuels, petroleum, or solvents. Do not reuse gaskets when joints are disassembled and refitted.

10.5 PIPE PREPARATION AND HANDLING

Except as approved by the District, do not distribute pipe to the job more than 3 days prior to installation. Material shall be stored in a manner that will not be a hazard to the public or to traffic, will not obstruct access to adjacent property, and will not obstruct other Contractors' working in the area.

Each pipe and fitting shall be carefully inspected before being installed. Any pipe which is, in the opinion of the District, damaged shall not be used and shall be promptly removed from the site. Wipe the joints of the pipe, fittings, and appurtenances clean of all dirt, grease, and foreign matter before the pipe is lowered into trench.

Use proper implements, tools, and facilities for the safe and proper protection of the pipe. Carefully handle pipe in such a manner as to avoid any physical damage to the pipe. Do not drop or dump pipe into trenches under any circumstances.

10.6 PREPARATION OF TRENCH

Pipelines shall be installed to line and grade per the Surveyor's cut sheets. Pipelines intended to be straight shall be so installed.

At the location of each joint, dig bell (joint) holes of ample dimensions in the bottom of the trench and at the sides where necessary to permit the joint to be made properly and to permit easy visual inspection of the entire joint and checking of the gasket with a feeler gauge as applicable.

Do not lay pipe in water, on unstable subgrade, or when, in the opinion of the District, trench conditions are unsuitable.

10.7 LAYING BURIED PIPE

All pipe, fittings, and appurtenances shall be installed in accordance with the manufacturer's instructions and these specifications. No pipe shall be directly jacked into place unless specifically designated.

All buried pipe shall be prepared as hereinbefore specified and shall be laid on the prepared crushed rock base and bedded to ensure uniform bearing. After each section is jointed, place pipe zone material under and along sides of the pipe to prevent movement and to ensure uniform support. Follow pipe laying operations closely with backfilling of the trenches with sufficient material to prevent the pipe from moving. Take precautions necessary to prevent the "uplift" or floating of the line prior to the completion of the backfilling operation.

Wherever it is necessary to deflect pipe from a straight line, either in the vertical or horizontal plane, do not exceed 75 percent of the amount of joint deflection recommended by the pipe, fitting, or coupling manufacturer and as approved by the District.

Foreign material shall not be allowed to enter the pipe while it is being placed in the trench. When laying operations are not in progress, whenever workmen are absent from the job and at the end of the work day, close and block the open end of the last laid section of pipe with a watertight plug to prevent entry of animals, foreign material or creep of the gasket joints. End closure shall be sufficient to prevent trench water from entering pipe. Keep water out of the trench.

10.8 REQUIREMENT FOR PIPE COVER

Sewers shall be installed at a depth that will provide suitable service to the properties connected and will allow subsequent installation of water lines in accordance with the water Sewer Separation requirements with a minimum of special construction.

The sewer main shall have a minimum of five feet (5') of cover from the top of the pipe to the flow line of the existing or proposed gutter, or where no gutter exists from the outer most edge of the traveled way.

Service laterals shall be installed at a minimum depth to provide a connection to any point on the lot within the established building setback lines, to allow for a minimum pipe slope of 2 percent and with a minimum cover of 2 feet (2') to the top of the pipe.

10.9 STRUCTURE BACKFILL

Attention is directed to Section 300-3, "Structure Excavation and Backfill", of the Standard Specifications and these Provisions.

Backfilling shall not begin until construction below finish grade has been approved, forms removed, and the excavation cleaned of trash and debris. Backfill shall be placed symmetrically around structures to prevent eccentric loading upon or against said structures. Backfill shall be compacted in lifts no greater than 8 inches deep and brought to finished grade.

10.10 TRENCH BACKFILL

Attention is directed to Section 306-1.2.1, " Bedding", and Section 306.1.3, "Backfill and Densification", of the Standard Specifications, County of Santa Barbara Public Works Department Standard Details 1-020 and 1-030, approved drawings and these provisions.

During the process of laying pipe in trenches, sufficient bedding material, as described herein, shall be carefully placed and tamped about the pipe to hold it firmly to established line and grade. Oversize material, trash, debris, broken rock or shale, if encountered, shall not be used for backfill.

All backfill material, above the pipe zone, shall be deposited in horizontal layers as specified herein. The distribution of materials shall be such that all material following compaction and consolidation will form a homogeneous mass free of voids, pockets, streaks or other imperfections. Backfill material shall conform to authorizing City or County agency. Do not backfill over porous, wet, or spongy subgrade.

Native backfill material, above the pipe zone, shall be deposited in horizontal layers as specified herein. The distribution of materials shall be such that all material following compaction and consolidation will form a homogeneous mass free of voids, pockets or other imperfections. Backfilling shall be done with soil free from lumps, hardpan, paving materials, organic matter or other deleterious substances. Oversize material, trash, debris, broken rock or shale, if encountered, shall not be used for backfill.

The compaction of backfill material shall be achieved by mechanical equipment. Optimum moisture content of fill materials shall be maintained to attain required compaction density. Compaction of backfill material for trenches or structures, shall be done to a minimum density of 95% as determined by laboratory procedure prescribed in ASTM D-1557. Jetting of trench backfill shall not be permitted. Surplus fill material shall be removed from site.

Within County of Santa Barbara public right-of-ways: Above the pipe zone and up to 5 feet below the bottom of the asphalt concrete surfacing, the trench shall be backfilled with native material from the trench excavation or with select imported material with a sand equivalent greater than 20 meeting County of Santa Barbara Class I Backfill requirements per the County Standard Detail 1-020.

From 5 feet below the bottom of the asphalt concrete surfacing to the asphalt concrete surfacing shall be one (1) sack cement slurry in accordance with County of Santa Barbara Public Works Department Standard Details 1-020, 1-030 and the Project Drawings.

Prior to placement of surfacing materials, the Owner or Applicant's Geotechnical Engineer shall take compaction tests in any backfill area and at any depth, with the Contractor providing equipment and operator to assist in such test. If any such compaction test fails, the Contractor shall correct such failure and pay for any re-testing that is required. The Owner or Applicant's Geotechnical Engineer shall make as many tests as are required to receive a satisfactory and acceptable job.

END OF SECTION

SECTION 11: INSPECTION AND TESTING

11.1 COMPACTION TEST STANDARDS

The standard test used to define minimum density of compaction work for earthwork shall be ASTM Test Procedure D 1557, unless designated otherwise. Densities shall be expressed as a relative compaction in terms of maximum density obtained in the laboratory by the foregoing standard procedure.

The standard test used to define minimum density of compaction work for crushed aggregate base and crushed rock shall be California Test Method 216. Densities shall be expressed as a relative compaction in terms of maximum density obtained in the laboratory by the foregoing standard procedure.

11.2 TESTING AND CLEANING PIPELINES

Attention is directed to Section 306-1.4, "Testing Pipelines", of the Standard Specifications and these Special Provisions.

The Contractor shall furnish the material, labor, and equipment for making tests for leakage and infiltration of groundwater. Tests shall be made after the sewer trench has been backfilled and before paving. All sections of sewer shall be tested in accordance with the following requirements for leakage and infiltration tests as directed by the Engineer. Each section of pipe line between manholes shall be tested by a low pressure air test. If for some reason an air pressure test is not feasible a water infiltration test will be used.

The Contractor may perform any preliminary tests desired which are not harmful to the pipelines before backfilling is completed. Before final tests are performed for acceptance of any sewer the pipe shall be cleaned.

11.2.1 AIR PRESSURE TEST

Attention is directed to Section 306-1.4.4, "Air Pressure Test", of the Standard Specifications, and the District Standards.

The Contractor shall furnish all materials, equipment and labor for conducting an air test. The final acceptance test shall be done in the presence of a District Representative.

1. Air shall be introduced into pipeline until 3.0 psi gage pressure is reached.
2. Maintain internal air pressure between 2.5 and 3.5 psi gage pressure for at least 2 minutes. Pressure in the pipeline shall not be allowed to exceed 5 psi gage pressure. The pipeline pressure shall be constantly monitored. The gage and hose arrangement shall be separate from the hose used to introduce air into the pipe.
3. Air pressure shall be reduced to 2.5 psi gage pressure. A stop watch shall be used to determine the elapsed time for the pressure to drop from 2.5 psi to 1.5 psi gage pressure.

4. If elapsed time is less than that shown in the following table, the Contractor shall make necessary corrections to the pipeline and retest until satisfactory.

Air Test Chart

Diameter of Pipe (inches)	Length of Pipe (Feet)	Allotted Test Minutes
4	All	2
6	0 to 300	2
6	300 to 370	2.5
6	370 and greater	3
8	0 to 170	2
8	170 to 210	2.5
8	210 to 250	3
8	250 to 290	3.5
8	290 and greater	3.75
10	0 to 110	2
10	110 to 165	3
10	165 to 215	4
10	215 and greater	4.75
12	0 to 115	3
12	115 to 155	4
12	155 to 190	5
12	190 and greater	6
15	0 to 120	5
15	120 to 165	7
15	165 and Greater	15
18-30	All	15

11.2.2 WATER INFILTRATION TEST

Attention is directed to Section 306-1.4.3, "Water Infiltration Test", of the Standard Specifications and the District Standards.

The Contractor shall furnish all materials, equipment and labor for conducting a water infiltration test. The final acceptance test shall be done in the presence of a District Representative.

If, in the construction of a section of the sewer between any two structures, excessive groundwater is encountered, a test for exfiltration test for leakage shall not be used, but instead the end of the sewer at the upper structure shall be closed sufficiently to prevent the entrance of water, and the pumping of the groundwater shall be discontinued for at least three (3) days after which the amount of water intercepted at the structure below the plugged end of the sewer shall not exceed two-tenths (0.2) gallon per minute per inch of nominal diameter of pipe per thousand feet of length of sewer being tested. The length of house connections shall not be used in computing the length of sewer main being tested.

If the leakage or infiltration, as shown by the tests, is greater than the amount specified, the pipe shall be overhauled and re-laid, if necessary, by the Contractor, at their expense, until the leakage is reduced satisfactorily.

Regardless of the results of the above tests, any visible evidence of individual leaks shall be corrected by the Contractor to the satisfaction of the Engineer.

After backfilling and compaction testing is completed, sewer lines shall be balled, flushed and cleaned, before acceptance by the District and connection to the sewer system.

The Contractor shall furnish all sewer line plugs necessary for blocking off all lines as required by the Engineer until final acceptance.

11.2.3 DEFLECTION TESTING

The Contractor shall furnish a mandrel and other required apparatus, and personnel for conducting a mandrel test under the direction and supervision of the Inspector. The mandrel shall have an odd number of webs (minimum of nine), and measure pipe deflection not greater than five percent (5%) of the pipe diameter. The mandrel shall be supplied by the pipe manufacturer.

11.3 PIPE CLEANING

All installed sewer mains and trunks shall be cleaned, as required by the Inspector, with a hydraulic jet-rodder with spinning nozzle or by the balling method, as approved by the District, in accordance with the manufacturer's instructions and recommendations. Screens used for trapping debris shall be approved by the District and secured with a nylon rope. Cleaning, including screen installation and removal, shall be done in the presence of the Inspector.

11.4 CCTV INSPECTIONS OF SEWER PIPES

Attention is directed to Section 500-1.1.5, "Television Inspection", of the Standard Specifications. All new sewer mains and trunks installed shall be inspected by close circuit television (CCTV) from center of manhole to center of manhole. CCTV recordings shall be in color on a DVD and have audio and text comments and clearly legible footage readings. Prior to the acceptance of sewer pipe(s), the Contractor shall provide DVD video inspection records of the new sewer pipe. Television Inspection shall be made after the construction of the system is completed and shall follow the sequence from the upstream end to the downstream end of the project. No splicing allowed!

The inspection shall be conducted in the presence of the District or their authorized representative. The CCTV inspection shall be performed while the upstream lines are plugged or bypassed. The line shall be dry except for flow from the laterals in the section of line being televised. Prior to camera inspection, water shall be flushed through the pipe being inspected to make low points easier to detect. Additionally, during camera inspection, if pipe sags are apparent, the District may require flowing water through the pipe. The rate of flow shall be as required by the District Representative.

CCTV inspection shall be performed utilizing a rotating lens video camera system. The video inspection and recording performed with this camera shall stop at each lateral and the head shall be rotated to look up the lateral to identify potential defects. Defects shall also be closely inspected by rotating the camera head for close-up view.

Log sheets indicating date of inspection, location of services, upstream manhole and downstream manhole, direction of view, pipeline length, and all found defects shall be kept during

inspection. DVDs shall be numbered and marked with the location of the inspection. DVDs shall become the property of the District once inspection is complete.

The camera shall be equipped with a remote reading footage counter and shall be checked and calibrated, if required, before inspection begins. Camera runs shall start from the center of the upstream manhole of the pipe being inspected and shall be pulled through at a speed that allows a close of inspection and shall not exceed 20 feet per minute. The Camera shall be in focus and display a clear view of the pipe on the field monitor. The inspection shall end at the center of the downstream manhole of the pipe being inspected.

11.5 MANHOLE VACUUM TEST

The Contractor shall perform a vacuum leak test on all new sewer manholes after assembly and before backfill. The Contractor shall furnish all materials, equipment and labor for conducting a vacuum test. The test shall be done in the presence of a District Representative.

Pipes entering the manhole shall be plugged and braced to prevent movement of the plug during testing. The vacuum apparatus shall be connected to the manhole frame. A positive seal between the manhole and the vacuum base shall be established. The test gauge shall be placed at the top of the manhole in accordance with the manufacturer's recommendations.

A vacuum of ten inches of mercury shall be drawn on the manhole, the valve on the vacuum line of the test head closed and the vacuum pump shut off. The time shall be measured for the mercury to drop from ten inches to nine inches of mercury. The manhole shall pass if the time it takes the mercury to drop one inch is more than 60 seconds for a four-foot manhole or more than 75 seconds for a five foot-manhole. If manhole fails, Contractor shall make necessary repairs and retested until a satisfactory test is obtained.

If gaskets are displaced during testing the manhole shall be dismantled and the gasket(s) shall be replaced with new gaskets.

<u>Depth of Manhole</u> <u>(feet)</u>	<u>Diameter of Manhole (feet)</u>		
	4	5	6
Up to 8	20	26	33
10	25	33	41
12	30	39	49
14	35	46	57
16	40	52	67
18	45	59	73
20	50	65	81
22	55	72	89
24	59	78	97
26	64	85	105
28	69	91	113
30+	74	98	121

11.6 TEST RECORDS

Records shall be made of each pipe system test. These records shall include:

- Date of test.
- Location, description and identification of pipe or structure tested.
- Test fluid/medium.
- Test pressure.
- Remarks to include such items as: Leaks (type, location, etc.). Repairs made on leaks.
- Certification by Contractor and signed acknowledgment by Inspector/Engineer.

END OF SECTION

SECTION 12: MANHOLE REHABILITATION

12.1 REQUIREMENTS

Attention is directed to Section 500-2, "Manhole and Structure Rehabilitation," of the Standard Specifications. Manhole rehabilitation shall conform to section 500-2 of the Standard Specifications and its supplements except as modified herein.

The Contractor shall select one of the lining systems listed below to rehabilitate manhole interior concrete or brick surfaces.

1. Air-Place Concrete and Polyurethane Protective Lining Manhole Rehabilitation shall comply with Subsection 500-2.4 of the Standard Specification for Public Works Construction.
2. Air-Place Concrete and Epoxy (100% Solids) Protective Lining Manhole Rehabilitation shall comply with Subsection 500-2.4 of the Standard Specification for Public Works Construction.
3. Cured-In-Place Fiberglass Manhole Liner System in accordance with these Section 12.7.

Verification of product conformance with these requirements shall be submitted to the District.

12.2 WARRANTY

Manufacturer shall warrant all work against defects in materials and workmanship for a period of five (5) years from the date of final acceptance of the project. Manufacturer shall, within a reasonable time after receipt of written notice, repair defects in materials and workmanship within said five (5) year period. Any damage to other work caused by such defects or the repairing of same, shall be at the Contractor's expense and without cost to the District.

12.3 GENERAL

Attention is directed to Section 500-2.1.1, "General" of the Standard Specifications.

Add: Channel And Shelf Rebuilding. Where indicated on the Plans, channel and shelf areas shall be brought back to there original or otherwise specified dimensions using concrete mortar. Shelves shall be hand troweled to provide a smooth and uniform width channel.

12.4 PRE-INSPECTION AND SURFACE PREPARATION

Prior to commencing any work, the Contractor shall inspect and verify all dimensions and the locations and number of all sewer connections entering each manhole, and examine the condition of the existing manholes. Any areas of apparent structural damage shall be reported to the District. For cured-in-place fiberglass manhole liner systems outside dimensions of the reinforcing fabric shall be properly sized to allow for stretch to fit the contour and shape of the interior of the manhole.

Attention is directed to Section 500-2.4.2, "Cleaning" of the Standard Specifications. All surfaces to be lined shall be cleaned by water blasting to remove all loose deteriorated

concrete, dirt, grease, sand and other foreign matter. High-pressure water blast shall be at pressures between 5,000-psi minimum to 10,000 psi maximum. All materials generated by preparation of surfaces shall be trapped and collected for disposal off site; no materials will be allowed to enter the sewer at any time. If a degreasing compound is used, the surface shall be thoroughly rinsed prior to the installation of the lining system.

All voids and spalled areas shall be filled and patched to provide a relatively smooth surface. The cementitious patching/plugging compound shall be a high strength, non-shrink grout approved by the District. All sewer pipes protruding into the manhole shall be cut flush with the interior manhole wall or brought flush with the manhole wall using hydraulic cement and fiberglass, per the manufacturer's recommendation.

All unused stubs shall be bulkheaded and mortared smooth and flush with the interior of the manhole wall. Pull rings shall be left in place and sealed with resin (and fiberglass for CIPP). Other obstructions, including manhole steps, shall be cut flush with the interior manhole wall. After surface preparation and prior to concrete repair, the Contractor shall stop all infiltration in the existing structure. Infiltration in existing structures shall be stopped by injection of chemical grout. Grout shall be installed per the manufacturer's recommendations.

12.5 INSTALLATION

Installation of the lining system shall be performed by a licensed contractor certified by the manufacturer to install their system. Unless otherwise shown on the Plans, limits of the lining shall extend from the manhole frame down to 3" below the low water level in the channel.

Installation of the lining system shall be scheduled and coordinated with the sewer replacement work. Installation of manhole lining system shall be scheduled after the sewer pipe and frames are installed.

The completed product shall be a permanent, monolithic, smooth, impervious liner shaped to the interior of the manhole. The lined manhole shall be completely water tight and free of any joints or openings other than pipe inlets, pipe outlets and the rim opening. All defective areas and imperfections including, but not limited to poor adhesion, voids and air bubbles shall be repaired in strict conformance with the recommendation of the manufacturer and subject to the approval of the Engineer.

12.6 SUBMITTALS

The Contractor shall submit a complete manhole rehabilitation submittal to the District for review and approval. The submittal shall include, but shall not be limited to the following:

1. Name of the manufacturer and product data including material safety data sheets, certifications of materials, and the physical properties and chemical resistance testing of the resin or epoxy system.
2. Name of the manufacturer and product data including the material safety data sheets for the patching/plugging compound and the chemical grout, if infiltration exists.
3. Plan of construction including schedule, equipment setup, inspection, preparation, cleaning, and complete installation procedures and details.
4. Qualifications of the installer including certification by the manufacturer.

12.7 CURED-IN-PLACE FIBERGLASS MANHOLE LINING SYSTEM

12.7.1 MATERIALS

The lining system shall be suitable for continuous service in sewerage environments with 1N sulfuric acid at an average wastewater temperature of 80 degrees F and intermittent exposure to a pH of 11. The lining system shall consist of a 4-ply fiberglass reinforcing fabric impregnated with a modified epoxy resin system with a minimum cured wall thickness of 90 mils. The fiberglass fabric shall be layered product of Type E glass stitched with chopped strand and bound with styrene-soluble binder. The surfacing veil shall be woven and made of Type E glass with volan finish and styrene-soluble binder. The modified epoxy resin shall be a two components resin/mastic system cross-linked with a modified polyamide-curing agent.

12.7.2 INSTALLATION

The reinforcing fabric shall be saturated with the properly mixed resin system and lowered into the manhole and secured in place. The liner system shall be inflated with air pressure to fit the interior of the manhole and allowed to cure under suitable heat and controlled temperature. After curing and after an adequate cool down period, the lining system shall be cut and trimmed with all services restored. The perimeter of the system shall be fully sealed with compatible resin and fiberglass to form a structurally sound and vapor tight joint with the liner pipe and the lined sewer. The completed product shall be a permanent, monolithic, lined and impervious structure shaped to the interior of the manhole. The lined manhole shall be completely water tight and free of any joints or openings other than pipe inlets, pipe outlets and the rim opening. All defective areas and imperfections including, but not limited to poor adhesion, excessive voids, air bubbles, and exposed glass shall be repaired in strict conformance with the recommendation of the manufacturer and subject to the approval of the District.

12.8 TESTING AND INSPECTION

12.8.1 THICKNESS TESTING

During application of coatings a wet film thickness gage meeting ASTM D4414 – “Standard Practice for Measurement of Wet Film Organic Coatings by notched Gages”, shall be used to ensure a monolithic coating and uniform thickness during application.

12.8.2 HOLIDAY TESTING

Attention is directed to Section 500-2.4.8, “Spark Test” of the Standard Specifications.

The finished liner will be spark tested for pinholes with a spark tester set at 15,000 volts minimum. All areas in question shall be marked and patched. Patched areas shall be retested with the spark tester set at 15,000 volts minimum.

12.8.3 BOND STRENGTH TESTING

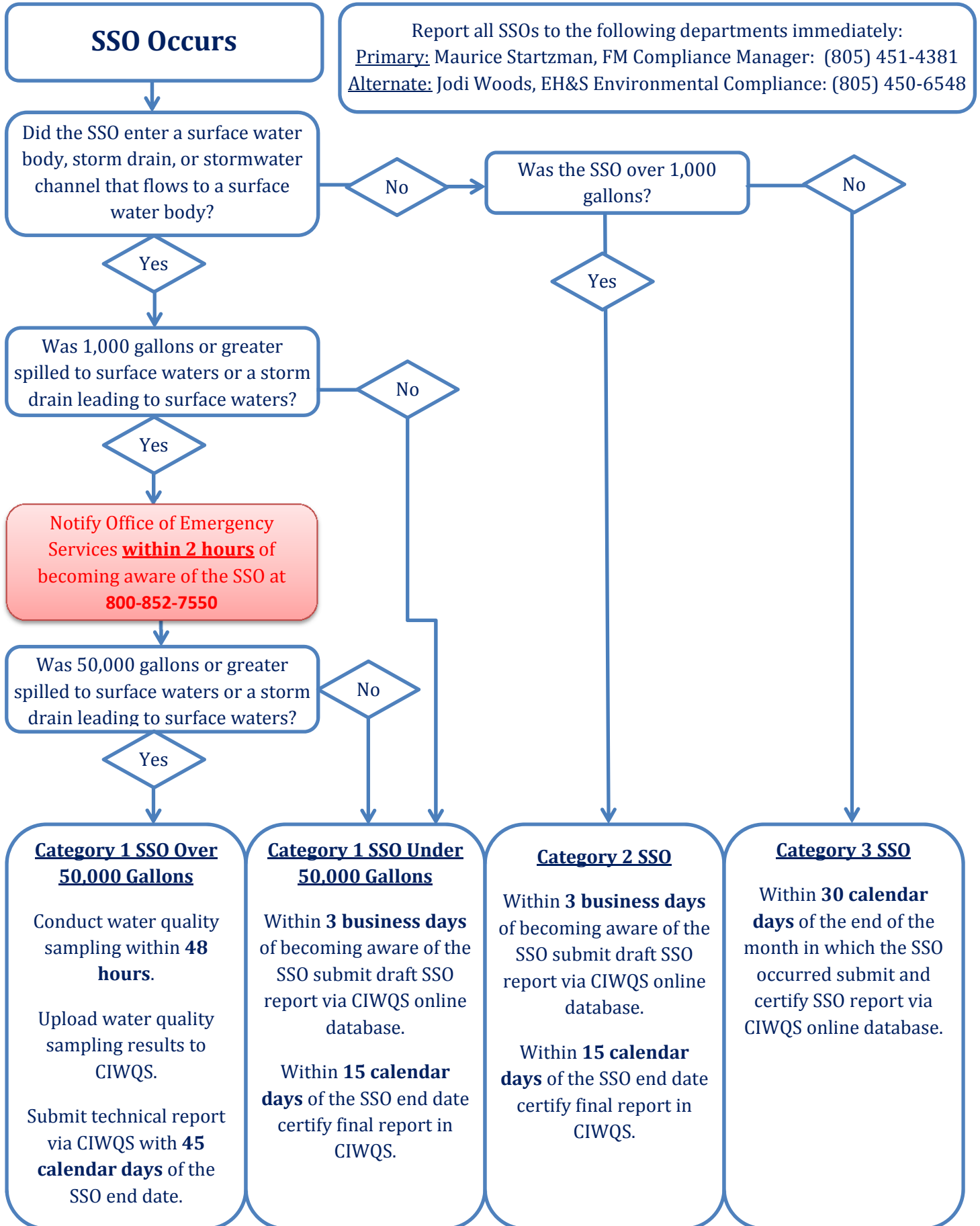
Measurement of bond strength of the protective coating to the substrate shall be made at regular intervals, as directed by the District Inspector, a minimum of one test per five manholes. Bond strength shall be measured in accordance with ASTM D-4541. Passing criteria shall be a pull resulting in concrete failure, with concrete visibly bonded to the test section of coating material. Areas detected to have inadequate bond strength shall be evaluated by the District.

Further bond tests may be required to determine the extent of potentially deficient bonded areas. Repairs shall be made in strict conformance with the manufacturer's recommendations. Tested areas shall be patched and spark tested.

END OF SECTION

APPENDIX D
SSO INCIDENT REPORT FORMS

SSO Notification and Reporting Flowchart



Sanitary Sewer Overflow (SSO) Incident Report Form

Page 1 of 3

Submit completed form to EHS.

Date of SSO spill: _____ Identify the SSO category (check one):

- Category 1 SSO – Spills of any volume that reach surface water
- Category 2 SSO – Spills greater than or equal to 1,000 gallons that do not reach surface water
- Category 3 SSO – Spills less than 1,000 gallons that do not reach surface water

Name (*person completing this form*): _____ Phone: _____

Exact spill location: _____

Latitude: _____ Longitude: _____

Spill location description: _____

Date/time spill was first discovered or reported to Facilities Management:

Date: _____ Time: _____ am/pm

Estimated spill start date/time: Date: _____ Time: _____ am/pm

Estimated first responder arrival date/time: Date: _____ Time: _____ am/pm

Estimated spill end date/time: Date: _____ Time: _____ am/pm

Final spill destination (*Check all that apply*):

- Building/Structure Street Curb/Gutter Paved Surface Unpaved Surface
- Storm Drain Surface Water Drainage Channel
- Storm Water Infiltration/Retention Structure/Field Other (*specify*): _____

Number of spill appearance points: _____

Spill appearance point (*Check all that apply. See page 3 complete list*):

- Gravity Mainline Inside Building or Structure Manhole
- Other Sewer System Structure (*specify*): _____

Spill cause (*Check all that apply. See page 3 complete list of options*):

- Debris - General Debris – Rags Root Intrusion Debris from Construction
- Construction Diversion Failure Collection System Maintenance Caused Spill/Damage
- Damage by Others Not Related to Collection System Other (*specify*): _____

Where did failure occur? (*Check all that apply. See page 3 complete list of options*):

- Gravity Mainline Manhole Inside Building or Structure Other (*specify*): _____

Was this spill associated with a storm event? Yes No

Diameter of sewer pipe at the point of blockage or failure: _____ inches

Material of sewer pipe at the point of blockage or failure: _____

Estimated age of sewer asset at the point of blockage or failure: _____ years

Sanitary Sewer Overflow (SSO) Incident Report Form

Page 2 of 3

Spill Volume Estimation

Did spill discharge to land? <i>(Includes discharges directly to land and discharges to a storm drain system or drainage channel that flows to a storm water infiltration/retention structure, field, or other non-surface water location)</i>	If Yes, estimated spill volume discharged to land:	gallons
	Estimated spill volume recovered from discharge to land: <i>(Do not include water used for clean-up)</i>	- gallons
	Total discharge to land:	= gallons
Did spill reach storm drain?	If Yes, estimated spill volume that reached storm drain :	gallons
	Estimated spill volume recovered from storm drain:	- gallons
	Total discharge to storm drain	= gallons
Did spill reach drainage channel?	If Yes, estimated spill volume that reached discharge channel:	gallons
	Estimated spill volume recovered from drainage channel:	- gallons
	Total discharge to drainage channel:	= gallons
Total SSO Discharge		= gallons

Methods used to estimate spill volumes *(Check all that apply. Use attached Volume Estimation Forms to document spill dimensions, shapes and other volume estimation information)*:

- 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

Spill response activities *(Check all that apply)*:

- Cleaned-up Contained All or Portion of Spill Mitigated Effects of Spill Restored Flow
- Returned All of Spill to Sanitary Sewer System Other Enforcement Agency Notified
- Other *(specify)*: _____

Spill response completion date: _____

Spill corrective action taken: *(Check all that apply. See page 3 complete list of options)*:

- Added Sewer to Preventive Maintenance Program Adjusted Schedule/Method of Preventive Maintenance
- Inspected Sewer Using CCTV to Determine Cause Plan Rehabilitation or Replacement of Sewer
- Repaired Facilities or Replaced Defect Other *(specify)* _____

Cal OES notification information *(required for Category 1 SSOs over 1,000 gallons)*:

Control Number: _____ Date: _____ Time: _____ am/pm

Sanitary Sewer Overflow (SSO) Incident Report Form

Page 3 of 3

CIWQS SSO Online Database Dropdown Lists:

Spill Appearance Point

Force Main
Gravity Mainline
Inside Building or Structure
Lateral Clean-Out
Lower Lateral
Manhole
Other Sewer System Structure
Pump Station
Upper Lateral

Spill Cause

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-Dispersible Operator Error
Other (specify)
Pipe Structural Problem/ Failure Installation
Pump Station Failure- Controls
Pump Station Failure- Mechanical
Pump station Failure- Lower
Rainfall Exceeded Design, Inflow and Infiltration
(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

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

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

Method 1: Eyeball Estimate

- Imagine amount of water that would spill from a 1-gallon jug, 5-gallon bucket or 50-gallon barrel
- Method can be used to estimate the volume of spills on asphalt, concrete, sloped surfaces, and flat surfaces
- Only useful for spills up to 200 gal

One gallon spill on a sloped surface
(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 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): Length _____ Width _____ Depth _____

Shape of spill: RECTANGLE TRIANGLE CIRCLE

Estimated spill volume: _____ gal



One gallon on sloped surface



Two gallon spill on sloped surface



Five gallon spill on sloped surface

Estimated volume of spill recovered: _____ gal

Please sketch spill with dimensions:

Was a reference image used? YES NO

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

Method 2: Duration and Flow Rate

If area/ depth are 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.
 2. Local residents can be used to establish start time. Observations like odors or sounds (e.g. water running in a normally dry creek bed) can be used to estimate the start time.
 3. Observe conditions at the SSO site. Initially there will be limited deposits of sewage solids and toilet paper. After a few days to a week, 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. Taking photographs to document the observations can be helpful if questions arise later in the process.
- To estimate **end time**, field crews observe and record time of the “blow down” that occurs when blockage is removed or observe “blow down” on flow meters.

Flow Rate: The flow rate is the average flow that left the sewer system during the time of the spill. There are three common ways to estimate the flow rate.

1. Use data from **flow meter** to estimate flow rate for the spill (better for large SSOs). Changes in flows in downstream flow meters can be used to estimate the flow rate during the spill
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 average hourly or daily water use per connection.
3. Refer to the **Flow Rate Charts for Estimating Sewer Spills** to estimate flow rate based on images of sewage flowing from manholes at varying flow rates.

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 2: 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

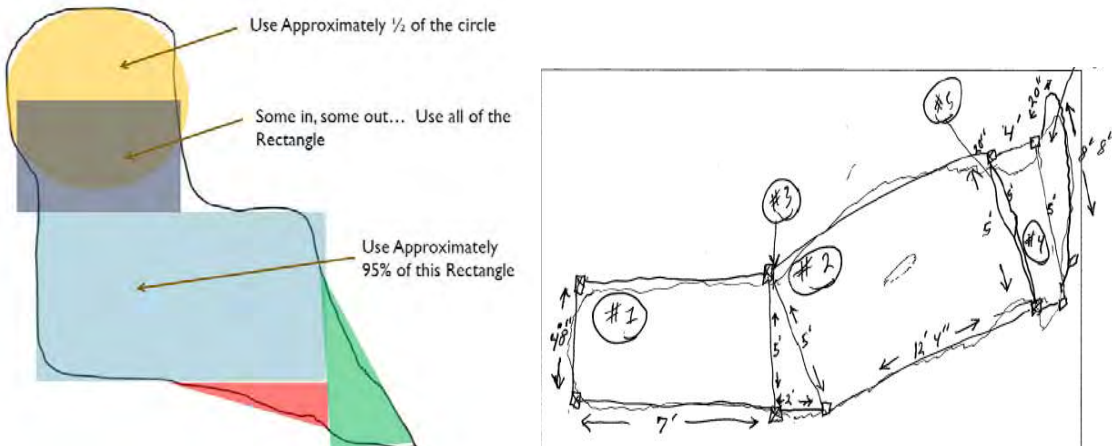
Please Sketch Spill with Dimensions:

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

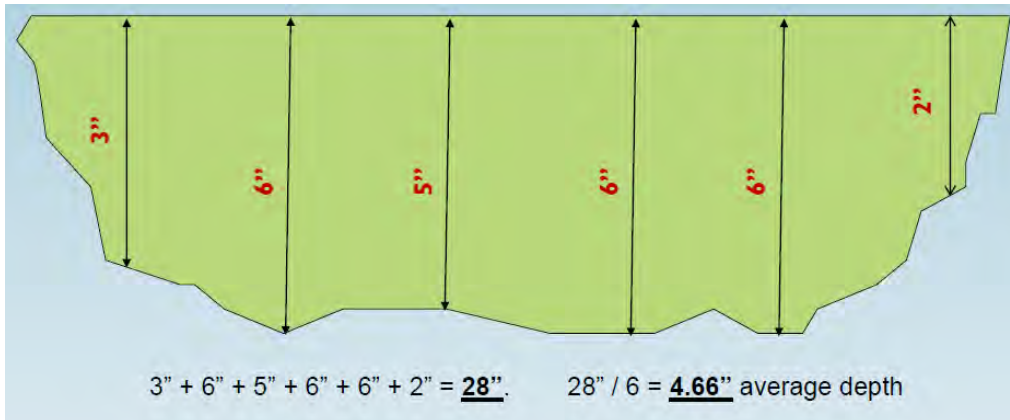
Method 3: Estimating Volume Based on Spill Dimensions

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 3: 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	_____

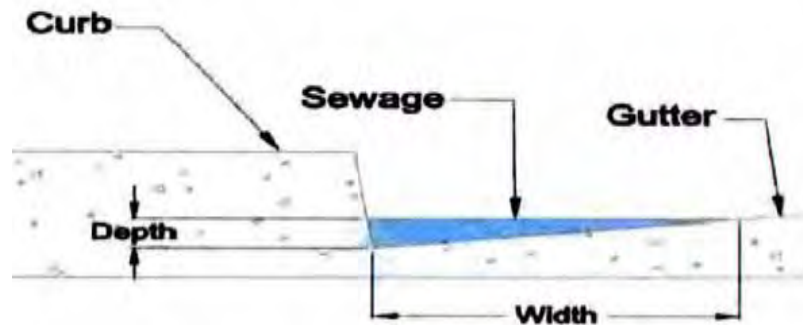
Please Calculate Average Depth:

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 4: Open Channel Spill Estimation

- 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.):

APPENDIX E
ANNUAL CHECKLIST

University of California, Santa Barbara

Sewer System Management Plan Audit

Every two years a review of the Sewer System Management Plan (SSMP) must be conducted by representatives from the following departments:

- Plumbing Shop (required)
- Environment, Health and Safety (required)
- Fire Department (invited)
- Physical Planning & Construction (invited)
- Physical Plant (invited)

Representatives should each have a copy of the SSMP and use the following checklist to determine if the plan is effective and in compliance with the regulatory requirements. Environment, Health and Safety shall maintain the documentation of this review for five years.

Section A - General Information

This is a review of the UCSB SSMP during _____. (indicate the time period covered)

This review is being conducted by the following persons:

Printed Name:	Department:
_____	Plumbing
_____	Environment, Health and Safety
_____	_____
_____	_____

Section B - Performance Indicators

Environment, Health and Safety shall prepare data for the first five performance indicators. Plumbing shall prepare data for the next five performance indicators.

Performance Indicators

- 1 Number of sewer system overflows (SSOs) during the review period. _____
- 2 Indicate the location of all SSOs during the review period on a map. _____
- 3 Total volume of all SSOs during the review period. _____
- 4 Average volume of an SSO during the review period. _____
- 5 Volume of the largest SSO during the review period. _____
- 6 % of sewer lines without obstructions. _____
- 7 % of blockages cleared within 4 hours. _____
- 8 % of repairs completed within campus established time frames. _____
- 9 Miles of sanitary sewer lines cleaned. _____
- 10 Miles of sanitary sewer lines inspected. _____

Section C - SSMP

Requirement		Answer		
		Yes	No	N/A
1	Have there been changes to the regulations since the SSMP was last reviewed?			
	If yes, have the applicable SSMP sections been updated?			
I Goals				
2	Are the goals stated in the SSMP still appropriate and accurate?			
	If no, have the applicable SSMP sections been updated?			
II Organization				
3	Is the contact information for the responsible or authorized representative current?			
	If no, have the applicable SSMP sections been updated?			
4	Is the contact information for the staff responsible for implementing specific measures in the SSMP program current?			
	If no, have the applicable SSMP sections been updated?			
5	Is SSO reporting and response Chain of Communication current?			
	If no, have the applicable SSMP sections been updated?			
III Legal Authority				
6	Does the SSMP cite the University's authority to:			
	6.1 Prevent illicit discharges?			
	6.2 Require proper design and construction of sewers and connections?			
	6.3 Ensure access for maintenance, inspection, or repairs for portions of the lateral owned or maintained by the University?			
	6.4 Limit discharge of fats, oils, grease, and other debris that may cause blockages?			
	6.5 Enforce any violation of its sewer ordinances?			
	If no, have the applicable SSMP sections been updated?			
IV Operation and Maintenance Program				
7	Does the SSMP reference the current process and procedures for maintaining the University's sanitary sewer system maps?			
	If no, have the applicable SSMP sections been updated?			
8	Are the University's sanitary sewer system maps complete, current, and sufficiently detailed?			
	If no, have the applicable SSMP sections and/or maps been updated?			
9	Does the SSMP describe routine preventive operation and maintenance activities by staff and contractors, including a system for scheduling regular maintenance and cleaning of the sanitary sewer system?			
	If no, have the applicable SSMP sections been updated?			
10	Does the SSMP address the need for more frequent cleaning and maintenance targeted at known problem areas?			
	If no, have the applicable SSMP sections been updated?			
11	Does the University's Preventative Maintenance program referenced in the SSMP have a system to document scheduled and conducted activities, such as work orders?			
	If no, have the applicable SSMP sections been updated?			
12	Does the University's Rehabilitation and Replacement Plan referenced in the SSMP identify and prioritize system deficiencies and implement short-term and long-term rehabilitation actions to address each deficiency?			

	If no, have the applicable SSMP sections been updated?			
13	Does the SSMP describe training expectations and programs?			
	If no, have the applicable SSMP sections been updated?			
14	Does the SSMP list the major equipment currently used in the operation and maintenance of the sanitary sewer systems and does it list the procedures for inventory management?			
	If no, have the applicable SSMP sections been updated?			
15	Are contingency equipment and replacement parts sufficient to respond to emergencies and properly conduct regular maintenance?			
V Design and Performance Provisions				
16	Does the SSMP contain current design and construction standards for the installation of new sanitary sewer systems, pump stations, and other appurtenances and for the rehabilitation and repair of existing sanitary sewer systems?			
	If no, have the applicable SSMP sections been updated?			
17	Does the SSMP include current procedures and standards for inspecting and testing the installation of new sewers, pumps, and other appurtenances and the rehabilitation and repair of existing sewer lines?			
	If no, have the applicable SSMP sections been updated?			
VI Overflow Emergency Response Plan				
18	Does the Overflow Emergency Response Plan establish procedures for the emergency response, notification, and reporting of SSO's?			
	If no, have the applicable SSMP sections been updated?			
19	Does the SSMP include procedures to ensure the University's staff and contractor personnel are appropriately trained on the procedures of the Overflow Emergency Response Plan?			
	If no, have the applicable SSMP sections been updated?			
20	Is the Overflow Emergency Response Plan effective in handling SSOs in order to safeguard public health and the environment?			
	If no, have the applicable SSMP sections been updated?			
21	Are all components of the Overflow Emergency Response Plan up to date?			
	If no, have the applicable SSMP sections been updated?			
VII Fats, Oils, and Grease Control Program				
22	Does the Fats, Oils, and Grease (FOG) Control Program include efforts to educate the public on the proper handling and disposal of FOG?			
	If no, have the applicable SSMP sections been updated?			
23	Does the FOG Control Program identify sections of the sanitary sewer system subject to FOG blockages, establish a cleaning schedule and address source control measures to minimize the blockages?			
	If no, have the applicable SSMP sections been updated?			
24	Does the University have sufficient legal authority to implement and enforce the FOG Control Program?			
	If no, have the applicable SSMP sections been updated?			
25	Are requirements for grease removal devices, best management practices (BMP), record keeping, and reporting established in the FOG Control Program?			
	If no, have the applicable SSMP sections been updated?			
26	Is the current FOG Control Program effective in minimizing blockages of sewer lines resulting from discharges of FOG to the system?			

	If no, have the applicable SSMP sections been updated?			
VIII System Evaluation and Capacity Assurance Plan				
27	Does the hydraulic capacity evaluation identify deficiencies in the sanitary sewer systems, establish sufficient design criteria and recommend both short-term and long-term capacity enhancement and improvement projects?			
	If no, have the applicable SSMP sections been updated?			
28	Does the Capital Improvement Program (CIP) establish a schedule of completion dates for both short-term and long-term improvements and is the schedule reviewed and updated to reflect current budgetary capabilities and activity accomplishment?			
	If no, have the applicable SSMP sections been updated?			
IX Monitoring, Measurement, and Program Modifications				
29	Does the SSMP accurately portray the methods of tracking and reporting selected performance indicators?			
	If no, have the applicable SSMP sections been updated?			
30	Is the University able to sufficiently evaluate the effectiveness of SSMP elements based on relevant information?			
	If no, have the applicable SSMP sections been updated?			
X SSMP Program Audits				
31	Is this audit occurring at an appropriate frequency based on the size of the system and the number of SSOs?			
	If no, have the applicable SSMP sections been updated?			
32	Will the audit be submitted to the Regional Water Quality Control Board?			
	If no, have the applicable SSMP sections been updated?			
33	Does this audit record changes made and/or corrective actions taken?			
	If no, have the applicable SSMP sections been updated?			
XI Communication Program				
34	Does the University effectively communicate the performance of their sanitary sewer systems with the public?			
	If no, have the applicable SSMP sections been updated?			
35	Will the most current SSMP be posted on the University's EH&S website?			

APPENDIX F
ABBREVIATIONS

APPENDIX G - ABBREVIATIONS

BMP	Best Management Practices
CIWQS	California Integrated Water Quality System
EH&S	Environmental Health & Safety
EH&S – EHP	Environmental Health & Safety – Environmental Health Program
FM/D&CS	Facilities Management, Design & Construction Services
FM/PF	Facilities Management, Physical Facilities
FOG	Fats, Oils, and Grease
GSA	Graduate Student Association
GSD	Goleta Sanitary District
GWSD	Goleta West Sanitary District
HRS	Housing & Residential Services
MRP	Monitoring and Reporting Plan
OERP	Overflow Emergency Response Plan
OES	Office of Emergency Services
RWQCB	Central Coast, Regional Water Quality Control Board
SBC-OES	Santa Barbara County Office of Emergency Services
SBEHS	Santa Barbara County Public Health Department/Environmental Health Services
SCADA	Supervisory Control and Data Acquisition
SSMP	Sewer System Management Plan
SSO	Sanitary Sewer Overflow
SWRCB	State Water Resources Control Board
TPS	Transportation & Parking Services
UCen	University Center
UCSB	University of California, Santa Barbara
WDR	Waste Discharge Requirement
WQWG	Water Quality Working Group