

University of California, Berkeley

Wastewater Toxics Management Plan

July 2019

Prepared by the Office of Environment, Health & Safety

Background

East Bay Municipal Utility District (EBMUD) requires the campus to submit a Wastewater Discharge Permit (Permit) application every 5 years that describes the campus waste use, process description, wastewater origins, characteristics and volumes. EBMUD issues a Permit that allows the campus to discharge approximately 1,000,000 gallons of wastewater daily to the community sewer system. The wastewater is treated at the EBMUD Wastewater Treatment Plant in Oakland.

The treatment plant uses bacteria digesters to breakdown the sewage as part of the process to eliminate sewage solids before discharging the treated water to San Francisco Bay. However, the bacteria are sensitive to pH changes and toxic chemicals that may kill the bacteria and disrupt the treatment process, possibly resulting in raw sewage discharges. Also, there is no mechanism for removing non-digestible toxic organic or heavy metal chemicals that pass through the treatment plant to pollute the San Francisco Bay or end up in the remaining sludge that is recycled as fertilizer.

EBMUD includes conditions and requirements in the Permit to prevent the campus from killing the bacteria or causing pass through of toxic chemicals.

This Wastewater Toxics Management Plan (WTMP), formally known as the Toxics Organic Management Plan (TOMP), incorporates all pollution prevention requirements found in the Permit. This plan includes, but is not limited to chemicals listed in 40 CFR Part 122, Appendix D, Tables II and III (**Attachment A**). **The federal Environmental Protection Agency has listed these chemicals and elements as priority pollutants because their bio-accumulative and toxic nature has been demonstrated to be harmful to human health and wildlife.**

University Chemical Use Description

Most of the campus chemical inventory is located in buildings used for academic research and teaching. The College of Chemistry (COC) (consisting of Latimer Hall, Lewis Hall, Hildebrand Hall, Giauque Hall, Tan Hall and Gilman Hall) contains approximately 80% of the campus chemical inventory. One of the most commonly used priority pollutants in the CoC is methylene chloride. Researchers in organic synthesis laboratories use methylene chloride in rotary evaporators for isolating compounds of interest. Researchers are informed of drain disposal restrictions and incorporate cold-vapor solvent trapping techniques (among others) combined with a re-circulating water-bath vacuum source to eliminate methylene chloride discharges to the sanitary sewer. Other chemical synthesis takes place across the campus, with similar steps taken to prevent introduction to the sanitary sewer.

Several photographic laboratories that generate silver containing waste photographic fixer (fixer) are located on campus. This waste is restricted from drain disposal because of hazardous waste laws as well as specific Permit limits.

Facilities Services operations include building washing, cooling tower water discharge, and boiler blow-down. Facilities maintenance can be a source of pollutants (surface wash waters containing contaminants). Building exterior washing can be a source of metal pollution (e.g., lead from lead-based painted surfaces) and machine rooms can be a source of petroleum (e.g., spills from hydraulic reservoirs, or leaking generator fuel tanks located in machine rooms).

There is legacy mercury in some drains in old campus buildings from historic spills. Assessment of the locations of where the legacy mercury exists is underway.

EBMUD collects samples of wastewater periodically to determine if pollution prevention practices are implemented by campus staff and students. Samples are taken during hours while classes are in session. In the past ten years, results of all wastewater samples analyzed for metals have been below permit limits. Wastewater samples analyzed for volatile organic compounds have typically indicated elevated levels of methylene chloride with a downward trend in the last five years. EBMUD has issued notices of violations to the campus for total identifiable chlorinated hydrocarbons above Permit limits.

Wastewater Toxic Management Plan (WTMP) Components

The following components of the WTMP are implemented on an on-going basis in order to minimize the potential for discharge of priority pollutants into the sanitary sewer.

Information and Education Program

EH&S regularly informs the campus of EBMUD discharge prohibitions through a variety of media that includes:

- Maintaining the EH&S website (<http://ehs.berkeley.edu>)
 - Post “Drain Disposal Restriction for Chemicals” document to campus chemical users which can be found at ehs.berkeley.edu/draindisposal
 - Publishing “Fact Sheets” and other materials describing chemical waste disposal procedures
- Posting “Do Not Drain Dispose” and “No Fixer” labels on laboratory sinks (including fume hood cup sinks and benchtop drain troughs) and photographic laboratory sinks, respectively
- Provide online training and training tools to campus chemical users
- Continue to provide alcohol-filled thermometers as an alternative to mercury-filled thermometers

Chemical Inventory

The Office of Environment, Health & Safety (EH&S) maintains a chemical inventory system called “Chemicals”. Chemicals is a computerized database of hazardous chemicals that complies with the requirements of California Health and Safety Code Section 25500 et. Seq. (Hazardous Materials Business Plan). Annual inventory updates are coordinated by EH&S with campus chemical users.

EH&S also maintains the Comprehensive Waste Tracking System (CWTS), which is the campus computerized database for hazardous waste pick-up, packaging and disposal tracking.

Both databases include all priority pollutants listed in 40 CFR Part 122, Appendix D, Tables II and III (**Attachment A**). These databases are used to direct Information and Education program resources to the highest priority chemical users.

Sink Posting

Every sink located in an area of chemical use (e.g. laboratories, shops and custodial rooms) is posted with a drain disposal sticker, including the cup sinks. The posting states that hazardous chemicals are prohibited from drain disposal.

Photographic Fixer Management Program

Over the past decade, the number of photoprocessing laboratories has greatly reduced on campus. Most laboratories have gone to digital photoprocessing. For laboratories that still use photographic fixer, photographic fixer is properly disposed or recycled.

Campus fixer users are informed through the Information and Education Program that they must collect fixer in labeled containers. EH&S picks up the containers and ships them as hazardous waste to a silver recycling vendor. The campus disposes of or recycles silver bearing fixer through a licensed hazardous waste treatment contractor. In addition, photographic laboratory sinks are posted with “No Fixer” signs that state the discharge of fixer to the sanitary sewer is prohibited.

EH&S maintains a listing of photographic chemical users. Lists of the names of the users and their location on campus are generated using the CIS and the CWTS databases.

Mercury Thermometer Exchange Program (“Make UCB Mercury Free”)

In 2004, EH&S partnered with EBMUD to create the Mercury Thermometer Exchange Program. EH&S and EBMUD collected over 3,600 mercury-filled thermometers and reduced the emergency response for broken thermometers by collecting over 1,160 additional pounds of mercury-containing equipment. EH&S continues to exchange mercury-filled thermometers with alcohol-filled thermometers.

Slug Control Plan

The Slug Control Plan includes:

- A listing of slug discharge prevention practices
- Notification procedures to be followed in the event that prohibited priority pollutants are discharged to the sanitary sewer and
- Pollution prevention and notification training requirements for chemical users

The Slug Control Plan is implemented for all campus chemical users in laboratories, shops and physical plant operations and can be found on the EH&S website (ehs.berkeley.edu).

Standard Operating Procedures and Specifications

UC Berkeley has created procedures for common discharges that may take place on the Berkeley campus. These procedures are also incorporated into the Information and Education Program.

See **Attachment B** for procedures/forms for staff which include:

- Standard Operating Procedure - “Flood Water Discharges from Elevator Service Pits and Sumps”

- Standard Operating Procedure - “Procedures for Wastewater Management From UC Berkeley Building Washing and Maintenance Operations”
- “Wastewater Discharge Form” – This form is used by UC Berkeley to track and approve/reject wastewater discharges from various operations.

UC Berkeley has a Stormwater Pollution Prevention Specification (**Attachment C**) which is given to construction projects. As of March 2016, this specification has been updated, renamed and moved to Division 01 57 23 – Temporary Storm Water Pollution Controls.

ATTACHMENTS

**ATTACHMENT A: 40 CFR PART 122,
APPENDIX D, TABLES II and III**

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40 CFR Ch. I (7-1-10 Edition)

“Cold water aquatic animals” include, but are not limited to, the *Salmonidae* family of fish; e.g., trout and salmon.

“Warm water aquatic animals” include, but are not limited to, the *Ameiuride*, *Centrarchidae* and *Cyprinidae* families of fish; e.g., respectively, catfish, sunfish and minnows.

APPENDIX D TO PART 122—NPDES PERMIT APPLICATION TESTING REQUIREMENTS (§ 122.21)

TABLE I—TESTING REQUIREMENTS FOR ORGANIC TOXIC POLLUTANTS BY INDUSTRIAL CATEGORY FOR EXISTING DISCHARGERS

Industrial category	GC/MS Fraction ¹			
	Volatile	Acid	Base/neutral	Pesticide
Adhesives and Sealants	2	2	2	
Aluminum Forming	2	2	2	
Auto and Other Laundries	2	2	2	2
Battery Manufacturing	2	2	2	
Coal Mining	2	2	2	2
Coil Coating	2	2	2	
Copper Forming	2	2	2	
Electric and Electronic Components	2	2	2	2
Electroplating	2	2	2	
Explosives Manufacturing		2	2	
Foundries	2	2	2	
Gum and Wood Chemicals	2	2	2	2
Inorganic Chemicals Manufacturing	2	2	2	
Iron and Steel Manufacturing	2	2	2	
Leather Tanning and Finishing	2	2	2	2
Mechanical Products Manufacturing	2	2	2	
Nonferrous Metals Manufacturing	2	2	2	2
Ore Mining	2	2	2	2
Organic Chemicals Manufacturing	2	2	2	2
Paint and Ink Formulation	2	2	2	2
Pesticides	2	2	2	2
Petroleum Refining	2	2	2	2
Pharmaceutical Preparations	2	2	2	
Photographic Equipment and Supplies	2	2	2	2
Plastic and Synthetic Materials Manufacturing	2	2	2	2
Plastic Processing	2			
Porcelain Enameling	2		2	2
Printing and Publishing	2	2	2	2
Pulp and Paper Mills	2	2	2	2
Rubber Processing	2	2	2	
Soap and Detergent Manufacturing	2	2	2	
Steam Electric Power Plants	2	2	2	
Textile Mills	2	2	2	2

TABLE I—TESTING REQUIREMENTS FOR ORGANIC TOXIC POLLUTANTS BY INDUSTRIAL CATEGORY FOR EXISTING DISCHARGERS—Continued

Industrial category	GC/MS Fraction ¹			
	Volatile	Acid	Base/neutral	Pesticide
Timber Products Processing	2	2	2	2

¹ The toxic pollutants in each fraction are listed in Table II.
² Testing required.

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

<i>Volatiles</i>	
1V	acrolein
2V	acrylonitrile
3V	benzene
5V	bromoform
6V	carbon tetrachloride
7V	chlorobenzene
8V	chlorodibromomethane
9V	chloroethane
10V	2-chloroethylvinyl ether
11V	chloroform
12V	dichlorobromomethane
14V	1,1-dichloroethane
15V	1,2-dichloroethane
16V	1,1-dichloroethylene
17V	1,2-dichloropropane
18V	1,3-dichloropropylene
19V	ethylbenzene
20V	methyl bromide
21V	methyl chloride
22V	methylene chloride
23V	1,1,2,2-tetrachloroethane
24V	tetrachloroethylene
25V	toluene
26V	1,2-trans-dichloroethylene
27V	1,1,1-trichloroethane
28V	1,1,2-trichloroethane
29V	trichloroethylene
31V	vinyl chloride
<i>Acid Compounds</i>	
1A	2-chlorophenol
2A	2,4-dichlorophenol
3A	2,4-dimethylphenol
4A	4,6-dinitro-o-cresol
5A	2,4-dinitrophenol
6A	2-nitrophenol
7A	4-nitrophenol
8A	p-chloro-m-cresol
9A	pentachlorophenol
10A	phenol
11A	2,4,6-trichlorophenol
<i>Base/Neutral</i>	
1B	acenaphthene
2B	acenaphthylene
3B	anthracene

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- 4B benzidine
- 5B benzo(a)anthracene
- 6B benzo(a)pyrene
- 7B 3,4-benzofluoranthene
- 8B benzo(ghi)perylene
- 9B benzo(k)fluoranthene
- 10B bis(2-chloroethoxy)methane
- 11B bis(2-chloroethyl)ether
- 12B bis(2-chloroisopropyl)ether
- 13B bis (2-ethylhexyl)phthalate
- 14B 4-bromophenyl phenyl ether
- 15B butylbenzyl phthalate
- 16B 2-chloronaphthalene
- 17B 4-chlorophenyl phenyl ether
- 18B chrysene
- 19B dibenzo(a,h)anthracene
- 20B 1,2-dichlorobenzene
- 21B 1,3-dichlorobenzene
- 22B 1,4-dichlorobenzene
- 23B 3,3'-dichlorobenzidine
- 24B diethyl phthalate
- 25B dimethyl phthalate
- 26B di-n-butyl phthalate
- 27B 2,4-dinitrotoluene
- 28B 2,6-dinitrotoluene
- 29B di-n-octyl phthalate
- 30B 1,2-diphenylhydrazine (as azobenzene)
- 31B fluoranthene
- 32B fluorene
- 33B hexachlorobenzene
- 34B hexachlorobutadiene
- 35B hexachlorocyclopentadiene
- 36B hexachloroethane
- 37B indeno(1,2,3-cd)pyrene
- 38B isophorone
- 39B naphthalene
- 40B nitrobenzene
- 41B N-nitrosodimethylamine
- 42B N-nitrosodi-n-propylamine
- 43B N-nitrosodiphenylamine
- 44B phenanthrene
- 45B pyrene
- 46B 1,2,4-trichlorobenzene

Pesticides

- 1P aldrin
- 2P alpha-BHC
- 3P beta-BHC
- 4P gamma-BHC
- 5P delta-BHC
- 6P chlordane
- 7P 4,4'-DDT
- 8P 4,4'-DDE
- 9P 4,4'-DDD
- 10P dieldrin
- 11P alpha-endosulfan
- 12P beta-endosulfan
- 13P endosulfan sulfate
- 14P endrin
- 15P endrin aldehyde
- 16P heptachlor
- 17P heptachlor epoxide
- 18P PCB-1242
- 19P PCB-1254
- 20P PCB-1221
- 21P PCB-1232
- 22P PCB-1248

- 23P PCB-1260
- 24P PCB-1016
- 25P toxaphene

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

- Antimony, Total
- Arsenic, Total
- Beryllium, Total
- Cadmium, Total
- Chromium, Total
- Copper, Total
- Lead, Total
- Mercury, Total
- Nickel, Total
- Selenium, Total
- Silver, Total
- Thallium, Total
- Zinc, Total
- Cyanide, Total
- Phenols, Total

TABLE IV—CONVENTIONAL AND NONCONVENTIONAL POLLUTANTS REQUIRED TO BE TESTED BY EXISTING DISCHARGERS IF EXPECTED TO BE PRESENT

- Bromide
- Chlorine, Total Residual
- Color
- Fecal Coliform
- Fluoride
- Nitrate-Nitrite
- Nitrogen, Total Organic
- Oil and Grease
- Phosphorus, Total
- Radioactivity
- Sulfate
- Sulfide
- Sulfite
- Surfactants
- Aluminum, Total
- Barium, Total
- Boron, Total
- Cobalt, Total
- Iron, Total
- Magnesium, Total
- Molybdenum, Total
- Manganese, Total
- Tin, Total
- Titanium, Total

TABLE V—TOXIC POLLUTANTS AND HAZARDOUS SUBSTANCES REQUIRED TO BE IDENTIFIED BY EXISTING DISCHARGERS IF EXPECTED TO BE PRESENT

Toxic Pollutants

Asbestos

Hazardous Substances

- Acetaldehyde
- Allyl alcohol
- Allyl chloride
- Amyl acetate
- Aniline
- Benzonitrile

Benzyl chloride
 Butyl acetate
 Butylamine
 Captan
 Carbaryl
 Carbofuran
 Carbon disulfide
 Chlorpyrifos
 Coumaphos
 Cresol
 Crotonaldehyde
 Cyclohexane
 2,4-D (2,4-Dichlorophenoxy acetic acid)
 Diazinon
 Dicamba
 Dichlobenil
 Dichlone
 2,2-Dichloropropionic acid
 Dichlorvos
 Diethyl amine
 Dimethyl amine
 Dintrobenzene
 Diquat
 Disulfoton
 Diuron
 Epichlorohydrin
 Ethion
 Ethylene diamine
 Ethylene dibromide
 Formaldehyde
 Furfural
 Guthion
 Isoprene
 Isopropanolamine Dodecylbenzenesulfonate
 Kelthane
 Kepone
 Malathion
 Mercaptodimethur
 Methoxychlor
 Methyl mercaptan
 Methyl methacrylate
 Methyl parathion
 Mevinphos
 Mexacarbate
 Monoethyl amine
 Monomethyl amine
 Naled
 Napthenic acid
 Nitrotoluene
 Parathion
 Phenolsulfanate
 Phosgene
 Propargite
 Propylene oxide
 Pyrethrins
 Quinoline
 Resorcinol
 Strontium
 Strychnine
 Styrene
 2,4,5-T (2,4,5-Trichlorophenoxy acetic acid)
 TDE (Tetrachlorodiphenylethane)
 2,4,5-TP [2-(2,4,5-Trichlorophenoxy) pro-
 panoic acid]
 Trichlorofan
 Triethanolamine dodecylbenzenesulfonate
 Triethylamine

Trimethylamine
 Uranium
 Vanadium
 Vinyl acetate
 Xylene
 Xylenol
 Zirconium

[Note 1: The Environmental Protection Agency has suspended the requirements of §122.21(g)(7)(ii)(A) and Table I of Appendix D as they apply to certain industrial categories. The suspensions are as follows:

a. At 46 FR 2046, Jan. 8, 1981, the Environmental Protection Agency suspended until further notice §122.21(g)(7)(ii)(A) as it applies to coal mines.

b. At 46 FR 22585, Apr. 20, 1981, the Environmental Protection Agency suspended until further notice §122.21(g)(7)(ii)(A) and the corresponding portions of Item V-C of the NPDES application Form 2c as they apply to:

1. Testing and reporting for all four organic fractions in the Greige Mills Subcategory of the Textile Mills industry (Subpart C—Low water use processing of 40 CFR part 410), and testing and reporting for the pesticide fraction in all other subcategories of this industrial category.

2. Testing and reporting for the volatile, base/neutral and pesticide fractions in the Base and Precious Metals Subcategory of the Ore Mining and Dressing industry (subpart B of 40 CFR part 440), and testing and reporting for all four fractions in all other subcategories of this industrial category.

3. Testing and reporting for all four GC/MS fractions in the Porcelain Enameling industry.

c. At 46 FR 35090, July 1, 1981, the Environmental Protection Agency suspended until further notice §122.21(g)(7)(ii)(A) and the corresponding portions of Item V-C of the NPDES application Form 2c as they apply to:

1. Testing and reporting for the pesticide fraction in the Tall Oil Rosin Subcategory (subpart D) and Rosin-Based Derivatives Subcategory (subpart F) of the Gum and Wood Chemicals industry (40 CFR part 454), and testing and reporting for the pesticide and base/neutral fractions in all other subcategories of this industrial category.

2. Testing and reporting for the pesticide fraction in the Leather Tanning and Finishing, Paint and Ink Formulation, and Photographic Supplies industrial categories.

3. Testing and reporting for the acid, base/neutral and pesticide fractions in the Petroleum Refining industrial category.

4. Testing and reporting for the pesticide fraction in the Papergrade Sulfite subcategories (subparts J and U) of the Pulp and Paper industry (40 CFR part 430); testing and reporting for the base/neutral and pesticide fractions in the following subcategories: Deink (subpart Q), Dissolving Kraft (subpart

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F), and Paperboard from Waste Paper (subpart E); testing and reporting for the volatile, base/neutral and pesticide fractions in the following subcategories: BCT Bleached Kraft (subpart H), Semi-Chemical (subparts B and C), and Nonintegrated-Fine Papers (subpart R); and testing and reporting for the acid, base/neutral, and pesticide fractions in the following subcategories: Fine Bleached Kraft (subpart I), Dissolving Sulfite Pulp (subpart K), Groundwood-Fine Papers (subpart O), Market Bleached Kraft (subpart G), Tissue from Wastepaper (subpart T), and Nonintegrated-Tissue Papers (subpart S).

5. Testing and reporting for the base/neutral fraction in the Once-Through Cooling Water, Fly Ash and Bottom Ash Transport Water process wastestreams of the Steam Electric Power Plant industrial category.

This revision continues these suspensions.]*
For the duration of the suspensions, therefore, Table I effectively reads:

TABLE I—TESTING REQUIREMENTS FOR ORGANIC TOXIC POLLUTANTS BY INDUSTRY CATEGORY

Industry category	GC/MS fraction ²			
	Volatile	Acid	Neutral	Pesticide
Adhesives and sealants	(1)	(1)	(1)	
Aluminum forming	(1)	(1)	(1)	
Auto and other laundries ...	(1)	(1)	(1)	(1)
Battery manufacturing	(1)		(1)	
Coal mining				
Coil coating	(1)	(1)	(1)	
Copper forming	(1)	(1)	(1)	
Electric and electronic compounds	(1)	(1)	(1)	(1)
Electroplating	(1)	(1)	(1)	
Explosives manufacturing	(1)	(1)	(1)	
Foundries	(1)	(1)	(1)	
Gum and wood (all subparts except D and F) ...	(1)	(1)		
Subpart D—tall oil rosin ...	(1)	(1)	(1)	
Subpart F—rosin-based derivatives	(1)	(1)	(1)	
Inorganic chemicals manufacturing	(1)	(1)	(1)	
Iron and steel manufacturing	(1)	(1)	(1)	
Leather tanning and finishing	(1)	(1)	(1)	
Mechanical products manufacturing	(1)	(1)	(1)	
Nonferrous metals manufacturing	(1)	(1)	(1)	(1)
Ore mining (applies to the base and precious metals/Subpart B)		(1)		
Organic chemicals manufacturing	(1)	(1)	(1)	(1)
Paint and ink formulation ...	(1)	(1)	(1)	
Pesticides	(1)	(1)	(1)	(1)
Petroleum refining	(1)			

* Editorial Note: The words "This revision" refer to the document published at 48 FR 14153, Apr. 1, 1983.

TABLE I—TESTING REQUIREMENTS FOR ORGANIC TOXIC POLLUTANTS BY INDUSTRY CATEGORY—Continued

Industry category	GC/MS fraction ²			
	Volatile	Acid	Neutral	Pesticide
Pharmaceutical preparations	(1)	(1)	(1)	
Photographic equipment and supplies	(1)	(1)	(1)	
Plastic and synthetic materials manufacturing	(1)	(1)	(1)	(1)
Plastic processing	(1)			
Porcelain enameling				
Printing and publishing	(1)	(1)	(1)	(1)
Pulp and paperboard mills—see footnote ³				
Rubber processing	(1)	(1)	(1)	
Soap and detergent manufacturing	(1)	(1)	(1)	
Steam electric power plants	(1)	(1)		
Textile mills (Subpart C—Greige Mills are exempt from this table)	(1)	(1)	(1)	
Timber products processing	(1)	(1)	(1)	(1)

¹ Testing required.
² The pollutants in each fraction are listed in Item V-C.
³ Pulp and Paperboard Mills:

Subpart ³	GS/MS fractions			
	VOA	Acid	Base/neutral	Pesticides
A	2	(1)	2	(1)
B	2	(1)	2	2
C	2	(1)	2	2
D	2	(1)	2	2
E	(1)	(1)	2	(1)
F	(1)	(1)	2	2
G	(1)	(1)	2	2
H	(1)	(1)	2	2
I	(1)	(1)	2	2
J	(1)	(1)	(1)	2
K	(1)	(1)	2	2
L	(1)	(1)	2	2
M	(1)	(1)	2	2
N	(1)	(1)	2	2
O	(1)	(1)	2	2
P	(1)	(1)	2	2
Q	(1)	(1)	2	(1)
R	2	(1)	2	2
S	(1)	(1)	2	(1)
T	(1)	(1)	2	(1)
U	(1)	(1)	(1)	2

¹ Must test.
² Do not test unless "reason to believe" it is discharged.
³ Subparts are defined in 40 CFR Part 430.

[48 FR 14153, Apr. 1, 1983, as amended at 49 FR 38050, Sept. 26, 1984; 50 FR 6940, Feb. 19, 1985]

**ATTACHMENT B: STANDARD
OPERATING PROCEDURES (SOPs) AND FORMS**

Flood Water Discharges from Elevator Service Pits and Sumps

Scope

This procedure applies to any discharge of flood water from elevator service pits with the exception of those situations where life safety or catastrophic property damage is threatened.

This procedure is intended to prevent the release of prohibited pollutants to either the sanitary sewer system or storm system that would cause a violation of applicable regulations or ordinances or would otherwise cause significant harm to either surface waters, the surrounding environment or the sanitary sewer system.

This procedure provides guidance to workers who encounter accumulated water that must be removed from elevator service pits in order to perform maintenance, inspection, installation, or repair of machinery and systems.

This procedure applies to personnel most likely to discover or respond to flooded elevator service pits such as members of Facilities Services, Residential Student Services Programs, building or department trades people, Building Coordinators, or similar.

Discussion

Elevator service pits on campus may flood with water due to their low-lying nature. This water may contact surfaces that have varying levels of contaminants ranging from simple trace residues to significant quantities of stored or spilled materials (dust, lubricants, hydraulic fluids, etc). Improperly discharging this water to either the surface water storm system or the sanitary sewer system could result in damage to the environment as well as a violation of regulations designed to prevent discharges of polluted water.

The prevention of these potentially damaging discharges of contaminated water is best achieved by eliminating as much as is practical the infiltration of water into interior spaces and buildings on campus. Capital improvement programs are addressing these instances in a systematic manner over the longer term based on severity and funding.

In the shorter term, by developing this procedure and training appropriate personnel in its use, improper discharges of accumulated water from elevator pits may be eliminated.

Procedure

1. Upon discovery or notification of a flooded service pit, personnel must immediately notify their supervisor of the situation but refrain from discharging any water. Any sump pumps or valves known to drain the space should be secured in the off or closed position to prevent the unplanned release of water from the flooded area.
Personnel shall refrain from entering the flooded space until potential safety hazards (sources of electricity, hazardous materials, dangerous atmosphere,

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Flood Water Discharges from Elevator Service Pits and Sumps

physical hazards such as sharp or protruding obstructions) can be identified and eliminated or controlled. Initial responders should also isolate the source of the accumulating water if feasible to do so (i.e. turn off isolating valves, sand bag or cover inlets, plug or seal conduits or lines).

2. Only supervisory personnel trained in this procedure will determine the presence or absence of contaminants in accumulated water. This will be done primarily through visual observations of the water (for sheen, color, turbidity) and by taking note of any odors present. Determination will also include an investigation of the path and source of the water.

In addition, responding personnel will consult with persons familiar with the processes located in the immediate area and will review the use of the flooded area to determine whether or not a source of contaminants are in contact with accumulated water. Additional hazard categorization or even analysis may be required based on investigation of the flooded area. If there are reasonable doubts as to the presence of significant contaminants, do not pump or release the accumulated water.

3. If the water is suspected or proved to contain significant levels of contaminants, no pumping or other removal will take place until proper containment can be procured (i.e. drums, portable tanks, vacuum truck). Contact EH&S to assist in analysis of the collected water and determination of the disposal method.
4. If the source of the accumulated water is determined to be from domestic (drinking) water supply lines or domestic sewage lines and, upon assessment by a supervisor, determined to be free of prohibited materials (i.e. oil, fuel, paint, hydraulic fluid, coolants, etc.), this water may be pumped to sanitary sewer.
5. If the source of accumulated water is found to be surface water from a storm event and is determined by a supervisor to be free of significant contamination (i.e. no chemicals or suspended solids), discharge to the storm conveyance system is allowed.
6. Care will be taken to prevent wash water from clean-up activities from entering storm drains. Inlets will be plugged or blocked and temporary dikes placed to protect the storm system and allow collection of generated wash water.

Wash water generated during clean-up activities will also be characterized to determine whether sanitary sewer drain disposal is allowable. Wash waters containing prohibited substances or exhibiting hazardous waste characteristics

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Flood Water Discharges from Elevator Service Pits and Sumps

may not be discharged to the sewer and must be contained for offsite treatment. Contact EH&S for assistance.

7. Responding personnel will conduct a post clean-up investigation to determine both the source and path of the floodwater and develop a written action plan to prevent future occurrences. Plans must be kept on record and made available to authorized agency representatives upon request (East Bay Municipal Utility District [EBMUD], Regional Water Quality Board [RWQCB], Department of Fish and Wildlife [DFG], and City of Berkeley [COB]).

Essential Contacts

Name	Business Hours Phone Number	Off-Hours Phone Number
Facilities Services	(510) 642-6556	(510)642-6556
Residential Student Services Programs (RSSP)	(510) 642-2828	(510) 642-2828
Environment, Health & Safety (EH&S)	(510) 642-3073	(510) 642-6760

Training

Personnel likely to be called to respond to flooded spaces shall be trained in this procedure and records of this training shall be made available upon request to authorized agency representatives. Training will include a discussion of means and methods to be used to determine the presence of contaminants in accumulated flood waters.

For additional assistance, contact EH&S at ehs@berkeley.edu or (510) 642-3073.

Procedure for Wastewater Management from UC Berkeley Building Washing and Maintenance Operations

This procedure describes wastewater management for UC Berkeley building washing operations and is to be used in conjunction with all operations where building exterior surface cleaning generates wash-water. Wastewater from washing operations is prohibited from discharge to storm drains because it may contain chloramines, cleaning compounds, or materials dislodged from the building surfaces during cleaning (such as leaded paint). Wastewater may be disposed to landscaped areas or the sanitary sewer on the condition that contaminant concentrations will not harm the landscape or the sewage treatment facility's operations.

Offsite disposal through the Office of Environment, Health & Safety (EH&S) may be necessary if contaminants in the wash-water exceed sewer discharge contaminant limits. If cleaning compounds containing surfactants, detergents or other chemicals are used in the cleaning process and there are sludges or residues that need to be disposed of, contact EH&S, (510) 642-3073, for disposal guidance.

Building Washing Wastewater Management Procedures

Unpainted Buildings

- Construct a containment system to eliminate wash-water discharge to the storm drain.
- Divert wash-water onto landscaping (preferable) or into the sanitary sewer.
- If high pressure water is used (e.g., hydro-blasting to remove spalled concrete) then settle out the solids using a containment tank, or filter out the solids using filter fabric or other solids removal method.

Painted Buildings

- Construct a containment system to eliminate wash-water from draining to the storm drain or the sanitary sewer system.
- Pour, pump or drain the wash-water into a containment tank.
- Use a filter system (e.g., cartridge filters) to remove suspended paint solids. Use settling methods to minimize the amount of solids entering the filter system. This will prevent filter saturation.
- Sample the filtered water before it is discharge to the sanitary sewer. Have the sample analyzed for the 13 priority pollutant metals (antimony, arsenic, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, thallium, zinc) and any other chemicals of concern that could be present to determine whether or not the water is suitable for sanitary sewer discharge. Send a copy of the analytical results to EH&S for disposal method determination.
- If the analytical results exceed the EBMUD discharge limits, consider options for using a finer pore size filter, or dispose of the water through EH&S. EH&S will arrange to ship the water to a properly permitted disposal facility.

Water Discharge Form

(Revised 05/08/2018)

University of California, Berkeley
317 University Hall #1150
Berkeley, CA 94720



Fill in the form and return to the Office of Environment, Health & Safety in person or through email (ehs-ep@berkeley.edu). If you require assistance, contact EH&S Fire Marshal or Construction Specialist at (510) 642-3073.

SECTION ONE: Basic Information			
NAME OF PROJECT			
NAME OF DISCHARGER			
TYPE OF WATER DISCHARGE	<input type="checkbox"/> Water Main <input type="checkbox"/> Fire Hydrant Flush <input type="checkbox"/> Fire Service Main Flush <input type="checkbox"/> Domestic Water Main Flush <input type="checkbox"/> Water Supply Test <input type="checkbox"/> Fire Sprinkler System Discharge	<input type="checkbox"/> Fire Standpipe Test <input type="checkbox"/> Backflow Prevention Test/Flush <input type="checkbox"/> Pressure Reducing Valve Test <input type="checkbox"/> Building/Pavement/Equipment Wash Water <input type="checkbox"/> Other (Specify):	
LOCATION OF DISCHARGE			
TIME FRAME	BEGIN:		END:
DATE OF DISCHARGE		TOTAL GALLONS EXPECTING TO DISCHARGE	gallons
DURATION OF DISCHARGE	minutes	EXPECTED DISCHARGE FLOW RATE	gpm
WHERE ARE YOU DISCHARGING TO*?	<input type="checkbox"/> Landscape <input type="checkbox"/> Sanitary Sewer(s) <input type="checkbox"/> Stormwater Drain(s) – <i>(If so, please fill in information in Section Two.)</i> * Sanitary sewers must be used unless the project deems it is infeasible and is reviewed with EH&S.	SANITARY SEWER DETERMINATION Project has the responsibility to contact campus plumbing or other qualified individual for a determination.	<input type="checkbox"/> Approved for sanitary discharge Date of Contact: Contact Name: <input type="checkbox"/> Rejected due to: <input type="checkbox"/> Inadequate capacity <input type="checkbox"/> Condition of line <input type="checkbox"/> Other (specify):
DESCRIPTION OF SEDIMENT CONTROLS USED			
WILL A TANK BE PROVIDED?	<input type="checkbox"/> Yes <input type="checkbox"/> No	IF A TANK IS PROVIDED, WHAT TYPE AND SIZE?	
EAST BAY MUNICIPAL UTILITY DISTRICT (EBMUD) CONTACTED?	<input type="checkbox"/> Yes, date of contact: <input type="checkbox"/> n/a, please explain:		
SECTION TWO: Dechloramination Information (Fill in this section ONLY if you plan to discharge to a Stormwater Drain.)			
DECHLORAMINATION CHEMICALS TO BE USED			
NUMBER OF DECHLORAMINATION TABLETS TO BE USED			
SECTION THREE: Site Map / Location			
Please attach a site map to this form.			

(PRINT NAME OF COMPANY EMPLOYEE)

(SIGNATURE OF COMPANY EMPLOYEE) (DATE)

(PRINT NAME OF EH&S REPRESENTATIVE)

(SIGNATURE OF EH&S REPRESENTATIVE) (DATE)

FOR EH&S USE ONLY:	DATE RECEIVED: _____
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Instructions

SECTION ONE: BASIC INFORMATION

Name of Project: The name of the project where the discharge is to occur.

Name of Discharger: This is the name of the company or the University of California Berkeley Department performing the discharge. This could be UC Berkeley Physical Plant-Campus Services (PP-CS), AAA Contactor, etc.

Type of Water Discharge: Indicate the type of water discharge to be performed by checkboxing the appropriate discharge description.

Location of Discharge: The exact location of the discharging water. It is not necessarily the name of the project. It should include where the water will be discharged (i.e. storm drain at XYZ location or sanitary drain at XYZ location, etc.)

Time Frame: The approximate time when the discharge is expected to occur. If the time changes by 4 hours or more, notify Environment, Health & Safety (EH&S) prior to the new time in order to obtain approval for the change.

Date of Discharge: The date when the discharge is expected to occur. If the date is changed, notify EH&S prior to the new date in order to obtain approval of the change.

Total Gallons Discharged: This is the maximum expected quantity of water in gallons to be discharged.

Duration of Discharge: This is the approximate duration in minutes. It is dependent on the flow rate and length of pipe to be flushed. CAUTION: If debris is collected in the burlap bags during the flush, the flush must be repeated until the discharge is clean. This may double the expected time of the discharge. For a water supply test, this is the time duration of a water supply test.

Expected Discharge Flow Rate: This is the maximum expected flow rate in gallons per minute.

Description of Sediment Controls to be Used: This should indicate filtration techniques to be used on hosing and drains used for discharging water. Sediment controls should also be incorporated for spills, leaks and water line-breaks.

Tank: Discharges that occur above 500 gpm may overwhelm drainage systems and will require using a containment tank to settle high pulses of water.

East Bay Municipal Utility District (EBMUD) Contact: Depending on the location of the hydrant flush on campus, EBMUD must be notified in advance.

SECTION TWO: DECHLORAMINATION INFORMATION

Dechloramination Chemicals Used: The chemical name of the chemical used to neutralized the chloramines in the water discharge. Currently, the most common tablets and accepted as best practice are made from sodium bisulfate, sodium sulfate and sodium thiosulfate. Sodium thiosulfate is most recommended for safe stormwater discharges.

Number of Dechloramination Tablets to be Used: This is based on the manufacturer's estimate of the quantity of water that can be dechloraminated per tablet. A safety factor of 50% must be used to ensure all water is treated.

SECTION THREE: SITE MAP / LOCATION

Site Map / Location: Site Map / Location should note the point of discharge, adjacent buildings / structures, pedestrian pathways, roadways and sanitary sewers/storm drains that are in the vicinity. Indicate on this map which drain(s) are to be used for discharge. Attach a map to this form.

Submit completed form to Office of Environment, Health & Safety.

FOR EH&S USE ONLY:	DATE RECEIVED: _____
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ATTACHMENT C: STORM WATER POLLUTION CONSTRUCTION PROJECT SPECIFICATION

1. Refer to Division 22 14 00: Facility Storm Drainage for requirements of permanent Storm Water remediation
2. Impervious surface area on a site shall be minimized in order to mitigate the adverse effects of storm water runoff on receiving waters. The campus shall maintain the 'no net increase' of runoff per the draft 2020 Long Range Development Plan (LRDP). This can be achieved through storm water detention practices and designs that minimize impervious surfaces and employ such methods as open paving or porous pavement surfaces. Where appropriate, storm water systems shall be designed to permit aquifer recharge.
3. General
 - a. Background
 - i. Storm drains discharge directly to creeks and the Bay without treatment. Discharge of pollutants (any substance, material, or waste other than uncontaminated storm water) from this Project into the storm drain system is strictly prohibited by the California Regional Water Quality Control Board's (RWQCB) Water Quality Control Plan (Basin Plan).
4. General Contractor Scope
 - a. Provide all material, labor, equipment, for installation, implementation, and maintenance of all surface-water pollution prevention measures. The Contractor shall not be required to maintain post-construction pollution prevention structures. This work includes the following:
 - i. All sites that will create and/or replace greater than 2,500 square feet of impervious surface area must comply with all design and operational requirements outlined for Non-Traditional Permittees in the State Water Board's Phase II Small MS4 General Permit, Waste Discharge Requirements Order No: 2013-0001-DWQ. Post-Construction Site Design Measures will be documented with the State's 'Post-Construction Water Balance Calculator' and additional hydro-modification facilities will be registered with UCB EH&S. Projects must also submit a Storm Water Pollution Prevention Plan to UCB EH&S.
 - ii. Construction sites that will disturb (e.g., digging, trenching, grading, clearing, filling) greater than 1 acre of site soil will be required to register for the State Water Board's Construction General Permit Order No: 2009-0009 in that agency's Storm Water Multiple Application and Report Tracking (SMART) System.
 - iii. Furnishing, placing, and installing effective measures for preventing erosion and runoff of soil, silts, gravel, hazardous chemicals or other materials prohibited by the San Francisco Bay Region Water Quality Control Board from entering the stormwater drainage system.
 - iv. Management of on-site construction materials in such a manner as to prevent said materials from contacting stormwater or wash water and running off into the storm drain system.
 - v. Complying with applicable standards and regulations per Paragraph 1.03.
 - vi. Include post-construction stormwater pollution prevention structures in the stormwater pollution prevention plan. Contractor shall use construction drawings as the reference for post-construction BMPs.
 - b. This section does not replace any other relevant section of the project specifications. Where sections are in disagreement, the more stringent requirement shall apply.
 - c. In this section, the term "storm drain system" shall include storm water conduits, storm drain inlets and other storm drain structures, street gutters, channels, watercourses, creeks, lakes, and the San Francisco Bay.

- d. Sanitary sewer discharge regulations are intended to provide protection of the sanitary sewer system and East Bay Municipal Utility District’s (EBMUD) water pollution control plant. In this section, “sanitary sewer” shall include any sanitary sewer manhole, clean-out, side sewer or other connection to the EBMUD wastewater treatment plant.
- e. The Contractor shall have storm drain pollution prevention measures in place and follow this specification during the rainy season (October 1 through May 1), and anytime rain is predicted in the San Francisco Bay Area. It is the responsibility of the Contractor to be prepared for a rain event in the non-rainy season, and to be aware of weather predictions. The University is not responsible for informing the Contractor of rain predictions.
- f. Sanitary sewer blockage will likely result in a back-up and overflow to the storm drain system. The Contractor shall immediately notify the Project Manager or the Inspector of Record if there is a clogged sanitary sewer.
- g. The Contractor shall not allow any non-storm water to enter the storm drain system. Non-storm water includes domestic supply water used to wash streets, painting and drywall equipment, tools, equipment, or vehicles.

5. Regulations and Standards

- a. Contractor shall comply with the following applicable regulations:
 - i. Clean Water Act, United States Environmental Protection Agency, and Porter-Cologne Clean Water Act, State of California.
 - ii. “San Francisco Bay Basin (Region 2) Water Quality Control Plan” (Basin Plan), California Regional Water Quality Control Board, 1995 Edition.
 - iii. Regional Water Quality Control Board – Construction General Permit — Stormwater Pollution Prevention Order No: 2009-0009-DWQ.
 - iv. Small Municipal Separate Storm Sewer System (MS4) General Permit (Section F. Non-Traditional Small MS4 Permittee Provisions), Waste Discharge Requirements Order No: 2013-0001-DWQ.
- b. Contractor shall comply with the following standards and guidelines on storm drain pollution prevention:
 - i. *Stormwater Best Management Practice Handbook – New Development and Redevelopment*; California Stormwater Quality Association
 Order From: California Stormwater Quality Association,
 P.O. Box 2105, Menlo Park,
 CA 94026-2105
 Phone: (650) 366 -1042
 - ii. *Erosion and Sediment Control Field Manual*; California Regional Water Quality Control Board (RWQCB)—San Francisco Bay Region, Third Edition, July 1999.

 Order From: San Francisco Estuary Project
 1515 Clay Street, Suite 1400
 Oakland, CA 94612
 (510) 622-2465
 - iii. *Construction Site Monitoring Program Guidance Manual*; CalTrans

 Order From: Storm Water Liaison,
 Caltrans Division of Environmental Analysis,
 MS 27, P.O. Box 942874
 Sacramento, CA 94274

6. Submittals/Deliverables

- a. Submit a Storm Water Pollution Prevention Plan (SWPPP) to the Construction & Design Project Manager for plan approval. Contractor shall not disturb soil onsite until the University approves the plan.
- If the project disturbs greater than one (1) acre of soil, the University shall send a “Notice of Intent” (NOI) to the RWQCB, with the applicable fee (Contractor shall supply Owner with the check for this fee). Upon completion of the Project, the University shall send a “Notice of Termination” (NOT), as required by the RWQCB. All permit-related documents shall be submitted to the RWQCB by UC Berkeley EH&S.

The plan shall include the following:

- 1. Title Page. The title page shall primarily identify that the document is a SWPPP. Elements that shall be included on the title page are the following:
 - a. UCB Project Name and UCB Project Number,
 - b. Owner and Contractor of the Project,
 - c. Contact person(s)/address/daytime and emergency phone numbers with area codes.
 - d. ••• Waste Discharge Identification Number (WDID No.) for the Project. This number is assigned by the RWQCB upon submission of the NOI. The number shall be included in the plan after it is assigned.

2. •••Certification Page

The Contractor shall include a certification page immediately following the SWPPP title page. This page shall be signed by the University and state the following:

“I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted, is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.”

Name, Title	Date of Preparation
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3. •••Amendments

The Contractor shall amend the SWPPP whenever there is a change in construction or operations which may affect the discharge of significant quantities of pollutants to surface waters, ground waters, or a municipal separate storm sewer system. The SWPPP shall also be amended if it is in violation of any condition of the State of California General Permit or has not achieved the general objective of reducing pollutants in storm water discharges. In addition, the University shall require the Contractor to amend the SWPPP if the discharge is in violation of the RWQCB San Francisco Bay Basin (Region 2) Water Quality Control Plan.

The following items shall be discussed in the Amendment section as appropriate:

- a. Location of proposed change shall be shown on the site map, and referenced in the Amendment section of the SWPPP.
- b. Describe the existing condition and why it is being amended.

- c. List the person or agency who requested the amendment.
 - d. Describe the new control measure.
 - e. Attach a certification page to the beginning of the amendment.
4. Table of Contents
- a. Include a Table of Contents in the SWPPP, including page numbers.
5. Introduction
- a. The Introduction shall provide the following information:
 - i. Type and size of the construction project, including land area in acres.
 - ii. Project location, including county, and address.
 - iii. The beginning date of the Project groundbreaking.
 - iv. The beginning and end dates for all phases.
6. Source Identification and Best Management Practices
- a. Identify storm water and non-storm water pollutant sources at the construction site. Choose an appropriate storm water pollution prevention best management practice (BMP) to control the pollution source.
 - b. Provide in the SWPPP a geographical description of potential storm water pollution sources. Topographic and site maps shall be used for this purpose.
 - i. Topography Map
 - 1. The map shall extend approximately one quarter mile beyond the construction site boundary and show the following: the construction site, surface water bodies (including springs and wetlands), known wells, an outline of off-site drainage discharging into the construction site, general topography, and the storm water discharge locations for construction site storm water.
 - 2. The Contractor shall use a U.S. Geological Survey quad map and shall modify it to show the required information. Include dimensions, scale, legends, flow direction of water bodies, run-on and run-off water and drainage, drainage locations, and delineation of permanent erosion and sediment control measures.
 - ii. Site Map
 - 1. The Contractor shall identify pollution sources, construct and implement storm water and non-storm water pollution prevention BMPs at the construction site. The Contractor shall implement the SWPPP. The Contractor shall include SWPPP for the post-construction pollution sources and erosion and sediment control BMPs. A separate map may be used for showing the locations of the post-construction BMPs.
 - 2. The site map shall be one (1) or more detailed map(s) showing the location of pollution sources, (e.g. construction site drainage patterns, grading activities that change drainage patterns, drain inlets, hazardous materials storage, contaminated soil). The site map shall show the location of BMPs designed to prevent pollution sources from causing storm water or non-storm water pollution. The Contractor shall choose the best available performance-based technology and methods to prevent storm water pollution for construction site activity. Many of those methods are detailed in the reference materials listed in Regulations and Standards, above.
 - 3. The following is a list of BMPs, geographic features or pollution sources to be shown (if applicable) on the site map. Further detail on

these topics is in “Execution” of this Section below (Paragraph number in parentheses).

- a. Storm water flow drainage patterns and grading activities that change drainage patterns (10);
- b. Perennial, intermittent or seasonal surface water bodies, oceans, lakes, rivers, creeks or streams, ponds, springs, and wetlands. (11)
- c. Areas of existing vegetation (12)
- d. Areas of disturbed soil (13)
- e. Existing and planned paved areas and buildings (14)
- f. Dust suppression water management (15)
- g. Fire hydrant protection (16)
- h. De-watering and sediment settling (17);
- i. Erosion and sediment control measures (18);
- j. On-site soils movement and storage (19);
- k. Site ingress and egress mud tracking prevention (20);
- l. Storm drain inlet protection (21);
- m. Construction materials storage (22);
- n. Concrete, mortar, saw cutting (23);
- o. Sanitary Sewer Discharge Point Identification (24);
- p. Fueling, washing and equipment cleaning (25);
- q. Building wash or hydro-blasting water management (26);
- r. Inspection, monitoring and maintenance of BMP control structures (27);
- s. Spill Prevention and Control (28);
- t. Water Main Break Contingency Plan (29);
- u. Housekeeping Practices (30);
- v. Post-construction storm water run-off control measures (31);
- w. Personnel training (32);
- x. List of Contractors and phone numbers (33);
- y. Or other appropriate site-specific storm drain pollution prevention methods necessary to achieve the objectives stated in Section 4: General Contractor Scope, above.

7. Impervious Surface Calculations

- a. All projects regardless of size, will document installations or changes to: landscaping, roofing, walkways, permeable or impermeable surfaces as outlined in both Water Board Order Numbers: 2009-0009-DWQ and 2013-0001-DWQ by using the State Water Board’s Post Water Balance Calculator.

8. Environmental Enforcement

- a. The Regional Water Quality Control Board (RWQCB), East Bay Municipal Utilities District (EBMUD), and the City of Berkeley (COB) have authority to enforce, through codified regulations, any portions of this Section that if not implemented may violate applicable regulations. Agency enforcement may include but is not limited to: citations, orders to abate, bills for cleanup costs and administration, civil suits, and/or criminal charges. Contract compliance action by UC Berkeley shall not be construed to void or suspend any enforcement actions by these or other regulatory agencies.

9. Materials

- a. General
 - i. Provide materials as required for execution of the Work.

10. Execution

- a. For each applicable sub-part(s) below, the Contractor shall delineate on the site map BMP locations and provide a detailed description in the plan for pollution prevention structures or methods that shall be constructed, implemented and maintained on site.

11. Storm Water Drainage Patterns and Graded Slopes

- a. Drainage patterns shall be shown on the site map. Drainage patterns that are modified during the construction of the project shall be clearly shown on the site map. All slopes shall indicate grading ratio and flow direction.
- b. The size of the construction site (in acres).
- c. The run-off coefficient of the site before and after construction.
- d. The percentage of the area of construction that is impervious before and after construction.

12. Surface Water Locations

- a. All surface water locations shall be clearly delineated on the site map. Surface water bodies include: oceans, lakes, rivers, creeks or streams, ponds, springs and wet lands. Include intermittent or seasonal surface water bodies. Estimate the storm water flow onto the site, assuming a ten (10) year six-hour (6h) rain event. Estimate the volume of water the site could contain in trenches, excavations, pier holes, or pits for the different phases of work.

13. Areas Of Existing Vegetation

- a. The Contractor shall protect existing vegetation that is to be preserved on the site from mechanical or other injury during the Project. Areas of existing vegetation shall be clearly delineated on the site map.

14. Areas Of Disturbed Soil

- a. The Contractor shall clearly identify on the site map all areas of soil disturbance. These areas shall include soil removal or augmentation, such as holes, pits, excavations, trenches, berms, slopes, fill, and imported top soil.

15. Existing and Planned Paved Areas and Buildings

- a. Areas that are covered by concrete, asphalt, or other permanent coverage of the soil shall be clearly delineated on the site map. Imprints of buildings shall also be indicated whether they are permanent or temporary.

16. Dust-Suppression Water Management

- a. The Contractor shall use best available dust suppression equipment and methods to control dust so that the dust does not cause discomfort or nuisance to occupants of the project site neighboring property. Contractor shall control dust suppression water so that it is effective in controlling dust, but does not enter the storm drain system. Contractor shall describe its dust suppression water management methods in this plan.

17. Fire Hydrant Protection

- a. The Contractor shall protect fire hydrants on and near the project site from mechanical damage. If the Contractor's or subcontractors' personnel causes damage that results in a release of fire suppression water, the Contractor shall implement the clean-up procedures described in these Specifications.

18. De-Watering and Sediment Management

- a. If storm water or groundwater in site excavations or drilled holes, (e.g., trenches, pits, pier holes, footings), needs to be removed, it shall be made clean by filtering, settling, or other method capable

of removing solids and suspended particles from this water prior to discharge to the storm drain system. The Contractor shall ensure that this discharge complies with all applicable provisions of the Basin Plan (see Paragraph 1.01 of this Section). Contractor will be required to document discharge activity with the EH&S Water Discharge Form: <http://ehs.berkeley.edu/sites/default/files/lines-of-services/environmental-protection/2013ucbwaterdischargeform.pdf>.

- b. If excavation water is domestic supply water, or the water is contaminated with a hazardous substance, then the Contractor shall dispose of according to guidance from the Project Manager. For disposal authorization, the Contractor shall contact the Project Manager (PM) to determine the discharge requirement. The PM will work with UC Berkeley Office of Environment, Health & Safety (EH&S), who will establish the discharge requirements.
 - i. If the Contractor suspects the presence of contaminated groundwater, or domestic supply water, the Contractor shall immediately notify Owner's Representative or EH&S at (510) 642-3073. The Contractor shall not attempt to pump out or treat any material suspected of containing a hazardous material or petroleum product.

19. Description Of Erosion and Sediment Control Measures

- a. Provide a description of erosion and sediment control measures that will be used on the site, and correlate the description with the site map (may be listed on the map in a comments section). Areas requiring erosion control measures are exposed soil, such as soil piles, bare soil, sloped soil, and any area of disturbed soil. Erosion control measures include paving, tarp placement, soil blankets, mulching, seeding, hydro-mulching, the use of straw wattles, and spreading straw. Sediment control measures include drain inlet protection, filter fabric, geo-textile silt fencing, gravel placement, gravel or sandbag placement, sediment settling tanks, and straw wattle placement. This list is not all inclusive and the Contractor shall refer to the resources listed in Paragraph 1.03 of this Section. Both erosion and sediment control practices are designed to be implemented as an integrated system of pollution control. Without erosion controls, sediment controls are easily overwhelmed and will not prevent pollution.

20. On-Site Soils Movement and Storage

- a. The Contractor shall describe and implement proven methods to prevent erosion from soils stored on site.

21. Site Ingress and Egress Management Mud Tracking Prevention

- a. The Contractor shall ensure that mud is not tracked from the site onto public or campus roads. The Contractor shall select the most appropriate Best Management Practice (BMP) to accomplish this.

22. Storm Drain Inlet Protection

- a. The Contractor shall protect storm drain inlets from receiving sediment, hazardous chemicals, gasoline, diesel, oil or grease, trash, debris or other pollutants from the construction site.

23. Construction Materials Storage

- a. Storage and exposure of raw materials, byproducts, finished products, and hazardous materials containers shall be controlled as described below:
 - i. All construction materials shall be stored at least ten feet (10'-0") away from storm drain system inlets, catch basins, and curb returns.
 - ii. The Contractor shall not allow any material to enter the storm drain system.
 - iii. At the end of each working day, the Contractor shall collect and prepare for disposal all scrap, debris, and waste material generated by Project activities.
 - iv. During wet weather or when rain is in the forecast, the Contractor shall store materials, (that can flow or be transported by storm water), inside a building or under a secured waterproof covering to prevent accidental release to the storm drain system. Examples: use sealed debris

bins in rainy weather; store fuel containers out of the weather; cover soil, sand, or debris piles with tarps.

- v. The Contractor is responsible for ensuring that storage and disposal of all hazardous materials brought on site for this project (e.g., coatings, thinners, solvents, and fuels), and all hazardous waste generated during project activities (e.g., waste oil) is in compliance with all applicable federal, state, and local standards and requirements.
- vi. Liquid materials shall be stored in secondary containment. The containment shall be designed to hold at least 110% of the volume of the largest stored container.

24. Concrete, Mortar, Saw Cutting

- a. For concrete or mortar application to be performed on-site, the Contractor shall comply with the following provisions:
 - i. Washing sweepings of exposed aggregate concrete into the street or storm drain system as defined in this Specification is prohibited. Collect and return sweepings to aggregate base stockpile, or dispose of as construction debris.
 - ii. Do not wash out concrete trucks and equipment into the storm drain system. Whenever possible, perform washout of concrete trucks (if any) and equipment off-site where discharge is controlled.
 - iii. If on-site washout of trucks and equipment is necessary, then the Contractor shall comply with the following procedures:
 - 1. Locate washout area at least fifty feet (50'-0") from storm drains, open ditches or water bodies, preferably in a dirt area.
 - 2. Do not allow storm water run-off from the washout area.
 - 3. Construct a temporary pit or berm-enclosed area large enough to contain the wash-water and surplus concrete waste.
 - 4. Wash out concrete waste into the temporary pit where the concrete can set, be broken up, and then disposed of as construction debris. If the volume of water is greater than what will allow concrete to set, allow the wash water to concentrate and/or evaporate, if possible. Otherwise, allow water to settle before filtering it, and then pump to the sanitary sewer (as long as the pH is less than hazardous waste limit of 12.5).
 - iv. Wash-water from tools used for mixing mortar, in sheet rock work, plaster, drywall, mortar work or similar work shall be settled before disposal to the sanitary sewer. Solids shall be disposed to the debris bin. This wash-water is prohibited from storm water discharge.
 - v. Concrete sawing or drill cutting lubricating/cooling water or shall be collected using a wet-vacuum. The lubricating/cooling water shall be settled before disposal to the sanitary sewer. Solids shall be disposed to the debris bin. This lubricant/cooling water is prohibited from storm water discharge.

25. Sanitary Sewer Discharge Point Identification

- a. If the Contractor will be disposing of water from a settling operation, or any other water approved by EH&S for sanitary sewer disposal, the Contractor shall verify with Facilities Services Utilities Operations unit that the manhole used for disposal is a sanitary sewer and not a storm drain. (Note: Do not assume that a manhole is a sanitary sewer, even if the words "sanitary sewer" are embossed on it. Sometimes utility maps and manhole cover designations are incorrect.) The Contractor shall be given Facilities Services' contact information by the Project Manager.

26. Fueling, Washing and Equipment Cleaning

- a. The Contractor shall not perform vehicle cleaning on site, unless a properly designed wash area prevents run-off from entering the storm drain system. Domestic water supply is prohibited from entering the storm drain because it contains chloramines. It can go to the sanitary sewer if the

sediment is allowed to settle before discharge and it meets the standards of the EBMUD Wastewater Discharge Permit pollutant strength limits.

- b. If fueling must occur on-site, use designated areas away from drainage. Locate on-site fuel storage tanks within a berm-enclosed area designed to hold the tank volume. The area shall be covered so that rain water will not get into the berm-enclosed area. The berm-enclosed area shall be lined so that leaks, spills or drips will not contaminate the soil. Use secondary containment while fueling or changing fluids to catch drips or small spills.
- c. The Contractor shall dispose of wash water from the cleaning of non-hazardous water-based coating equipment (such as latex paints or drywall compounds) and tools to the sanitary sewer. Unused latex paint, oil based paint, used or new paint thinner and solvents are prohibited from disposal to the sanitary sewer and the storm drain system. The Contractor shall dispose of these wastes in accordance with federal, state, and local hazardous waste and solid waste regulations.

27. Building Wash Or Hydro-Blasting Water Management

- a. Contractors shall follow UC Berkeley Water Protection Policy (<http://campuspol.chance.berkeley.edu/policies/waterprotection.pdf>) if washing buildings, surrounding environs or hydro-blasting to complete any portion of the Work.

28. Inspection, Monitoring and Maintenance Of Pollution Control Systems

- a. Inspect the site before and after storm events, or during any storm event lasting more than twenty-four (24) hours. Inspections shall be done during the storm water observation period (October 1 through May 1) to ensure that storm drain pollution prevention controls are in place. Provide documentation of these inspections, and improvements or modifications of the control systems. The Contractor shall designate an inspector and list the name and contact information of the inspector in the list of Project contacts as required by the contract submittals. The Contractor shall maintain structural controls and updates/amendments to the SWPPP. Representatives from UC Berkeley shall conduct periodic inspections of the site to verify adequacy of storm drain pollution prevention controls and compliance with applicable regulations and standards as stated in subpart 1.03(A).
- b. UC Berkeley shall disclose historic site activities that may have included the use of hazardous materials (e.g., gas station, dry cleaner, underground storage tank, manufacturing facility) and that have or are suspected to have caused pollution at the Site. The University shall write and implement a plan to monitor, sample and analyze storm water discharges for pollutants related to the construction activity. If applicable to Site conditions, the Contractor shall include this hazardous materials monitoring plan in the SWPPP.

29. Spill Prevention and Control

- a. The Contractor shall take precautions to prevent accidental spills of pollutants, including hazardous materials brought onsite by the Contractor. However, in the event of a spill, the Contractor shall be held responsible for the following:
 - i. Immediately contain and prevent leaks and spills of prohibited pollutants from entering the storm drain system. Clean up the spill and label the container. Store the container in a safe place and contact the Project Manager to arrange disposal of the waste. The Contractor shall keep a spill kit on site at all times for this purpose.
 - ii. The Contractor shall comply with all federal, state, and local hazardous waste requirements and ensure that no spilled materials are washed into the storm water or non-storm water systems.
 - iii. Report any hazardous or unknown material spills immediately to EH&S at 510-642-3073. If a spill occurs after hours or on a weekend, call 9-911 from campus phones (911 from off-campus phones, or 642-3333 from cellular phones) to contact the UC Berkeley Police Department.

- b. The Contractor is responsible for ensuring that its employees and subcontractors (if any) working on site are aware of the location of the campus phone nearest the Project site.

30. Water Main and Sanitary Sewer Line Break Contingency Plan

- a. If working on or near a water main line or sanitary sewer line, the Contractor shall have a written emergency response plan that states procedures for responding to a break and release of supply water to the storm drain system. The Contractor shall meet the following requirements:

- i. Water Main Work

- 1. Determine the direction of water flow if the main were to break.
 - 2. Build a containment berm between the work area and the storm drain inlet(s) that the water would flow into. Make the containment structure large enough to hold the water so that it can be pumped to a sanitary sewer.
 - 3. Build this containment structure before digging.
 - 4. If there is a water main break, pump the water that collects in the containment structure to a sanitary sewer.
 - 5. If the containment fails, prevent chlorinated water from entering the storm drain system by placing dechlorination sodium sulfite tablets in the sewage according to Attachment 2 of this Section.
 - 6. Put in place, before digging, sediment control structures upstream of drain inlets and at drain inlets.
 - 7. If a break occurs, contact the Project Manager (PM) or Inspector of Record immediately. Include in the plan the phone numbers of the PM and EH&S contacts.

- ii. Sanitary Sewer Line Work

- 1. This sub-part applies only to Contractors who are hired to work on sanitary sewer lines and are trained to work near sewage.
 - a. Determine where the sewage will flow if the Work could cause a blockage.
 - b. Build a containment structure between the work area and the storm drain inlet(s) that the sewage water would flow into. Make the containment structure large enough to hold the sewage flow so that it can be pumped to a sanitary sewer.
 - c. Build the containment before working on the sewer line. Put in place, before digging, solids (toilet paper, etc.) control structures upstream of drain inlets and at drain inlets.
 - d. If a sewage blockage occurs, pump it to a sanitary sewer, and do not allow it to flow into the storm drain system.
 - e. If the containment fails, prevent chlorinated water from entering the storm drain system by placing dechlorination sodium sulfite tablets in the sewage according to Attachment 2 of this Section).
 - f. If a sewage blockage or spill occurs, contact the Project Manager or Inspector of Record immediately. The PM will immediately notify EH&S. Include in the plan the phone numbers of the PM and EH&S contacts.

- iii. Excavation Work

- 1. This Paragraph applies to Contractors who excavate in the vicinity of sanitary sewer lines and cause or discover a sewage spill, leak or blockage.
 - a. Immediately notify the Project Manager (PM). The PM shall immediately notify EH&S. Include in the plan the phone numbers of the PM and EH&S contacts.

31. Housekeeping Practices

- a. The Contractor shall implement the following applicable good housekeeping practices:
 - i. Store materials that have the potential to be transported to the storm drain system by storm runoff or spillage away from areas of heavy traffic and under cover in a contained area or in sealed waterproof containers.
 - ii. Use tarps on the ground to collect fallen debris or splatters that could contribute to storm water pollution.
 - iii. Secure opened bags of powdered materials (if any) that could contribute to storm water pollution and visible dust emissions.
 - iv. Pick up litter, construction debris, and other waste generated by Project activities daily from adjacent areas, including the sidewalk area, gutter, street pavement, and storm drains impacted by the Project. All wastes shall be stored in covered containers, disposed of, or recycled immediately.
 - v. Clean sidewalks, driveways, or other paved areas within the construction site to eliminate or prevent mud-tracking conditions. Vacuuming, power sweeping, or manual sweeping is acceptable. Dispose of sweepings in a place that shall not pollute the storm drain system. Domestic water may be used but it shall be contained and directed to landscapes or the sanitary sewer. The discharge of wash-water to the storm drain system is prohibited.
 - vi. Inspect vehicles and equipment arriving on site for leaking fluids, and promptly repair leaking vehicles and equipment. Use drip pans to catch leaks until repairs are made.
 - vii. Avoid spills by handling materials carefully. Keep a stockpile of appropriate spill clean-up materials, such as rags or absorbent materials, readily accessible on site. Clean up all spills of materials brought on site for project activities according to the requirements of these specifications.
 - viii. Train employees regularly on good housekeeping practices and procedures. Assign responsibility to specific employees for inspecting good housekeeping, and responding to spills.

32. Post-Construction Storm Water Run-Off Control Measures

- a. All permanent structural and nonstructural control measures that are planned for the project to control pollutants in storm water discharges after construction is completed shall be delineated on a site map. These controls shall be part of the design of the project and included in the architectural drawings. Post-construction Best Management Practices (BMPs) include, but are not limited to:
 - i. Minimization of land disturbance
 - ii. Minimization of impervious surfaces
 - iii. Treatment of storm water run-off using infiltration
 - iv. Water detention/retention
 - v. Bio-filter BMPs
 - vi. Efficient irrigation systems
 - vii. Ensuring that interior building drains and trash enclosures are tied to the sanitary sewer system, and not the storm drain system
 - viii. Appropriately designed and constructed energy dissipation devices
- b. Post-construction BMPs shall be consistent with all local post-construction storm water management requirements, policies and guidelines as mandated by:
 - i. State Water Resources Board Order No. 2013-0001 DWQ – Phase II Small MS4 Permit for sites below an acre and;
 - ii. State Water Resources Board Order No. 2009-0009 as Modified by 2010-0014 DWQ for sites above an acre, registered in SMARTS.
- c. The Contractor shall provide operation and maintenance manuals for post-construction storm water management controls installed as part of this Project. Funding for the operation and maintenance of the BMPs shall be identified by the Project Manager, and included in the manuals by the Contractor.

- d. The Contractor shall refer to construction drawings for post-construction BMPs and include them in the SWPPP.
- e. Develop a maintenance plan for the permanent BMPs installed at the site.

33. Personnel Training

- a. The Contractor shall train its employees working on the site on the requirements contained in this Section. The Contractor shall document this training in writing. University Representatives for the site will request to see the training materials and records at the onset of work.
- b. The Contractor shall inform all subcontractors (if any) of the water pollution prevention requirements contained in this specification and include appropriate subcontract provisions to ensure that these requirements are met.

34. List Of Contractors Designated SWPPP Contacts and Phone Numbers

- a. Provide a list of employees who shall be responsible for writing, implementing and updating the SWPPP.

01 58 00 Project Identification

01 58 13 Temporary Project Signage

- 1. Advertising Signage: The use of Contractor or subcontractor advertising signage is prohibited except as approved by the Owner's Representative in a written contract between the advertising entity and the owner. Do not display such advertising or job signs except as may be required for identification and deliveries as approved by the Owner's Representative.
- 2. Owner-Furnished Warning Signs: Whenever required by the Owner's Representative, post Owner-furnished warning signs in locations as directed.

01 60 00 Product Requirements

01 61 00 Common Product Requirements

- 1. Manufacturers of products shall have produced said product (or like product) for at least five (5) years.
- 2. Cut sheets, installation manuals, and operations and maintenance manuals for each product shall be published, in English, on the manufacture's website and easily accessible. Contractor to furnish this documentation via submittals outlined in 01 78 00 *Closeout Submittals*.
- 3. Manufacturers shall have been doing business in the State of California for a minimum of five (5) years.

01 64 00 Owner-Furnished Products

1. General

- a. Certain materials, equipment and other items are identified in the Contract Documents as being furnished by the Owner and installed by the Contractor.
- b. In all cases so identified, the Contractor shall give timely notice to the Owner's Representative of its readiness to perform the Work.
- c. The Contractor shall receive all material furnished by the Owner or others at the Project site, as designated by the Owner's Representative. Upon delivery, the Contractor shall inspect the material and notify the Owner's Representative of any damage or insufficiency that would preclude the Contractor performing the Work.
- d. Where material furnished by others requires connections or attachments made by Separate Contractors for other Bid Packages, the Contractor shall coordinate with such other Separate Contractors to assure a complete installation.