



University of California, Berkeley

Spill Emergency Response Plan

May 2023

effective June 5, 2023

Enrollees:

UC Berkeley CS, WDID #: 2SSO10210

University Village Albany CS, WDID #: 2SSO18101

UC Berkeley, Richmond Field Station CS, WDID #: 2SSO18100

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1.0 INTRODUCTION

This Spill Emergency Response Plan (SERP) is required under Waste Discharge Requirements (WDR) Order No. 2002-0103-DWQ (“General Order”), adopted by the State Water Resources Control Board (SWRCB) on December 6, 2022. The WDR stipulates that Enrollees must maintain an up-to-date SERP to: 1) ensure prompt detection and response to spills; 2) reduce spill volumes; and 3) collect information for the prevention of future spills.

1.1 Overview

UC Berkeley operates three sanitary sewer collection systems (CSs) subject to regulation and permitted under the General Order (referred to as “Enrollees”):

- UC Berkeley CS, Waste Discharge Identification number (WDID) 2SSO10210
- University Village Albany CS, WDID 2SSO18101
- UC Berkeley, Richmond Field Station CS, WDID 2SSO18100

Mains and laterals located on UC Berkeley property are all owned by UC Berkeley, unless otherwise specified in contractual agreements. This applies to all sewage spills caused by a failure or blockage of the Enrollees’ sanitary sewer system.

The following departments are responsible for responding to sewage spills at UC Berkeley:

- Environment, Health & Safety (EH&S)
- Facilities Services (FS)
- Residential & Student Services Programs (RSSP)
- RFS Operations (RFS Ops)
- University of California Police Department (UCPD)

1.2 Regulatory Background

This document has been developed to comply with the General Order, which requires Enrollees to prepare and implement a SERP that has procedures to:

- Notify primary responders, appropriate local officials, and appropriate regulatory agencies 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.

1.3 Purpose and Goals

The purpose of the SERP is to support a quick and effective response to a sanitary sewer spill and to reduce the public health and environmental risks of such spills. UC Berkeley's goals with respect to responding to a sanitary sewer spill are:

- Prompt detection
- Quick, coordinated response to stop the cause of the spill
- Containment of the spill (to the extent feasible) or spill volume reduction
- Spill impact mitigation
- Compliance with regulatory requirements (notification, reporting and monitoring)

1.4 Definitions

The General Order specifies the definitions of several terms, including spill categories and other terminology. Frequently used terms are defined below; see the [General Order](#) for a complete list.

Drainage Conveyance System: A publicly- or privately-owned separate storm sewer system, including but not limited to drainage canals, channels, pipelines, pump stations, detention basins, infiltration basins/facilities, or other facilities constructed to transport stormwater and non-stormwater flows.

California Integrated Water Quality System (CIWQS): The statewide database that provides for mandatory electronic reporting as required in State and Regional Water Board-issued waste discharge requirements.

Enrollee: A public, private, or other non-governmental entity that has obtained approval for regulatory coverage under the Statewide Sanitary Sewer Systems General Order 2022-0103-DWQ.

Exfiltration: The underground exiting of sewage from a sanitary sewer system through cracks, offset or separated joints, or failed infrastructure due to corrosion or other factors.

Lateral: An underground segment of smaller diameter pipe that transports sewage from a customer's building or property (residential, commercial, or industrial) to the Enrollee's main sewer line in a street or easement.

Lower Lateral: The portion of the lateral located between the sanitary sewer system main, and either the property line, sewer clean out, curb line, established utility easement boundary or other jurisdictional locations.

Legally Responsible Official: An official representative, designated by the Enrollee, with authority to sign and certify submitted information and documents required by the Statewide Sanitary Sewer Systems General Order 2022-0103-DWQ.

Potential to Discharge, Potential Discharge: Any exiting of sewage from a sanitary sewer system that can reasonably be expected to discharge into a water of the State based on the size of the sewage spill, proximity to a drainage conveyance system, and the nature of the surrounding environment.

Sanitary Sewer System: A system that is designed to convey sewage, including but not limited to, pipes, manholes, pump stations, siphons, wet wells, diversion structures and/or other pertinent infrastructure, upstream of a wastewater treatment plant headwork, including: laterals owned and/or operated by the Enrollee; satellite sewer systems; and/or temporary conveyance and storage facilities, including but not limited to temporary piping, vaults, construction trenches, wet walls, impoundments, tanks and diversionary structures.

Spill: A discharge of sewage from any portion of a sanitary sewer system due to a sanitary sewer system overflow, operational failure, and/or infrastructure failure. Exfiltration of sewage is not considered to be a spill if the exfiltrated sewage remains in the subsurface and does not reach a surface water of the State.

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.

According to State Water Resources Control Board personnel, it is assumed that a sewage spill of 1,000 gallons or more will discharge or has the potential to discharge to surface water.¹

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.

Upper Lateral: The portion of the lateral from the property line, sewer clean out, curb line, established utility easement boundary or other jurisdictional locations, to the building or property.

Waters of the State: Surface waters or groundwater within boundaries of the state as defined in Water Code section 13050(e), in which the State and Regional Water Boards have authority to protect beneficial uses. Includes, but is not limited to, groundwater aquifers, surface waters, saline waters, natural washes and pools, wetlands, sloughs, and estuaries, regardless of flow or whether water exists during dry conditions. Waters of the State include waters of the United States.

Waters of the United States: Surface waters or waterbodies that are subject to federal jurisdiction in accordance with the Clean Water Act.

1.5 Plan Location

The SERP is saved in electronic format on the EH&S server and is publicly available on the EH&S website at ehs.berkeley.edu/ssmp.

1.6 Notification, Monitoring and Reporting Requirements

The following table summarizes the actions and associated deadlines for each of the four spill categories. All reports are submitted via CIWQS.

NOTIFICATION, MONITORING AND REPORTING REQUIREMENTS	SPILL CATEGORY				
	1	2	3	4	*
Notify the California Office of Emergency Services (CalOES) 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 CalOES.	X	X			
Assess the spill location and spread and estimate spill volume. For spills discharging to surface waters, conduct additional observations of the receiving water.	X	X	X	X	

¹ Email correspondence between UC Berkeley EH&S and Walter Mobley, State Water Resources Control Board dated February 8, 2023; email correspondence between UC Berkeley EH&S and Bay Area Clean Water Agencies dated February 17.

NOTIFICATION, MONITORING AND REPORTING REQUIREMENTS	SPILL CATEGORY				
	1	2	3	4	*
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 1 st after the end of the calendar year in which the spills occur.				X	X
<p>Notes: * = Non-numerical placeholder for spills less than 1,000 gallons from Enrollee owned and/or operated laterals that do not discharge to surface waters.</p>					

2.0 CAMPUS DEPARTMENT RESPONSIBILITIES

The following are departmental responsibilities for sewage spill response, including internal incident notifications; stopping, containing, and cleaning up the spill; traffic and crowd control; notification and reporting to appropriate regulatory agencies and other potentially affected entities; performing water quality monitoring; and conducting post-spill review of spill response activities.

Employees with spill response responsibilities (i.e., EH&S-EP team members, Designated Urgent Response Team [DURT] members, utility plumbers, Legally Responsible Officials) are provided with annual in-house training on SERP procedures (at a minimum, those procedures necessary to their response, notification, monitoring, reporting, and/or recordkeeping roles). Staff who report on-scene to clean up and stop spills also participate in annual practice drills and have periodic on-the-job training. All campus staff responding to sewage spills are trained in the use of proper personal protective equipment and good hygiene practices. Only employees with proper training assist in the clean-up of sanitary sewage spills.

2.1 First Responder – FS | RSSP | RFS Ops Responsibilities

- Contact EH&S immediately when a sewage spill has been reported, *if initial notification was not from EH&S*.
- Mobilize resources to stop the source of the sanitary sewer discharge.
- Visually assess the spill location and spread.
- Estimate the spill volume.
- Make observations of the receiving water, for spills discharging to surface waters.
- Document conditions of affected area and extent of spill with photographs and/or videos, upon arrival at the scene.
- Contain the spill and prevent or minimize discharge to surface water (e.g., block storm sewer inlets with covers, sandbags, and/or mats), when feasible.
- If sewage spill has entered surface water or storm drain, attempt to contain it by plugging the downstream location.
- Remove sewage from the surface water or drainage conveyance system (e.g., storm sewer, creek) and redirect to sewer system or containerize for off-site disposal.
- Clean the spill area and drainage conveyance system in a manner that does not inadvertently impact beneficial uses in the receiving waters. For example, water used for cleanup must be de-chlorinated prior to use; flushed water is recovered downstream with a wet/dry vacuum.
- Minimize public access to and contact with spilled sewage (if not already done by EH&S).
- If additional resources are needed for repair or cleanup, contact vendors.
- Send documentation and photographs to EH&S-EP at the end of your shift.

2.2 EH&S Responsibilities

- Provide the First Responder with information about the spill and response needs, if initial notification to EH&S was not from a FS, RSSP or RFS Ops First Responder.
- Verbally notify CalOES and/or other regulatory agencies.

- Assess the spill location and spread (if not already done by the First Responder).
- Estimate the spill volume (if not already done by the First Responder).
- Make observations of the receiving water, for spills discharging to surface waters (if not already done by the First Responder).
- Document conditions of affected area and extent of spill with photographs and/or videos, upon arrival at the scene (if not already done by the First Responder).
- Barricade the area from public access (if not already done by the First Responder).
- Post public health signs along affected areas, as needed.
- Maintain communication with First Responder to ensure the sanitary sewer spill is responded to properly and provide guidance to reduce environmental impacts.
- Conduct water quality sampling of the receiving water or contact vendor if additional resources are needed for sampling.
- Prepare written spill reports, as required, and coordinate with the Legally Responsible Official for CIWQS submittal and certification.
- Work with local storm sewer agencies to coordinate emergency spill response, provide storm sewer system access during spills, and prevent unintentional cross connections of sanitary sewer infrastructure to storm sewer infrastructure.

2.3 UCPD

- Contact EH&S immediately when a sewage spill has been reported.
- Provide traffic control and crowd control, or other necessary emergency response activities, as necessary.

2.4 COMMUNICATION & PUBLIC AFFAIRS

- Conduct external communications with storm sewer agencies, including the City of Berkeley, the City of Albany, the City of Richmond and Lawrence Berkeley Laboratory.
- Allow for collaboration between campus departments and storm sewer agencies to maximize the effectiveness of the control and cleanup of sanitary sewer discharges.

3.0 SPILL RESPONSE PROCEDURES

3.1 Public Observation of Sewage Spill

The public can report sewage spills immediately to either EH&S during business hours (weekdays between 8 AM and 5 PM) or UCPD after hours. UCPD routes the after-hours call to the on-call EH&S Designated Urgent Response Team (DURT).

DEPARTMENT	BUSINESS HOURS	AFTER HOURS
EH&S	(510) 642-3073	(510) 642-6760
UCPD	(510) 642-6760	(510) 642-6760

Based on the location of the sewage spill, EH&S will contact the appropriate maintenance department (FS, RSSP or RFS Ops) to implement spill response procedures.

3.2 UC Berkeley Employee Observation of Sewage Spill

UC Berkeley employees contact their appropriate maintenance department to respond to sanitary sewer spills. The responding maintenance department contacts EH&S (if not already notified) of the spill.

DEPARTMENT	BUSINESS HOURS	AFTER HOURS
FS	(510) 642-1032	(510) 642-1032
RSSP	(510) 642-2828	(510) 642-2828
RFS Ops	(510) 665-3401	(510) 642-3333

3.3 Log of Campus Notification

The initial incident notification to campus is logged:

- During business hours by the First Responder (FS | RSSP | RFS Ops) or EH&S-EP staff using the First Responder form in Appendix A; or
- After hours by DURT using the online DURT Incident Response Tracker Form. The information collected in the form is shared by DURT with campus staff responsible for spill response, as necessary for notification, response, monitoring, and reporting purposes.

4.0 SPILL RESPONSE PROCEDURES

4.1 First Responder - FS | RSSP | RFS Ops Procedures

Immediately following a report of a sewage spill, FS | RSSP | RFS Ops shall:

1. Contact EH&S during business hours at (510) 642-3073 or UCPD after hours at (510) 642-6760. UCPD will contact the on-call DURT member.
2. Note your arrival time at the reported spill location and verify the presence of a sanitary sewer spill.
3. Assess the affected area and extent of the spill and record with photographs and/or videos. Assessment may include observation of receiving water and inspections of lift station pumps and downstream sewer access holes.
4. If there is a possibility of pedestrian access to the site, barricade the area or use cones and/or caution tape to secure the site from public access. Contact UCPD for additional assistance, if needed (e.g., vehicular traffic control).
5. Contain the sanitary sewer spill to the maximum extent possible by utilizing spill containment devices (e.g., sandbags, storm inlet covers) to prevent the spill from entering drainage conveyance system. Landscaping materials (i.e., soil) may also be used to divert the spill away from a drainage conveyance system and towards a landscaped area.
6. If possible, pump the sewage to an alternate sewer access hole (downstream or a different sanitary sewer line); or turn off the water supply to the building.
7. Once the spill is contained, correct the plumbing problem to stop the spill or the cause of the spill. If necessary, call a vendor for assistance.
8. Remove contaminated residual from storm pipes and attempt to recover all sewage from the storm drain, if possible.
9. Clean and sanitize the affected area(s) and ensure that only de-chlorinated cleanup water is discharged into the storm drain.
10. Fill out the [Sanitary Sewer First Responder Form](#), sign, and submit to EH&S by the end of your shift. This form is used by EH&S and the Legally Responsible Officials to complete and submit spill reports to the state.

4.1.1 Creek Pumping Procedures

In the event a sanitary sewer spill enters Strawberry Creek, this procedure is used.

	METHOD A: DIVERT CREEK WATER AROUND THE SPILL	METHOD B: DIVERT CREEK WATER AND SPILL
Applicability	If response time is quick enough to capture the leading edge of spill. Otherwise, go to Method B.	In cases where you cannot capture the leading edge of a spill.
Equipment and Supplies	2 trash pumps sandbags (for dam structure)	1 trash pump sandbags (for dam structure)
Agency Notification	EBMUD approval is needed prior to pumping creek water into the sanitary sewer; see Section 5.1	
Procedures	<ol style="list-style-type: none"> 1. Create a temporary dam immediately downstream of the sanitary sewer spill. 2. Use the trash pump to transfer the sewage to an adjacent sanitary sewer, downstream of the failure. 3. Create a temporary dam immediately upstream of the affected area 4. Use the other trash pump to transfer creek water to a point downstream of the dam created in Step 1. 	<ol style="list-style-type: none"> 1. Construct a downstream dam. 2. Use the trash pump to transfer the mixture of sanitary sewer spill and creek water to the sanitary sewer. Continue pumping until clean flows. 3. If a layer of solids has been deposited on the creek bed, flush with dechlorinated water. 4. Pump all wash water to the sanitary sewer.

4.2 EH&S Procedures

Immediately following a report of a sewage spill, EH&S shall:

1. Contact a First Responder for spill response resources, if not previously notified ([Section 3.2](#) for contact information).
2. Assess the situation by communicating and coordinating with the First Responder.
3. Respond to the spill location if the First Responder needs on-site assistance (e.g., provide incident command for a spill that discharges to a drainage conveyance system and/or a surface water, document spill origination and extent while First Responder addresses spill containment, cleanup, etc.).
 - a. Assess the affected area, including making observations of the receiving water (if applicable) and extent of the spill.

- b. Take photographs and/or record videos to assist in estimating spill volume, documenting spill locations; see photograph-related questions in the [Sanitary Sewer Spill First Responder Form](#).
 - c. Complete "First Responder" sections of the [Sanitary Sewer Spill First Responder Form](#).
4. Notify CalOES as soon as possible but no later than two hours after knowledge of the spill (see Section 6); use the California Office of Emergency Services Notification, EH&S Staff Form (Appendix A).
5. Notify other regulatory agencies using the triggers in Section 6, providing initial notification of sanitary sewer spills to regulatory agencies in a timely manner.
6. Fill out the EH&S sections of the [Sanitary Sewer Spill EH&S Staff Form](#).
7. Contact neighboring agencies, as needed for additional support and resources.

4.2.1 EH&S-EP Procedures

Following the initial response to the spill, EH&S-EP staff shall:

1. Determine if water quality sampling is necessary (required within 18 hours for sewage spills of 50,000 gallons or more) and prepare for sample collection and analysis.
2. Provide updates to CalOES when there are substantial changes to:
 - a. The estimated volume of the spill (increase or decrease)
 - b. The estimated direct discharge volume to surface water or indirect discharge to a drainage conveyance system (increase or decrease)
 - c. Additional impacts to the receiving water and beneficial uses

Continue to make update notifications to CalOES until a spill report is submitted and certified in the CIWQS Sanitary Sewer System Database.

3. Submit spill reports and related documentation via CIWQS and notify the Legally Responsible Official when certification is needed.

5.0 NOTIFICATION REQUIREMENTS

5.1 Regulatory Agency Notifications

EH&S staff notifies regulatory agencies based on specific triggers and the Enrollee's spill location. Of note, specific spill details must be provided to the CalOES and are identified in a form in Appendix A. Communications/notifications to regulatory agencies are logged by sending an email to ehs-ep@berkeley.edu with the name of the agency contacted, date and time of notification, and the trigger for notification.

TRIGGER AND TIMELINE	REGULATORY AGENCY AND PHONE NUMBER		
	LOCATION	BUSINESS HOURS	AFTER HOURS
Sanitary sewer spill of 1,000 gallons or more to surface water or threatening to discharge to surface water As soon as possible, but not later than two hours	All	CalOES (800) 852-7550	
	Berkeley	City of Berkeley, Environmental Health Division (510) 981-5310	City of Berkeley, Streets & Utilities Division (510) 981-6620
	Albany	City of Albany Public Works Department (510) 524-9543	City of Albany Police Department Non-Emergency (510) 525-7300
	Richmond	City of Richmond, Wastewater Division (510) 307-8091	Veolia Water North America (contractor to City of Richmond) (510) 412-2001
Sanitary sewer spill of any volume that enters downstream sewer agency's jurisdiction As soon as possible	Berkeley	City of Berkeley, Environmental Health Division (510) 981-5310	City of Berkeley, Streets & Utilities Division (510) 981-6620
	Albany	City of Albany Public Works Department (510) 524-9543	City of Albany Police Department Non-Emergency (510) 525-7300
	Richmond	Veolia Water North America (contractor to City of Richmond) (510) 412-2001 City of Richmond, Wastewater Division (510) 307-8091	Veolia Water North America (contractor to City of Richmond) (510) 412-2001

REGULATORY AGENCY AND PHONE NUMBER			
TRIGGER AND TIMELINE	LOCATION	BUSINESS HOURS	AFTER HOURS
Sanitary sewer spill that requires pumping surface water to the sanitary sewer Prior to pumping	Berkeley Albany	EBMUD (510) 287-1651 Adam Kern, EBMUD Wastewater Control Representative (510) 287-1622	EBMUD (866) 403-2683
	Richmond	Veolia Water North America (contractor to City of Richmond) (510) 412-2001 City of Richmond, Wastewater Division (510) 307-8091	Veolia Water North America (contractor to City of Richmond) (510) 412-2001
Sanitary sewer spill that results in fish kill As soon as possible	All	California Department of Fish and Wildlife, Bay Delta Regional Office (707) 428-2002	

5.2 Public Health Notifications

5.2.1 Authority to Post and Remove Public Health Warnings

Authority to post and remove public health warnings at UC Berkeley is assigned to the Director of EH&S, who delegates the posting authority within EH&S when these procedures are followed. In general, all posting is to be performed under the direction of EH&S.

Public health warnings can be removed upon the approval of the EH&S Director or delegated EH&S staff member. If the spill has migrated off-site, public health warning signs shall be coordinated with the consultation of the downstream sewer and/or environmental health agencies.

5.2.1.1 Trigger for Posting on UC Berkeley Property

Barricades and warning signs should be posted whenever a sewage spill is detected or suspected that may pose a public health concern. Public health postings should be placed at visible locations where there is a likelihood for the public to have access to the contaminated area, including landscaped and paved areas.

Public health postings with high pedestrian foot traffic should utilize multiple barricades such as cones in addition to caution tape. Pedestrian foot traffic should be redirected inside buildings so that occupants do not come in contact with the sewage as clean-up is occurring.

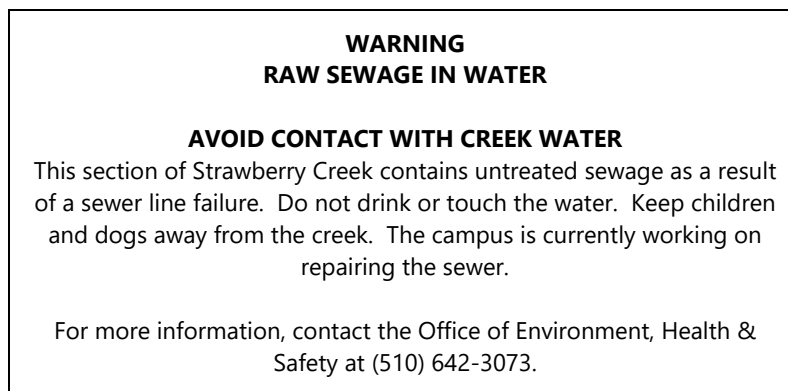
Posting is not necessary if a significant rainfall event occurs that adequately flushes the contaminants from the site.

5.2.1.2 Trigger for Posting Off-site Locations

If a sewage spill flows off-site, EH&S shall contact the downstream sewer agency to coordinate posting. In general, the downstream sewer collection system is responsible for posting, but the downstream entity may request assistance, in which case, UC Berkeley signs can be posted in locations that they recommend.

5.2.2 Public Health Warning Signage and Placement

Below is an example of signage to post along Strawberry Creek. The signage can be modified to reflect location-specific information.



The signs should be staked into the ground on both sides of the creek, approximately every 100 feet. If necessary, caution tape should be strung between signs, especially in areas where the potential for incidental contact with the creek is high.

Laminated signage, such as the one below, can be posted at the sewage spill location or where stakes aren't feasible to use. Barricades and caution tape may be sufficient to warn the public of the hazard if cleanup is underway.



6.0 WATER QUALITY SAMPLING AND ANALYSIS PLAN

The WDR requires water quality sampling in the event of a sanitary sewer spill in which an estimated 50,000 gallons or greater are discharged to surface water. Samples must be analyzed for ammonia and appropriate bacterial indicator(s) per the applicable Basin Plan water quality objectives, including one or more of the following: total coliform bacteria, fecal coliform bacteria, *E Coli* and Enterococcus. Sections 6.1 and 6.2 summarize the selection of “appropriate bacterial indicators” for which Enrollees will analyze samples and water quality objectives.

In the case where the source of the sanitary sewer spill has been stopped and the entire sanitary sewer spill has migrated off UC Berkeley property, sampling shall be coordinated with the downstream agency.

6.1 Beneficial Uses of Receiving Waters

The Water Quality Control Plan (Basin Plan) for the San Francisco Bay Basin identifies existing and potential beneficial uses for a large, representative portion of water bodies in the San Francisco Bay Region. The table below lists receiving water bodies downstream of UC Berkeley’s three enrolled collection systems, as well as their existing and potential beneficial uses ([Basin Plan Table 2-1](#)).

RECEIVING WATER	BENEFICIAL USE								
	EST	COLD	MIGR	RARE	SPWN	WARM	WILD	REC1	REC2
Strawberry Creek	--	--	--	--	--	E	E	E	E
Codornices Creek	--	E	E	E	E	--	--	--	--
Village Creek	--	--	--	--	--	E	E	E	E
Berkeley Aquatic Park Lagoon	E	--	E	--	P	--	E	E	E

Acronyms: COLD = Cold Freshwater Habitat; E = Existing Beneficial Use; EST = Estuarine Habitat; MIGR = Fish Migration; P = Potential Beneficial Use; RARE = Preservation of Rare and Endangered Species; REC1 = Water Contact Recreation; REC2 = Noncontact Water Recreation; SPWN = Fish Spawning; WARM = Warm Freshwater Habitat; WILD = Wildlife Habitat

6.2 Water Quality Objectives

6.2.1 Ammonia

For Central (San Francisco) Bay and the upstream receiving waters, which covers receiving waters that a UC Berkeley Enrollee could discharge into, the water quality objective for un-ionized ammonia is 0.16 mg/l as N.

6.2.2 Bacterial Indicators

Based on the beneficial uses for the receiving waters (see Section 6.1), only two beneficial uses (REC1 and REC2) have bacterial water quality objectives (**Basin Plan Table 3-1**). The Basin Plan lists water quality objectives solely for fecal coliform, Enterococcus, and *E. coli*. However, these water quality objectives appear to be for routine sample collection and analysis as they are statistically calculated values from multiple samples over specific periods of time.

WATER QUALITY OBJECTIVES FOR BACTERIAL INDICATORS ¹			
BENEFICIAL USE	FECAL COLIFORM (MPN/100mL) ²	ENTEROCOCCUS (CFU/100MI) ³	E. COLI (CFU/100mL) ⁴
REC1	--	Geometric mean <30 STV <110	Geometric mean <100 STV <320
REC2	Mean < 2000 90 th percentile <4000	--	--

Acronyms: CFU = Colony Forming Units; MPN = Most Probable Number; STV = statistical threshold value

Notes:

- 1) The geometric mean is computed weekly for all samples in a 6-week interval. The STV shall not be exceeded by more than 10 percent of the samples collected in a calendar month.
- 2) Based on a minimum of five consecutive samples equally spaced over a 30-day period.
- 3) The objective applies to marine and estuarine waters where the salinity is greater than 1 part per thousand, more than 5% of the time.
- 4) The objective applies to freshwaters where the salinity is equal to or less than 1 part per thousand, 95% or more of the time.

Pursuant to the Basin Plan, the bacterial water quality objectives are applicable except when otherwise provided for in a Total Maximum Daily Load (TMDL). None of the receiving bodies downstream of UC Berkeley's three enrolled collection systems are on the Clean Water Act Section 303(d) list as impaired with TMDLs for bacterial pollutants.

6.3 Sample Locations

Samples will be collected by EH&S-EP staff members or a vendor from the Drainage Conveyance System (DCS) and/or three Receiving Surface Water (RSW) locations.

If sewage discharges to a surface water via a drainage conveyance system, one water sample will be collected each day of the duration of the spill at DCS-001 (see table below).

If sewage discharges to a surface water, the receiving water will be sampled at three different locations (see table below), each day of the duration of the spill. If the receiving water has no flow during the spill, it will be reported in CIWQS as “No Sampling due to no Flow.” The upstream and downstream RSW sample locations will be selected using EH&S-EP staff’s best professional based on receiving water flow, accessibility to water banks, and size of visible sewage plume.

SPILL SCENARIO	SAMPLE ID	SAMPLE LOCATION DESCRIPTION
Discharge to surface water via drainage conveyance system	DSC-001	A point in a drainage conveyance system before the drainage conveyance system flow discharges into a receiving water.
Discharge to receiving water	RSW-001	The point in the receiving water where sewage initially enters the receiving water (point of discharge).
	RSW-001U	A point upstream in the receiving water to RSW-001.
	RSW-001D	A point downstream in the receiving water to RSW-001; where the spill material is fully mixed with the receiving water.

Sample locations are documented in writing, along with accompanying photographs that include reference points in the images.

If one or more of the sampling locations is located off-site, EH&S-EP will contact the appropriate sewer authority agency to facilitate sample collection (see Section 5.0 for agencies and contact information).

If the receiving water has no flow during the duration of the spill, the report shall indicate “No Sampling Due to No Flow,” in accordance with the WDR.

6.4 Sampling Frequency

Sample collection is required within 18 hours of UC Berkeley becoming aware of a known or potential sewage spill discharging 50,000 gallons or more. The WDR requires daily sample collection for each day of the duration of the spill.

6.5 Sample Analysis

Samples will be analyzed by an Environmental Laboratory Accreditation Program (ELAP)-accredited laboratory with accredited fields of testing for ammonia as N and one or more of the following bacterial indicators: fecal coliform bacteria, *E Coli*, and Enterococcus. The test method will be identified by the ELAP-certified laboratory utilized for sample analysis.

6.6 Safety and Access Exceptions

Water quality sampling is to be performed only if it is safe to do so and access to the surface water is not restricted. Unsafe conditions include, but are not limited to, visibility, heavy wind or rain, and steep water banks.

When sampling is not possible, details of the access restrictions and/or safety hazards will be recorded in related reports (e.g., Draft Spill Report, Certified Spill Report, Spill Technical Report).

6.7 Field Sampling Equipment and Supplies

The following is a list of field sampling equipment and supplies stored at the Hazardous Materials Facility, unless noted otherwise.

PPE	SAMPLING EQUIPMENT
Nitrile, non-powdered gloves (box) Safety glasses Waders Rubber boots or steel-toed boots Safety vest	Clipboard and notebook Camera Sample collection devices (e.g., clean 1-liter plastic bottles) Sample containers and labels Permanent marker Zip-top bags Cooler or ice chest Ice ¹ Chain-of-custody (COC)
CLEANING	SAFETY
DI water Soap Trash bag Paper towels	Drinking water Cell phone Sunscreen ² Raingear ²
Notes: 1. Collected from a Cal Dining operation or purchased from a local store. 2. Weather-dependent equipment/gear.	

6.8 Sample Collection and Handling

The following are procedures for sample collection and handling by EH&S-EP personnel.

1. Notify the laboratory in advance of sample collection; advise the laboratory of the number of samples, analyses and when they can expect to receive them.
2. Don PPE and ensure necessary equipment is gathered prior to performing sampling.
3. The grab surface water samples will be collected either by:

- a. Directly filling the container from the drainage conveyance system or the receiving water being sampled; filled against the direction of water flow; or
 - b. Decanting water from a collection device such as a clean 1-liter plastic bottle or other device. If transferring from a collection device, care will be taken to ensure the device does not come into contact with the sample containers.
4. A sample may be collected directly into the sample container when the sampling location is accessible by wading or other means. If wading is not possible due to safety concerns, locate a spot along the edge of the receiving water where the sample can be safely collected.
 - a. Face upstream and collect the sample without disturbing the bottom sediment.
 - b. Take care not to displace the preservative from a pre-preserved sample container.
5. A deconned collection device may be used to collect a water sample from a location that is too deep to access by wading or is not easily accessible (e.g., storm drain catch basin).
6. Collect the sample into lab-provided containers and label. Do not overfill sample containers with chemical preservatives.
7. Place sample containers associated with a single location into a zip-top bag and place them on ice in the cooler.
8. Record sampling locations and date and time of sample collection.
9. Complete the COC and place with the samples.
10. Courier or transport the samples in the cooler to the lab within 6 to 8 hours of sample collection (the holding time for bacterial indicators)

7.0 EXTERNAL RESOURCES

7.1 Vendors

As necessary, the First Responders (FS, RSSP or RFS Ops) and/or EH&S may utilize vendors for additional resources to aid in spill response (including sewer system repairs), cleanup and monitoring (sampling and analysis).

Vendors providing plumbing, restoration, and/or cleanup are experienced with sanitary sewer work and comply with all laws and regulations governing sanitary sewers, sanitation, and public health. Vendors providing laboratory analysis are accredited by the SWRCB's ELAP.

SERVICE	COMPANY	TELEPHONE NUMBER	DEPARTMENT THAT ENGAGES
Plumbing	Berkeley Plumbing and Heating	(510) 841-0883	FS / RSSP / RFS Ops
Plumbing	United Mechanical Inc.	(408) 228-1913	FS / RSSP / RFS Ops
Plumbing, Restoration, Cleanup	Roto-Rooter	(925) 443-5454	FS / RSSP / RFS Ops
Restoration, Cleanup	ATI	(888) 571-4968	FS / RSSP / RFS Ops
Restoration, Cleanup	NRC/US Ecology	(877) 880-4672	FS / RSSP / RFS Ops
Water Quality Sampling	Tetra Tech	(510) 302-6300	EH&S
Laboratory Analysis	McC Campbell Analytical, Inc. ¹	(877) 252-9262	EH&S
Notes: 1 This laboratory accepts samples for biological analyses as follows: fecal coliform bacteria (Monday through Wednesday, business hours); Enterococcus (Monday through Thursday, business hours).			

8.0 ANNUAL REVIEW

EH&S-EP will annually review the effectiveness of the SERP and will make updates, if needed. The review will include an evaluation of SERP procedures and responses to sanitary sewer spills over the past year. As part of the review, EH&S-EP will request feedback and participation from First Responders, DURT members, and Legally Responsible Officials.

9.0 ACRONYMS

CalOES	California Office of Emergency Services
CIWQS	California Integrated Water Quality System
COC	Chain-of-custody
CS	Collection System
DCS	Drainage Conveyance System
DURT	Designated Urgent Response Team
EH&S	Environment, Health & Safety
EP	Environmental Protection
FS	Facilities Services
RFS Ops	Richmond Field Station Operations
RSSP	Residential & Student Services Programs
RSW	Receiving Surface Water
SERP	Spill Emergency Response Plan
SWRCB	State Water Resources Control Board
TMDL	Total Maximum Daily Load
UCPD	University of California Police Department
WDID	Waste Discharge Identification number
WDR	Waste Discharge Requirements

10.0 RECORD OF PLAN REVISIONS

REVISION DATE	SECTIONS REVISED	NOTES	CHANGE WRITTEN BY /AUTHORIZED BY
9/2013	Title; Section B; Section I; Section J; Section L Added Section K, previously Section J Revised Attachment 1; Added new attachments 8 and 9 (placeholder)	Changed Title to include Central and East campus; Section B was revised to include new scope of procedures, previously did not include basements and landscaped areas; Section I was updated to include a placeholder for new scenarios; Section J renamed as Section K; Section K includes updated reporting procedures (MRP – effective 9/2013); Section J was added as placeholder for sampling protocols; Section L (previously Section K) was updated with City of Berkeley notifications Various agency names were changed (Cal EMA to Cal OES and Department of Fish and Game to Department of Fish and Wildlife). Attachment 1 was replaced with new MRP; Attachment 8 was added; Attachment 9 placeholder was added	Bernadette Dugtong, EH&S/ Greg Haet, EH&S
12/2013	Added Estimating Spill Volumes guide; Attachment 3 and 5 removed; Re- numbered Sections;	Incorporated new Section for RSSP Plumbers; Worksheets for Estimating Spill Volumes (in progress); Removed Attachment 3 and incorporated information into Section L – Notification and Reporting Procedures; Revised Section L to incorporate new MRP requirements; Removed Attachment 5 due to similar information in Attachment 8	Bernadette Dugtong, EH&S/ Greg Haet, EH&S
05/2014	Attachments; Section C	General Revisions Minor revision to Attachment numbering Removed previous Attachment 1 containing regulatory language, since it was duplicative of Appendix A Section C Revised Sewer System Descriptions for Richmond Field Station and University Village	Bernadette Dugtong, EH&S/ Greg Haet, EH&S
09/2014		Section F “Stop the source of the SSO” has been changed to “Stop the SSO or stop the cause of the SSO.”	Bernadette Dugtong, EH&S/

REVISION DATE	SECTIONS REVISED	NOTES	CHANGE WRITTEN BY /AUTHORIZED BY
		<p>Section G Trigger "SSO that exceeds 1,000 gallons to surface water" has been changed to "SSO that is greater than or equal to 1,000 gallons discharged to surface water." Section K Added clarification regarding Environmental Health Department Added posting is required for landscaped and paved areas with public access</p>	Greg Haet, EH&S
12/2014	Attachment 6	Updated new Sanitary Sewer Overflow Incident Form	Bernadette Dugtong, EH&S/ Greg Haet, EH&S
12/2015	All	<p>Revisions: Global replace of "Richmond Field Station" to "Berkeley Global Campus at Richmond Bay" Global replace of "Physical Plant-Campus Services" to "Facilities Services" Global replace of "University Village Apartments" to "University Village Albany" Global replace of "Richmond Field Station Operations" to "Berkeley Global Campus Operations"</p> <p>Section B Revised section to include: "Laterals and mains located on UC Berkeley property are all owned by UC Berkeley, <i>unless otherwise specified in contractual agreements.</i>" and removed sentence: "There are no private laterals in the collection systems."</p> <p>Section C Updated Berkeley Global Campus sanitary sewer description to differentiate pipe length between Richmond Field Station site and Regatta</p> <p>Section Updated EBMUD Representative from Deirdre Mena to Nadia Borisova</p> <p>Section D Change Sanitary Sewer Management Plan to Sewer System Management Plan</p>	Bernadette Santos, EH&S/ Greg Haet, EH&S

REVISION DATE	SECTIONS REVISED	NOTES	CHANGE WRITTEN BY /AUTHORIZED BY
		<p>Attachment 7 Change Method #5 title from Open Channel Spill Estimation to Drop Bucket Method Reformatted estimation spill volume procedures Removed worksheets</p>	
2016	Sanitary Sewer Overflow Incident Form	Attachment 6: Updated Sanitary Sewer Overflow Incident Form format to match CIWQS database	Bernadette Santos, EH&S/ Greg Haet, EH&S
05/2019	Various	<p>Title Page: Update date to "May 2019" Global Replace: Change "Berkeley Global Campus Operations" to "Richmond Field Station Operations" Section A: Removed "and/or laboratory wastewater" Section B: Remove paragraph "Blockages in sewer pipes can occur when pipes become obstructed by tree roots infiltrating systems or by debris (such as debris from construction or domestic activities, or pieces of broken pipe). If the flow rate is sufficient, sewage can backup from the blockage and eventually escape the sewer system at an upstream low point, such as a manhole or floor drain.", added details regarding UC Berkeley CS (sewer pipe lengths) and University Village Albany (Private sewer laterals). Section D: Update Designated Spill Response Team to "Urgent Response Support Program"; update tables to current contacts and equipment locations; minor grammatical change to sentence Section G: Update EBMUD contact from "Nadia Borisova" to "Adam Kern"; revised number formatting; revised telephone number formatting Section I: Slight correction to attachment title Section J: Update PSLD definition as UC Berkeley now has PSLD's within its sewer system. Previously, this category was not applicable. Section K: Corrected text justification</p> <p>Attachment 2: Updated EH&S vehicle names</p> <p>Attachment 3:</p>	Bernadette Santos, EH&S/ Greg Haet, EH&S

REVISION DATE	SECTIONS REVISED	NOTES	CHANGE WRITTEN BY /AUTHORIZED BY
		Water Quality Analyses – Protocol: Added McCampbell Analytical, Inc. Update Plan to state that EH&S may collect the sample or call a sampling contractor. Attachment 7: Revised number formatting; revised title formatting	
5/2023	All	Revised and updated the entire plan to meet the reissued WDR requirements.	Sharon Harichandran, EH&S/ Alicia Bihler, EH&S

Appendix A: Forms

