UC SANTA BARBARA

Sanitary Sewer Spill Emergency Response Plan

Rev. JULY 2024

Prepared by

Environmental Health & Safety

Design, Facilities and Safety Services

Table of Contents

1. Introduction

This Spill Emergency Response Plan (SERP) is prepared for the University of California, Santa Barbara (UCSB) in accordance with the Statewide Waste Discharge Requirements General Order for Sanitary Sewer Systems (SWRCB Order No. 2022-0103) (General Order) adopted on December 6, 2022 and effective June 5, 2023.

1.1 Overview

This SERP is designed to:

1. ensure prompt detection and response to spills;
2. to reduce spill volumes; and
3. to collect information for prevention of future spills.

This SERP includes procedures to:

- Notify primary responders, appropriate local officials, and appropriate regulatory agencies of a spill in a timely manner;
- Notify other potentially affected entities (for example, health agencies, water suppliers, etc.) of spills that potentially affect public health or reach waters of the State;
- Comply with the notification, monitoring and reporting requirements of this General Order, State law and regulations, and applicable Regional Water Board Orders;
- Ensure that appropriate staff and contractors implement the Spill Emergency Response Plan and are appropriately trained;
- Address emergency system operations, traffic control and other necessary response activities;
- Contain a spill and prevent/minimize discharge to waters of the State or any drainage conveyance system;
- Minimize and remediate public health impacts and adverse impacts on beneficial uses of waters of the State;
- Remove sewage from the drainage conveyance system;
- Clean the spill area and drainage conveyance system in a manner that does not inadvertently impact beneficial uses in the receiving waters;
- Implement technologies, practices, equipment, and interagency coordination to expedite spill containment and recovery;
- Implement pre-planned coordination and collaboration with storm drain agencies and other utility agencies/departments prior, during, and after a spill event;
- Conduct post-spill assessments of spill response activities;
- Document and report spill events as required in this General Order; and
- Annually, review and assess effectiveness of the Spill Emergency Response Plan, and update the Plan as needed.

1.2 Plan Location

This SERP is stored electronically on the Office of Environmental Health and Safety (EH&S) server and can be accessed publicly on the EH&S website at ehs.ucsb.edu/index.php/programs-services/environmental-compliance/waste-water.

1.3 Spill Categories

Category 1 Spill: A spill of any volume of sewage from or caused by a regulated sanitary sewer system that results in a discharge to:

- A surface water, including a surface water body that contains no flow or volume of water; or
- A drainage conveyance system that discharges to surface waters when the sewage is not fully captured and returned to the sanitary sewer system or disposed of properly.

Any spill volume not recovered from a drainage conveyance system is considered a discharge to surface water, unless the drainage conveyance system discharges to a dedicated stormwater infiltration basin or facility. A spill from an Enrollee-owned and/or operated lateral that discharges to a surface water is a Category 1 spill.

Category 2 Spill: A spill of 1,000 gallons or greater, from or caused by a regulated sanitary sewer system that does not discharge to a surface water. A spill of 1,000 gallons or greater that spills out of a lateral and is caused by a failure or blockage in the sanitary sewer system is a Category 2 spill.

Category 3 Spill: A spill of equal to or greater than 50 gallons and less than 1,000 gallons, from or caused by a regulated sanitary sewer system that does not discharge to a surface water. A spill of equal to or greater than 50 gallons and less than 1,000 gallons, that spills out of a lateral and is caused by a failure or blockage in the sanitary sewer system is a Category 3 spill.

Category 4 Spill: A spill of less than 50 gallons, from or caused by a regulated sanitary sewer system that does not discharge to a surface water. A spill of less than 50 gallons, that spills out of a lateral and is caused by a failure or blockage in the sanitary sewer system is a Category 4 spill.

1.4 Notification, Monitoring, and Reporting Requirements

The following table summarizes the notification, monitoring, and reporting requirements for each of the four spill categories. Reports are submitted to the State and Regional Water Quality Control Boards via the California Integrated Water Quality System (CIWQS).

Notification, Monitoring, and Reporting Requirements	Spill Category				
	1	2	3	4	*
Notify the California Office of Emergency Services (Cal OES) within 2 hours of knowledge of a spill of 1,000 gallons or more, discharging or threatening to discharge to surface waters; obtain notification control number from Cal OES.	X	X			
Assess the spill location, spread, and estimate spill volume. For spills discharging to surface waters, conduct additional observations of the receiving water.	X	X	X	X	
Conduct water quality sampling of the receiving water within 18 hours of initial knowledge of a spill that is 50,000 gallons or more, discharging to surface waters.	X				
Submit a Draft Spill Report within 3 business days of knowledge of the spill.	X	X			
Submit a Certified Spill Report within 15 calendar days of the spill end date.	X	X			
Submit monthly Certified Spill Report within 30 calendar days after the end of the month in which the spill occurs.			X		
Certify monthly the estimated total spill volume exiting the sanitary sewer system, and the total number of all Category 4 spills; submit within 30 calendar days after the end of the month in which the spill occurs.				X	
Submit a Technical Report within 45 days after the spill end date for a spill of 50,000 gallons or more discharged to surface waters.	X				

If necessary to update a Certified Spill Report, submit an Amended Spill Report within 90 calendar days after the spill end date.	X	X			
If necessary to update a monthly Certified Spill Report, submit an Amended Spill Report within 90 calendar days after the Certified Spill Report due date.			X		
Upload and certify a report of all spills of this category by February 1st after the end of the calendar year in which the spills occur.				X	X

Note: (*) is a non-numerical placeholder for spills less than 1,000 gallons from Enrollee owned and/or operated laterals that do not discharge to surface waters.

1.5 Annual Review

Qualified EH&S personnel will annually review and assess effectiveness of this SERP and update as needed.

2. Spill Response Procedures

This SERP details a strategy to respond to spills with appropriate personnel, materials, and resources. 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 system.

2.1 Spill Notification

In the event of a sanitary sewer spill, the employee who first identifies the spill is the designated First Spill Responder. During normal business hours (8am-5pm, M-F) the First Spill Responder will immediately notify:

- Facilities Management (FM) Dispatch (805-451-9914); or
- Housing, Dining & Auxiliary Enterprises (805-448-0474) Dispatch; and
- Environmental Health & Safety (Attachment 1).

If a sanitary sewer spill is identified outside of normal business hours, the First Spill Responder will immediately notify:

- UCSB Police Department (UCPD) Non-Emergency (805-893-3446).

The following sections detail the spill response procedures that should be followed in the event of sanitary sewer spill.

2.2 Spill Assessment

After notification of a spill or failure of any element of the sanitary sewer system that threatens to cause a spill, the First Spill Responder will assess the affected area and determine an appropriate spill response by evaluating the following factors:

- Location and extent of the spill;
- Cause or potential cause of the spill;
- Impacts to downstream receiving water(s); and
- Estimate spill volume (Attachment 2).

The First Spill Responder will record with photographs and/or videos, as appropriate, to document spill conditions. The assessment may include observation of lift station pumps, sewer access holes, and stormwater conveyance infrastructure. To assist with accurate and complete data collection throughout the spill response, an Incident Report Form is included as an attachment to this SERP (Attachment 3).

Additionally, the First Spill Responder will evaluate the potential hazard to employees and surrounding public. If it is determined that the spill cannot be safely and effectively controlled with UCSB resources and personnel, then the First Spill Responder will initiate an evacuation and immediately notify outside emergency response agencies and/ or contactors to implement spill containment and cleanup.

2.3 Spill Containment

Upon completion of the spill assessment, the First Spill Responder will direct employees trained in spill response, to obtain appropriate spill response materials. Examples of spill response materials include sand or gravel bags, dirt or sand piles, plastic sheeting, storm drain covers, and absorbents (socks, booms, pads, pillows, and rolls). The spill responder(s) will attempt to contain the spill to prevent its entry into any downstream receiving waters or conveyance that eventually discharges to downstream receiving waters. Sewage may be pumped to an alternate/ unimpaired sewer access hole. Water supply to the upstream building(s) may be turned off.

While the spill is being contained, other spill responders will attempt to seal or otherwise stop the source of the spill. If only one spill responder is available, then spill containment should be completed before the spill source is stopped.

2.4 Spill Cleanup

Once the spill is contained and the source is eliminated, the spill responder(s) will:

- Remove residual sewage from any drainage conveyance system(s) utilizing methods that will not impact water quality in downstream receiving waters and record the estimated volume of sewage recovered;
- Clean and sanitize the affected area(s), ensuring that only de-chlorinated water is discharged into drainage conveyance system(s); and
- Collect contaminated materials in an appropriate manner for disposal to landfill.

Spill responders will take photos of all affected areas once the spill is contained, prior to and post cleanup. Send documentation of spill incident including location, date, time, estimate of spill volume, estimate of spill volume recovered, photos, videos, and a narrative description of spill response and cleanup activities to EH&S.

3. Safety Procedures

When appropriately trained to do so, spill responders may be required to implement the following safety procedures:

- Lock-Out/Tag-Out for equipment repair or maintenance;
- Confined Space Entry;
- Hazard Communication;
- Traffic Control; and
- Use of Personal Protective Equipment (PPE).

If it is determined that traffic control is necessary, the spill responders will contact UCPD and/or Transportation & Parking Services (TPS) staff for assistance. Traffic control measures may include:

- Barricades, traffic cones, and/ or warning tape to restrict access;
- Reflective vests when working in or around a roadway; and
- Appropriate traffic control patterns and advanced warning signs.

Spill responders are trained on the proper use of PPE in response to sanitary sewer spills. Depending on the size and nature of the spill, required PPE may include safety glasses or goggles, dust mask, protective face mask or splash-proof face shield, latex or nitrile gloves, poly-laminated Tyvek, water-resistant work or rubber boots, waterproof and slip resistant boots (Attachment 4).

4. Spill Notification Procedures

EH&S is responsible for notifying appropriate regulatory agencies of a spill in a timely manner. Additionally, EH&S will notify other potentially affected entities of spills that potentially affect public health or reach downstream receiving waters. The table below identifies the immediate entities to be notified, as well as other potentially affected entities that will be notified at the discretion of EH&S.

Notification	Trigger	Timeline	Contacts
Immediate	Sanitary sewer spill of **1,000 gallons or more** to surface water or threatening to discharge to surface water	As soon as possible, **but no later than (2) hours after:** Enrollee has knowledge of the spill & notification can be provided without substantially impending cleanup or other emergency measures	**California Office of Emergency Services (Cal OES)** (800) 852-7550
Additional (External)	Sanitary sewer spill of **1,000 gallons or more** to surface water or threatening to discharge to surface water	Within **24 hours**	**Santa Barbara County Office of Emergency Management (SBC-OEM)** (805) 681-5526
Additional (External)	Public health concern or release to a waterway	Within **24 hours**	**Santa Barbara County Public Health Department/Environmental Health Services (SBEHS)** (805) 681-4900
Additional (Internal)	Public health concern or release to a waterway	Courtesy notification as necessary in addition to SB County Public Health	**UCSB Environmental Health Specialist (Shannon Hinrichs)** (805) 893-2471
Additional (External)	Spill to a waterway	Courtesy notification as necessary	**Central Coast Regional Water Quality Control Board** (805) 549-3147
Additional (External)	Spill to a waterway	Courtesy notification as necessary	**California Department of Fish and Wildlife** (South Coast Region, Region 5) (858) 467-4201
Additional (External)	If overflow affects traffic along State Route 217	Courtesy notification as necessary	**California Department of Transportation** (Caltrans, District 5) (805) 549-3111

Additional (External)	Spill to a waterway	Courtesy notification as necessary	**US Environmental Protection Agency (EPA)** (415) 744-2000
Additional (External)	GSD and/or GWSD will be notified if there is any violation of a discharge prohibition	Courtesy notification as necessary	**Goleta Sanitary District (GSD)** (805) 967-4519 & **Goleta West Sanitary District (GWSD)** (805) 968-2617

4.1 Notification to Cal OES

EH&S will notify Cal OES **within two (2) hours** after becoming aware of a Category 1 spill of 1,000 gallons or greater, discharging or threatening to discharge to surface waters. The notification will include:

- Name and phone number of the person notifying Cal OES;
- Estimated spill volume (gallons);
- Estimated spill rate from the system (gallons per minute);
- Estimated discharge rate (gallons per minute) directly into waters of the State or indirectly into a drainage conveyance system;
- Brief narrative of the spill event;
- Spill incident location (address, city, and zip code) and closest cross streets and/or landmarks;
- Name and phone number of contact person on-scene;
- Date and time the Enrollee was informed of the spill event;
- Name of sanitary sewer system causing the spill;
- Spill cause or suspected cause (if known);
- Amount of spill contained;
- Name of receiving water body receiving or potentially receiving discharge; and
- Description of water body impact and/ or potential impact to beneficial uses.

4.2 Notification Updates to Cal OES

After the initial notification to Cal OES and until EH&S certifies the spill report in CIWQS, EH&S will provide updates to Cal OES regarding any changes to the:

- Estimated spill volume (increase or decrease in gallons than initially stated);
- Estimated discharge volume discharged directly into waters of California or indirectly into a drainage conveyance system (increase or decrease in gallons initially estimated); and
- Additional impact(s) to the receiving water(s) and beneficial uses.

5. Water Quality Sampling and Analysis Plan

UCSB will conduct water quality sampling no later than **18 hours** after becoming aware of a sewage spill in which an estimated 50,000 gallons or greater is discharged into a surface water.

5.1 Sampling Locations and Frequency

One (1) water sample will be collected each day for the duration of a spill, at the following locations:

Sample Type	Sampling Location	Sampling Location Description
Drainage Conveyance System (DCS)	DCS-001	A point in a drainage conveyance system before the drainage conveyance system flow discharges into a receiving water.
Receiving Surface Water (RSW)	RSW-001	A point in the receiving water where sewage initially enters the receiving water.
	RSW-001U	A point in the receiving water, upstream of the point of sewage discharge, to capture ambient conditions absent of sewage discharge impacts.
	RSW-001D	A point in the receiving water, downstream of the point of sewage discharge, where the spill material is fully mixed with the receiving water.

Note: If the receiving water has no flow during the duration of the spill, the Enrollee must report "No Sampling Due To No Flow" for its receiving water sampling locations. Additional water samples will be collected and analyzed as required by the applicable Regional Water Board Executive Officer or designee.

5.2 Water Quality Parameters

Samples will be collected and analyzed for ammonia and appropriate bacterial indicators per Central Coast Basin Plan (Basin Plan) water quality objectives. Water quality objectives for specific beneficial uses for bacteria for inland surface waters, enclosed bays, and estuaries are:

- Water Contact Recreation (REC1)
    - Fecal coliform concentration, based on a minimum of not less than five samples for any 30-day period, shall not exceed a log mean of 200/100 mL, nor shall more than ten percent of total samples during any 30-day period exceed 400/100 mL.
- Non-Contact Water Recreation (REC2)
    - Fecal coliform concentration, based on a minimum of not less than five samples for any 30-day period, shall not exceed a log mean of 2000/100 mL, nor shall more than ten percent of samples collected during any 30-day period exceed 4000/100 mL.
- Shellfish Harvesting (SHELL)
    - The median total coliform concentration throughout the water column for any 30-day period shall not exceed 70/100 mL, nor shall more than ten percent of the samples collected during any 30-day period exceed 230/100 mL for a five-tube decimal dilution test or 330/100 mL when a three-tube decimal dilution test is used.

Water quality objectives for specific beneficial uses for bacteria for ocean waters are:

- Water Contact Recreation (REC1)
    - A six-week rolling GM* of enterococci not to exceed 30 colony forming units (cfu) per 100 milliliters (mL), calculated weekly, and a statistical threshold value* (STV) of 110 cfu/100 mL not to be exceeded by more than 10 percent of the samples collected in a calendar month*, calculated in a static manner.
    - A 30-day geometric mean* (GM) of fecal coliform density not to exceed 200 per 100 milliliters (mL), calculated based on the five most recent samples from each site, and a single sample maximum* (SSM) not to exceed 400 per 100 mL.
- Shellfish Harvesting (SHELL)

- The median total coliform density shall not exceed 70 per 100 mL, and not more than 10 percent of the samples shall exceed 230 per 100 mL.

A summary table of waterbodies proximal to the UCSB campus and relevant beneficial use designations are summarized in the table below.

Waterbody	Reference	Beneficial Use		
		REC1	REC2	SHELL
Devereaux Ranch Lagoon	Basin Plan	X	X	X
Devereaux Creek	Basin Plan	X	X	
Goleta Point Marsh	Basin Plan	X	X	
Goleta Slough/Estuary	Basin Plan	X	X	X
Tecolotito Creek	Basin Plan	X	X	
Pt. Arguello to Coal Oil Pt.	Ocean Plan	X	X	X
Coal Oil Pt. to Rincon Pt.	Ocean Plan	X	X	X

Note: Modified from Central Coast Basin Plan (2019), Tables 2-1 and 2-2.

Samples collected from all inland surface waters, enclosed bays, and estuaries will be analyzed for total coliform and fecal coliform. Samples collected from ocean waters will be sampled for total coliform, fecal coliform, and enterococcus.

5.3 Water Quality Sampling and Analysis

Water quality sampling and analysis will be performed by Fruit Growers Laboratory, Inc. (FGL) in Santa Paula, California or another laboratory with Environmental Laboratory Accreditation Program (ELAP) accreditation. Analytical method specifications and sample handling information for the selected water quality parameters are summarized in the table below.

Parameter	Test Method	Sample Container	Preservative	Hold Time
Ammonia (as N)	SM4500-NH3	16oz plastic	H2SO4	28 days
Total Coliform	SM 9221 B	120 ml Sterile Plastic Bacti Bottle	Na2S2O3	8 hours
Fecal Coliform	SM 9221 B,E	120 ml Sterile Plastic Bacti Bottle	Na2S2O3	8 hours
Enterococci	Enterolert	120 ml Sterile Plastic Bacti Bottle	Na2S2O3	8 hours

5.4 Safety and Access Exceptions

Water quality sampling will only be conducted under safe conditions with unrestricted accesses to surface water. Unsafe conditions include limited visibility, heavy wind or rain, and steep water banks. In cases where sampling cannot be done, details of access restrictions and/or safety hazards will be documented in related reports (e.g., Draft Spill Report, Certified Spill Report, Spill Technical Report).

6. Training

Initial and annual training is conducted for employees that are responsible for preforming duties related to the sanitary sewer system and this SERP. Initial training is conducted in collaboration between EH&S and DKF Solutions Group. Initial training items include:

- Requirements of the General Order;
- UCSB's Spill Emergency Response Plan procedures and practice drills;
- Skilled estimation of spill volume for field operators; and
- Electronic CIWQS reporting procedures for staff submitting data (*for EH&S staff responsible for electronic reporting only*).

Upon completion of initial training, employees are required annually to attend a live online training "Spill Volume & Start Time Determination" and to review the requirements of this SERP. Training records are maintained in a local electronic file system (Attachment 5).

7. External Resources

As necessary, contractors may be utilized to aid in spill response, cleanup and monitoring. Contractors will be experienced with sanitary sewer work, knowledgeable of the General Order and comply with the requirements of this SERP. Contact information for some potential contractors are provided in the table below.

Contractor	Services
Fruit Growers Laboratory, Inc. 853 Corporation Street Santa Paula, CA 93060 (805) 392-2000	Water quality sampling and analysis
DKF Solutions Group 164 Robles Way, Suite 274 Vallejo, California 94591 (800) 215-5206	Initial and annual live online and in-person training, SERP review, and surface water sampling support
Marborg Industries 728 E Yanonali Street Santa Barbara, CA 93103 (805) 963-1852	Spill response and cleanup

Attachment 1: Environmental Health & Safety Notification

Version 15: 03/04/24

University of California Santa Barbara
Office of Environmental Health & Safety

Campus Police/Fire Dispatch (805-893-3446 & 4457)
Facilities Management/Physical Facilities Dispatch (805-451-9914)
Housing, Dining & Auxiliary Enterprises Dispatch (805-448-0474)

Business Hours Notification

8:00 am – 12:00 pm & 1:00 pm – 5:00 pm

893-3194

After Hours/Weekends Notification

12:00 pm – 1:00 pm & after 5:00 pm

Use any number until contact is made

Acuna, Hector	805-450-1896	Laboratory Safety
Aghayan, Ali	805-451-7623	Environmental Health
Berberet, Kerri	805-696-0410	Deputy Fire Marshal
Bickley, Jesse	805-722-7634	Industrial Hygiene
Brown, Robert	661-219-1924	Radiation Safety
Caesar, Jim	805-450-1437	Emergency Manager
Carter, Bruce	805-722-7168	Hazardous Waste
Fitzpatrick, Tim	717-682-4031	Director
Gregson, Al	805-451-7201	Deputy Fire Marshal
Hinrichs, Shannon	805-729-6519	Public Health
McCarthy, Chandra	805-698-6191	Deputy Fire Marshal
Moretto, Alex	617-480-6630	Laboratory Safety
Seaman, John	805-451-3157	General Safety
White, Jim	805-451-3925	Fire Marshal

Attachment 2: Spill Volume Estimation Methodology

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)

City of San Diego
Metropolitan Wastewater Department

Reference Sheet for Estimating Sewer Spills from Overflowing Sewer Manholes

*All estimates are calculated in **gallons per minute (gpm)***

Wastewater Collection Division
(619) 654-4160

5 gpm

25 gpm

50 gpm

100 gpm

150 gpm

200 gpm

225 gpm

250 gpm

275 gpm

All photos were taken during a demonstration using metered water from a hydrant in cooperation with the City of San Diego's Water Department.

rev. 4/99

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.):

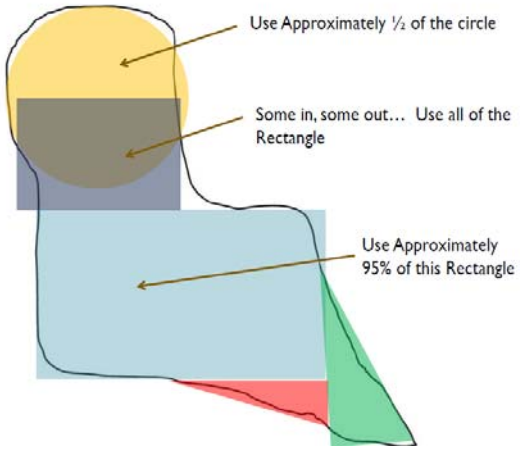
_____
_____
_____
_____
_____
_____

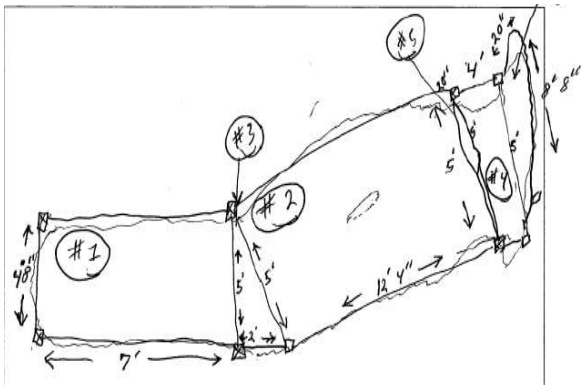
Method 3: Estimating Volume Based on Spill Dimensions

If not raining, the shape, dimensions, and depth of spill may be used to estimate volume

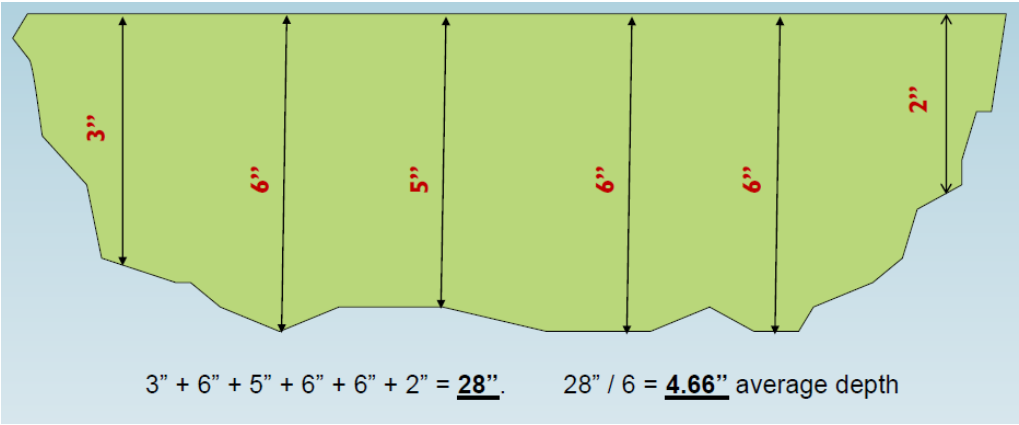
1. Sketch shape of spill
2. Measure/pace off dimensions
3. Measure depth in several locations; take average
4. Convert all dimensions to feet
5. Calculate area of spill based on approximate shape:
   - Rectangle: Area = length x width
   - Circle: Area = diameter x diameter x 0.785
   - Triangle: Area = 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

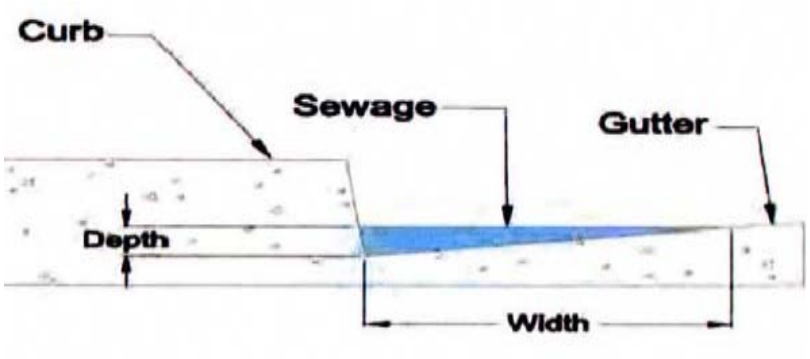
Additional Notes and Documentation (please describe how the spill volume was calculated/ measured. Please show calculations.):

_____
_____
_____
_____
_____

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.):

_____
_____
_____
_____
_____
_____

Method 5: Drop Bucket Method

- Can be used for **small spills** where the entire flow stream can be captured in a bucket. The flow rate of the spill must be constant to use this method.
    1. Place bucket so that it captures the entire flow stream and time how long it takes to fill the bucket.
    2. Dividing the volume of the bucket (in gallons) by the elapsed time to fill the bucket (in minutes) equals the flow rate in gallons per minute (gpm).
        - Example: If it takes 30 seconds to fill a 5-gallon bucket and the spill has occurred for 20 minutes the total spill volume would be 200 gallons (5gal/.5min = 10gpm X20min = 200gal).

Method 5: Spill Volume Estimation Based on Drop Bucket Method

Manhole/ Pipe Number: _____
Date: _____

Name of Estimator: _____ **Telephone: _____**

Exact Location of Spill (address): _____
Exact Latitude: _____ **Exact Longitude: _____**

Volume of bucket used to determine volume: _____ gal

Time needed for flow to fill bucket: _____ min

Flow rate: _____ gal/min

Spill duration: _____min

Estimated spill volume (duration x flow rate): _____gal

Estimated volume of spill recovered: _____gal

Picture taken? YES NO

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

Shape of spill: RECTANGLE TRIANGLE CIRCLE

Please Sketch Spill with Dimensions:

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

_____
_____
_____
_____
_____
_____
_____

Method 6: Determine Spill Volume from Vent or Pick Holes

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

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

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

Hole Dia. inches	Area sq. ft.	Coeff.of Vel. Cv	Coeff. Of Cont. Cc	C Cv x Cc	Water Ht inches	Water Ht inches	Water Ht feet	Q cfs	Q gpm	Q gph
Vent Hole										
0.50	0.00136	0.945	0.70	0.662	1/16 th	0.063	0.005	0.0005	0.23	14
0.50	0.00136	0.945	0.70	0.662	1/8 th	0.125	0.010	0.0007	0.33	20
0.50	0.00136	0.945	0.70	0.662	1/4 th	0.250	0.021	0.0010	0.47	28
0.50	0.00136	0.945	0.70	0.662	one half	0.500	0.042	0.0015	0.66	40
0.50	0.00136	0.945	0.70	0.662	3/4 ths	0.750	0.063	0.0018	0.81	49
0.50	0.00136	0.945	0.70	0.662	1 inch	1.000	0.083	0.0021	0.94	56
Vent Hole										
0.75	0.00307	0.955	0.67	0.640	1/16 th	0.063	0.005	0.0011	0.51	31
0.75	0.00307	0.955	0.67	0.640	1/8 th	0.125	0.010	0.0016	0.72	43
0.75	0.00307	0.955	0.67	0.640	1/4 th	0.250	0.021	0.0023	1.02	61
0.75	0.00307	0.955	0.67	0.640	one half	0.500	0.042	0.0032	1.44	87
0.75	0.00307	0.955	0.67	0.640	3/4 ths	0.750	0.063	0.0039	1.77	106
0.75	0.00307	0.955	0.67	0.640	1 inch	1.000	0.083	0.0045	2.04	122
Vent Hole										
1.00	0.00545	0.960	0.65	0.624	1/16 th	0.063	0.005	0.0020	0.88	53
1.00	0.00545	0.960	0.65	0.624	1/8 th	0.125	0.010	0.0028	1.25	75
1.00	0.00545	0.960	0.65	0.624	1/4 th	0.250	0.021	0.0039	1.77	106
1.00	0.00545	0.960	0.65	0.624	one half	0.500	0.042	0.0056	2.50	150
1.00	0.00545	0.960	0.65	0.624	3/4 ths	0.750	0.063	0.0068	3.06	184
1.00	0.00545	0.960	0.65	0.624	1 inch	1.000	0.083	0.0079	3.54	212
Pick Hole semicircular area										
1.00	0.00273	0.960	0.65	0.624	1/16 th	0.063	0.005	0.0010	0.44	27
1.00	0.00273	0.960	0.65	0.624	1/8 th	0.125	0.010	0.0014	0.63	38
1.00	0.00273	0.960	0.65	0.624	1/4 th	0.250	0.021	0.0020	0.89	53
1.00	0.00273	0.960	0.65	0.624	one half	0.500	0.042	0.0028	1.25	75
1.00	0.00273	0.960	0.65	0.624	3/4 ths	0.750	0.063	0.0034	1.53	92
1.00	0.00273	0.960	0.65	0.624	1 inch	1.000	0.083	0.0039	1.77	106
1.00	0.00273	0.960	0.65	0.624	1-1/2 inch	1.500	0.125	0.0048	2.17	130
1.00	0.00273	0.960	0.65	0.624	2 inches	2.000	0.167	0.0056	2.51	150

Method 6: Spill Volume Estimation Based on Spill from Vent or Pick Holes

Manhole/ Pipe Number: _____
Date: _____

Name of Estimator: _____ **Telephone: _____**

Exact Location of Spill (address): _____
Exact Latitude: _____ **Exact Longitude: _____**

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

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

Spill duration: _____min

Number of Pick of Vent Holes: _____

Size of Pick or Vent Holes (diameter): _____ inches

Height of water exiting pick or vent holes: _____ inches

Flow rate from each hole (chart): _____ gal/min

Estimated spill volume (duration x flow rate x number of holes): _____gal

Estimated volume of spill recovered: _____gal

Picture taken? YES NO
Dimensions of spill (in ft. or paces): Length _____ Width _____ Depth _____

Shape of spill: RECTANGLE TRIANGLE CIRCLE

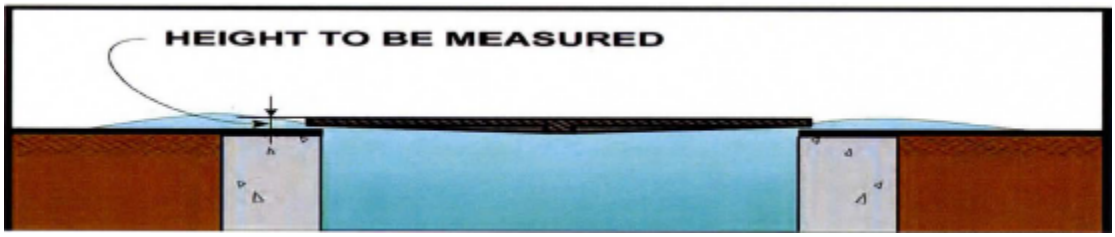
Please Sketch Spill with Dimensions:

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

_____
_____
_____
_____
_____
_____
_____

Method 7: Determine the Volume of a Spill from Around the Rim of a Manhole Cover

- If manhole cover is in place:
    1. Find the area of the gap (diameter of the cover from the diameter of the inside of the ring)
    2. Find the velocity (ft/sec) of the spill by measuring the height of the sewage plume



    3. Area times the velocity (ft/sec) times the duration of the spill times (448.8 for gpm/cfs) equals the total spill volume in gallons

TABLE 'A'

ESTIMATED SSO FLOW OUT OF M/H WITH COVER IN PLACE

24" COVER

Height of spout above M/H rim H in inches	S S O FLOW Q in gpm	in MGD	Min. Sewer size in which these flows are possible
1/4	1	0.001	
1/2	3	0.004	
3/4	6	0.008	
1	9	0.013	
1 1/4	12	0.018	
1 1/2	16	0.024	
1 3/4	21	0.030	
2	25	0.037	
2 1/4	31	0.045	
2 1/2	38	0.054	
2 3/4	45	0.065	
3	54	0.077	
3 1/4	64	0.092	
3 1/2	75	0.107	
3 3/4	87	0.125	
4	100	0.145	
4 1/4	115	0.166	
4 1/2	131	0.189	
4 3/4	148	0.214	
5	166	0.240	
5 1/4	185	0.266	
5 1/2	204	0.294	
5 3/4	224	0.322	6"
6	244	0.352	
6 1/4	265	0.382	
6 1/2	286	0.412	
6 3/4	308	0.444	
7	331	0.476	
7 1/4	354	0.509	
7 1/2	377	0.543	
7 3/4	401	0.578	8"
8	426	0.613	
8 1/4	451	0.649	
8 1/2	476	0.686	
8 3/4	502	0.723	
9	529	0.761	

36" COVER

Height of spout above M/H rim H in inches	S S O FLOW Q in gpm	in MGD	Min. Sewer size in which these flows are possible
1/4	1	0.002	
1/2	4	0.006	
3/4	8	0.012	
1	13	0.019	
1 1/4	18	0.026	
1 1/2	24	0.035	
1 3/4	31	0.044	
2	37	0.054	
2 1/4	45	0.065	
2 1/2	55	0.079	
2 3/4	66	0.095	
3	78	0.113	
3 1/4	93	0.134	
3 1/2	109	0.157	
3 3/4	127	0.183	
4	147	0.211	
4 1/4	169	0.243	
4 1/2	192	0.276	
4 3/4	217	0.312	6"
5	243	0.350	
5 1/4	270	0.389	
5 1/2	299	0.430	
5 3/4	327	0.471	
6	357	0.514	
6 1/4	387	0.558	8"
6 1/2	419	0.603	
6 3/4	451	0.649	
7	483	0.696	
7 1/4	517	0.744	
7 1/2	551	0.794	
7 3/4	587	0.845	10"
8	622	0.896	
8 1/4	659	0.949	
8 1/2	697	1.003	
8 3/4	734	1.057	
9	773	1.113	

Method 7: Spill Volume Estimation Based on Spill Around the Rim of a Manhole Cover that is in Place

Manhole/ Pipe Number: _____
Date: _____

Name of Estimator: _____ **Telephone: _____**

Exact Location of Spill (address): _____
Exact Latitude: _____ **Exact Longitude: _____**

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

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

Spill duration: _____min

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

Height of sewage plume: _____ inches

Velocity (chart): _____ ft./sec

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

Estimated volume of spill recovered: _____gal

Picture taken? YES NO
Was reference photo used? YES NO
Dimensions of spill (in ft. or paces): Length _____ Width _____ Depth _____

Shape of spill: RECTANGLE TRIANGLE CIRCLE

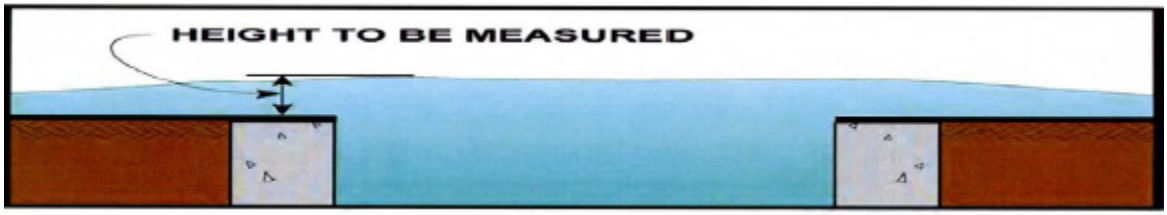
Please Sketch Spill with Dimensions:

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

_____
_____
_____
_____
_____
_____
_____

Method 8: Determine the Volume of a Spill from a Manhole without a Cover

- If manhole cover is not in place:
    1. Find the area of the manhole opening (Area = 3.14 R2)
    2. Find the velocity (ft/sec) of the spill by measuring the height of the sewage plume



    3. Area times the velocity (ft/sec) times the duration of the spill times (448.8 gpm/cfs) equals the total spill volume in gallons.

TABLE 'B'

ESTIMATED SSO FLOW OUT OF M/H WITH COVER REMOVED

24" FRAME

Water Height above M/H frame H in inches	S S O Q FLOW in gpm	in MGD	Min. Sewer size in which these flows are possible
1/8	28	0.04	
1/4	62	0.09	
3/8	111	0.16	
1/2	160	0.23	
5/8	215	0.31	6"
3/4	354	0.51	8"
7/8	569	0.82	10"
1	799	1.15	12"
1 1/8	1,035	1.49	
1 1/4	1,340	1.93	15"
1 3/8	1,660	2.39	
1 1/2	1,986	2.86	
1 5/8	2,396	3.45	18"
1 3/4	2,799	4.03	
1 7/8	3,132	4.51	
2	3,444	4.96	21"
2 1/8	3,750	5.4	
2 1/4	3,986	5.74	
2 3/8	4,215	6.07	
2 1/2	4,437	6.39	
2 5/8	4,569	6.58	24"
2 3/4	4,687	6.75	
2 7/8	4,799	6.91	
3	4,910	7.07	

36" FRAME

Water Height above M/H frame H in inches	S S O Q FLOW in gpm	in MGD	Min. Sewer size in which these flows are possible
1/8	49	0.07	
1/4	111	0.16	
3/8	187	0.27	6"
1/2	271	0.39	
5/8	361	0.52	8"
3/4	458	0.66	
7/8	556	0.8	10"
1	660	0.95	12"
1 1/8	1,035	1.49	
1 1/4	1,486	2.14	15"
1 3/8	1,951	2.81	
1 1/2	2,424	3.49	18"
1 5/8	2,903	4.18	
1 3/4	3,382	4.87	
1 7/8	3,917	5.64	21"
2	4,458	6.42	
2 1/8	5,000	7.2	24"
2 1/4	5,556	8	
2 3/8	6,118	8.81	
2 1/2	6,764	9.74	
2 5/8	7,403	10.66	
2 3/4	7,972	11.48	30"
2 7/8	8,521	12.27	
3	9,062	13.05	
3 1/8	9,604	13.83	
3 1/4	10,139	14.6	
3 3/8	10,625	15.3	36"
3 1/2	11,097	15.98	
3 5/8	11,569	16.66	
3 3/4	12,035	17.33	
3 7/8	12,486	17.98	
4	12,861	18.52	
4 1/8	13,076	18.83	
4 1/4	13,285	19.13	
4 3/8	13,486	19.42	

Method 8: Spill Volume Estimation Based on Spill from a Manhole without a Cover

Manhole/ Pipe Number: _____
Date: _____

Name of Estimator: _____ **Telephone: _____**

Exact Location of Spill (address): _____
Exact Latitude: _____ **Exact Longitude: _____**

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

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

Spill duration: _____min

Area of manhole opening (A=3.14 r^2): _____ ft2

Height of sewage plume: _____ inches

Velocity (chart): _____ ft./sec

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

Estimated volume of spill recovered: _____gal

Picture taken? YES NO
Was reference photo used? YES NO
Dimensions of spill (in ft. or paces): Length _____ Width _____ Depth _____

Shape of spill: RECTANGLE TRIANGLE CIRCLE

Please Sketch Spill with Dimensions:

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

_____
_____
_____
_____
_____
_____
_____

Attachment 3: Sanitary Sewer Spill - Incident Report Form

From:	Ali Aghayan University of California, Santa Barbara Environmental Health & Safety Santa Barbara, CA 93106-5132 Phone: 805-893-8533 Fax: 805-893-8659	**To:**	❑ **EPA** [Duty officer] 415-744-2000/Fax: NA ❑ **F&G** [Natasha Lohmus] 805-684-6281/Fax: 568-1235 ❑ **GSD** [Teresa Kistner] 805-967-4519/Fax: 964-3583 ❑ **GWSD** [Mark Nation] 805-968-2617/Fax: 562-8987 ❑ **HSD** [Duty officer] 805-963-8616/Fax: 962-0927 ❑ **OES** [Richard Abrams] 805-681-5532/Fax: 560-1040 ❑ **RWQCB** [Ryan Lodge] 805-549-3506/Fax: 788-3584 ❑ **SBC** [Lloyd Simms] 805-681-4926/Fax: 681-4901 ❑ Other: _____
	Date/time: _____		Page 1 of _____ Report No.: _____

University of California, Santa Barbara

Sewage Release/Spill Reporting Form

Reporting party (RP): _____ UCSB affiliate: ❑ Yes: ❑ Staff, ❑ Student / ❑ No

Address: _____ Phone: ❑ W / ❑ H _____

Responding party: _____ ❑ EH&S, ❑ FM-PF, ❑ HRS, ❑ Other: _____

Address: _____ Phone: ❑ W / ❑ H _____

Cause of spill: _____

Type of release: ❑ Surface, ❑ Minor, ❑ Major, ❑ Lift station / Explain: _____

Date of spill: _____ Time spill began: _____ Time spill stopped: _____

Location/path: _____ Map: ❑ Yes / ❑ No

State: ❑ Liquid / ❑ Solid / ❑ Liquid-Solid / ❑ Other Explain: _____

Quantity: _____ Unit: ❑ Gal. / ❑ Lb. / ❑ Other: _____ Composition %: _____

Number of spills in the same location in the past three (3) years: ❑ 0 / ❑ _____ Explain: _____

Corrective action: _____

Date/time cleanup started: _____ Date/time cleanup ended: _____

Method of disposal: _____

Problem corrected: ❑ Yes Date/time: _____ / ❑ No Explain: _____

Was any chemical used as part of the corrective action?: ❑ No / ❑ Yes Explain: _____

Personal protective equipment: ❑ No / ❑ Yes Type: _____

Non-University assistance: ❑ No / ❑ Yes Name: _____ Date/time: _____

Address: _____ Phone: _____

Type of assistance: _____

Public health concern/exposure: ❑ No / ❑ Yes Explain: _____

Environmental concern/damage: ❑ No / ❑ Yes Explain: _____

Structural concern/damage: ❑ No / ❑ Yes Explain: _____

Were public health warning signs posted?: ❑ Yes / ❑ No Explain: _____

Agency notification: ❑ No / ❑ Yes: ❑ EPA, ❑ F&G, ❑ GSD, ❑ GWSD, ❑ HSD, ❑ OES, ❑ RWQCB, ❑ S.B. County

Additional information/comments: _____

Follow-up/referral/preventive measures: _____

_____

Report prepared by: _____ Phone/fax: _____ Date/time: _____

ORIGINAL

Photocopy this form for future use

Attachment 4: Personal Protective Equipment

Required Personal Protective Equipment (PPE) for Sanitary Sewer Spills

Small Spills

Hazards:

The spill does not exceed 2 inches in depth.

Large Spills

Hazards:

The spill exceeds 2 inches in depth.
There is a potential for splashing.

Attachment 5: Example Training Log

UCSB

Spill Emergency Response Plan (SERP)

Training Log

Trainer(s):			**Date:**	
Name	**Job Description/ Title**	**Department**	**Training Type** **(Initial, Annual, or Other*)**	**Signature**

*Specify reason for training