

University of California, Berkeley

Wastewater Slug Control Plan

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Prepared by the Office of Environment, Health & Safety

Introduction

The purpose of this Wastewater Slug Control Plan (formerly, Slug Discharge Prevention and Contingency Plan [SDPC Plan]) is to eliminate or minimize the potential for an accidental discharge of pollutants that could reach the sanitary sewer and cause a violation of UC Berkeley's East Bay Municipal Utility District (EBMUD) sanitary sewer discharge permit conditions.

The following Slug Control Plan describes procedures 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. In addition, this plan presents best management practices for preventing slug discharges to sanitary sewers. **This plan applies to all campus operations where there is a potential for slug discharges, including research and teaching laboratories, facilities operations, food preparations, construction sites, and hazardous waste accumulation areas.**

Definition of a Slug Discharge

For purposes of this plan, a slug discharge means any discharge of a non-routine, episodic nature, including, but not limited to:

- A spill or non-customary discharge of potentially hazardous material
- Hazardous waste discharges
- Discharges reaching the campus storm drain system other than clean rainwater
- Discharges that exceed EBMUD Wastewater Control Ordinance limitations
- Discharges not allowed by the ***Drain Disposal Restrictions for Chemicals – UC Berkeley*** document (ehs.berkeley.edu/draindisposal)

Description of Discharge Practices (40 CFR § 403.8)(vi)(A)

UC Berkeley discharges wastewater from a variety of operations, including research and teaching laboratories, shop and facility operations, food preparation, and janitorial activities. Additionally, there are chemical use, storage and handling locations that do not normally discharge wastewater, but may have the potential to release a slug discharge in the event of an accidental spill during operations, earthquakes, or system failures.

Only discharges included in the wastewater discharge permit may occur, which are listed as discharges from the following activities: education, laboratory research, photo processing, food service/restaurant activities, and facility maintenance; which includes central heating plant blowdown, building washing/maintenance, vehicle washing, cooling tower discharge, pool discharge, and stormwater discharge (33 GPD).

UC Berkeley discharges continuously 24 hours a day, 365 days a year.

For all other discharges not included in the wastewater permit, UC Berkeley's Office of Environment Health & Safety (EH&S) will contact EBMUD for approval prior to the discharge by contacting **EBMUD's Hotline phone number (510) 287-1651 during business hours or EBMUD's toll-free phone number (866) 403-2683 during non-business hours.**

Description of Stored Chemicals (40 CFR § 403.8)(vi)(B)

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 on an on-going basis in the Chemicals database, which is maintained by EH&S and submitted electronically to the City of Berkeley Toxics Management Division (COB TMD) via the California Environmental Reporting Systems (CERS) on an annual basis.

Stored chemicals are classified into three groups for drain disposal determinations (as referenced in **Drain Disposal Restrictions for Chemicals**): Class A, Class B, and Class C.

- Class A includes chemicals that pose little or no hazardous in dilute aqueous solution. Class A chemicals include many simple organic and inorganic compounds, as well as common inorganic chemicals. Included in Class A are most biological metabolites and non-toxic cellular constituents (proteins, nucleic acids, carbohydrates, soluble fats, and their precursors and catabolites).
- Class B includes chemicals of moderate hazard in dilute aqueous solution. Class B chemicals include all of the chemicals listed as a toxic (T) in the California Code of Regulations Section 22-66261.30 et. seq. that are water soluble, except for those listed as Class A chemicals or Class C chemicals. Class B chemicals also include inorganic salts.
- Class C includes chemicals that may not be drain disposed in any amount. Class C chemicals include all chemicals that are not soluble as defined above, chemicals that cause unacceptable concentrations of offensive, toxic or explosive vapors and chemicals that are toxic or reactive at concentrations below 1 ppm in aqueous solution. Chemical C chemical include the chemicals identified the UC Berkeley Main Campus EBMUD Wastewater Discharge Permit "Priority Pollutant Management Plan" Compliance Requirement (Federal Clean Water Act priority pollutants listed in 40 CFR Part 112 Appendix D, Tables II and III).

Class C chemicals would be considered a slug discharge if prior approval was not received by both EBMUD and the Lab Operations Safety Committee (LOSC).

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

CLASS A	
Organic Chemicals	
<p><u>Alcohols</u></p> <ul style="list-style-type: none"> alkanols with fewer than 5 atoms alkanediols with fewer than 8 atoms sugars and sugar alcohols alkoxyalkanols with fewer than 7 carbon atoms butanol, 1-(n-butyl alcohol) butanol, 2-(sec-butyl alcohol) ethanol ethanol,2-(2-butoxyethoxy) ethylene glycol glycerol methanol methyl 1-propanol, 2-(isobutyl alcohol) propanol, 1-(n-propyl alcohol) propanol, 2-(isopropyl alcohol) <p><u>Aldehydes</u></p> <ul style="list-style-type: none"> aliphatic aldehydes with fewer than 5 carbon atoms acetaldehyde butyraldehyde formaldehyde (only formaldehyde solutions that are \leq 2.5% concentration may be drain disposed) gluteraldehyde propionaldehyde <p><u>Amides</u></p> <ul style="list-style-type: none"> RCONH₂ and RCONHR with fewer than 5 carbon atoms RCONR₂ with fewer than 11 carbon atoms formamide propionamide methylpropionamide, N- butanamide <p><u>Amines**</u></p> <ul style="list-style-type: none"> aliphatic amines with fewer than 7 carbon atoms aliphatic diamines with fewer than 7 carbon atoms benzylamine butylamine, n- dimethylamine dipropylamine propylamine pyridine <p><i>** Those organic compounds with a disagreeable odor, such as dimethylamine, 1,4 butanediamine, butyric acids and valeric acids, should be neutralized, and the resulting salt solutions flushed down the drain, diluted with at least 1,000 volumes of water.</i></p>	<p><u>Carboxylic Acids**</u></p> <ul style="list-style-type: none"> alkanoic acids with fewer than 6 carbon atoms alkanedioic acids with fewer than 6 carbon atoms hydroxyalkanoic acids with fewer than 6 carbon atoms aminoalkanoic acids with fewer than 7 carbon atoms ammonium, sodium, and potassium salts of the above acid classes with fewer than 21 carbon atoms acetic acid citric acid oxalic acid potassium binoxalate propanoic acid formic acid sodium acetate sodium citrate <p><u>Esters</u></p> <ul style="list-style-type: none"> esters with fewer than 5 carbon atoms ethyl acetate isopropyl acetate methyl acetate methyl formate methyl propionate propyl formate, n- <p><u>Ethers</u></p> <ul style="list-style-type: none"> dioxane, 1,4- dioxolane tetrahydrofuran <p><u>Ketones</u></p> <ul style="list-style-type: none"> ketones with fewer than 6 carbon atoms acetone (2-propanone) cyclohexanone methyl ethyl ketone (2-butanone) methyl isobutyl ketone pentanone, 2- <p><u>Nitriles</u></p> <ul style="list-style-type: none"> acetonitrile propionitrile <p><u>Sulfonic Acids</u></p> <ul style="list-style-type: none"> sodium or potassium salts of most are acceptable

Class A (continued)			
Inorganic Chemicals			
<u>Cations</u>		<u>Anions</u>	
aluminum Al ³⁺ ammonium NH ₄ ⁺ calcium Ca ²⁺ cesium Cs ⁺ hydrogen H ⁺ lithium Li ⁺ magnesium Mg ²⁺	potassium K ⁺ sodium Na ⁺ strontium Sr ²⁺ tin Sn ²⁺ titanium Ti ³⁺ , Ti ⁴⁺ zirconium Zr ²⁺	borate (BO ₃ ³⁻ , B ₄ O ₇ ²⁻) bromide (Br ⁻) carbonate (CO ₃ ²⁻) chloride (Cl ⁻) bisulfite (HSO ₃ ⁻) hydroxide (OH ⁻)	oxide (O ²⁻) iodide (I ⁻) nitrate (NO ₃ ⁻) phosphate (PO ₄ ³⁻) sulfate (SO ₄ ²⁻)
Proprietary Products			
Bleach (sodium hypochlorite solution) Detergents (alkanesulfonates) Household ammonia		Photographic solutions - spent black and white developers and developer replenishers (No Fixers)	
Alphabetical List of Commonly Used Chemicals			
<u>Organic</u>			
acetaldehyde acetic acid acetone (2-propanone) acetonitrile benzylamine butanamide butanol, 1-(n-butyl alcohol) butanol, 2-(sec-butyl alcohol) butylamine, n- butyraldehyde citric acid cyclohexanone dimethylamine dioxane, 1,4- dioxolane dipropylamine ethanol ethanol, 2-(2-butoxyethoxy) ethyl acetate ethylene glycol formaldehyde formamide formic acid gluteraldehyde glycerol	isopropyl acetate methanol methyl 1-propanol, 2-(isobutyl alcohol) methyl 2- butanol, 2-(t-amyl alcohol) methyl 2-propanol, 2-(tert-butyl alcohol) methyl acetatemethyl ethyl ketone (2-butanone) methyl formate methyl isobutyl ketone methylpropionamide, N- methyl propionate oxalic acid pentanone, 2- potassium binoxalate propanoic acid propanol, 1-(n-propyl alcohol) propanol, 2-(isopropyl alcohol) propionaldehyde propionamide propionitrile propyl formate, n- propylamine pyridine sodium acetate sodium citrate tetrahydrofuran		

CLASS A (continued)	
Alphabetical List of Commonly Used Chemicals (continued)	
<u>Inorganic</u>	
ammonium chloride	potassium bicarbonate
ammonium nitrate	potassium bromide
ammonium sulfate	potassium carbonate
ammonium thiosulfate	potassium chloride
boric acid	potassium iodide
calcium carbonate	potassium nitrate
calcium chloride	potassium phosphate
calcium hydroxide	potassium sulfate
calcium nitrate	sodium bicarbonate
calcium sulfate	sodium borate
cesium chloride	sodium carbonate
hydrochloric acid (neutralized)	sodium chloride
lithium bromide	sodium hydroxide (neutralized)
lithium chloride	sodium iodide
magnesium chloride	sodium molybdate
magnesium oxide	sodium nitrate
magnesium sulfate	sodium phosphate
nitric acid (neutralized)	sodium sulfate
perchloric acid (neutralized)	sodium sulfite
phosphoric acid (neutralized)	sodium thiosulfate
Plaster of Paris (calcium sulfate)	sulfuric acid (neutralized)

CLASS B		
Organic Chemicals	Inorganic Chemicals	
acrylamide trypan blue	<u>Cations of the following metals :</u> barium cobalt gallium germanium hafnium indium iridium iron manganese molybdate osmium platinum rhenium rhodium ruthenium tellurium tungsten vanadium	<u>Anions and neutral compounds:</u> aluminum hydride (AlH ₄) amide (NH ₂ ⁻) azide (N ₃ ⁻) borohydride (BH ₄ ⁻) bromate (BrO ₃ ⁻) chlorate (ClO ₃ ⁻) fluoride (F ⁻) hydride (H ⁻) hydroperoxide (O ₂ H ⁻) hydrosulfide (SH ⁻) hypochlorite (OCl ⁻) iodate (IO ₃ ⁻) nitrite (NO ₂ ⁻) perchlorate (ClO ₄ ⁻) permanganate (MnO ₄ ⁻) peroxide (O ₂ ²⁻) persulfate (S ₂ O ₈ ²⁻) sulfide (S ²⁻)

CLASS C	
Radioactive Materials	
<p>Radioactive liquid wastes are not authorized for drain disposal. All liquids generated as part of radioactive materials experiments must be collected and sampled for radioactivity. Any sample whose count rate is more than three standard deviations above background, (e.g., a good approximation is: $bkg + (3\sqrt{bkg})$) is considered a statistically significant amount of radioactivity above background and must be collected for disposal through EH&S as radioactive waste. Any aqueous sample with a count rate below this threshold can be disposed of if they meet all other criteria laid out in this document. Mixed radioactive waste (waste containing both radioactive and chemical components) must be collected by EH&S for proper disposal.</p>	
Organic Chemicals	Inorganic Chemicals
<p>All alkanes and water-insoluble hydrocarbons. All chlorinated and brominated hydrocarbons. EPA Priority Pollutants (see list below).</p> <p>Specific commonly used Class C organic chemicals:</p> <ul style="list-style-type: none"> benzene cyclohexane ethyl ether ethidium bromide hexane phenol and phenolic compounds toluene xylene ortho-phthalaldehyde (Cidex-OPA) chlorinated hydrocarbons <ul style="list-style-type: none"> chloroform carbon tetrachloride methylene chloride (dichloromethane) PCBs tetrachloroethylene trichloroethane trichloroethylene chlorofluorocarbons (freons, halons) 	<p>Chemicals containing the following metals and compounds:</p> <ul style="list-style-type: none"> antimony arsenic (including arsenate [AsO₃⁻, AsO₄³⁻] and arsenite [AsO₂⁻]) beryllium cadmium chromium (including chromate and dichromate) copper cyanides, cyanates (OCN⁻), thiocyanates (SCN⁻) lead mercury nickel selenium silver, including photographic fixer thallium zinc <p>Specific commonly used Class C inorganic chemicals:</p> <ul style="list-style-type: none"> sodium azide sodium cyanide chromium glassware cleaners- chromerge, chromium trioxide/sulfuric acid solutions "biodegradable" liquid scintillation cocktails
EPA Priority Pollutants (40 CFR Part 112, Appendix D, Tables II and III)	
(see next page)	

TABLE II – ORGANIC TOXIC POLLUTANTS IN EACH OF FOUR FRACTIONS IN ANALYSIS BY GAS CHROMATOGRAPHY/MASS SPECTROSCOPY (GS/MS)

<i>Volatiles</i>		<i>Base/Neutral</i>			
1V	acrolein	1B	acenaphthene	42B	N-nitrosodi-n-propylamine
2V	acrylonitrile	2B	acenaphthylene	43B	N-nitrosodiphenylamine
3V	benzene	3B	anthracene	44B	phenanthrene
5V	bromoform	4B	benzidine	45B	pyrene
6V	carbon tetrachloride	5B	benzo(a)anthracene	46B	1,2,4-trichlorobenzene
7V	chlorobenzene	6B	benzo(a)pyrene		
8V	chlorodibromomethane	7B	3,4-benzofluoranthene		<i>Pesticides</i>
9V	chloroethane	8B	benzo(ghi)perylene	1P	aldrin
10V	2-chloroethylvinyl ether	9B	benzo(k)fluoranthene	2P	alpha-BHC
11V	chloroform	10B	bis(2-chloroethoxy)methane	3P	beta-BHC
12V	dichlorobromomethane	11B	bis(2-chloroethyl)ether	4P	gamma-BHC
14V	1,1-dichloroethane	12B	bis(2-chloroisopropyl)ether	5P	delta-BHC
15V	1,2-dichloroethane	13B	bis(2-ethylhexyl)phthalate	6P	chlordan
16V	1,1-dichloroethylene	14B	4-bromophenyl phenyl ether	7P	4,4'-DDT
17V	1,2-dichloropropane	15B	butylbenzyl phthalate	8P	4,4'-DDE
18V	1,3-dichloropropylene	16B	2-chloronaphthalene	9P	4,4'-DDD
19V	ethylbenzene	17B	4-chlorophenyl phenyl ether	10P	dieldrin
20V	methyl bromide	18B	chrysene	11P	alpha-endosulfan
21V	methyl chloride	19B	dibenzo(a, h)anthracene	12P	beta-endosulfan
22V	methylene chloride	20B	1,2-dichlorobenzene	13P	endosulfan sulfate
23V	1,1,2,2-tetrachloroethane	21B	1,3-dichlorobenzene	14P	endrin
24V	tetrachloroethylene	22B	1,4-dichlorobenzene	15P	endrin aldehyde
25V	toluene	23B	3,3'-dichlorobenzidine	16P	heptachlor
26V	1,2-trans-dichloroethylene	24B	diethyl phthalate	17P	heptachlor epoxide
27V	1,1,1-trichloroethane	25B	dimethyl phthalate	18P	PCB-1242
28V	1,1,2-trichloroethane	26B	di-n-butyl phthalate	19P	PCB-1254
29V	trichloroethylene	27B	2,4-dinitrotoluene	20P	PCB-1221
31V	vinyl chloride	28B	2,6-dinitrotoluene	21P	PCB-1232
	<i>Acid Compounds</i>	29B	di-n-octyl phthalate	22P	PCB-1248
1A	2-chlorophenol	30B	1,2-diphenylhydrazine (as azobenzene)	23P	PCB-1260
2A	2,4-dichlorophenol	31B	fluoranthene	24P	PCB-1016
3A	2,4-dimethylphenol	32B	fluorene	25P	toxaphene
4A	4,6-dinitro-o-cresol	33B	hexachlorobenzene		
5A	2,4-dinitrophenol	34B	hexachlorobutadiene		<i>Other</i>
6A	2-nitrophenol	35B	hexachlorocyclopentadiene		dioxins- 2,3,7,8 tetrachloro-
7A	4-nitrophenol	36B	hexachloroethane		dibenzo-p-dioxin (TCDD)
8A	p-chloro-m-cresol	37B	indeno(1,2,3-cd)pyrene		and others
9A	pentachlorophenol	38B	isophorone		asbestos
10A	phenol	39B	naphthalene		
11A	2,4,6-trichlorophenol	40B	nitrobenzene		
		41B	N-nitrosodimethylamine		

TABLE III – OTHER TOXIC POLLUTANTS (METALS AND CYANIDE) AND TOTAL PHENOLS

antimony, total	selenium, total
arsenic, total	silver, total
beryllium, total	thallium, total
cadmium, total	zinc, total
chromium, total	cyanide, total
copper, total	phenols, total
lead, total	
mercury, total	
nickel, total	

Laboratory, Facility and Photo Processing Areas

The campus stores flammable, corrosive, reactive, and toxic chemicals for use in laboratories, shops and facilities, which totals over 2,000 locations and 100,000 chemicals.

Hazardous Waste Storage Areas

The campus EH&S Hazardous Materials Facility (HMF) is the location of hazardous waste packaging, including radioactive wastes. The HMF building is equipped with a spill containment system, including trenches that drain to an emergency containment tank. There are no floor drains that lead to the sanitary sewer. Chemicals are stored in cabinets, drums, or in secondary containment. Registered hazardous waste transportation companies transport waste from the HMF to permitted disposal sites. The College of Chemistry has one 90-day hazardous waste accumulation area. Room B-8 Latimer Hall is used to temporarily store flammable and non-flammable solvents, as well as some solid and liquid flammable, corrosive, reactive, or toxic chemical reagents. There are no open floor drains in these rooms. EH&S personnel pick up the waste from this location and transport it to the HMF for packaging and manifesting.

Machine, Electrical and Elevator Rooms

Across campus, in each building, there are likely to be rooms housing machinery such as cooling and heating units, emergency power generator sets, compressors, electrical switches and transformers, and elevators. Many of these machines contain fuel, coolant, hydraulic fluids, lubricants, and other process chemicals capable of spilling in the event of equipment failure or operations mishaps. UC Berkeley does routine maintenance and inspection of machinery located in these areas to reduce the risk of chemical releases to both the sewer and storm drain systems. Spill absorbents are located in or near these areas to provide personnel the resources for a timely response for stopping leaks and spills before the chemicals reach the sewer or storm system. Implementing secondary containment, plugging of floor drains and placing drainage signage in all areas is currently an on-going process. The highest risk areas have implemented these measures to prevent a slug discharge.

Construction Sites

Construction site materials may vary depending on the project. However, all construction sites must abide by the campus construction specifications, which require them to comply with all environmental regulations. The EH&S Construction Coordinator makes frequent site visits to ensure that there is environmental oversight. The EH&S Construction Coordinator also attends pre-construction kick off meetings to offer guidance on environmental regulations and is in regular communication with the Project Manager through the life of the project.

Food Preparations

The primary slug discharges from food preparation facilities include suspended solids or grease. Food preparation facilities follow the best management practices outlined by East Bay Municipal Utility District's Fats, Oils, and Grease program as well as UC Berkeley's Sewer System Management Plan.

Procedures for immediately notifying EBMUD of Slug Discharges (40 CFR § 403.8(vi)(C))

Following is the spill notification for campus laboratory, shop and facility personnel in the event that a slug discharge or accidental chemical spill enters a sink or floor drain.

If a chemical spill enters a sink or floor drain, immediately notify EH&S at (510) 642-3073 during business hours (8:00 AM to 5:00 PM). After hours, immediately notify UCPD (510) 642-6760 and ask them to contact the EH&S off-hours emergency responder. EH&S will notify the appropriate authorities of the discharge.

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 included in the Chemical Hygiene Plan (CHP) Chemical Spill sections.

Upon receiving a report of a prohibited accidental or slug discharge, EH&S will immediately notify EBMUD. These procedures include:

- A verbal notification within 24 hours of the slug discharge – EBMUD Hotline phone number (510) 287-1651 during business hours and toll-free (866) 403-2683 during non-business hours.
- Follow up written notification submitted within five days of the slug discharge to EBMUD.

Procedures to prevent adverse impact from accidental spills (40 CFR § 403.8(vi)(D))

Due to the diverse nature of laboratory, shop, and facility operations that use, store and handle chemicals, this Wastewater 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. In addition, more specific BMPs for some standard operations are presented in the attached fact sheet titled “Wastewater Slug Discharge Prevention and Emergency Notification (No. 53)” and other similar fact sheets located on the EH&S website (ehs.berkeley.edu). Spill prevention measures are incorporated in standard operating procedures for chemical use operations. EH&S is in the process of revising many standard operating procedures to incorporate this standard.

Best Management Practices for containing toxic organic and inorganic pollutants, including solvents, from laboratories, shops, and facilities 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

Inspection and maintenance of storage areas

All chemical use and storage areas (for example, storerooms) are inspected for best management practice implementation on a regular basis in addition to annual inspection required by the Injury Illness Prevention Plan (IIPP).

EH&S has laboratory/shop inspector positions which were created as part of the Laboratory Safety Culture Initiative. The EH&S inspectors routinely audit laboratory and shop operations, which include proper housekeeping and operations and the BMPs mentioned in the previous section.

In April 2014, UC Berkeley hired a consultant, Fuel Oil Systems, to conduct a Diesel Risk Assessment for all diesel fuel storage on campus and implement a series of corrective measures with the remaining budget from the assessment. As previously identified by EH&S staff, petroleum-like substances constitutes one of the largest risks to a high volume campus slug discharge. A report was finalized and a series of upgrades were performed on the Koshland and Valley Life Sciences underground storage tanks on campus to mitigate spills.

Handling and Transfer of Materials

When chemicals are transferred within buildings or between buildings, chemicals are placed in secondary containers, which can contain over 100% of the chemical, if the primary container

breaks. 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 storm water pollution prevention BMPs are followed per the UC Berkeley Water Protection Policy.

Where locations drain to the sanitary sewer, floor drains should be plugged at all times, except when floor drains are needed (for example, when floors are mopped). Temporary drain plugs should be used during times when floor drains are not in use. UC Berkeley is currently auditing these areas for implementation of these procedures.

Worker Training

All personnel involved 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. All personnel engaging in operations that could cause a slug discharge are trained in the contents of this plan through several venues, which include, but is not limited to, EH&S Training Programs (listed below) and other training implemented by the Department Safety Coordinators (DSCs). Training records are kept with the Office of Environment, Health & Safety through the UC Learning Center.

Office of Environment, Health & Safety 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	<ul style="list-style-type: none"> • 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
Hazardous Materials Spill Response Training	All personnel who work with hazardous materials and/or conduct a hazardous operation	<ul style="list-style-type: none"> • Basic spill response procedures and supporting programs 	Annually	Online
Chemical Hygiene Plan (CHP)	Anyone who works with hazardous materials in laboratories	<ul style="list-style-type: none"> • 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.

(Taken from rac.berkeley.edu/training.html)

In addition to training from EH&S and DSCs, education and outreach is 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.



**DO NOT
DISPOSE
DOWN DRAIN**

- chlorinated solvents
- toxic heavy metals
- toxic chemicals
- radioactive materials
- ignitable chemicals
- reactive chemicals
- corrosive materials (pH <5 or >10)
- other prohibited substances*

In case of a spill, call...
EH&S (510) 642-3073 (9:00am-3:00pm)
UCPD (510) 642-6760 (after hours)

*For more information on
Drain Disposal Restrictions, visit:
ehs.berkeley.edu/draindisposal



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Measures and Equipment for Emergency Response

Facilities Services and the Office of Environment, Health & Safety both have equipment to respond to an accidental or slug discharge. In the case of a large accidental or slug discharge, contractors are kept on retainer to provide emergency response services. Spill response materials are located in the proximity of where hazardous materials are stored. Additional spill response materials are kept on Facility Services operation and maintenance trucks, the Facilities Services Carleton site, and the Hazardous Materials Facility.

Spill containment and control equipment include, but are not limited to: absorbent booms, dikes, berms, spilled material storage containers, and protective clothing, respirators.

The Office of Environment, Health & Safety has a Designated Urgent Response Team (DURT) that can respond to accidental or slug discharges. EH&S maintains equipment that can be used to test for the presence of toxic gases or oxygen deficiency.

Contacts for more information

Questions regarding this plan or methods to prevent spills and slug discharges should be directed to the lab supervisor or Department Safety Coordinator. Questions can also be answered by contacting the Office of Environment, Health & Safety via phone (510) 642-3073 or email ehs@berkeley.edu.

ATTACHMENTS

ATTACHMENT 1: WASTEWATER SLUG DISCHARGE PREVENTION AND EMERGENCY NOTIFICATION – EH&S FACT SHEET

Wastewater Slug Discharge Prevention and Emergency Notification

This Fact Sheet is designed to help Principal Investigators (PIs) and supervisors fulfill their responsibilities to train their staff on the Wastewater Slug Control Plan (formerly Slug Discharge Prevention and Contingency Plan [SDPC Plan]).

In 1999, East Bay Municipal Utility District (EBMUD) added a new condition to the UC Berkeley Wastewater Discharge Permit. It requires the campus to maintain and implement a Wastewater 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. This is a requirement of all pollutant sources in the EBMUD service area. Potential pollutant sources include laboratories, photo-processing operations, construction sites, physical plant operations and food processing venues.

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:

- any hazardous waste,
- a substance that exceeds EBMUD Wastewater Control Ordinance limitations, or
- a substance that is prohibited by the *Drain Disposal Restrictions* document. (To obtain a copy, print one from the EH&S web site: ehs.berkeley.edu or call EH&S at (510) 642-3073.)

Why are slug discharges a problem?

The EBMUD Wastewater Treatment Plant treats conventional pollutants, such as organic 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 treatment plant uses bacteria in an oxygen-rich environment to break down sewage solids and to clean the water before it is discharged to the 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 water 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.

Wastewater Slug Control Plan Components

The three components of the Wastewater Slug Control Plan require hazardous chemical users to:

1. Implement Best Management Practices (BMPs) for slug discharge prevention.
2. Post slug discharge notification procedures in areas of chemical use and implement them in case of a spill to the drain.
3. Receive documented training on slug discharge notification procedures.

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.

Measures for containing toxic organic and inorganic pollutants:

- Avoid open container use of hazardous 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 hazardous chemicals in sinks.

Inspection and maintenance of storage areas:

All chemical use and storage areas should be regularly inspected for proper application 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 EH&S Fact Sheet #17, "Transporting Chemicals Safely on Campus."

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. All sinks must display the label below. 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 hazardous chemical users, training should be documented on a roster that is kept on file.

EBMUD inspects the campus for indications of Wastewater 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 fails to implement the notification procedures. If violations are not corrected, they may impose monetary penalties or restrict the use of the drains. For questions related to Wastewater Slug Control Plan requirements, contact EH&S at (510) 642-3073.