



**SAN DIEGO
COMMUNITY COLLEGE
DISTRICT**

San Diego Community College District Holistic Administrative Plan

Chapter 5- Facilities and Equipment Services

7400.14

Chemical Hygiene Plan



PROGRAM AUTHORIZATION

Chancellor	
_____	_____
Trustee	Trustee
_____	_____
Trustee	Trustee
_____	_____
Trustee	
_____	_____
Vice Chancellor, Facilities	Vice Chancellor, Human Resources

Risk Manager	
Date: _____	



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3. *Properly implementing safe chemical and waste handling practices in the accomplishment of their duties* 3

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5. *Staying informed of all chemical hazards they may come into contact with*..... 3

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1. *Bonded: a method of equilibrating the electrical potential difference between two containers to prevent the buildup of static electricity by using a conductor attached to both containers.* 3

2. *Chemical: for the purposes of this Program, the term chemical refers to any substance with the exception of water.* 3

3. *Compressed gas cylinder: also referred to as ‘cylinder;’ a pressure vessel designed for the sole purpose of containing high-pressure or liquefied gases above atmospheric pressure; equipped with a valve to control the release of contents, cylinders can range from low pressure (e.g., propane at 28 psi) to high pressure (e.g., oxygen at 4500 psi); sizes can range from ‘lecture bottle’ (12-18 inches) to liquefied cryogenic gas cylinders (>60 inches by 20 inches);*..... 3

4. *Control measures: means (physical or procedural) to reduce the level of risk associated with a hazard*..... 3

5. *Employee: any individual who receives compensation from the San Diego Community College District in exchange for services, including employed students*..... 3

6. *Fume hood: a cabinet enclosed on three sides, top and bottom with an integral mechanical exhaust ventilation system designed to contain and minimize employee exposure to hazardous vapors, fumes, and mists*



by way of negative pressure;..... 3

7. *Grounded: a means of reducing the buildup of static electricity by providing a conductive path to the earth;*4

8. *Hazardous material: a hazardous material is a chemical that poses a viable risk to the health or well-being of an individual by way of its ability to burn (flammability), dissolve flesh or steel (corrosivity), result in deleterious health effects (toxic), or react with other chemicals in a manner that produces another hazard (reactivity); chemicals may also be classified by their known or suspected ability to cause cancer (carcinogen), impact the reproductive system (reproductive toxin), or impact a developing fetus (teratogen); the State of California also designates specific chemicals as ‘extremely hazardous’ and the Environmental Protection Agency designates specific chemicals as ‘acutely hazardous;’* 4

9. *Hazardous Waste Manifest: a document that is used to track the movement of hazardous waste from the originator of the waste (generator) to its final disposition location; the use of a Manifest does not absolve the generator of responsibility of the waste but is used to confirm the waste was delivered to an appropriate facility that, by permit and construction, is able to receive hazardous waste;*..... 4

10. *Hazardous waste: a material that no longer serves a purpose to the Facility or College and has certain characteristics that are harmful to people or the environment; chemicals that are no longer useable for their original intended purpose or are no longer useful to the possessor; unused chemicals that are not wanted by the possessor are considered waste;*..... 4

11. *Sash: an integral feature of a fume hood; a moveable partition designed to increase or decrease the accessible area of a fume hood’s face which also results in modifying the velocity if in-flowing air;*..... 4

12. *Table-top hoods: ventilated enclosures that are designed to remove noxious odors from employee and student work areas; used to hold small amounts of non- to low-toxicity chemicals; do not provide any fire or explosion resistance; are not outfitted with sashes; for the purposes of this Program, they are not considered fume hoods;*..... 4

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4. *These spills can be handled by the employee responsible using the nearest spill kit ONLY if appropriately trained and equipped. 23*
5. *The Dean or Supervisor will complete and submit an Injury and Illness Incident and Investigation Report within 24 hours. 23*

B. Moderate Spills 23

Spills of less than two liters (2 L) of low hazard materials, including volatiles and irritants, and less than fifty milliliters (50 mL) of highly hazardous materials: 23

1. *If a person is splashed with chemicals, rinse the area with copious amounts of water..... 23*
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3. *The area of the spill shall be cordoned off by way of caution tape or closing laboratory doors. 24*
4. *The supervisor shall obtain the Safety Data Sheets for the spilled chemical(s). 24*
5. *Facilities Maintenance should be contacted immediately to assist with the spill response. 24*
6. *Appropriately trained responders shall be contacted immediately to clean up the spill. 24*
7. *If chemicals are migrating towards drains, sanitary sewer accesses, or surface waters, the nearest spill kit shall be accessed. 24*
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9. *If the material is volatile or toxic, the clean-up must be performed by a properly trained individual using a respirator with the proper cartridges, chemical protective clothing, and proper chemical-resistant gloves.* 24

10. *Any sorbent material (pillows, pads, absorbent solids) or other disposable material used shall be packaged in a plastic bag, sealed, and disposed of as hazardous waste.* 24

11. *Any reusable items used during spill cleanup, such as dustpans and hand brooms, shall be decontaminated after use.* 24

12. *The Dean or Supervisor will complete and submit an Injury and Illness Incident and Investigation Report within twenty-four (24) hours.* 24

13. *If the chemical touches bare earth, surface water, or enters a public sewer, the Dean or Supervisor will properly notify the San Diego County Hazardous Materials Division of the release for proper reporting and further required actions.* 24

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1. *College Police Dispatch (6405 or 619-388-6405) shall be contacted immediately to request assistance from the local Hazardous Materials Response team or hazardous waste contractor to address the release/spill.* 25

2. *Injured persons shall be assisted and addressed as applicable and contaminated persons, even if injured, shall be isolated.* 25

4. *The Supervisor or Dean will determine if the Emergency Action Plan needs to be initiated.* 25

5. *The area around the spill/release shall be cordoned off at a safe distance, determined by the amount, scope, and chemical involved.* 25

6. *The HVAC system in building shall be turned off by Facilities Maintenance or the area shall be atmospherically isolated from other locations.* 25

7. *For flammable chemical spills or gas releases, all sources of ignition need to be immediately extinguished, including open flames, heating mantles, vacuum pump motors, and powered equipment.* 25

8. *The Dean, Faculty member, or ILT shall provide the SDS to first responders.* 25

9. *The Dean or Supervisor will complete and submit an Injury and Illness Incident and Investigation Report within twenty-four (24) hours.* 25

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4. *Records of this training will be retained by the Dean or supervisor and forwarded to the Risk Management Office.* 26

5. *All employees who will respond to spills in order to clean up and prevent further contamination or supervise the activities of those who will must be 29 CFR 1910.120/8 CCR 5192 (Hazardous Waste Operations and Emergency Response (HAZWOPER)) trained.* 26



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1. For the purposes of this section, ‘used oil’ is any refined or synthetic product that has been used and is contaminated with physical (metal shavings) or chemical (water) impurities. Oils include 30

2. Used oil is managed as hazardous waste unless it is to be recycled. 30

3. Used oil shall be placed in appropriate containers and are subject to the container requirements of hazardous waste..... 30



4. *In addition to the hazardous waste labeling requirements, the containers must be labeled "Used Oil" ... 30*

5. *Funnels may be used to add material to the container..... 30*

6. *Containers receiving used oil shall be placed on drip pads, containment skids, or other means to prevent oil dripping onto the ground and to contain any leaks or spills. 30*

7. *Used oil containers shall be removed with other hazardous waste during regularly scheduled pickups. .. 30*

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3. *Empty filters are placed in a rigid container clearly labeled "Drained Used Oil Filters." 31*

4. *The filters must be delivered to the recycling center within one (1) year of the accumulation start date. 31*

5. *A record of the delivery to the recycle center ('bill of lading') must be obtained and kept for three (3) years. The record must include..... 31*

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 3. *For instructional laboratories, 38*

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 1. *Each Facility, during its chemical inventory, must determine whether any of the following carcinogens as identified by the State of California are present at the listed concentration: 39*

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 3. *The welding operation shall be outfitted with local exhaust ventilation (LEV)..... 40*

 4. *Due to the infrequent exposure of employees to welding, less than 30 days per year, engineering controls, work practice controls, monitoring, and medical surveillance are not required (8 CCR 5206(g)(1)(D)). 40*

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I. PURPOSE

The Board of Trustees, recognizing that the health, safety, and well-being of its employees is of paramount importance in the management of the San Diego Community College District, affirms its commitment to create and maintain a safe and healthful working environment.

The San Diego Community College District Chemical Hygiene Program (CHP) provides direction to minimize the exposure of employees, students, and the community to hazardous chemicals. This Program sets out provisions to control the exposure and release of hazardous chemicals by way of control methods, work practices, and personal protective equipment. The goal of the CHP is to control the intentional and unintentional movement of hazardous materials on District property.

This program is applicable to all laboratories, maintenance and facilities operations, or any other District location that uses or stores chemicals. All employees who handle non-household chemicals or household chemicals that are used in bulk amounts are also covered by this program.

II. DISTRICT POLICIES AND PROCEDURES

SDCCD Administrative Procedure 4800.1
SDCCD Administrative Procedure 7400.14

III. AUTHORITY

The Chancellor has ultimate authority and responsibility for the health and safety programs within the district. Creating a broad-based accountability for safety is the responsibility of the Chancellor and District leadership.

The Chancellor has designated the Vice Presidents of Administration and the Regional Facilities Officers to act as the CHP administrators at each College within the District. At the District Office, the designees are the Risk Manager and District Architect while at the District Facilities Services Center, it is the Director of Facilities.

To ensure effective implementation of this program, all personnel designated to carry out specific responsibilities are expected to know and understand the procedures outlined in this document and the specific contents of this *Chemical Hygiene Plan* for their assigned facility.

A. Chancellor’s Designated Chemical Hygiene Officer

The Chemical hygiene Officer has the authority and are responsible for the implementation and maintenance of this program, including:

1. Developing or adopting the necessary policies and programs to adequately maintain a safe and healthful work and learning environment at the facilities of their responsibility
2. Conducting formal inspections of each assigned workplace. The inspections shall include appropriate documentation of the physical workplace, chemical hazards, work practices, new processes, recently reported accidents, and employee suggestions

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3. Conducting investigations of all chemical exposures
4. Providing for proper protective equipment for personnel who handle chemicals and respond to spills
5. Reporting all chemical hazards involving an imminent danger to employees or students immediately to the College President, with a recommendation for abatement
6. Recommending to the College Safety Committee any additions or changes to the Chemical Hygiene Plan
7. Assisting supervisors in conducting workplace hazard assessments to identify, evaluate, and correct chemical hazards
8. Providing for training to those employees required to abide by this *Program*
9. Assigning designees to fulfill all aspects of this *Program*.

B. Risk Management Office

The District Risk Management Office is responsible for the oversight and maintenance of this program, including:

1. Reviewing the program annually and updating, as necessary
2. Evaluating the adequacy and consistency of chemical safety-related training in the district
3. Providing technical expertise to all Chancellor’s Designees, as requested and required
4. Monitoring Cal/OSHA standards for relevant regulatory changes
5. Conducting periodic program audits and inspections at District facilities to evaluate compliance with all Federal, State, County, District, Facility, and College chemical handling and hazardous waste regulations
6. Reviewing site-specific programs drafted by the independent Colleges to ensure compliance and consistency with regulations, this program, and District policy.

C. Facilities Maintenance

The Facilities Maintenance Office is responsible for the implementation of this program, including:

1. Planning, organizing, and coordinating chemical safety training
2. Monitoring and overseeing hazardous waste activities, including coordinating with the hazardous waste contractor
3. Maintaining equipment necessary for the safe handling of chemicals, such as ventilation systems, eyewash and safety showers, fire extinguishers, and alarm systems
4. Maintaining appropriate permits, including filing required annual elements with the appropriate State and County departments
5. Maintaining the records of inspections, hazard abatements, and training.

D. Supervisors

Supervisors are responsible for implementing and enforcing the provisions of this program, including:

1. Identifying locations where chemicals are present and activities where chemicals are used



- in their area(s) of responsibility
- 2. Training employees on proper chemical hygiene practices
- 3. Providing personal protective equipment and technical expertise to employees
- 4. Identifying proper chemical and waste storage locations
- 5. Reporting to the Risk Management Office any chemical exposures, regardless of the route of entry (inhalation, absorption, ingestion, injection)
- 5. Assigning designees to fulfill all aspects of this Program.

E. Employees

Employees are responsible for

- 1. Completing all necessary training
- 2. Complying with all aspects of the *Chemical Hygiene Program*
- 3. Properly implementing safe chemical and waste handling practices in the accomplishment of their duties
- 4. Reporting all exposures and near misses to the appropriate supervisor
- 5. Staying informed of all chemical hazards they may come into contact with
- 6. Reporting any program deficiencies to their supervisor or the Risk Management Office.

F. Students

While students are not specifically covered under the provisions of the regulations due to their non-employee status, students shall be made aware of chemical health and safety hazards in laboratories. Students are responsible for conducting each operation in accordance with prescribed chemical hygiene procedures. Blatant disregard for provisions of this program will result in being excused from the laboratory or other areas where chemicals are present.

IV. DEFINITIONS

- 1. *Bonded*: a method of equilibrating the electrical potential difference between two containers to prevent the buildup of static electricity by using a conductor attached to both containers.
- 2. *Chemical*: for the purposes of this *Program*, the term chemical refers to any substance except for water.
- 3. *Compressed gas cylinder*: also referred to as ‘cylinder;’ a pressure vessel designed for the sole purpose of containing high-pressure or liquefied gases above atmospheric pressure; equipped with a valve to control the release of contents, cylinders can range from low pressure (e.g., propane at 28 psi) to high pressure (e.g., oxygen at 4500 psi); sizes can range from ‘lecture bottle’ (12-18 inches) to liquefied cryogenic gas cylinders (>60 inches by 20 inches);
- 4. *Control measures*: means (physical or procedural) to reduce the level of risk associated with a hazard.
- 5. *Employee*: any individual who receives compensation from the San Diego Community College District in exchange for services, including employed students.
- 6. *Fume hood*: a cabinet enclosed on three sides, top and bottom with an integral mechanical exhaust ventilation system designed to contain and minimize employee exposure to hazardous vapors, fumes, and mists by way of negative pressure;



7. *Grounded*: a means of reducing the buildup of static electricity by providing a conductive path to the earth;
8. *Hazardous material*: a hazardous material is a chemical that poses a viable risk to the health or well-being of an individual by way of its ability to burn (flammability), dissolve flesh or steel (corrosivity), result in deleterious health effects (toxic), or react with other chemicals in a manner that produces another hazard (reactivity); chemicals may also be classified by their known or suspected ability to cause cancer (carcinogen), impact the reproductive system (reproductive toxin), or impact a developing fetus (teratogen); the State of California also designates specific chemicals as ‘extremely hazardous’ and the Environmental Protection Agency designates specific chemicals as ‘acutely hazardous;’
9. *Hazardous Waste Manifest*: a document that is used to track the movement of hazardous waste from the originator of the waste (generator) to its final disposition location; the use of a Manifest does not absolve the generator of responsibility of the waste but is used to confirm the waste was delivered to an appropriate facility that, by permit and construction, is able to receive hazardous waste;
10. *Hazardous waste*: a material that no longer serves a purpose to the Facility or College and has certain characteristics that are harmful to people or the environment; chemicals that are no longer useable for their original intended purpose or are no longer useful to the possessor; unused chemicals that are not wanted by the possessor are considered waste;
11. *Sash*: an integral feature of a fume hood; a moveable partition designed to increase or decrease the accessible area of a fume hood’s face which also results in modifying the velocity if in-flowing air;
12. *Table-top hoods*: ventilated enclosures that are designed to remove noxious odors from employee and student work areas; used to hold small amounts of non- to low-toxicity chemicals; do not provide any fire or explosion resistance; are not outfitted with sashes; for the purposes of this *Program*, they are not considered fume hoods;
13. *Universal waste*: waste that it widely produced by households and by businesses; the wastes are considered hazardous, but due to the prevalence in non-industrial businesses and homes, are handled in a different manner than hazardous waste;

V. CONTROL MEASURES

The control of the exposure, release, and spread of hazardous chemicals and waste is accomplished by the integration of engineering controls, administrative controls, and personal protective equipment.

A. Engineering Controls

1. Fume hoods

Fume hoods are commonly located in chemistry and biology instructional laboratories; however, other locations may incorporate fume-style hoods for the storage and handling of hazardous chemicals. Biological safety cabinets are not the same as fume hoods as they lack the construction and safety features of chemical fume hoods. Table-top hoods are useful only for small quantities of non- to low-toxicity substances, due to lower flow velocities and lack of explosion containment, when compared to full-sized fume hoods.



- a. Fume hoods shall be used when handling volatile chemicals or chemicals with low occupational exposure limits (<200 ppm or <50 mg/kg, time-weighted average (24 CCR, Part 9)).
- b. Fume hoods shall be used when consolidating hazardous wastes.
- c. The fume hoods shall remain running whenever chemicals are present in the hoods unless maintenance is being performed on any portion of the system
 - 1) When maintenance is being performed, all containers shall be securely capped or removed to prevent the escape of vapors and exposure of maintenance personnel.
 - 2) The status of the fume hood shall be verified by a green indicator light and the affixing of a light-weight tape or other material to qualitatively demonstrate the negative pressure of the hood face.
- d. The fume hoods shall maintain an average face velocity of at least 100 fpm.
 - 1) If the hood falls below 80 fpm or the alarm actuates with audible alarm or blinks red, all work in the hood is to be immediately stopped, all chemicals and waste shall be removed from the hood, and the hood shall be labeled "Do Not Use" with date, initials, and reason for removal. Maintenance should be contacted to evaluate the hood.
 - 2) No point of the fume hood face may measure less than 70 fpm.
- e. Fume hoods are checked annually by a qualified person.
 - 1) Labels with inspection date and sash opening height shall be affixed to the fume hood where they are readily seen by users.
 - 2) Qualitative assessment of the hoods' ability to draw air by way of a tracer gas or other visualization test shall be performed at least once every two (2) years with the annual flow testing.
 - 3) The face velocity at which the alarm actuates shall also be determined using a one-point, center of hood face reading.
 - a) The alarm should actuate at or above 80 fpm.
 - i. If the alarm does not actuate, the hood shall be removed from service, the Regional Facilities Operator shall be notified, the laboratory supervisor shall be notified, and the hood shall be labeled "Do Not Use" with date, initials, and reason for removal from service.
 - ii. The alarm shall be serviced as soon as possible.
 - iii. Re-testing shall be performed prior to the hood being put back into service.
 - 4) Records of fume hood checks are kept with Laboratory Supervisor.
- f. When chemicals are present in the fume hood, the sash shall not be raised above the designated height.
- g. The sash may be lower than the designated height but may not be fully closed at any time, unless the unit is off and all chemicals have been removed.
- h. Baffles and vents shall not be blocked by equipment or containers.
- i. Hoods are equipped with audible and visual alarms that actuate when the face velocity decreases to 80 fpm or below.
 - 1) If the alarm sounds and the sash is at the designated height, work in the hood shall be immediately stopped, the laboratory manger notified, the hood marked with a sign, and Facilities notified immediately to correct the



- problem.
- 2) The posted sign shall read “Do Not Use” and be marked with the date of posting, reason for posting, and individual posting sign.
- 3) All chemicals within the hood shall be properly capped or moved to another hood.
- j. Employees and students must not place head inside of fume hood while chemicals are present.
- k. Any required maintenance or adjustments are performed by Facilities Maintenance or an outside contractor.
- l. Chemicals shall not be permanently stored in instructional laboratory fume hoods.
 - 1) Only chemicals that are being actively used shall be placed in hoods.
 - 2) Exception- chemical waste receiving containers may be stored in the fume hoods.
 - a) These containers must be capped with appropriate lids when waste is not being put into them.
 - i. If funnels are used to add waste, the funnel can be left in place if it has an appropriate cap or lid and an interface that hinders the escape of vapors.
 - b) Appropriate caps must always remain near or on the bottles.

2. Chemical Storage Cabinets

Chemicals should be stored in specially designed cabinets in chemical storerooms or in hazardous waste accumulation areas. These cabinets must

- a. Be made of materials compatible with the chemicals stored within (e.g., plastic or wood for corrosives, metal for flammables) Be properly rated for the chemicals they contain, such as fire resistance
- b. Be inspected at least annually for signs of corrosion or damage
 - 1) Records of inspections shall be kept for three (3) years.
- c. Be properly vented if they store volatile organic or volatile corrosive materials
 - 1) Flammable cabinet venting shall be metal.
 - 2) Corrosive cabinet venting shall be plastic.
- d. Be outfitted with secondary containment for corrosives, such as plastic pans.
- e. Be properly secured to the structure
- f. Be limited to sixty (60) gallons of flammable materials each and only three (3) flammable cabinets per area, unless separated by one hundred (100) feet
- g. Allow for the proper segregation and separation of incompatible chemicals.
 - 1) Water reactive chemicals shall not be stored in the same cabinet or room as flammable or combustible liquids.
 - 2) Acids and bases shall be stored separately
 - 3) Oxidizing acids (e.g., nitric and perchloric) shall be segregated and separated from other acids.
- h. Have doors that close and secure properly



- i. Be located away from emergency access and egress areas such as hallways, stairwells, and doorways.

B. Administrative Controls and General Safety Guidelines

Administrative controls are policies and procedures designed to reduce employee and student exposure to hazardous chemicals. The use of standard operating procedures (SOP's), general laboratory guidelines, housekeeping, and chemical handling procedures are administrative controls used by the District to minimize and contain the release of any chemicals.

1. Standard Operating Procedures

- a. This program, combined with training, will act as the Standard Operating Procedures for those processes that involve chemical movement, storage, and waste handling.
- b. Individual facilities may write supplemental Standard Operating Procedures to delineate site-specific program compliance for their unique programs and hazards.
- c. For instructional laboratory applications, the supplemental Standard Operating Procedures will consist of written laboratory experiments.
 - 1) Each Faculty member that uses chemicals in an instructional laboratory setting shall set forth, in writing, the proper use, handling, and disposal of the chemicals and provide a copy to each student prior to the laboratory exercises.
 - 2) Any deviations by students must be previously approved by the Faculty member responsible for the experiment.

2. General Chemical Safety Guidelines

- a. Personnel should not work with or transfer flammable or toxic chemicals alone.
 - 1) If staffing levels result in individuals working alone, the area where chemicals are stored, mixed, prepared, or used shall have a designated notification system (alarm or communication device) to alert personnel in the area of a potential emergency.
 - 2) The notification system should be constantly monitored by a campus authority cognizant of the alarm's purpose.
- b. Hands should be washed with soap and water prior to leaving the area where chemicals are used.
- c. No eating or drinking, including taking medication and using smokeless tobacco, is allowed in areas where chemicals are used or stored.
- d. Horseplay is prohibited.
- e. Running is not allowed in laboratories, stock rooms, or storage locations.
- f. No applying of cosmetics or contact lenses is allowed in areas where chemicals are used or stored.
- g. Do not touch door handles with gloved hands.
- h. Do not smell chemicals unless as part of a monitored experiment.



- i. Do not taste chemicals.
- j. Mouth pipetting is forbidden.
- k. All work with volatile chemicals shall be conducted in the fume hoods or other well-ventilated areas.
 - 1) The fume hood shall be operating and the alarm system status should be green.
 - a) If the alarm sounds or indicator light turns red, the chemical(s) in the hood will be immediately capped or covered and work will stop immediately.
 - 2) Work with small amounts (<500 mLs) of non-toxic chemicals may be conducted outside of the hood.
- l. Work with volatile irritants, such as ammonium hydroxide or acetic acid, shall be conducted in the fume hoods.
- m. Any process that involves heating or evaporating chemicals shall be conducted in the fume hood.
 - 1) Volatile chemicals shall not be placed in chemical fume hoods as a manner of disposal.
- n. Areas where chemicals or waste are stored shall be secured from unauthorized access.
- o. Mixtures will be handled as if their properties are consummate with the most hazardous component.
- p. Chemicals that require special handling or safety requirements shall not be ordered without the express approval of the Dean or Supervisor and the Risk Management Office to ensure that adequate controls are available and appropriate.
- q. Lined waste receptacles shall be made available for disposable items used in experiments, chemical sampling, chemical transfers, or materials used to clean up chemical drips and spills.
 - 1) The receptacles shall be labeled as hazardous waste. Refer to Section VI of this *Program* for labeling requirements.
 - 2) Solid waste chemicals shall not be placed in these receptacles but shall be placed in separate, properly labeled containers.
 - 3) The receptacles shall be subject to the same time limitations as other hazardous waste collection vessels.

VI. Housekeeping

- a. All doorways and walkways are to remain clear and free from obstructions.
- b. The area around eyewashes and safety showers shall always remain clear of obstructions to a distance of at least twenty-four (24) inches.
- c. The area around gas supply valves shall always remain clear of obstructions to a distance of at least twenty-four (24) inches.
- d. Glassware shall not be left out on the laboratory tables or counters and should be stored in cabinets or on the drying racks.
- e. Areas shall be kept clean and neat.
- f. Procedures that are more likely to result in splashing or spilling of chemicals, such as stirring, vortexing, or decanting, should be performed on disposable bench protectors or absorbent mats.



- 1) Bench protectors and mats can be used until visibly soiled or, in instructional laboratories, after one day of classes.
- 2) If material is spilled on the protector or mat, it shall be replaced as soon as possible and disposed of as hazardous waste.
- f. Small drips or spills of chemicals shall be wiped up immediately using appropriate chemical protective gloves and proper materials for the chemical.
 - 1) Materials used for cleaning small spills shall be disposed of as hazardous waste.
 - 2) Spilled solid material shall be cleaned up immediately and disposed of as hazardous waste.
- g. Any items used to weigh chemicals, such as weigh boats or weigh papers, shall be disposed of as solid hazardous waste.
- h. Disposable cuvettes, culture tubes, pipettes, pipette tips, and scoops shall be disposed of as hazardous waste.
- i. Broken glass shall be disposed of in designated containers.
 - 1) Broken glass shall not be picked up by hand but shall be swept with a broom into a dustpan or picked up using tongs and disposed of in the designated container.
 - 2) The container shall be lined with a plastic bag to prevent liquids from leaking out of the container.
 - 3) The entire container will be disposed of when more than half full.
 - a) The lid will be secured and sealed with tape and the entire box will be disposed of as hazardous waste.
 - 4) These receptacles can be used for other types of solid, hazardous waste such as used gloves, pipettes, or test tubes.
- j. Sharps, such as scalpel or razor blades, shall be disposed of in an appropriate rigid container.
 - 1) The sharps container shall be disposed of when more than half full.
 - a) The lid shall be secured and taped to the container prior to disposal.
 - b) The container shall be properly labeled as hazardous waste.
 - c) The container can be placed in the solid hazardous waste receptacle.

3. Chemical Handling

Chemical handling is the application of best practices to minimize the risk in using, moving, or transferring chemicals. The basis of safe chemical handling is being aware of what chemicals are present in the workplace and their associated hazards.

a. Chemical Inventory

- 1) A chemical inventory shall be conducted at least annually and will be retained by each Department.
 - a) Refer to the *Hazard Communication Program*, Section VI for additional information and requirements for the inventory.

b. Receiving Chemicals



- 1) The District will not accept donations of chemicals, either new or partially consumed.
 - a) All chemicals will be purchased from vendors, manufacturers, or distributors.
- 2) All chemicals shall have the date received and person receiving written on the label in permanent ink.
- 3) Chemicals shall be marked with date and initials when first opened.
- 4) For chemicals received or opened prior to the implementation of this program, stickers shall be placed on the container reading “Received/opened prior to (date)” and initialed by the individual placing the sticker.
- 5) As applicable, expiration dates shall be written on the container label.
- 6) The chemical inventory shall be updated whenever a chemical is received (see *a* above).

c. Chemical Labeling

- 1) Refer to the District’s *Hazard Communication Program* for chemical labeling requirements.

d. Chemical Storage

- 1) Chemicals shall be stored in the appropriate storage location, separated and segregated from incompatible chemicals.
- 2) Storage areas shall have a manual emergency local alarm with the actuation device located outside of access to the area (24 CCR Part 2, Section 414.7.1).
- 3) Chemicals shall not be stored at elevations more than six (6) feet from the floor.
- 4) Shelves holding chemicals shall have lips or other integral restraining devices to prevent chemicals from sliding off (24 CCR, Part 9, 5003.9.9).
 - a) Cabinets specially designed for hazardous chemicals do not require lips.
- 5) Shelves holding chemicals and hazardous waste shall be braced and anchored.
- 6) Cabinets containing corrosives shall be clearly marked “Corrosives” and “Hazardous- keep fire away.”
 - a) Bases shall be stored below counter or waist level.
 - b) Containers holding corrosive materials shall be stored in plastic secondary containment to contain leaks.
 - c) Volatile corrosives should be stored in properly vented wooden or plastic cabinets.
- 7) Volatile non-flammable chemicals shall be stored in vented cabinets or may be stored in refrigerators or freezers.
 - a) These refrigerators or freezers must be clearly marked as chemical storage.



- b) No food or drink shall be stored in these refrigerators or freezers.
 - 8) Flammable chemicals shall be stored in metal flammable cabinets.
 - a) Cabinets containing flammable chemicals or wastes shall be labeled in red letters “Flammable- Keep Fire Away.”
 - b) Flammable cabinets should remain closed at all times.
 - c) Each flammable cabinet shall not contain more than 60 gallons of flammable material.
 - d) Total storage of flammable and combustible chemicals in any one cabinet shall not exceed 120 gallons.
 - e) Only three cabinets are allowed to store flammable chemicals in the each area.
 - f) Very volatile flammable chemicals (boiling points at or below 50 C) should be stored in refrigerators or freezers.
 - i. These refrigerators or freezers must be clearly marked as chemical storage.
 - ii. These refrigerators or freezers must be labeled as containing flammable materials.
 - iii. They must be explosion-proof and rated to contain flammable materials.
 - iv. No food or drink shall be stored in these refrigerators or freezers.
 - 9) All opaque cabinets and doors to chemical and hazardous waste storage areas shall be clearly marked as chemical storage and have an NFPA 704 hazard identification label affixed.
 - a) Entries for each category shall represent the highest hazard class present in the storage cabinet, locker, or area.
 - b) Refer to the *Hazard Communication Program* for labeling guidance.
 - 10) The District does not currently stock any acutely hazardous materials.
- e. Transporting Chemicals
- 1) Chemicals shall be securely capped prior to transport.
 - 2) Chemicals shall not be transported in vehicles unless the driver is properly licensed by the Department of Transportation and the vehicle is properly placarded.
 - 3) A secondary means of containing chemicals should be used when transporting, such as a poly bucket or cart.
 - 4) If containers carrying more than 4 liters/1 gallon are to be transported, a cart, dolly, or other means should be used.
 - a) Carts used to transport chemicals must be capable of containing a complete failure of the largest container being transported (24 CCR, Part 9, 5003.10.3.4).
 - 5) Interior corridors routinely used to transport hazardous chemicals (having an NFPA 704 rating of 3 or 4) shall have an emergency notification device located at each exit access and every one hundred and fifty (150) feet of travel (24 CCR, Part 2, 414.7.2). The notification system shall



- a) Be a phone or alarm system
 - b) Be constantly monitored while employees are working with chemicals or wastes.
- 6) Chemicals and waste should not be moved via stairwells.
- a) Chemicals and waste shall be moved between floors by way of elevators.
 - b) Chemicals and waste that are moved via elevator shall have a means of secondary containment.
 - c) The maximum size container allowed to be moved in an elevator is twenty (20) liters (5.28 gallons) (24 CCR, Part 9, 5003.10.4.2).
 - d) The maximum size container for toxic or highly toxic substances is 500 milliliters or 454 grams (24 CCR, Part 9, 5003.10.4.3).
 - e) Students and other employees shall be excluded from elevators while they are being used to move chemicals or waste.
 - f) Extreme caution shall be taken to not contaminate the elevator surfaces, including floor selector buttons, during transportation.
 - g) If the chemicals must be moved from higher than the second floor, a means must be implemented to prevent the elevator from going to or stopping at other floors (24 CCR, Part 9, 5003.10.4.4).
- f. Transferring Chemicals
- 1) Chemicals can be transferred from one container to another by way of pouring, pipetting, or non-mechanical pumps.
 - 2) If flammable chemicals are to be transferred to or from plastic or metal containers,
 - a) If neither of the containers is glass, the containers shall be electrically bonded to one another with a conductive strap.
 - b) Polymer or metal container(s) shall be appropriately grounded.
- g. Compressed Gas Cylinders
- 1) Storage
 - a) Areas containing compressed gas cylinders, with the exception of lecture-size bottles, shall be marked "Compressed Gas"
 - b) When not in use, including when empty, cylinder valves shall be fully closed with protective caps securely in place
 - c) Oxygen cylinders shall be stored at least twenty (20) feet away from fuel gas cylinders or separated by at least a five (5) foot wall having a 30-minute fire rating.
 - i. Cylinders shall be stored at least ten (10) feet away from combustible materials.
 - d) Cylinders shall not be stored indoors unless the area is properly ventilated.
 - e) Cylinders shall not be stored under stairs or near emergency exits.
 - f) Cylinders shall be stored upright at all times.
 - g) If not stored in an engineered and secured rack, compressed gas



- cylinders shall be secured to a fixed object by no fewer than two restraints.
- i. One restraint shall be approximately 1/3 from the top.
 - ii. The second restraint shall be approximately 1/3 from the bottom.
 - iii. The restraints shall be of sufficient strength and be adequately tight to prevent the cylinder from falling over.
- h) Storage areas for cylinders shall be secured to prevent access by unauthorized individuals.
- i) Cylinders stored in exterior locations shall be protected from damage by vehicles using guard posts or other permanent means.
- j) Cylinders should not be stored on the ground to prevent corrosion.
- k) Corrosive gases stored outside must be at least twenty (20) feet away from buildings.
- l) Lecture-bottle cylinders shall be stored in a fume hood and may be laid on their side.
- m) Cylinders shall not be stored in direct sunlight or near other sources of heating to prevent over-pressure hazards.
- n) Empty cylinders shall be clearly marked "Empty" and stored separately from full or in-use cylinders.
- 2) Moving
- a) Cylinders shall be moved using cylinder carts and shall not be rolled on their edges.
 - b) Cylinders shall be capped while moving.
 - c) Regulators shall be removed while moving.
 - d) Cylinders shall be secured to the cart/dolly while moving.
- 3) Labeling
- a) The cylinder shall be clearly labeled as to its contents.
 - b) The label shall not be removed.
 - c) Cylinders shall be labeled "Full," "In Use," or "Empty" as appropriate.
 - i. Labels shall be attached to cylinder caps, when in place. Otherwise, as in the case of manifolds, the label shall be attached to the valve assembly.
- 4) Use
- a) Tools, such as wrenches, shall not be used to open or close valves unless the valve is designed as such.
 - b) Valves shall be fully closed before attaching or removing regulators.
 - c) Only properly fitting regulators rated for the gas and pressure shall be used.
 - d) Regulators and hoses shall be wrench-tight to prevent leaking.
 - i. Care should be taken to not overtighten connections which can damage the hoses and unions.
 - ii. Unions should be checked with leak detection solutions prior to use.
 - e) Lubricating greases shall never be used on valve assemblies or



- regulators.
- f) If cylinders are placed in gas cabinets, the cabinets must (24 CCR 5003.8.6.1)
- i. Be constructed of at least 12 gauge steel
 - ii. Have self-closing access panels
 - iii. Have self-closing doors
 - iv. Be compatible with the gas it is intended to hold.
 - v. Have a ventilation system that creates a negative pressure relative to the surrounding environment.
- 5) Acetylene tanks
- a) The maximum amount of acetylene that can be stored inside a building is 2500 ft³.
 - b) Copper tubing and fittings shall not be used for acetylene tank transfer lines.
 - c) Acetylene tanks must be stored away from oxygen cylinders by more than twenty (20) feet of distance or with a five (5) foot high fire-resistant wall between them, unless they are in use.
 - i. The use of oxygen/acetylene carts is permitted in welding operations.
 - d) Areas containing acetylene tanks must have a conspicuous 'no smoking or open flame' sign posted at all times.
 - e) Do not open the valve without a regulator attachment to prevent potential expulsion of solvent.
- 6) Refrigerant gases
- a) Refrigerant gas cylinders shall be appropriately marked.
 - i. Color-coded gray with yellow top
 - ii. Labeled with a DOT-approved non-flammable gas label
 - iii. Clearly labeled 'refrigerant' with the type of refrigerant, if known.
 - b) Different refrigerants shall not be mixed in cylinders.
 - c) Refrigerant gas cylinders shall be equipped with pressure release devices.
 - d) Refrigerant gas cylinders shall not be stored in direct sunlight.
 - e) Refillable cylinders shall not be filled more than eighty (80) percent full, sixty (60) percent in warm weather months.
 - f) Filling or transferring refrigerant gases can present hazards
 - i. Refrigerant shall only be transferred to or from cylinders in well-ventilated areas.
 - ii. Proper PPE shall be used to protect employees from the hazards associated with cryogenic gases including safety glasses and insulating gloves.
 - g) All transfer hoses and equipment shall be inspected prior to use for any cracks or signs of deterioration.
 - i. Hoses, valves, and unions that are visibly deteriorated shall not be used and shall immediately be replaced.
 - h) Whenever cylinders are opened, the valve shall be positioned away from employees and surrounding personnel.



- i) Dented, damaged, or visibly corroded cylinders shall not be refilled and should be removed from service for recycling.
 - i. Cylinder contents shall be completely transferred prior to recycling or disposal.
- j) Under no condition shall refrigerant cylinders be intentionally vented unless overpressure is an impending hazard.
- 7) Cylinder failure
 - a) If a cylinder or valve assembly begins to leak or the valve cannot be closed
 - i. For non-toxic, non-flammable, and non-corrosive gases, the cylinder shall be moved to an exterior location away from buildings or pedestrian walkways and allowed to vent.
 - ii. For toxic, flammable, and corrosive gases, the incident shall be treated as an uncontrolled release- see “Emergency Response Procedures,” in this document or refer to the *EAP Guide*.

VII. Personal Protective Equipment

The last line of defense against chemical hazards is personal protective equipment (PPE) since any failure in the measure will likely result in an exposure. The following are the district’s guidelines for personal protective equipment while handling chemicals pursuant to California Code of Regulations, Title 8, Section 3302. For additional information, refer to the District’s *Personal Protective Equipment Program*. Students in instructional laboratories that use chemicals are expected to be informed of and adhere to the following guidelines.

1. General Guidelines

- a. Shorts may not be worn in laboratory areas or when handling chemicals.
- b. Tank tops, sleeveless shirts, or shirts that expose the chest shall not be worn when working with chemicals unless covered by a laboratory coat.
- c. Skirts or dresses that come above the ankle shall not be worn if working with chemicals unless a laboratory coat is worn.
- d. Long hair shall be pulled back or worn up to prevent inadvertent contact with chemicals.
 - i. Hair nets can be used.
- e. Students in instructional laboratories are responsible for providing their own, appropriate protective equipment.
 - 1) Faculty shall provide specific guidance regarding the type of PPE to be purchased by the students.
 - 2) Faculty shall be responsible for enforcing the use of PPE in instructional laboratories.
 - 3) Students with insufficient or inappropriate PPE shall be immediately removed from the instructional laboratory until such time they have the appropriate equipment.
 - 4) Minimum student PPE for instructional laboratories include:
 - a) Chemical splash goggles



- b) Laboratory coats
- c) Chemical-resistant (non-latex) disposable gloves.
- f. The District shall provide appropriate PPE for student workers and volunteers providing equivalent protection as that offered to employees.

2. Gloves

- a. Each Department is responsible for providing employees with an adequate supply of glove types and sizes, based on the chemicals and processes used.
 - 1) Employees obtain gloves that are properly sized and appropriate for the chemicals they are using from their supervisor or, depending on Department policy, directly from an external vendor.
 - 2) Specialty gloves shall also be provided or ordered as required.
- b. Gloves are not required to be worn when receiving chemical deliveries or handling chemicals that have not been previously opened.
- c. Gloves are required to be worn by any employee who opens, handles, transfers, pours, or otherwise uses chemicals of any amount, including toxic, corrosive, and refrigerant gases.
 - 1) This includes taking inventory or moving previously stored chemicals.
- d. The Safety Data Sheet (SDS) or glove manufacturer websites can be consulted for the appropriate chemical protective glove for many chemicals.
 - 1) At a minimum, employees should be provided with nitrile gloves which are good protection against corrosives, poor protection against petrochemicals and oxygen-containing compounds.
 - a) Different thicknesses of nitrile gloves are available
 - 2) Latex gloves will not be provided due to the potential for latex allergy and the material's lack of chemical protection.
- e. Gloves should be inspected for defects prior to donning.
 - 1) If a defect is found, the glove is to be discarded and replaced.
- f. Disposable gloves should be discarded:
 - 1) After they have become visibly contaminated,
 - 2) After they have become discolored,
 - 3) After use, or
 - 4) Before the employee or student leaves the laboratory or storage area.
- g. Gloves with wrist length gauntlets shall not be immersed in chemicals or used for washing items with chemical solutions.
 - 1) Forearm or longer length gloves shall be used for this purpose with a larger mil thickness than typical gloves.
 - 2) These gloves are disposable, although they may be reused several times, and should be managed as solid hazardous waste.
 - a) If they are to be reused, a change schedule or procedure to notify employees when they need to change gloves must be established.
 - 3) When gloves shall be immersed in solvents for any period of time, the employee should be aware of the permeation rate of the chemical they are using.
- h. Used gloves are disposed of as solid hazardous waste.
- i. Gloves that have been used to handle chemicals shall be removed and



disposed of before the employee contacts doors leading out of the area or other items that should remain uncontaminated.

j. Gloves shall not be worn outside of the area where chemicals are located.

k. Cryogenic gloves are to be used whenever an employee is transferring liquid nitrogen, working with solid carbon dioxide (dry ice), transferring refrigerant, or retrieving items from a freezer for an extended period of time.

1) Cryogenic gloves are not chemical resistant and therefore will not be used for general chemical handling.

3. Laboratory coats (Instructional Laboratories only)

a. Laboratory coats shall be worn by employees whenever they are working with chemicals or hazardous waste.

1) The use of smocks in lieu of laboratory coats may be appropriate in some Departments.

b. Laboratory coats shall be inspected prior to each use for defects.

1) If defects are noted, the laboratory coat shall not be used and shall be forwarded to the ILT or supervisor, as appropriate.

a) The coat shall have a label attached noting the defect.

2) Damaged or defective laboratory coats shall be replaced or repaired immediately and may not be worn near chemicals.

c. Laboratory coats shall be worn with the sleeves unrolled and with all buttons properly buttoned.

d. Laboratory coats are to be hung on the racks near the entrances to the areas where chemicals are present.

e. Laboratory coats shall not be worn outside the laboratory or areas where chemicals are present unless chemicals are being transported.

f. Laboratory coats shall be laundered on a regular basis or when

1) They become visibly contaminated

a) If a laboratory coat becomes contaminated with a chemical, it shall be separately packaged in a plastic bag, taped closed, labeled as 'contaminated' and placed in the laundry basket.

b) If a laboratory coat becomes saturated or heavily contaminated with a chemical, it shall be disposed of as hazardous waste.

2) They are visibly dirty

3) At the employee's discretion.

g. Laboratory coats shall be worn when transferring or handling cryogenic liquids.

h. Laboratory coats are not required when handling, installing, or using gas cylinders.

i. Chemical resistant aprons should be worn over laboratory coats while performing operations that may cause splashing such as transferring or consolidating chemicals or wastes.

4. Protective clothing (Non-Instructional Areas)

a. Non-instructional staff that handle chemicals should wear protective



coveralls or other garments, which may include laboratory style coats, to protect their personal clothes from incidental chemical exposure.

b. Chemical protective clothing, including chemical resistant aprons, may be used to provide protection from splashing or spilling of chemicals such as during transportation or consolidation.

5. Shoes

a. All employees, students, and visitors shall wear close-toed and close-heeled shoes whenever they are handling or transferring chemicals or waste.

b. Flip flops or other sandal-type shoes shall not be worn when working with chemicals.

6. Eye Protection

a. Chemical safety goggles shall be worn at all times by faculty, employees, and students when chemicals are being used.

b. Employees shall wear either chemical splash goggles or a face shield with safety glasses if the operation has the opportunity to splash chemicals in the eyes.

1) Such operations may include washing, rinsing with high volume water sources, or transferring chemicals, including consolidation.

c. Prescription glasses are not considered safety glasses and cannot be worn without supplemental splash protection.

1) Eye glasses may be worn under safety goggles only if the goggles are designed to accommodate the temple pieces.

2) Contact lenses may be worn under goggles.

d. Employees and faculty may obtain their goggles from their supervisor or, depending on Department policy, directly from an external vendor.

1) Employees who require prescription lenses may coordinate with their supervisor regarding prescription goggles or other splash protective eyewear.

2) Damaged or severely scratched goggles should be replaced immediately.

VIII. Spill Response Kits

1. Spill response kits shall be in areas where chemicals are handled, stored, used, or transferred.

2. The kits will be inspected monthly, and any missing supplies shall be replaced.

3. Materials within the spill kit will be appropriate for the chemicals used in the immediate vicinity.

1) Remember “NEAR”

a. **Notify**—Call for help.

b. **Evacuate**—Get everyone to a safe location.

c. **Assemble**—Assemble and take attendance of all students and employees.

d. **Report**—Fill out a detailed accident report after the emergency is over.

2) Clean up spills immediately and thoroughly. Follow approved spill cleanup procedures—spills should only be cleaned up by approved personnel.



- 3) A bucket of dry sand should be available to aid in providing traction on a slippery floor after a spill.
- 4) To make it easier to clean up, transport, and dispose, an absorbing agent, such as Kitty Litter, should be used to absorb a liquid spill.
- 5) Neutralizer for both acid and base spills should be available in the event of a chemical spill.
- 6) A 100% wool fire blanket will contain and control a spill and its vapors if no other spill control materials are available.

Storage and Handling Requirements—Flammable Chemicals

- 1) Store all flammables in a dedicated flammables cabinet.
- 2) Keep the flammable storage area cool, between 55 °F and 80 °F, at all times.
- 3) Store flammable materials away from all sources of ignition.
- 4) Store all flammable and combustible materials away from all oxidizers.
- 5) Never store flammables in refrigerators unless the refrigerator is explosion proof.
- 6) Avoid storing any chemicals, especially flammable materials, in direct sunlight.
- 7) A chemical storeroom that contains flammable materials should be equipped with an ABC fire extinguisher, fire blanket, and smoke detector.
- 8) Dispense flammable liquids from an operating fume hood.

Storage and Handling Requirements—Corrosive Materials

- 1) Store corrosives in appropriate corrosives cabinets.
- 2) If possible, keep certain items in the original shipping package, e.g., small containers (less than 500 mL) of acids and bases in the special and expensive Saf-Cube®.
- 3) Working with corrosive materials requires special eyewear. Wear chemical splash goggles when working with corrosives. Also, consider wearing a chemical splash face shield when handling corrosive materials.
- 4) If your corrosives cabinet has metal shelf clips, inspect these clips every three months. These shelf clips rust easily and may break, leading to a collapsed shelf. They require special attention.
- 5) Do not store glacial acetic acid and nitric acid next to each other in the corrosive’s cabinet.
- 6) Label all prepared acid solutions with the name, concentration, hazard warning and date before storing them. Always use plastic or rubber bottle carriers if transporting acids from one room to another.

- 1) Dispense concentrated acid from a fume hood.

IX. EMERGENCY EQUIPMENT

A. Eyewashes and Safety Showers

- 1. Eyewashes and safety showers shall be clearly identified with signage visible from at least twenty (20) feet away.
- 2. Eyewashes and showers must be accessible within ten (10) seconds of any area where



chemicals or waste are used or stored.

- a. In the event that shower and eyewash units are not operational within a 10-second travel time from an area where chemicals are being used or stored, all operations with chemicals shall be immediately suspended until the units are made functional by Campus Facilities.
 - 1) The use of chemicals by students is forbidden in instructional laboratories if nearby safety showers and eyewashes are non-functional.
- 3. Safety shower handles must be no more than sixty-nine (69) inches from the floor.
 - a. Extensions to the handle may be added for employees or students in wheelchairs.
- 4. Eyewashes shall be located between thirty-three (33) and fifty-three (53) inches from the floor.
- 5. Eyewashes must have protective caps over the spouts to prevent contamination.
 - a. The caps must remain in place except during testing and use.
 - b. Water pressure should be sufficient to remove caps during actuation.
- 6. The areas around eyewashes and safety showers must be cleared of debris and obstructions in a radius of at least twenty-four (24) inches from the center of the shower head.
- 7. Eyewash and safety shower stations shall be tested monthly and flushed for at least one (1) minute to clear the line of any debris.
- 8. Records of this test (initial and date) shall be attached to the shower or eyewash.
 - a. In the event that shower and eyewash units have not been inspected or the inspection has not been documented for the previous month, all operations with chemicals shall be immediately suspended until the units are checked.
 - 1) The use of chemicals by students is forbidden in instructional laboratories if nearby safety showers and eyewashes have not been checked.

B. Fire Extinguishers

- 1. Locations
 - a. Fire extinguishers must be located within thirty (30) feet of each instructional laboratory.
 - b. Chemical storage locations that contain flammable liquids must have a fire extinguisher located outside of the door but within ten (10) feet of the storage location.
 - c. Areas within buildings that contain flammable liquids, such as storage cabinets, must have a fire extinguisher 10-25 feet from the storage area.
- 2. The location of the fire extinguishers must be clearly identified with signage and visible from at least 30 feet away.
- 3. At least 24 inches of space must remain clear around each fire extinguisher.
- 4. Fire extinguishers must be stored in cabinets or on hangars to prevent damage.
 - a. Extinguishers may not be stored on the floor.
 - b. Cabinets may not be locked unless the extinguisher is in a location that is prone to vandalism or theft.
 - 1) The cabinet must have a means for emergency opening.
- 5. Fire extinguishers for the appropriate class of fire (A, B, C, or D) for the hazards present shall be immediately available.



- a. Combination extinguishers (e.g., A/B/C) are allowed.
- 6. Fire extinguishers shall be checked monthly.
 - a. The gauge on the extinguisher must read ‘full’ and be in the green portion of the gauge.
 - b. The pull pin must be in place in the handle assembly.
 - c. A tamper seal must be in place indicating the extinguisher has not been discharged.
 - d. The extinguisher must be physically lifted to determine if extinguishing agent is present in the unit.
 - e. A tag recording the inspection must be attached to the extinguisher or the mounting assembly.
 - f. If any of the above conditions are deficient, the fire extinguisher shall immediately be removed from service and Facilities Management shall be notified to address the extinguisher.
- 7. Fire extinguishers are inspected and serviced annually by an external contractor.
 - a. Tags are marked with the month and year of the annual inspection. The inspection will expire one year after the date marked on the tag.
- 8. Records of monthly and annual inspections are attached to the fire extinguisher.
 - a. In the event that an extinguisher has not been inspected in the previous month, an immediate inspection shall be conducted and documented on the tag.
 - b. In the event that an extinguisher has not been inspected for the previous two months, the extinguisher shall be removed from service and Facilities Maintenance shall be contacted to replace the extinguisher.
 - c. In the event that no properly inspected fire extinguisher is within thirty (30) feet of an area where chemicals are being used or stored, all operations with chemicals in that area shall be immediately suspended until a functioning extinguisher is available.
 - 1) The use of chemicals by students is forbidden in instructional laboratories if nearby fire extinguishers have not been checked within two months.

C. First Aid Kits (8 CCR 3400)

- 1. A first aid kit should be located in each area where chemicals or waste are used or stored.
- 2. The kit shall be inspected monthly and maintained by the supervisor’s designee.
 - a. A record of this inspection shall be maintained.
 - b. The kit shall be restocked as necessary or during the monthly inspection.

X. MEDICAL CONSULTATION AND EXAMINATIONS

A. Medical Assistance

- 1. The District shall provide employees, by way of the contracted occupational medical provider, medical consultation, monitoring, or examinations at no charge under the following circumstances:
 - a. When an employee develops signs or symptoms of chemical exposure
 - b. When employer monitoring demonstrates environmental levels that exceed



published action levels or exposure limits

- i. Action and exposure levels may be found in references produced by
 - a) Occupational Safety and Health Administration (OSHA)
 - b) National Institute of Occupational Safety and Health (NIOSH)
 - c) American Conference of Governmental Industrial Hygienists (ACGIH).
- 2) Exposure levels are typically reported as 8-hour time weighted averages.
- 3) Monitoring may be accomplished by
 - a) Air monitoring
 - b) Air sampling
 - c) Personal monitoring devices.
- c. When an emergency event, such as a leak, spill, release, or explosion, occurs that has a high likelihood of a hazardous exposure.
- 2. The employee shall be allowed to attend exposure-related medical appointments during normal work hours without using vacation or sick leave hours.
- 3. The supervisor or Dean shall provide the contracted medical provider with the following information prior to the appointment:
 - a. Identity of substances the employee was or may have been exposed to
 - b. Description of the conditions under which the exposure occurred, including any monitoring data
 - c. Signs and symptoms the employee was demonstrating that indicated potential chemical exposure.
- 4. The healthcare professional shall provide a written opinion that includes
 - a. Any recommended additional medical treatment(s)
 - b. Results of the examination, if requested by the employee
 - c. Existing medical conditions that may increase an employee’s risk associated with potential exposures
 - d. A statement that the employee has been informed by the healthcare professional of the results and any conditions that may require additional examinations or treatments.
 - e. Diagnoses unrelated to the occupational exposure shall not be included in the written opinion.
- 5. An *Injury and Illness Incident and Investigation Report* shall be completed by the supervisor and forwarded to the Risk Management Office.
- 6. A copy of the healthcare provider’s opinion shall be forwarded to the Risk Management Office.

XI. EMERGENCY RESPONSE PROCEDURES

A. Minor Spills

Incidental spills of less than 250 mL of low hazard materials, including volatiles and irritants, and less than 5 mL of highly hazardous materials:

- 1. If a person is splashed with chemicals, rinse the area with copious amounts of water.
 - a. For splashes to the eyes and face assist the individual to the eyewash station and flush eyes for fifteen (15) minutes, holding the eyelids open.



- 1) Employees assisting exposed individuals shall wear appropriate protective clothing (gloves, goggles, apron) to prevent further contamination.
- b. For significant body exposures, individual shall proceed to a safety shower and be doused with water for ten (10) minutes.
- c. Campus Police (6405 or 619-355-6405) or 911 shall be called immediately
- d. The SDS of the chemical involved shall be provided to the first responders by the supervisor.
- 2. If the spill is of a volatile material, the evacuation of the immediate area is at the discretion of the supervisor and will be based on the nature of the material.
- 3. Areas near the spill must be secured to prevent exposure or, in the case of spills on the floor, slipping by other employees or students.
- 4. These spills can be handled by the employee responsible using the nearest spill kit ONLY if appropriately trained and equipped.
 - a. If not trained or equipped to clean up spill, notify supervisor for further instructions.
 - b. Wear protective equipment (goggles, gloves, shoe covers).
 - c. Kimwipes or paper towels can be used to clean up the spill.
 - 1) Paper products shall not be used to clean up oxidizing acids or other oxidizing materials.
 - d. Any sorbent material (pillows, pads, absorbent solids) or other disposable material used shall be packaged in a plastic bag, sealed, and disposed of as hazardous waste.
 - e. Any reusable items used during spill cleanup, such as dustpans and hand brooms, shall be decontaminated after use.
 - 1) Any liquid used, such as soap and water, to clean reusable spill cleanup items must be collected and disposed of as hazardous waste.
 - a) Under no circumstances is the used solution to be disposed of in any sink.
- 5. The Dean or Supervisor will complete and submit an *Injury and Illness Incident and Investigation Report* within 24 hours.
 - a. One copy will be presented to the Campus/Facility Safety Committee at its next regularly scheduled meeting.
 - b. A copy will be forwarded to the Risk Management Office within forty-eight (48) hours of the spill.

B. Moderate Spills

Spills of less than two liters (2 L) of low hazard materials, including volatiles and irritants, and less than fifty milliliters (50 mL) of highly hazardous materials:

- 1. If a person is splashed with chemicals, rinse the area with copious amounts of water.
 - a. For splashes to the eyes and face assist the individual to the eyewash station and flush eyes for fifteen (15) minutes, holding the eyelids open.
 - 1) Employees assisting exposed individuals shall wear appropriate protective clothing (gloves, goggles, apron) to prevent further contamination.
 - b. For significant body exposures, individual shall proceed to a safety shower and be doused with water for ten (10) minutes.



- c. College Police (6405 or 619-355-6405) or 911 shall be called immediately
- d. The SDS of the chemical involved shall be provided to the first responders by the supervisor.
- 2. The immediate area should be evacuated of all employees and students.
- 3. The area of the spill shall be cordoned off by way of caution tape or closing laboratory doors.
- 4. The supervisor shall obtain the Safety Data Sheets for the spilled chemical(s).
- 5. Facilities Maintenance should be contacted immediately to assist with the spill response.
- 6. Appropriately trained responders shall be contacted immediately to clean up the spill.
- 7. If chemicals are migrating towards drains, sanitary sewer accesses, or surface waters, the nearest spill kit shall be accessed.
 - a. Pillows, pads, or berms shall be placed around the spill to prevent migration of the liquid.
 - b. If dirt is used to berm the flow of chemical, the dirt shall be collected and disposed of as hazardous waste to a depth of at least six (6) inches.
- 8. The ILT or Supervisor shall notify the responders regarding the identity or suspected identity of all components of the liquid.
 - a. Responders must be properly trained in the use respiratory protection and proper chemical protective clothing as well as air monitoring equipment to safely address the spill.
- 9. If the material is volatile or toxic, the clean-up must be performed by a properly trained individual using a respirator with the proper cartridges, chemical protective clothing, and proper chemical-resistant gloves.
 - a. Consideration must be given to isolating the HVAC system and providing external, portable local exhaust ventilation to keep atmospheric contaminants at safe levels.
 - b. Area monitoring external to the immediate spill area shall be conducted to evaluate potential exposures and the need for additional evacuations.
 - 1) In multi-story buildings, monitoring shall take place on the floors above and below, as applicable.
- 10. Any sorbent material (pillows, pads, absorbent solids) or other disposable material used shall be packaged in a plastic bag, sealed, and disposed of as hazardous waste.
- 11. Any reusable items used during spill cleanup, such as dustpans and hand brooms, shall be decontaminated after use.
 - a. Any liquid used, such as soap and water, to clean reusable spill cleanup items must be collected and disposed of as hazardous waste.
 - 1) Under no circumstances is the used solution to be disposed of in any sink.
- 12. The Dean or Supervisor will complete and submit an *Injury and Illness Incident and Investigation Report* within twenty-four (24) hours.
 - a. A copy will be presented to the Campus/Facility Safety Committee at its next regularly scheduled meeting.
 - b. A copy will be forwarded to the Risk Management Office.
- 13. If the chemical touches bare earth, surface water, or enters a public sewer, the Dean or Supervisor will properly notify the San Diego County Hazardous Materials Division of the release for proper reporting and further required actions.

C. Major spills/uncontrolled releases

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Liquid spills of more than two liters (2 L), more than fifty milliliters (50 mL) of highly hazardous materials, uncontrolled off-gassing of chemical reactions, and leaking cylinders require personnel with specific training using higher levels of personal protective equipment:

1. College Police Dispatch (**6405** or **619-388-6405**) shall be contacted immediately to request assistance from the local Hazardous Materials Response team or hazardous waste contractor to address the release/spill.
 - a. Notify the Dean or supervisor.
 - 1) Depending on the amount, areas impacted, and the type of chemical, the ECC may be initiated. Refer to the *Emergency Action Plan* for more information.
 - b. Relay the location, material spilled and possible injuries.
2. Injured persons shall be assisted and addressed as applicable and contaminated persons, even if injured, shall be isolated.
 - a. Unless properly trained and equipped with chemical protective equipment, do not render first aid in order to avoid contamination or chemical exposure.
4. The Supervisor or Dean will determine if the *Emergency Action Plan* needs to be initiated.
 - a. The Vice President of Administration or the Facility Director shall be notified of the spill as soon as possible.
5. The area around the spill/release shall be cordoned off at a safe distance, determined by the amount, scope, and chemical involved.
6. The HVAC system in building shall be turned off by Facilities Maintenance or the area shall be atmospherically isolated from other locations.
 - a. Power to any fume hoods in the vicinity must be maintained, if possible.
7. For flammable chemical spills or gas releases, all sources of ignition need to be immediately extinguished, including open flames, heating mantles, vacuum pump motors, and powered equipment.
8. The Dean, Faculty member, or ILT shall provide the SDS to first responders.
9. The Dean or Supervisor will complete and submit an *Injury and Illness Incident and Investigation Report* within twenty-four (24) hours.
 - a. One copy will be presented to the Campus/Facility Safety Committee at its next regularly scheduled meeting.
 - b. One copy will be forwarded to the Risk Management Office.

XII. TRAINING

1. Each new employee will be trained on the components of this *Program* prior to working with any chemicals.
 - a. Additional training can be found in the Environmental section of the Keenan SafeColleges website.
2. Employees who work with any of the following require substance-specific training per the applicable regulations:
 - a. Asbestos (8 CCR 5208)
 - b. Benzene (8 CCR 5218)
 - c. Carcinogens (8 CCR 5209)



- d. Chromium VI (8 CCR 5206)
 - e. Formaldehyde (8 CCR 5217)
 - f. Lead (8 CCR 5216)
 - g. Refer to *Appendix D: Select Substances of Concern* for additional information.
3. Each College and Facility is responsible for conducting annual re-training for employees that provides them with information on chemical hygiene, chemical handling, and general chemical safety.
 4. Records of this training will be retained by the Dean or supervisor and forwarded to the Risk Management Office.
 - a. Training records must be kept for five years.
 5. All employees who will respond to spills in order to clean up and prevent further contamination or supervise the activities of those who will must be 29 CFR 1910.120/8 CCR 5192 (Hazardous Waste Operations and Emergency Response (HAZWOPER)) trained.
 - a. At least three (3) employees per facility must be trained to this capacity in addition to the Laboratory Supervisor and Regional Facilities Officer.
 - b. This training includes a medical evaluation and annual refresher training.
 - c. Employees who will respond to moderate spills must undergo
 - 1) Twenty-four (24) hour First Responders Operations training
 - 2) Respiratory protection training
 - 3) The required annual 8-hour refresher training.
 - a) These employees may elect to undergo forty (40) hours of training.
 - d. Laboratory supervisors and Regional Facilities Officers must undergo
 - 1) Forty (40) hours of HAZWOPER training
 - 2) Respiratory protection training
 - 3) The required annual 8-hour refresher training.
 - e. The need and extent of training for other personnel will be determined in consultation with the Risk Management Office.
 6. Employees who will be responsible for handling or consolidating waste or employees who will be responsible for addressing chemical spills shall undergo training pursuant to
 - a. 29 CFR 1910.120/8 CCR 5192 (Hazardous Waste Operations and Emergency Response (HAZWOPER))
 - 1) Forty (40) hours of initial training, including respiratory protection training, and the required annual 8-hour refresher training.
 - b. US Department of Transportation (DOT) training (49 CFR 172.704)

XIII. RECORDS

The following records shall be retained:

1. Training records shall be retained for five (5) years
2. Manifests and records of Universal Waste disposal shall be retained for thirty (30) years
3. Weekly hazardous waste storage area inspections shall be kept for three (3) years
4. Archived chemicals shall be retained until thirty (30) years after the chemical was removed from the inventory.
5. *Injury Incident and Illness Investigation Reports* shall be kept pursuant to the Worker's

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Compensation guidelines.

6. Records for eyewash, safety shower, and fire extinguisher inspections shall be retained on the tag until space is no longer available.
 - a. Tags shall not be removed until all spaces have been filled in.
 - b. If an inspection is missed, the tag shall not be removed to start a new tag.
 - 1) The date of the next inspection shall be entered sequentially.
7. Fume hood verification records shall be kept for three (3) years.



Appendix A: Hazardous Waste Storage Area Inspection Checklist

HAZARDOUS WASTE STORAGE AREA INSPECTION CHECKLIST

Business Name: _____ Business Address: _____

Person responsible for weekly container inspections: _____

Month _____ Year _____ Inspection Item	Weekly Hazardous Waste Container Inspection					Comments
	Date _/_/___	Date _/_/___	Date _/_/___	Date _/_/___	Date _/_/___	
Containers marked properly name/address contents/composition physical state/hazard properties start date						
Stored 90/180/365 days or less						
No leaks/staining						
Closed tops/bungs						
No dents/corrosion						
Incompatible wastes and materials stored separately						
Aisle space maintained						
Secondary containment liquid free						
Inspector's Initials						
Overall Comments:						

In General:

- Acids must be segregated from ignitables.
- Acids must be segregated from caustics.
- Corrosives should be segregated from flammables.
- Oxidizers should be segregated from EVERYTHING.
- Many corrosives are water-reactive.
- Most organic reactives must be segregated from inorganic reactives (metals).

INCOMPATIBLE WASTES - Some Deadly Combinations -

- Acids + Oil or Grease = FIRE
- Acids + Caustics = HEAT/SPATTERING
- Caustics + Epoxies = EXTREME HEAT
- Chlorine Gas + Acetylene = EXPLOSION
- Flammable Liquids + Hydrogen Peroxide = FIRE/EXPLOSION
- Aluminum Powder + Ammonium Nitrate = EXPLOSION
- Sodium Cyanide + Sulfuric Acid = LETHAL GAS
- Ammonia + Bleach = LETHAL GAS

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Appendix B: Special Waste Category Handling Requirements

A. Liquid Paint

1. Unused liquid paint shall be managed either by
 - a. Transporting to a paint recycle center (preferred) or
 - b. Handling as hazardous waste.
2. Paint to be recycled
 - a. Containers shall be properly sealed to prevent spillage.
 - b. Liquid paint shall be included in the totals in determining the generator class (large or small).
 - c. Containers shall be marked with the date they were designated as waste.
 - d. Each Facility or College shall coordinate with the recycle center to determine ability to accept paint from the District and the types of waste paint, including aerosol cans, generated by the District.
3. Paint to be disposed
 - a. The Facility or College can
 - 1) Consolidate the liquid paint by pouring it into an appropriate and properly labeled hazardous waste container
 - a) The accumulation date shall be when the first paint is placed in the container.
 - b) When dry, the empty paint containers may be disposed of as solid waste.
 - c) No other hazardous waste shall be placed in the liquid paint receptacle.
 - 2) Containerize the paint containers by sealing them and placing them into an appropriate and properly labeled hazardous waste container
 - a) The accumulation date shall be when the first paint container is placed in the container.
 - 3) Place a hazardous waste label on each container of unused or unwanted liquid paint.
 - a) Each container must have a properly completed hazardous waste label.
 - b) The accumulation start date shall be noted as the date the paint was designated as waste.
 - b. The total paint volume must be considered during hazardous waste generator classification determination.

B. Dry Paint

1. Dry paint in containers or items contaminated with non-liquid paint may be disposed of in regular solid waste.
2. Under no circumstances can the lid of a container with liquid paint be removed with the intention of allowing the solvent to evaporate off to render the item non-hazardous waste.
 - a. This is considered treatment which requires a permit.



C. Oily Rags

1. Rags contaminated with oil, gasoline, solvents, or paint may be hazardous if they are saturated to the point of dripping or leave a residue on the hands when held.
 - a. If the rag does not drip or leave a residue, it can be laundered for reuse or disposed of in regular trash.
2. Contaminated rags must be placed in spring loaded metal cans designated for oily rags.
 - a. The lid must remain closed unless rags are being added or removed from container.
 - b. The can must be emptied daily.
 - 1) Rags must be stored in a closed-top container that is properly labeled as hazardous waste.
 - 2) The container must be labeled “Oily Rags” and no other solid waste may be included in that container.
 - 3) Rags may be laundered or disposed of within the time limits set forth by the generator class of the Facility or College.

D. Used Oil

1. For the purposes of this section, ‘used oil’ is any refined or synthetic product that has been used and is contaminated with physical (metal shavings) or chemical (water) impurities. Oils include
 - a. Motor oils
 - 1) Vehicle crankcase
 - 2) Engine
 - 3) Transmission
 - 4) Gearbox
 - b. Industrial
 - 1) Hydraulic
 - 2) Compressor
 - 3) Turbine
 - 4) Bearing
 - c. Other
 - 1) Transformer
 - 2) Refrigeration
 - 3) Metalworking
2. Used oil is managed as hazardous waste unless it is to be recycled.
3. Used oil shall be placed in appropriate containers and are subject to the container requirements of hazardous waste.
4. In addition to the hazardous waste labeling requirements, the containers must be labeled “Used Oil”
5. Funnels may be used to add material to the container.
 - a. Unless equipped with a lid, the funnel must be removed and the bung replaced when oil is not being added.
6. Containers receiving used oil shall be placed on drip pads, containment skids, or other means to prevent oil dripping onto the ground and to contain any leaks or spills.
7. Used oil containers shall be removed with other hazardous waste during regularly



scheduled pickups.

- a. If the oil is to be recycled, the containers can be transported by the recycling facility as long as proper paperwork is provided.
 - b. Recycling companies may not generate a *Uniform Manifest* but may instead provide the District with a *Consolidated Manifest* in the form of a receipt.
8. Documents provided by the transporter shall be retained for at least three (3) years.

E. Used Oil Filters

- 1. Used filters can be
 - a. Recycled
 - b. Managed as hazardous waste.
- 2. Prior to disposal, as much liquid as possible shall be drained out of the filter into a used oil waste receptacle.
 - a. If the filter is equipped with drain plugs, they shall be removed to allow complete emptying of the filter.
 - b. Manufactured filter crushers or piercing devices are allowed to facilitate the draining of residual oil.
 - 1) Facility-made crushers or piercers, including hand tools, are strictly forbidden.
- 3. Empty filters are placed in a rigid container clearly labeled “Drained Used Oil Filters.”
 - a. The container shall be either metal or plastic.
 - b. The container shall be able to contain any residual oil that leaks from the filters.
 - c. The container shall be marked with
 - 1) Date first filter was placed in container (accumulation start date)
 - 2) Facility or College name
 - 3) Contact individual
 - 4) Contact phone number
 - d. If the filters are to be disposed of due to residual free-flowing oil contained within, the hazardous waste label will contain all of the required information.
 - e. The container shall have an appropriate lid that is in place unless filters are being added or removed.
- 4. The filters must be delivered to the recycling center within one (1) year of the accumulation start date.
 - a. District employees or contractors, including the hazardous waste disposal contractor, can transport used oil filters to the recycle facility.
- 5. A record of the delivery to the recycle center (‘bill of lading’) must be obtained and kept for three (3) years. The record must include
 - a. Facility or College name, address, and contact phone number
 - b. Transporter’s name, address, and phone number
 - c. Name, address, and phone number of receiving facility
 - d. Quantity and capacity of the containers being transported
 - e. Date filters transported.

F. Empty Containers

- 1. Empty containers that previously held hazardous materials or hazardous waste are



themselves considered hazardous unless they are empty.

- a. All liquid contents must be transferred from the container to the point where inversion will not produce a constant dripping.
 - b. Solid material must be scraped from container.
 - c. Containers that held extremely hazardous waste must be triple-rinsed with an appropriate solvent.
 - 1) The rinses must be captured and disposed of as hazardous waste.
2. These containers must be properly managed.
- a. For containers larger than five (5) gallons, the container must be legibly and obviously labeled with the word 'empty'
 - 1) On the lid
 - 2) On the side
 - 3) Original labels to identify previous contents must be retained.
 - 4) The date the contents were removed and the container designated as waste must be legibly and obviously marked on the container.
 - b. Containers must be disposed of within one (1) year of being emptied.
 - 1) Containers less than five (5) gallons in size may be disposed of in regular trash.
 - 2) Containers more than five (5) gallons in size must be recycled, reconditioned, reused, or disposed of as hazardous waste.
 - a) Records of the facility the container was shipped to, including name, address, mailing address, and phone number must be kept for three (3) years.
 - c. The lid or bungs must be securely fastened at all time.

G. Pesticides

- 1. Every effort should be made to use as much of the pesticide as possible.
- 2. If a product is no longer used, the entire container shall be placed in the hazardous waste storage area and properly labeled as a hazardous waste.
- 3. If most of the product has been used, the container can be triple-rinsed with water and disposed of as solid waste.
 - a. Residual product can be transferred to other containers of the same product for use.
 - b. The rinsates can be captured and used for their original purpose or disposed of as hazardous waste.



Appendix C: Hazardous Waste Categories for Biennial Report

A. EPA Hazardous Waste Numbers

1. Ignitable- liquid with flash point <60 C (140 F) or solid that is flammable due to friction, water, spontaneous reaction, or is ignitable (22 CCR 66261.21)
 - a. D001
2. Corrosive- liquid with a pH <2 or >12.5 or solid that produces similar solution with water (22 CCR 66261.22)
 - a. D002
3. Reactive- water reactive, pyrophoric, or spontaneously combustible (22 CCR 66261.23)
 - a. D003
4. Toxic: refer to tables in 22 CCR 66261.24
5. Non-specific sources, refer to tables (22 CCR 66261.31)
 - a. F002- spent halogenated solvents
 - 1) Methylene chloride, carbon tetrachloride
 - b. F003- spent non-halogenated solvents
 - 1) xylene, acetone, ethyl acetate, ethyl benzene, ethyl ether, methyl isobutyl ketone, n-butyl alcohol, cyclohexanone, and methanol
 - c. F005- spent non-halogenated solvents
 - 1) toluene, methyl ethyl ketone, carbon disulfide, isobutanol, pyridine, benzene, 2-ethoxyethanol, and 2-nitropropane

B. California Hazardous Waste Category

Waste Code	Waste Description
Inorganics	
121	Alkaline solution (pH \geq 12.5) with metals (antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, mercury, molybdenum, nickel, selenium, silver, thallium, vanadium, and zinc)
122	Alkaline solution without metals (pH \geq 12.5)
131	Aqueous solution ($2 < \text{pH} < 12.5$) containing reactive anions (azide, bromate, chlorate, cyanide, fluoride, hypochlorite, nitrite, perchlorate, and sulfide anions)
133	Aqueous solution with 10% or more total organic residues
134	Aqueous solution with less than 10% total organic residues
132	Aqueous solution with metals (restricted levels and see waste code 121 for a list of metals)



181	Other inorganic solid waste
162	Other spent catalyst
123	Unspecified alkaline solution
135	Unspecified aqueous solution
Organics	
322	Biological waste other than sewage sludge
211	Halogenated solvents (chloroform, methyl chloride, perchloroethylene, etc.)
213	Hydrocarbon solvents (benzene, hexane, Stoddard, etc.)
342	Organic liquids with metals (see 121)
352	Other organic solids
212	Oxygenated solvents (acetone, butanol, ethyl acetate, etc.)
231	Pesticide rinse water
232	Pesticides and other waste associated with pesticide production
223	Unspecified oil-containing waste
343	Unspecified organic liquid mixture
214	Unspecified solvent mixture
221	Waste oil and mixed oil
Sludges	
461	Paint sludge
Miscellaneous	
513	Empty containers less than 30 gallons
511	Empty pesticide containers 30 gallons or more
551	Laboratory waste chemicals
512	Other empty containers 30 gallons or more
541	Photochemical/photoprocessing waste
California Restricted Wastes	
721	Liquids with arsenic ≥ 500 mg/l
722	Liquids with cadmium ≥ 100 mg/l
723	Liquids with chromium (VI) ≥ 500 mg/l



711	Liquids with cyanides \geq 1000 mg/l
741	Liquids with halogenated organic compounds \geq 1000 mg/l
724	Liquids with lead \geq 500 mg/l
725	Liquids with mercury \geq 20 mg/l
726	Liquids with nickel \geq 134 mg/l
791	Liquids with pH \geq 2
792	Liquids with pH \geq 2 with metals
727	Liquids with selenium \geq 100 mg/l
728	Liquids with thallium \geq 130 mg/l

C. DOT Hazard Classes

Class No.	Division No. (if any)	Name of class or division	49 CFR reference for definitions
None		Forbidden materials	173.21
None		Forbidden explosives	173.54
1	1.1-1.6	Explosives	173.50
2	2.1	Flammable gas	173.115
2	2.2	Non-flammable compressed gas	173.115
2	2.3	Poisonous gas	173.115
3		Flammable and combustible liquid	173.120
4	4.1	Flammable solid	173.124
4	4.2	Spontaneously combustible material	173.124
4	4.3	Dangerous when wet material	173.124
5	5.1	Oxidizer	173.127
5	5.2	Organic peroxide	173.128
6	6.1	Poisonous materials	173.132
6	6.2	Infectious substance (Etiologic agent)	173.134
7		Radioactive material	173.403
8		Corrosive material	173.136
9		Miscellaneous hazardous material	173.140
None		Other regulated material: ORM-D	173.144



Appendix D: Select Substances of Concern

A. Asbestos (8 CCR 5208)

Asbestos refers to several mineral fibers that have been associated with respiratory illnesses. Because of its insulating properties and its resistant to flame, asbestos has been used in insulation and fire retardant materials as well as floor tiles and brake pads. “Asbestos containing material” (ACM) is defined as any product or material that contains more than 1% asbestos. Asbestos was one of the first materials to be regulated by OSHA and has received much attention over the years. Due to the hazards, development of replacement materials, and the association with negative health consequences, the use of asbestos has been reduced dramatically.

However, due to its prevalence in construction materials used from the 50’s to 70’s, ACM are still commonly encountered in older buildings. There is no ban in the United States for using asbestos, but the health concerns have dramatically impacted its use.

Asbestos exposure is associated with inhaling small fibers typically during demolition or repair activities. If left alone, ACM pose absolutely no hazard to employees. However, as the products begin to age and deteriorate, they may fragment, break off, or require repair which then can expose an employee to the hazard. By its nature, asbestos fibers break into smaller fibers, a property called ‘friability.’ These fibers can fracture to such a small size that they can be inhaled and lodge in the small air sacs of the lungs called alveoli. Since the body cannot eliminate these fibers, the body responds to the contaminant by building scar tissue around the fibers, resulting in reduced lung function- a condition called asbestosis. Asbestos inhalation can also result in lung cancer or mesothelioma, tumor growth on the membrane lining the lung or stomach cavity.

Exposure to asbestos is reduced by protecting the airway with high-efficiency particulate air filters (HEPA). Filtering facepieces cannot be used to protect employees from asbestos exposure.

The only way to determine whether a material contains asbestos is to have it tested by a certified laboratory. If materials are then identified as containing asbestos, they must then be removed by a contractor licensed to perform asbestos abatement. Special equipment, controls, and monitoring are required to properly, safely, and completely remove ACM. Asbestos waste is removed using wet processes, is packaged separate from other wastes, and is disposed of as hazardous waste.

1. The Regional Facilities Officer at each College should be knowledgeable regarding the presence or absence of any ACM at their campus.
 - a. Natural rock or soil sources are excluded from this provision.
2. The RFO can request assistance from the Director of Facilities or the District Architect regarding identifying potential ACM.
3. If a material is suspected of containing asbestos, the material must be sampled and sent to a certified asbestos laboratory for analysis.
 - a. No work shall be done on or near the suspected ACM until the certified report has been received from the laboratory.
 - b. If the report comes back negative, work shall commence without restrictions.
 - c. If the report comes back positive, a licensed asbestos abatement company shall be



contacted to remove and dispose of the ACM.

- 1) After proper remediation is complete, work shall commence without restrictions.
- 2) A certification from the abatement contractor shall be kept on file until such time as the building is demolished.

d. All laboratory reports and abatement certifications shall be kept by the Regional Facilities Officer, the Director of Facilities, and the District Architect until such time as the building is demolished.



B. Benzene (8 CCR 5218)

Benzene is a clear, colorless liquid that is derived from coal and petroleum processing. It is found in gasoline, other fuels, and chemistry laboratories. It has a model-glue or paint-thinner like odor. Benzene is a flammable liquid with a flash point of 12 F and evaporates easily having a boiling point of 176 F.

The OSHA PEL is 1 ppm TWA and 5 ppm STEL. The NIOSH REL is 0.1 ppm TWA and 1 ppm STEL. Benzene is a potential human carcinogen. The action level of benzene, that level at or above which specific training and controls must be implemented, is 0.5 ppm TWA (8 CCR 5218).

Short-term exposure to large amounts of benzene vapors can cause drowsiness, dizziness, unconsciousness and death. Long-term exposures over the TWA have been linked to leukemia as well as bone marrow and blood production deficiencies.

1. These restrictions do not apply to
 - a. Gasoline or other fuel operations (unless that operation occurs indoors for more than four (4) hours per day) or
 - b. Mixtures of benzene less than 0.1% by volume.
2. Fuel shall be stored, handled, and transferred in outdoor locations whenever possible.
 - a. Supervisors whose employees handle or transfer gasoline into portable containers shall provide their employees with the following protective equipment:
 - 1) Safety goggles
 - 2) Polyvinyl alcohol (PVA) chemical resistant gloves
3. For instructional laboratories,
 - a. The Laboratory Supervisor needs to retain a record regarding the usage of benzene for experiments.
 - 1) If benzene is used less than ten (10) days per calendar year, there is no requirement for employee medical surveillance specific to benzene (8 CCR 5218 (i)(1)(A)).
 - b. Benzene and benzene-containing wastes shall only be handled in functioning, certified, fume hoods.
 - c. Benzene containers shall be stored in properly ventilated flammable storage cabinets.
 - 1) Annual testing for benzene shall be conducted in storage rooms that contain benzene, including waste accumulation locations.
 - 2) The Risk Management Office must be notified if the measured level for benzene only exceeds 0.5 ppm TWA.
 - d. Employees who transfer benzene or benzene-containing wastes shall use the following protective equipment:
 - 1) Safety goggles
 - 2) Polyvinyl alcohol (PVA) chemical resistant gloves.
 - e. As benzene shall only be handled, transferred, heated, or mixed in certified, functioning fume hoods and well-ventilated areas, there is no exposure hazard to employees and additional monitoring, controls, and medical surveillance is not required.



C. Carcinogens (8 CCR 5209)

1. Each Facility, during its chemical inventory, must determine whether any of the following carcinogens as identified by the State of California are present at the listed concentration:

Chemical	Concentration
2-Acetylaminofluorene	1.0
4-Aminodiphenyl	0.1
Benzidine (and its salts)	0.1
3,3'-Dichlorobenzidine (and its salts)	1.0
4-Dimethylaminoazobenzene	1.0
alpha-Naphthylamine	1.0
beta-Naphthylamine	0.1
4-Nitrobiphenyl	0.1
N-Nitrosodimethylamine	1.0
beta-Propiolactone	1.0
bis-Chloromethyl ether	0.1
Methyl chloromethyl ether	0.1
Ethyleneimine	1.0

2. If any of these substances are determined to be present, the Regional Facility Officer must contact the Risk Management Office to implement the requisite policies and procedures for safe handling and storage.



D. Chromium VI (8 CCR 5206)

Hexavalent chromium, also referred to as ‘Chrome 6’ or ‘hex chrome,’ is a toxic form of the metal chromium. Most occupational exposures to Chrome 6 occur during the welding of chrome-containing alloys, including stainless steel.

Inhalation of Chrome 6 fumes has been attributed to lung cancer, nose and throat irritation, and damage to eyes and skin. Also, welding fumes have been suspected of making welders more susceptible to pneumonia and other respiratory illnesses.

Most Chrome 6 exposures occur by inhaling the metal fumes generated during the welding process. Exposure to the fumes is controlled by exhausting the fumes away from the employee and providing respiratory protection to filter the fumes.

The following shall be implemented for any welding of chromium-containing metals, including stainless steel:

1. Welder shall position themselves, whenever possible, out of visible fume plume
2. Welder shall wear filtering facepiece.
 - a. Refer to the District’s *Respiratory Protection Program* for additional requirements.
3. The welding operation shall be outfitted with local exhaust ventilation (LEV)
 - a. The intake must be able to be positioned within six (6) inches of the work to remove the fumes.
 - b. LEV must be capable of at least 100 fpm.
 - c. If LEV is not available, welding shall be performed in a booth or in an exterior location.
 - 1) The booth shall have full containment including overlapping panels for access.
 - 2) Booth shall have negative exhaust ventilation of at least 100 fpm with a filter to capture fumes.
 - 3) Booth access shall be restricted to only those individuals with respiratory protection in addition to eye protection from welding arc and sparks.
4. Due to the infrequent exposure of employees to welding, less than 30 days per year, engineering controls, work practice controls, monitoring, and medical surveillance are not required (8 CCR 5206(g)(1)(D)).



E. Formaldehyde (8 CCR 5217)

Human physiology labs incorporate the use of preserved human cadavers. During the course of study, these cadavers are dissected and inspected to familiarize students with human systems. The preservative used in cadavers in California contains 2.5-5% formaldehyde, by volume of concentrate. The final concentration in a human specimen is unknown.

Short-term exposure to low levels of formaldehyde can cause sore throat, cough, eye irritation, and nosebleeds. Exposure to the skin can cause irritation and contact dermatitis. Long-term exposure can result in nose and throat cancers.

Formaldehyde exposure is controlled using ventilation and, if necessary, respiratory protection.

1. All Colleges that employ preserved human cadavers in instructional settings shall incorporate testing to determine the need for additional controls and medical surveillance.
 - a. Testing shall be accomplished by way of
 - 1) Personnel monitors, such as badges
 - 2) Air monitoring
 - 3) Air sampling
 - b. Testing shall be conducted
 - 1) To demonstrate compliance with this *Program*
 - 2) Whenever the College is notified that the embalming fluid solution has changed
 - 3) When employees report symptoms of potential exposure
 - c. The Testing program shall
 - 1) Have a written sampling plan
 - a) If badges are used, at least ten (10) individuals must be tested, including faculty, students, and instructional laboratory technicians
 - b) If air monitoring is used, at least ten (10) samples shall be collected, five (5) of which are collected in the breathing zone of those individuals performing the dissections.
 - c) Testing must occur over at least two (2) different laboratory sessions
 - 2) Record the following (8 CCR 5217 (o)(1))
 - a) Date of sampling
 - b) Operation being monitored
 - c) Method of sampling, including accuracy and precision
 - d) Number, duration, time, and results of sampling
 - e) Types of PPE being used
 - f) Name, job classification, social security numbers, and exposure estimates of monitored employees
 - 3) Include a written report of results
 - a) Results must include uncertainty of measurement statements
 - b) Results will be reported as eight-hour time weighted averages
 - 4) A copy of the report shall be
 - a) Presented to the faculty and employees involved in the cadaver program
 - b) Provided to the Risk Management Office
 - 5) The testing records and report must be kept for thirty (30) years.
2. The following is based on the results of the testing.
 - a. If the TWA is less than 0.1 ppm, no training or other formaldehyde-specific



requirements apply.

- 1) Additional air monitoring is not required unless there is a change in procedures or preservative chemical.
- b. If the TWA is between 0.1 and 0.5 ppm TWA
 - 1) The area and bags containing cadavers must be labeled
 - a) That they contain formaldehyde
 - b) With the name and address of the UCSD body donation program
 - c) Statement that the physical and health hazard information is available from the employer and from the SDS
 - 2) The College must train the faculty and instructional lab technicians
 - a) At the time of initial assignment
 - b) Annually
 - 3) The training program must include
 - a) Discussion of 8 CCR 5217
 - b) Purpose for and description of the medical surveillance program
 - c) Health hazards of formaldehyde
 - d) Signs and symptoms of formaldehyde exposure
 - e) Reporting protocol for potential formaldehyde exposure
 - f) Description of operations involving cadavers
 - g) Explanation of safe work practices
 - h) Use and limitations of PPE
 - i) Emergency response, including spills and clean up procedures
 - j) Engineering and work practice controls
 - k) Review of emergency procedures
 - l) How to locate written training materials
- c. If the TWA exceeds 0.5 ppm, in addition to 'b' above, the College shall
 - 1) Conduct air monitoring as noted above every six (6) months (8 CCR 5217 (d)(3)(A))
 - 2) Notify employees of the measured levels within fifteen (15) days of obtaining results
 - 3) Provide additional required PPE, including respiratory protection
 - 4) Install required signage pursuant to 8 CCR 5217 (e)(1)(A) and (h)(2)(B)(1)
 - 5) Institute a formaldehyde medial surveillance program as outlined in 8 CCR 5217 (l)



F. Lead (8 CCR 5198)

The requirements for testing and monitoring relate to employee exposure of airborne lead particles (8 CCR 5198 (d)(3)(A)(2)). As the processes that use lead do not generate airborne inhalable or respirable particles, the District has determined that the monitoring, medical surveillance, and control methods are not required as they pertain to lead.





TRAINING RECORD

Facility: _____

Date	Time	Instructor			
		Name (print)	Signature	Department	Supervisor