University of California, Berkeley

Slug Control Plan

June 2025

Prepared by the Office of Environment, Health & Safety

UC Berkeley

Introduction

A Slug Control Plan (Plan) outlines discharge practices (including non-routine batch discharges), describes chemical storage, provides procedures to immediately notify the publicly owned treatment work (POTW) of slug discharges, and includes procedures to prevent adverse impacts from accidental spills.

East Bay Municipal Utility District (EBMUD) requires that UC Berkeley implement a slug discharge control plan pursuant to Section VI of EBMUD Wastewater Discharge Permit No. 06600592 issued to Regents of the University of California, Berkeley, Main Campus (issued December 30, 2020, expires December 30, 2025).

This Plan applies to University operations where there is a potential for slug discharges to EBMUD.

What is a Slug Discharge? (EBMUD Wastewater Control Ordinance, §1.3(uu))

A slug load or slug discharge is any discharge at a flow rate or concentration that could cause a violation of EBMUD's prohibited discharge standards. A slug discharge is any discharge of a non-routine, episodic nature, including but not limited to an accidental spill or a non-customary batch discharge, which has a reasonable potential to cause interference or pass through, or in any other way violate EBMUD's regulations, local limits, or permit conditions.

Examples of slug discharges:

- Accidental spills of hazardous materials or hazardous wastes
- Non-routine wastewaters (e.g., backflow prevention test/flush, domestic water main flush) discharged without pre-approval by the Office of Environment, Health & Safety (EH&S) and EBMUD
- Wastewater that exceeds EBMUD local limits
- Discharges not allowed by the Drain Disposal Restrictions

Description of Discharge Practices

UC Berkeley discharges wastewater from a variety of operations, including research and teaching laboratories, photo-processing, shop, and facility operations (e.g., central heating plant blowdown, building washing/maintenance, vehicle washing, cooling tower discharge, pool discharge), food preparation and service, and janitorial activities.

Non-routine batch discharges must be approved by EH&S and EBMUD prior to discharge to the sanitary sewer system. UC Berkeley affiliates or contractors must prepare and submit a Water Discharge Form to EH&S, who will review and request EBMUD's approval prior to the discharge.

Description of Stored Chemicals

Summary List of Chemicals

All users of hazardous materials at UC Berkeley are required to maintain a chemical inventory and submit it to EH&S. The chemical inventory is compiled in the Chemicals database, which is maintained by EH&S, and annually submitted to the City of Berkeley Toxics Management Division (COB TMD) via the California Environmental Reporting Systems (CERS).

Below is an illustrative list of chemicals that may be stored at the UC Berkeley campus, it is not inclusive of all chemicals maintained on campus.

Radioactive Materials	
Organics	
acetaldehyde	methyl 2- butanol, 2-(t-amyl alcohol)
acetic Acid	methyl 2-propanol, 2-(tert-butyl alcohol)
acetone (2-propanone)	methyl acetate
acetonitrile	methyl ethyl ketone (2-butanone)
acrylamide	methyl formate
benzene	methyl isobutyl ketone
benzylamine butanamide	methylene chloride (dichloromethane)
butanol, 1-(n-butyl alcohol)	methylpropionamide, N-
butanol, 2-(sec-butyl alcohol)	methyl propionate
butylamine, n-	ortho-phthalaldehyde (Cidex-OPA)
butyraldehyde	oxalic acid
carbon tetrachloride	pentanone, 2-
chlorofluorocarbons (freons, halons)	phenol and phenolic compounds
chloroform	polychlorinated biphenyls (PCBs)
citric acid	potassium binoxalate
cyclohexane	propanoic acid
cyclohexanone	propanol, 1-(n-propyl alcohol)
dimethylamine	propanol, 2-(isopropyl alcohol)
dioxane, 1,4-	propionaldehyde
dioxolane	propionamide
dipropylamine	propionitrile
ethanol	propyl formate, n-
ethanol, 2-(2-butoxyethoxy)	propylamine pyridine
ethidium bromide	sodium acetate
ethyl acetate	sodium citrate
ethyl ether	tetrachloroethylene
ethylene glycol	tetrahydrofuran
formaldehyde	toluene
formamide	trichloroethane
formic acid	trichloroethylene
glutaraldehyde	trypan blue
glycerol	xylene
hexane	
isopropyl acetate	
methyl 1-propanol, 2-(isobutyl alcohol)	

Inorganics	
ammonium chloride	phosphoric acid (neutralized)
ammonium nitrate	Plaster of Paris (calcium sulfate)
ammonium sulfate	potassium bicarbonate
ammonium thiosulfate	potassium bromide
antimony	potassium carbonate
arsenic (including arsenate and arsenite)	potassium chloride
	potassium iodide
beryllium	potassium nitrate
boric acid	potassium phosphate
cadmium	potassium sulfate
calcium carbonate	selenium
calcium chloride	silver, including photographic fixer
calcium hydroxide	
calcium nitrate	sodium azide
calcium sulfate	sodium cyanide
cesium chloride	sodium bicarbonate
chromium (including chromate and dichromate)	sodium borate
	sodium carbonate
chromium glassware cleaners	sodium chloride
copper	sodium hydroxide (neutralized)
cyanides, cyanates, thiocyanates	sodium iodide
hydrochloric acid (neutralized)	sodium molybdate
lead	sodium nitrate
lithium bromide	sodium phosphate
lithium chloride	sodium sulfate
magnesium chloride	sodium sulfite
magnesium oxide	sodium thiosulfate
magnesium sulfate	sulfuric acid (neutralized)
mercury	thallium
nickel	zinc
nitric acid (neutralized)	“biodegradable” liquid
perchloric acid (neutralized)	scintillation cocktails
Cations of the following metals	
barium	molybdate
cobalt	osmium
gallium	platinum
germanium	rhenium
hafnium	rhodium
indium	ruthenium
iridium	tellurium
iron	tungsten
manganese	vanadium
Anions and Neutral Compounds	
aluminum hydride	hydrosulfide
amide	hypochlorite
azide	iodate
borohydride	nitrite
bromate	perchlorate
chlorate	permanganate
fluoride	peroxide
hydride	persulfate
hydroperoxide	sulfide

Laboratory, Shop and Photo Processing Areas

The campus stores flammable, corrosive, reactive, and toxic chemicals for use in laboratories, shops, and photo processing areas, which totals over 2,000 locations and 36,000 unique chemicals.

Hazardous Waste Storage Areas

The Hazardous Materials Facility (HMF) is the location of hazardous waste packaging, and radioactive waste packaging. The HMF building is equipped with a spill containment system, including trenches that drain to an emergency containment tank. Floor drains that lead to the sanitary sewer are only present in administrative office areas of the HMF. Hazardous waste is stored in cabinets, drums, or in secondary containment. Registered hazardous waste transportation companies transport waste from the HMF to permitted treatment, storage, and disposal facilities.

Mechanical Rooms, Electrical and Elevator Rooms

Rooms housing machinery, such as heating, ventilation, and air conditioning (HVAC) units, air handlers, emergency power generator sets, compressors, electrical switches, transformers, and elevators are present in buildings across campus. The equipment may use fuels, coolants, hydraulic fluids, lubricants, and other chemicals. In the event of equipment failure or operations errors, there is a potential for a spill. Spill absorbents are located near emergency generators, to provide personnel with the resources for a timely response for stopping leaks and spills before the chemicals reach the sanitary sewer or stormwater system.

Construction Sites

Construction sites must abide by the Campus Design Standards, which require them to comply with all environmental regulations. Construction site materials vary depending on the project. The EH&S Environmental Construction Specialist visits sites subject to the Construction General Permit and UC Berkeley’s Non-traditional Small MS4 Permit. The EH&S Environmental Construction Specialist also attends pre-construction meetings to offer guidance on environmental regulations and is in regular communication with the Capital Projects Project Manager through the life of the project.

Food Preparations

The primary wastewater discharges from food preparation facilities include suspended solids and fats, oils, and grease (FOG). Food preparation facilities follow the best management practices outlined by EBMUD’s Fats, Oils, and Grease program as well as UC Berkeley’s Sewer System Management Plan.

Procedures to immediately notify EBMUD of Slug Discharges

Campus Procedures

Below is the spill notification for campus laboratory, shop, and facility personnel.

This notification is a required posting in all areas where there is the potential for a slug discharge to the sanitary sewer or storm drain. The spill notification advisory posting for laboratories is within the Chemical Hygiene Plan (CHP) Chemical Spill sections.

If a chemical spill enters a sink or floor drain, immediately notify EH&S at (510) 642-3073. EH&S will notify the appropriate authorities of the discharge.

EH&S Procedures

Upon receipt of a report of a prohibited accidental or slug discharge, EH&S will:

1) Immediately notify EBMUD via telephone. Immediately notify EBMUD of the slug discharge at (510) 287-1651 during business hours or (866) 403-2683 during non-business hours.
2) Submit written notification to EBMUD within 5 days of incident. Within 5 days of the slug discharge, submit a written notification to EBMUD.

   Include the following details: name of facility; location of facility; name of caller; duration of discharge; including beginning and end times and dates, or if continuing, the time compliance is expected to occur; location of discharge; estimated volume of discharge; pollutants that may be present; corrective actions to prevent reoccurrence; whether discharge violates the terms and conditions of this permit.

   Send the written notification via email to cleanbay@ebmud.com and John Roberts, EBMUD Wastewater Control Representative (john.roberts@ebmud.com).

Procedures to prevent adverse impact from accidental spills

Due to the variety of laboratory, shop, and facility operations that use, store and handle chemicals, this Slug Control Plan does not contain specific prevention practices for all campus operations. General Best Management Practices (BMPs) for spill prevention applicable to all chemical use, handling, and storage operations that UC Berkeley personnel may implement, based on their operations, are presented in this plan. Spill prevention measures are incorporated in standard operating procedures (SOPs) for chemical use operations.

General BMPs for chemical storage and use in laboratory, shop, and facility operations

- Avoid open container use of chemicals near sinks and floor drains
- Where open container use of chemicals near sinks and floor drains is unavoidable, cap or plug sinks and drains during chemical use or use plastic dish tubs as secondary containment for pouring, transfer, or filling
- Store chemicals in tubs, cabinets, bermed or diked areas or in other secondary containment

- Avoid storing excess quantities of chemicals – order only what you need and dispose of unwanted or expired chemicals through EH&S
- Secure storage cabinets and shelves to prevent tipping or falling
- Use proper container restraints
- Maintain spill containment and clean-up materials nearby
- Follow good housekeeping practices – never use sinks to store chemicals
- Maintain and regularly inspect machinery and equipment to prevent leaks and potential failures

Storage Area Inspections

All laboratory and shop chemical use and storage areas (for example, storerooms) are inspected for BMP implementation on a regular basis. EH&S has laboratory/shop inspector positions who routinely inspect laboratory and shop operations, which include proper housekeeping and operations.

Material Handling and Transfer

When chemicals are transferred within buildings or between buildings, chemicals are placed in secondary containers. The use of protective bottle boots, plastic carriers or original shipping cartons reduces the likelihood of breakage during transport.

Loading and Unloading Operations

Most exterior loading and unloading locations (loading docks) drain to the storm drain system and stormwater pollution prevention BMPs are followed per the UC Berkeley Water Protection Policy.

Worker Training

All personnel who work with hazardous materials are trained in the procedures of how to properly dispose of chemicals and notify EH&S of any potential accidental or slug discharges. Personnel are trained upon hire and have routine refresher training. Training records are maintained through the online UC Learning Center.

EH&S Training Programs

Subject	Required for Whom?	Key Components	Required Training Frequency	Training Method
EHS 101 Fundamentals of Laboratory Safety	Anyone who works in a laboratory with hazardous materials or hazardous operations	• Chemical hazards • Laboratory Standard Operating Procedures (SOPs) • Emergency procedures • Contents of the facility's Chemical Hygiene Plan (CHP) • How to identify and evaluate chemical hazards using Safety Data Sheets and chemical label	Once every three years	Online
EHS 106 Hazardous Materials Spill Response Training	All personnel who work with hazardous materials and/or conduct a hazardous operation	• Basic spill response procedures and supporting programs	Annually	Online
Chemical Hygiene Plan (CHP)	Anyone who works with hazardous materials in laboratories	• Lab-specific procedures for safe use of chemicals • Emergency procedures • Standard Operating Procedures (SOPs) for hazardous materials and operations	Initial training and whenever CHP is revised. CHP must be reviewed by lab personnel annually for accuracy.	Read and sign document posted in the laboratory.

In addition to training from EH&S and DSCs, education and outreach are implemented. Drain disposal restrictions and spill discharge notification requirements are also posted on the "Do Not Drain Dispose" (or equivalent) stickers, which are required for laboratory, shops, and facilities chemical use areas.

Measures and Equipment for Emergency Response

Facilities Services (FS) and EH&S both have equipment to respond to an accidental or slug discharge. EH&S has a Designated Urgent Response Team that can respond to accidental or slug discharges. Spill response materials are kept on FS operation and maintenance trucks and at the FS Carleton facility and the HMF for urgent responses needs. In the case of a large accidental or slug discharge, contractors may be requested to provide emergency response services.

Spill containment and control equipment include, but are not limited to personal protective equipment, booms, pads, dikes, berms, and waste containers.

Contacts for more information

Questions regarding this plan or methods to prevent spills and slug discharges should be directed to the Principal Investigator (PI), supervisor, or Department Safety Coordinator. Questions can also be answered by contacting EH&S via email ehs-ep@berkeley.edu.

ATTACHMENTS

ATTACHMENT 1: EH&S SLUG DISCHARGE PREVENTION FACT SHEET

FACT SHEET

UC Berkeley Environment, Health & Safety

Slug Discharge Prevention

The purpose of this Fact Sheet is to help Principal Investigators (PIs) and supervisors fulfill their responsibilities to train their staff on the Slug Control Plan. **East Bay Municipal Utility District (EBMUD)** requires the campus to maintain and implement a Slug Control Plan to eliminate or minimize the potential for a slug discharge of any pollutant that could interfere with the EBMUD Wastewater Treatment Plant. Potential pollutant sources include laboratories, photo-processing operations, construction sites, physical plant operations, and food establishments.

What is a Slug Discharge?

A slug discharge is any discharge to the sanitary sewer of a non-routine, episodic nature, including but not limited to an accidental spill or a non-customary batch discharge of:

- Hazardous materials or hazardous wastes
- Non-routine wastewater (e.g., backflow prevention test/flush, domestic water main flush) discharged without pre-approval by the Office of Environment, Health & Safety (EH&S) and EBMUD
- A substance that exceeds EBMUD Local Limits
- Other substance that does not meet the Drain Disposal Restrictions.

Why are Slug Discharges a Problem?

Accidental discharge of pollutants that could cause sanitary sewer or wastewater treatment plant problems is a risk associated with the various chemicals handled in laboratory, shop, and facility operations. The EBMUD Wastewater Treatment Plant treats conventional pollutants, such as total suspended solids or those that deplete the oxygen content of the water. Campus discharge limits are set to prevent damage to the sewage treatment process and to prevent toxic chemicals from passing through the treatment plant into San Francisco Bay or into the residual sludge.

The EBMUD Wastewater Treatment Plant uses bacteria in an oxygen-rich environment to break down sewage solids and to clean the water before it is discharged to San Francisco Bay. The bacteria are sensitive to toxic chemicals and pH changes. A slug discharge of toxic material could kill the bacteria, rendering the treatment process ineffective. This could allow sewage-contaminated wastewater to pass through to the bay.

Additionally, campus plumbers may be working on sections of the campus sanitary sewer system at any time. Harmful slug discharges could hurt these workers if they were exposed to a slug discharge without warning. The following section introduces Best Management Practices for identifying potential spill sources, implementing preventative measures, conducting spill response, and notifying the appropriate authorities in the event of an accidental slug discharge to the sanitary sewer.

Slug Discharge Prevention

Best Management Practices (BMPs)

Following are general BMPs for slug discharge prevention applicable to chemical use, handling, and storage operations. These spill prevention measures should be standard operating procedures for campus hazardous material use operations.

Chemical storage and use in laboratory, shop, and facility operations:

- Avoid open container use of chemicals near sinks and floor drains.
- When open container use of chemicals near sinks and floor drains is unavoidable, cap or plug sinks and drains during chemical use.
- Store chemicals in tubs, cabinets, bermed or diked areas, or in other secondary containment.
- Avoid storing excess quantities of chemicals. Order only what you need and dispose of unwanted or expired chemicals through EH&S.
- Secure storage cabinets and shelves to prevent tipping or falling.
- Use proper containers and restraints.
- Maintain spill containment and clean-up materials nearby.
- Follow good housekeeping practices.
- Never store chemicals in sinks.

Inspection and maintenance of storage areas:

All chemical use and storage areas should be regularly inspected for implementation of BMPs. In chemical storerooms where floor drains go to the sanitary sewer, the floor drains should be plugged, except when they are in use (for example, when floors are mopped).

Chemical storerooms should use removable drain plugs in such cases.

Material handling and transfer:

Chemicals transferred within buildings or between buildings should be placed in secondary containers that can contain more than 100% of the chemical, in case the primary container breaks. Please see the Transporting Chemicals Safely on Campus Fact Sheet.

Shops, hazardous waste accumulation areas, satellite accumulation areas, or other hazardous material use areas must post the attached Slug Discharge Notification Procedure. This notification must be posted in all areas where there is the potential for a slug discharge to the sanitary sewer. For laboratories, this spill notification advisory is included in the Chemical Hygiene Plan (CHP) Emergency Procedures Section. Posting the CHP in the laboratory satisfies the EBMUD posting requirement. The CHP is available from your Department Safety Coordinator.

All personnel in operations that could cause a slug discharge must be trained on the contents of this Fact Sheet. For laboratory staff, reading and signing the CHP provides the required documented training. For all other chemical users, training should be documented on a roster that is kept on file.

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UC Berkeley Environment, Health & Safety

Slug Discharge Prevention

EBMUD inspects the campus for indications of Slug Control Plan implementation. Inspectors look for BMP implementation and check to see that slug discharge notification procedures are posted in chemical use areas. EBMUD may also check the CHP or other personnel training records. EBMUD may issue a notice of violation if the spill notification requirements are not posted, if personnel are not trained, or if staff fail to implement the notification procedures. If violations are not corrected, EBMUD may impose monetary penalties or restrict the use of the drains. For questions related to Slug Control Plan requirements, contact EH&S at (510) 642-3073.