



Chemical Hygiene Plan

San Bernardino Valley College
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San Bernardino, California 92410
&

Crafton Hills College
11711 Sand Canyon Road
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EFFECTIVE: December 2022

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Policy Statement

This Chemical Hygiene Plan (CHP) sets forth policies, procedures, equipment, personal protective equipment and work practices that are capable of protecting employees and students from the health hazards presented by hazardous chemicals used in laboratories. This Plan is intended to meet the requirements of 8 California Code of Regulations (CCR) 5191, Occupational Exposure to Hazardous Chemicals in Laboratories.

Scope

This CHP applies to our Biology, Microbiology, Anatomy and Physiology, and Chemistry laboratories where employees work with substances in which the containers used for reactions, transfers, and other handling of substances are easily and safely manipulated by one person. The objective of this program is to provide guidance to all laboratory personnel who use chemicals, so that they can perform their work safely.

Laboratory Employees -- Each individual working in a laboratory shall be informed about hazards associated with that laboratory and the specific work going on there. This includes all staff, students, instructors, faculty, and assistants.

Support Personnel – Warehouse, custodial, maintenance, and delivery personnel may be exposed to potential physical and chemical hazards from work carried out in the laboratory. They must be informed about the risks involved and trained how to avoid potential hazards.

Responsibilities

Chemical Hygiene Officer

The Dean of Science is the Chemical Hygiene Officer (CHO) for the Chemical Hygiene Program throughout the college and will provide continued direction for the Chemical Hygiene Program.

The Chemical Hygiene Officer shall:

- Work with administrators, faculty, and staff to develop and implement acceptable, appropriate chemical hygiene policies and practices
- Monitor procurement and use of chemicals in the lab; ensuring that laboratory facilities and training levels are adequate for chemicals in use
- Ensure regular, formal chemical hygiene and housekeeping inspections that include verifying that inspections of emergency equipment are occurring at regular intervals
- Work with the lab technicians to maintain a current chemical inventory of Biology, Microbiology, Anatomy and Physiology, and Chemistry
- Review and improve the Chemical Hygiene Plan on, at a minimum, an annual basis
- Maintain overall responsibility for the safe operation of the Biology, Microbiology, Anatomy and Physiology, and Chemistry department laboratories
- Ensure that workers/students know and follow chemical hygiene rules
- Ensure the proper level of personal protective equipment; ensure that such protective equipment is available; support the laboratory technicians in procuring protective equipment that is in working order

- Collaborate with employees and Environmental Health and Safety Office to provide the appropriate training to employees
- Ensure lab waste disposal is occurring in accordance with regulatory requirements.
- Ensure appropriate records for inspections and training are maintained

Faculty and Staff

Instructors: Directly responsible for chemical hygiene in the laboratory. All instructors are required to ensure that provisions of the CHP are being followed in the laboratory for the safety of the students and themselves. Provide information on safety, guidelines on lab behavior and techniques, and instructions on chemicals used in the lab to support student safety.

Laboratory Technicians:

- Responsible for the daily maintenance and upkeep of the laboratory.
- Prepare materials needed for laboratory experiments for instruction.
- Responsible for ordering materials i.e. chemicals, PPE (Personal Protective Equipment), and instructional equipment.
- Ensure chemicals must be segregated by hazard classification and compatibility in a well-identified area, with good general exhaust ventilation.
- Maintain a current inventory of all chemicals in the laboratory and accompanying Safety Data Sheets (SDSs).
- Monitor personal protective equipment to ensure equipment is intact and appropriate.
- Inspect eye washes and monitor inspection of other safety equipment.
- Conduct an annual examination and inventory of all chemicals.

Students: Responsible for conducting each operation in accordance with prescribed chemical hygiene procedures.

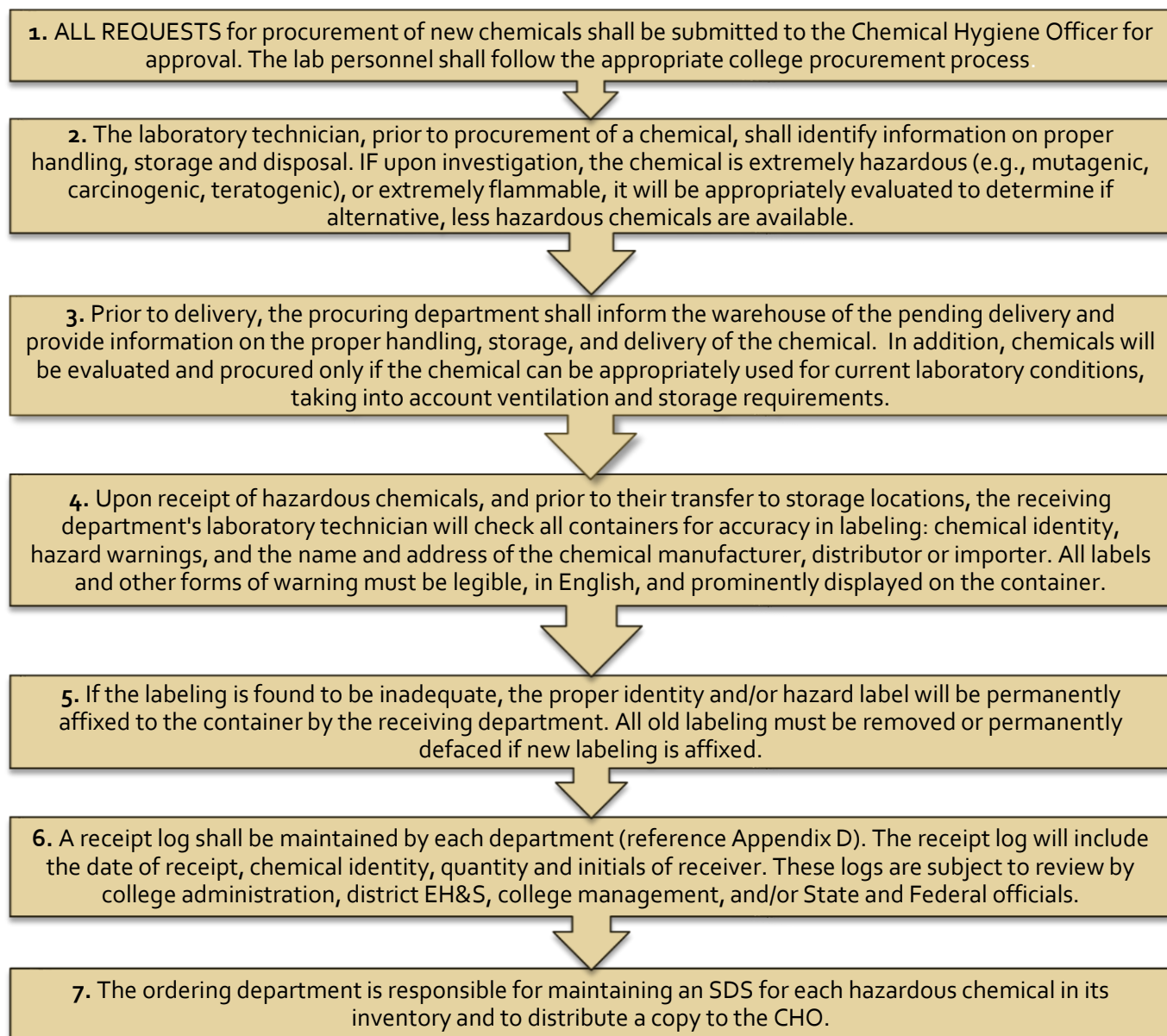
THIS CHP IS AVAILABLE ON THE DISTRICT WEBSITE, UNDER SAFETY PROGRAMS:

<https://sbccd.edu/district-services/safety-risk-management/safety-programs/index.php>

Standard Procedures for Laboratory Chemicals

Chemical Procurement

The decision to procure a chemical shall be made by the Biology, Microbiology, Anatomy and Physiology, and Chemistry instructors and associated lab technicians. Each instructor and lab technician will ensure a commitment to safe handling and use of the chemical from initial receipt to ultimate disposal. Each lab technician shall proactively and continually evaluate current inventory and properly dispose of unnecessary materials.



Chemical Storage

Receipt of chemicals shall be immediately coordinated between Shipping and Receiving and the department where the chemicals are to be delivered. Following the delivery from shipping and receiving to the designated department, the chemicals shall be moved to the designated chemical storage area by one of the lab technicians. Large glass containers shall either remain in their original shipping container or be placed in carrying containers (e.g., rubber "boots") during transportation. The storage area shall be well illuminated, with storage maintained at or below eye level. Flammables will be stowed in the designated flammable storage cabinets in lab prep areas. Mineral acids shall be segregated from flammable and combustible materials. Separation is defined by **8 CCR Section 5164**.

Storage areas shall be accessible during normal working hours. Storage areas are under the control of each laboratory technician and appropriate instructor for Biology, Microbiology, Anatomy and Physiology, and Chemistry. The amount of chemicals at the lab bench shall be as small as practical.

Stored chemicals shall be examined annually by the appropriate laboratory technician for container integrity and/or deterioration. The inspection shall determine whether any corrosion, deterioration, or damage has occurred to the storage facility as a result of leaking chemicals. When signage or labels become defaced, they must be relabeled or reposted in accordance with the SBCCD Hazardous Communications Program.

Laboratory technicians shall conduct periodic inspections for chemicals outside their respective storage areas. Unneeded items shall be properly discarded or returned to the storage area.

Chemical Handling

Each laboratory employee/student (with the training, education, and resources provided by supervision) shall develop work habits consistent with requirements of the SBCCD to minimize potential personal and coworker exposure to chemicals. Based on the realization that all chemicals inherently present hazards in certain conditions, exposure to all chemicals shall be minimized.

General precautions that shall be followed for the handling and use of all chemicals are:

- ▲ Skin contact with chemicals shall be avoided at all time. Use appropriate PPE when necessary.
- ▲ Employees and students shall wash all areas of exposed skin prior to leaving the laboratory. Hand soap is provided at each sink.
- ▲ Mouth suction for pipetting or starting a siphon is prohibited.
- ▲ Eating, drinking, smoking, chewing gum, or application of cosmetics in the laboratory is prohibited.
- ▲ Open toed shoes are prohibited in the laboratory.
- ▲ Storage of food or beverages is not allowed in storage areas or refrigerators used for laboratory operations.
- ▲ Any chemical mixture shall be assumed to be as toxic as its most toxic component.
- ▲ Substances of unknown toxicity shall be assumed to be toxic.
- ▲ Laboratory employees/students shall be familiar with the symptoms of exposure for the chemicals that they work with and the precautions necessary to prevent exposure.

- ▲ All laboratory employees/students shall adhere to the CHP.
- ▲ In all cases of chemical exposure neither the Permissible Exposure Limits (PEL's) of OSHA or the Threshold Limit Values (TLV's) of the American Conference of Governmental Industrial Hygienists (ACGIH) shall be exceeded through appropriate monitoring.
- ▲ If monitoring is required, then a copy of the test reports/monitoring results will be kept in the office of the CHO and Administrative Services. Copies will be provided to the affected departments as necessary.
- ▲ Engineering controls and safety equipment in the laboratory shall be utilized and inspected in accordance with guidelines established in the CHP.
- ▲ The maintenance department shall maintain an inspection log that documents eyewash/shower function, fire extinguisher inspections, and laboratory ventilation systems.
- ▲ Specific precautions based on the toxicological characteristics of individual chemicals shall be implemented as deemed necessary by the CHP.

Laboratory Equipment and Glassware

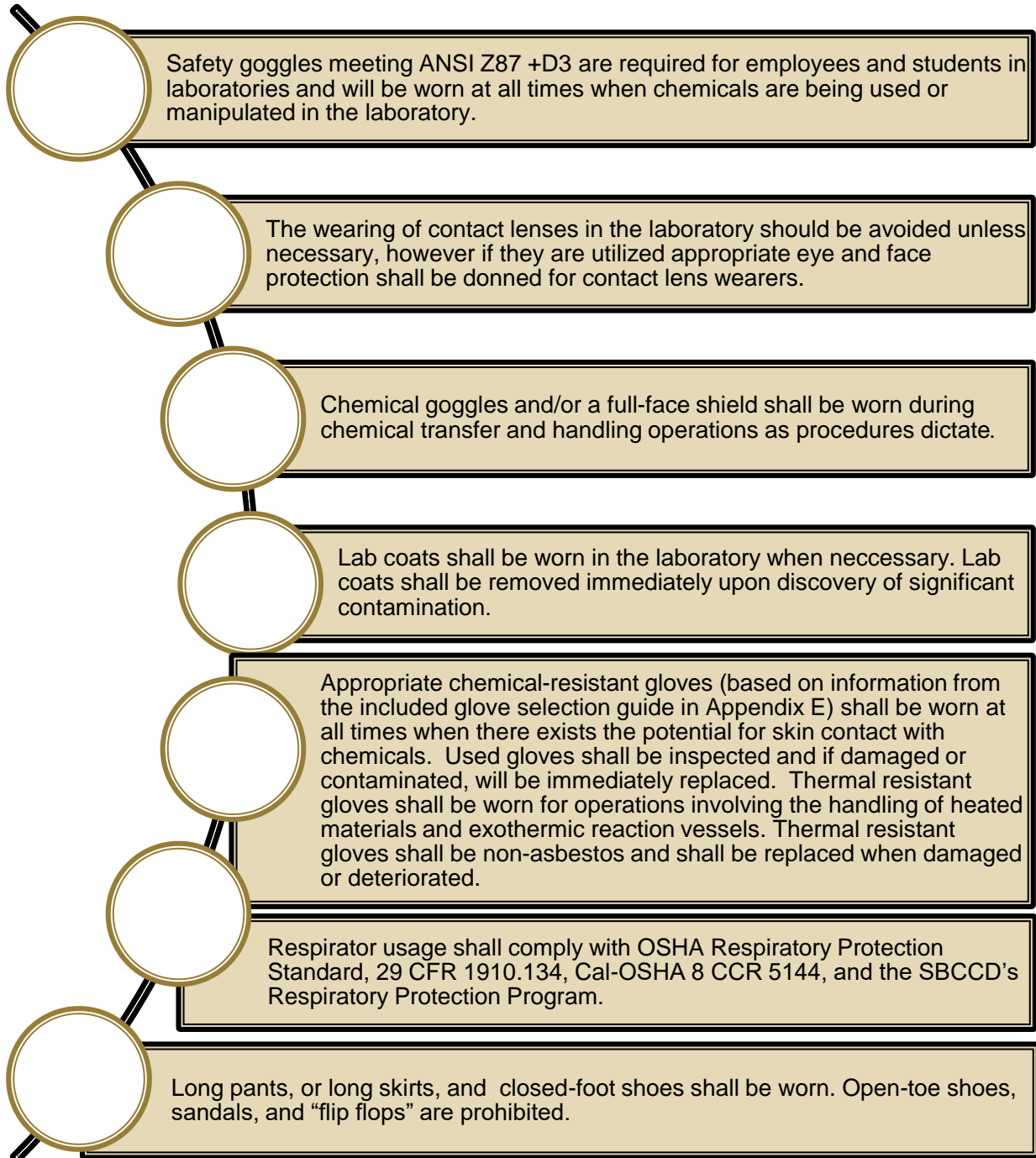
Each employee/student shall keep the work area clean and uncluttered. All chemicals and equipment shall be properly labeled, in accordance with the Chemical Hygiene Plan and the SBCCD Hazardous Communications Program.

At the completion of each workday or operation, the work area shall be thoroughly cleaned by users and all equipment cleaned and stowed.

In addition, the following procedures shall apply to the use of laboratory equipment:

- All laboratory equipment shall be used only for its intended purpose.
- All glassware will be handled and stored with care to minimize breakage; all broken glassware will be immediately disposed of in the broken glass container.
- All evacuated glass apparatus shall be shielded to contain chemicals and glass fragments should implosion occur.
- Labels shall be attached to all chemical containers, identifying the contents and related hazards.
- Chemical/hazardous waste receptacles shall be labeled as such.
- All laboratory equipment shall be inspected on a periodic basis and replaced or repaired as necessary. Students or staff that discovers broken or damaged equipment shall report it to the laboratory technician immediately.
- Installation of unapproved/unclassified electrical/other equipment into the laboratory hoods that could introduce an ignition source is prohibited.

Personal Protective Equipment



Personal Work Practice

Instructors must ensure that each student knows and follows the rules and procedures established by this plan.

- All employees/students shall remain vigilant to unsafe practices and conditions in the laboratory and shall immediately report such practices and/or conditions to their supervisor. The instructional dean for Biology, Microbiology, Anatomy and Physiology, and Chemistry must PROMPTLY correct unsafe practices or conditions.
- Long hair or loose-fitting clothing shall be confined close to the body to avoid contact with chemicals or being caught in moving machine/equipment parts.
- Use only those chemicals appropriate for the ventilation system.
- Students shall clean up their work area prior to leaving the lab. Spills must be reported to the lab technician or the instructor.
- Avoid unnecessary exposure to all chemicals by any route.
- Smelling or tasting of any chemicals is prohibited.
- Encourage safe work practices in coworkers by setting the proper example.
- Horseplay is strictly forbidden.
- Seek information and advice from knowledgeable persons regarding Standards and Codes about hazards present in the laboratory. Plan operations, equipment, and protective measures accordingly.
- Closed-foot shoes are required for employees and students to laboratories and will be worn at all times. Opened-toe shoes, sandals, and "flip flops" are prohibited.
- Inspect personal protective equipment prior to use, and wear appropriate protective equipment as procedures dictate and when necessary to avoid exposure.
- Employees and students shall wash all areas of exposed skin prior to leaving the laboratory.
- Good housekeeping practices shall apply to all laboratories at all times. Unneeded items shall be properly discarded or returned to their designated area.

Labeling

All containers in the laboratory shall be labeled. This includes chemical containers and waste containers. The labels shall be informative and durable, and at a minimum, will identify contents, source, date of acquisition and expiration, and indication of hazard.

Portable containers shall be labeled by the individual using the container. Exemptions for labeling requirements shall be made for chemical transfers from a labeled container into a container that is intended only for the immediate use of the employee who performed the transfer.

The labeling program shall be periodically inspected by the appropriate laboratory technician to ensure that labels have not been defaced or removed. When labels become damaged or defaced, they must be replaced.

Criteria for Implementation of Control Measures

When to use fume hoods

- Hoods shall be used **WHENEVER POSSIBLE** to contain and exhaust toxic, offensive, or flammable materials.
- Processes that have potential for generating hazardous airborne chemical concentrations shall be carried out within the fume hood.

When to use safety shields or other containment devices

- Safety shields must be used where the possibility exists for laboratory scale detonation.
- Protective devices, such as long and short-handled tongs for holding or manipulating hazardous items shall be used **WHENEVER POSSIBLE**.

When to use personal protective equipment

- **Eye Protection** - Safety goggles meeting ANSI Z87 +D3 must be worn by all personnel in the laboratory whenever hazardous chemicals are in use. **NO EXCEPTIONS**.
- **Skin Protection** - Lab coats, aprons, and gloves shall be worn to protect the skin from chemical and physical (e.g. heat, cold) exposures. Soiled, contaminated or damaged coats, aprons, or gloves shall be decontaminated, cleaned, and/or disposed of properly.
- **Respirators** - Respiratory protection may be necessary to maintain chemical exposure below OSHA's PEL. Respirators will be provided, if necessary.

Fume Hood Management

Frequency and Type of Monitoring

All local exhaust hoods used for primary containment control will be monitored for adequate airflow on an annual schedule. The survey will be completed with a calibrated velometer.

Acceptable Operating Range

Minimum face velocities of at least 100 linear feet per minute (fpm) must be maintained for each hood. If the face velocity does not meet a minimum of 100 linear fpm, maintenance personnel must be contacted to repair or upgrade the hood.

When handling carcinogens (i.e., Benzene, Formaldehyde, etc.), minimum face velocities of at least 150 linear fpm must be maintained. If the face velocity does not meet a minimum of 150 linear fpm, maintenance personnel must be contacted to repair or upgrade the hood.

Environmental Firm

An approved Environmental Firm will provide certification of all fume hoods on an annual basis. Results will be documented and kept in the office of Administrative Services and Maintenance & Operations (M&O).

Maintenance Schedule

The Maintenance and Operations department is responsible for the maintenance of local exhausts and fume hoods. The Maintenance and Operations department will complete the maintenance on an "as needed" basis, or annually, whichever comes first.

In the event the local exhausts or fume hoods fail, or show signs of failing:

- Immediately discontinue work and turn off equipment
- Close chemicals that may be in the fume hood
- Close sash
- Contact Maintenance and Operations Department for service
- Post signage on the fume hood warning that the Fume Hood is not operational

Employee Information and Training

Information

1. A copy of 8 CCR 5191 can be found on the web at <http://www.dir.ca.gov/title8/5191.html>; the SBCCD CHP can be found online at <https://sbccd.edu/district-services/safety-risk-management/safety-programs/index.php>

2. Recommended exposure limits for other hazardous chemicals, information on signs and symptoms associated with exposures to hazardous chemicals, safety data sheets, and other information on the hazards, safe handling, and storage of hazardous chemicals can be found on the NIOSH website for Chemical Hazards: <https://www.cdc.gov/niosh/npg/default.html>.

3. A list of OSHA health hazard definitions and lists of select carcinogens, reproductive toxins, and high acute toxicity materials are included in the NIOSH Pocket Guide for Chemical Hazards (see link in #2 above).

Training

1. Employees (including Adjunct professors) will be provided with opportunities for training to ensure that they are apprised of the hazards of chemicals present in their work area. Such training will be provided at the time of an employee's initial assignment to a work area where hazardous chemicals are present and prior to assignments involving new exposure situations. Refresher training will be provided annually.
2. Students will receive safety training in conjunction with the course curriculum, as provided by the instructor. The Chemical Hygiene Officer will establish and promote a practice of safety education by faculty members for students; and shall provide an annual report to the Safety Committee to validate student participation in student safety orientation.
3. Employee training will include:

- Provisions of 8 CCR Section 5191 including methods and observations that may be used to detect the presence or release of a hazardous chemical; the physical and health hazards of chemicals in the work area; and the measures employees can take to protect themselves from these hazards, including specific procedures the employer has implemented to protect employees from exposure to hazardous chemicals, such as appropriate work practices, emergency procedures, and personal protective equipment to be used.
 - The applicable details of the Chemical Hygiene Plan.
4. Training documentation will be documented by the respective Dean of Arts and Science for Biology, Microbiology, Anatomy and Physiology, and Chemistry and a copy forwarded to SBCCD Human Resources.

Required Approvals

Certain laboratory procedures, which present serious health hazards upon exposure, require prior approval by the respective Dean of Arts and Science for Biology, Microbiology, Anatomy and Physiology, and Chemistry before work may commence. Prior approval is required before proceeding with the following procedures:

- Working with Carcinogens/Teratogens/Mutagens

BIOLOGY/MICROBIOLOGY/ANATOMY

Formaldehyde (Formaldehyde use is regulated by the SBCCD Formaldehyde Program)

Chloroform

CHEMISTRY

Benzene

Carbon Tetrachloride

Lead

Chromium

Nickel

*Some chemicals within this category are stored in the chemical storage room but are NOT currently used in any experiments.

Medical Consultation and Examination

Procedures to secure medical consultation and examination have been developed in the event an employee who works with hazardous chemicals and one or more of the following apply. An examination is provided without cost to the employee, without loss of pay, and conducted at a reasonable time and place:

- Develops symptoms associated with a hazardous chemical to which the employee may have been exposed in the laboratory.
- Works where exposure monitoring reveals an exposure level routinely above the CalOSHA action level or, in the absence of a designated action level, exposure above the CalOSHA Permissible Exposure Limit (PEL), for CalOSHA

regulated substances for which there are medical monitoring and medical surveillance requirements. Chemicals that fall within this category are:

- Asbestos
- Vinyl Chloride
- Inorganic Arsenic
- Lead
- Benzene
- Coke Oven Emissions
- Cotton Dust
- 1, 2-Dibromo-3-Chloropropane
- Acrylonitrile
- Ethylene Oxide
- Formaldehyde
- Carbon Tetrachloride
- 2-aminonaphthalene
- Methylene Chloride

- Or is exposed to a hazardous chemical during a spill, leak, or explosion or other occurrence resulting in exposure is entitled to medical attention including an examination and follow-up exams as deemed necessary by the physician.

Procedures to Secure Medical Consultation

Procedures to secure medical consultation and examination are as follows:

1. Report exposure to CHO and respective deans.
2. Seek medical care as outlined in the SBCCD Injury and Illness Prevention Program (IIPP) (refer to the SBCCD's procedures for injured employees): www.sbccd.org/ehs, under SAFETY PROGRAMS.
3. The employer will provide the following information to the physician.
 - a) Safety Data Sheet (SDS).
 - b) Description of conditions under which exposure occurred.
 - c) Description of signs and symptoms employee is experiencing.
4. A written opinion from the physician shall be provided to the employer including:
 - a) Recommendation for further medical follow-up.
 - b) Results of medical exam and tests; limited to exposure with personal information disclosed.
 - c) Any medical condition revealed during the exam that places the employee at increased risk.
 - d) A statement that the employee has been informed by the physician of the results of the exam and any medical condition that may require further treatment or examination.

Additional Protection for Work with Particularly Hazardous Substances

Work with Substances with High Degree of Acute Toxicity

Individuals who work with selected carcinogens, reproductive toxins and substances that have a high degree of acute toxicity may require additional employee protection. Specific consideration will be given to:

- Establishment of a designated area
- Use of containment devices such as fume hoods or glove boxes
- Procedures for safe removal of contaminated waste
- And decontamination procedures.

Science Departments: Biology, Microbiology, Anatomy and Physiology and Chemistry

- ▲ Establishment of a Designated Area
 - Designated areas for working with laboratory specimens that contain carcinogens, reproductive toxins and substances that have a high degree of acute toxicity shall be established.
- ▲ Exposure Control
 - In accordance to Appendix E, disposable or lightweight nitrile, neoprene, natural rubber or PVC gloves provide protection from incidental contact and serves as a containment device. Heavier gloves shall be used when extended handling of contaminated or preserved materials or immersion is likely. A chemically resistant apron and over-sleeves shall be used when transferring or using large quantities and splash is likely. Appropriately fitted respirators (reference the Respiratory Protection Plan) and local exhaust fans shall be used and serves as containment devices. If either device fails, or shows signs of failing, do not continue to work with formaldehyde. Notify the Maintenance and Operations to service the exhaust fans. Notify the respective dean to obtain a properly working respirator.

Procedures for Safe Removal of Contaminated Waste

- Formaldehyde is a listed RCRA hazardous waste.
- Coordinate disposal of formaldehyde waste through the Maintenance and Operations (M&O) department.
- Read Safety Data Sheet (SDS) prior to use.
- Keep in a tightly closed container.
- Separate from oxidizing agents.
- Keep away from heat and flame.

Request for Waste Pick-up / Removal

- Refer to the SBCCD Hazardous Waste Management Program for details on types of wastes and their appropriate removal procedures.
- Formaldehyde:

Waste is collected in the cadaver room (CHC, CYN 212) and specimen storage room (SBVC, HLS#228) will be removed by certified hauler near the end of spring semester. Waste pickup shall be coordinated between the department and Maintenance and Operations.

➤ RCRA Hazardous Waste:

Waste pickup shall be coordinated between the department and Maintenance and Operations.

➤ All Other Hazardous Materials:

Hazardous waste collection is performed quarterly by a certified collection and disposal service and coordinated by the Maintenance & Operations Coordinator. The generating department will be required to identify materials designated for disposal and provide the following information to the custodial supervisor:

- Substance Location: Include the building name and room number. In addition, the location of the waste container shall also be noted in the event that M&O performs the waste pick-up when no lab personnel are present.
- Short Description
 - Chemical Name: Use full chemical names. Do not use formulas or abbreviations. Include all the constituents of each waste container.
 - Quantity: Include the number of containers of waste and their volumes.
 - Accumulation Start Date
- In the event that waste containers to be collected are intermingled with containers that you want to keep, it is helpful if you mark which containers that are being offered for disposal.
- Waste removers cannot accept unknown materials. All waste containers must be appropriately labeled as hazardous waste and their contents identified.

- A. All waste containers must have a tightly fitting cap that will not leak during transport. Be sure that you have the correct cap for your bottle. The bottles of the various chemical manufacturers all have differently threaded caps that are not interchangeable with one another, (i.e. Fisher bottle caps do not fit Aldrich bottles and vice versa). Improperly capped waste bottles will leak and will not be picked up.

Decontamination procedures should be established in writing in the site specific standard operating procedures for each lab, especially those involving chemical treatments, and consist of any necessary periodic (daily, weekly, etc.) procedures performed to control exposure of employees. Depending on the chemical material, this may consist only of wiping a counter with a wet paper towel, or periodic use of a neutralizing agent. To determine the proper decontamination procedures, one must consider the chemical (or type of chemical), the amount of chemical used, the specific use, the location of use, and other factors. Contact the respective dean if assistance is needed to determine the most appropriate decontamination procedures.

Emergency Response/Chemical Spills

All lab personnel shall be familiar with SBCCD's Emergency Operations Plan (EOP). This plan contains emergency telephone numbers and spill response contacts for the college. A copy of the Emergency Response procedures are

summarized in the campus specific Emergency Flip-Charts, displayed on the wall in each classroom space. The EOP can be accessed electronically at <https://sbccd.edu/district-services/police-department/crime-prevention/emergency-preparedness.php>.

Chemical Spills in the Laboratory

When chemical spills occur within the Laboratory, the following procedures are followed to prevent injury or property loss:

1. Provide any first aid (if necessary) to affected personnel. Liberally use eyewash station and/or safety shower to flush affected areas. Flush continuously for AT LEAST 15 minutes. Any exposure merits medical care and a large exposure to the body merits ambulatory service.
2. Notify the respective dean, or the “administrator in charge,” of a spill. If a spill is larger than 1 liter or extremely hazardous, the Campus Police will be notified. Injured employees shall refer to the SBCCD’s procedures for injured employees. Injured students shall be referred to the respective health center. CHC Health and Wellness Center (909) 389-3272. SBVC Student Health Services (909) 384-4495.
3. Evacuate students from the area.
4. If spilled materials exhibit flammability, eliminate ignition sources such as hot plates, Bunsen burners, etc.
5. Avoid all contact with spilled material. If necessary, use protective gloves, gown, goggles, and/or respirator.
6. Obtain supplies from Chemical Spill Clean-Up Kit located in the Chemistry Stockrooms and each Chemistry lab at SBVC and CHC campus.
7. Neutralize acids and bases.
8. Contain collected materials and label container with name of contents and also as Hazardous Waste.
9. Always refer to SDS for special precautions or spill cleanup requirements.

Liquid Spills

1. Confine spill to small area as practical.
2. For small quantities of acids or bases, use the neutralizing agent from the chemical spill clean-up kit. An absorbent material specially prepared for acid/base spills may also be used.
3. For small quantities of other materials, such as organic solvents, utilize an absorbent material to clean-up spill. Examples of absorbent materials are vermiculite, dry sand, paper towels, etc.
4. For large quantities of inorganic acids and bases, flush with large amounts of water, preferably toward a containment area or drain. *CAUTION must be taken not to add too much water to create a flood that may react with water-reactive materials and cause spattering and additional personnel exposure.
5. If possible, utilize a mop to pick up as much of the spilled material. An excellent clean-up device is the mop bucket and wringer to collect the liquid.
6. Carefully pick up and decontaminate any bottles, broken glass, and/or other containers. Decontaminate over the bucket or pail to collect contaminated wash.
7. Avoid using any shop vacuum that is not rated for chemical clean up. A potential exists for atomizing hazardous wastes and creating a potential human inhalation exposure.
8. If the spill is extremely volatile (high vapor pressure), allow the spill to evaporate and exhaust out the laboratory exhaust (e.g., fume hood).

9. Properly containerize, label, store and/or dispose of collected hazardous waste. (See waste disposal section for methods).

Solid Spills

If possible, sweep solid spills of low toxicity into a designated, easily decontaminated, dust pan and place in a labeled container for storage and/or disposal.

Additional Spills

Mercury – Do not attempt to contain or clean the spill. Evacuate the space, post the door “Hazardous Waste Spill, DO NOT ENTER,” and contact the appropriate individual as prescribed in A.2 above.

Compressed Gas Cylinders

Compressed gas cylinders are used in many workplaces to store gases that vary from flammable (acetylene) to inert (helium). Many of these cylinders store gases at high pressures that can turn a damaged cylinder into a torpedo, capable of going through multiple concrete block walls. Other cylinders store the contents as a liquid (acetylene) and have special orientation requirements. If handled properly, compressed gas cylinders are safe. Regardless of the properties of the gas, any gas under pressure that is improperly stored can result in a hazardous release of energy.

Any person who handles compressed gas cylinders should be informed of their potential health safety hazards and trained to handle them properly. For additional advice, and/or assistance in training, contact the District, Environmental Health & Safety Office at 909-388-6935 .

Incident Report

An incident investigation shall take place after each spill and/or accident. The Incident report (Appendix E -Incident Report) shall be completed by the supervisor/instructor and forwarded to the Chemical Hygiene Officer (Dean) and Site Safety Officer (VP Administrative Services).

Review and Update

This Chemical Hygiene Plan will be reviewed annually and updated as needed. .

Suggested Chemical Storage Patterns

Storage of laboratory chemicals presents an ongoing safety hazard for college science departments. Many chemicals are incompatible with each other. The common method of storing these products in alphabetical order sometimes results in incompatible shelved materials. For example, storing strong oxidizing materials next to organic chemicals can present a hazard.

A possible solution is to separate chemicals into their organic and inorganic families and then to further divide the materials into related and compatible families. Below is a list of compatible families.

Inorganic



Organic



Additional Storage Suggestions

- Avoid floor chemical storage (even temporary).
- No top shelf chemical storage.
- No reactive/volatile liquid chemicals stored above shoulder level.
- Shelf assemblies are firmly secured to walls. Avoid island shelf assemblies.
- Provide anti-roll-off lips on all shelves.
- Ideally shelving assemblies would be of wood construction.
- Avoid metal, adjustable shelf supports and clips; fixed, wooden supports are preferred.
- Store acids in dedicated acid cabinet(s). Store Nitric Acid in that same cabinet ONLY if isolated from other acids. Store both inorganic and some organic acids in the acid cabinet.
- Store flammables in a dedicated and ventilated flammables cabinet.
- Store severe poisons in a lockable, dedicated poisons cabinet.
- Segregate known or suspect carcinogens from other chemicals.

If you store volatile materials (ether, hydrocarbons, etc.) in a refrigerator, the refrigerator must be explosion-proof. The thermostat switch or light switch in a standard refrigerator may spark and set off the volatile vapors in the refrigerator and cause an explosion.

Appendix A: SBVC Site Specific Information

VP Admin.
Services

- (909) 384-8958

Chemical
Hygiene
Officer (CHO)

- (909) 384-8650

EH&S Office

- (909) 388-6935

Web Links

- Web links
- **www.sbccd.org/ehs**
- <http://www.dir.ca.gov/title8/5191.html>

Appendix B: CHC Site Specific Information

VP Admin.
Services

- (909) 389-3210

Chemical
Hygiene
Officer (CHO)

- (909) 389-3205

EH&S Office

- (909) 388-6935

Web Links

- Web links
- **www.sbccd.org/ehs**
- <http://www.dir.ca.gov/title8/5191.html>

Appendix C: Goggles Selection Guide

The following guide is a general guide for goggles selection in relation to chemicals handled:

Cal/OSHA – Title 8 §3382. Eye and Face Protection

(d)(1) Design, construction, testing and use of devices for eye and face protection purchased after January 12, 1995 shall be in accordance with American National Standard, Practice for Occupational and Educational Eye and Face Protection, Z87.1-1989, which is hereby incorporated by reference, except that integral lens and frame design will be allowed if the lens frame combination provides unit strength, as well as impact, penetration, heat and flammability resistance, optical qualities and eye zone coverage equal to or greater than is required by ANSI Z87.1-1989

ANSI / ISEA Z87.1-2020

ANSI Z87.1 requires markings on eye protection that relate directly to the device's ability to defend against specific hazards. Eye protection glasses that are Z87.1-compliant are marked with "Z87."

CHEMICAL – Liquids, acid and chemical handling, degreasing, plating.

Splash, droplets and sprays	<ul style="list-style-type: none"> • Goggles with indirect ventilation (eyecup or cover type) • Faceshield worn over goggles) • Loose-fitting respirator worn over spectacles or goggles • Full-facepiece respirator 	<p>Atmospheric conditions and the restricted ventilation of a protector can cause lenses to fog. Frequent cleaning may be required.</p> <p>To provide adequate protection, ensure goggles fit tightly to the face.</p>	Splash/droplet: D3
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ANSI Z87+D3



ANSI Z87



Appendix D : Glove Selection Guide

The following guide is a general guide for glove selection in relation to chemicals handled. The information presented here is believed to be accurate; however, we cannot guarantee its accuracy. Many factors affect the breakthrough times of glove materials including, but not limited to:

1. Thickness of glove material
2. Concentration of the chemical worked with
3. Amount of chemical the glove comes in contact with
4. Length of time which the glove is exposed to the chemical
5. Temperature at which the work is done
6. Possibility of abrasion or puncture.

Some Common Sense Rules for Glove Use

- Select gloves which are resistant to the chemicals you may be exposed to. Consult the relevant Material Safety Data Sheet (MSDS) which may recommend a particular glove material.
- Select gloves of the correct size and fitting; gloves that are too small are uncomfortable and may tear whereas overlarge gloves may interfere with dexterity. In some cases, such as use of HF, it may be advisable to select gloves that can be removed very rapidly in an emergency.
- Before use, check gloves (even new ones) for physical damage such as tears or pin holes and for previous chemical damage: this is especially important when dealing with dangerous materials such as HF.
- When working, it may be advisable to wash the external surface of the gloves frequently with water.
- Some gloves, especially lightweight disposables, may be flammable: keep hands well away from naked flames or other high temperature heat sources.
- When removing gloves, do so in a way that avoids the contaminated exterior contacting the skin.
- Wash hands after removing gloves.
- Dispose of contaminated gloves properly.
- Do not attempt to re-use disposable gloves.
- Never wear possibly contaminated gloves outside of the laboratory or to handle telephones, computer keyboards, etc.

This information is provided as a guide to proper glove material selection. Glove performance varies between manufacturers, so always give yourself extra time and do not push glove strength to the estimated limits and consult a certified safety consultant when in doubt to make sure you have the right glove for your application.

Selection Key:

4	Excellent, breakthrough times generally greater than 8 hours.
3	Good, breakthrough times generally greater than 4 hours.
2	Fair, breakthrough times generally greater than 1 hour.
1	Not Recommended, breakthrough times generally less than 1 hour.
?	Not Tested or Information unknown. Use known tested glove type.

GLOVE SELECTION GUIDE

	<u>Natural Rubber</u>	<u>Neoprene</u>	<u>Butyl</u>	<u>PVC</u>	<u>Nitrile</u>	<u>Viton</u>
Chemical						
Organic Acids						
Acetic acid	2	3	4	2	1	4
Formic acid	2	3	4	3	2	2
Lactic Acid	4	4	4	3	4	4
Maleic acid	3	3	2	3	3	4
Oxalic acid	4	4	4	4	4	4
	<u>Natural Rubber</u>	<u>Neoprene</u>	<u>Butyl</u>	<u>PVC</u>	<u>Nitrile</u>	<u>Viton</u>
Inorganic acids						
Chromic acid up to 70%	1	1	4	3	3	4
Hydrochloric acid up to 37%	3	3	4	3	3	3
Hydrofluoric acid up to 70%	2	2	3	1	1	?
Nitric acid 70+ %	?	1	2	?	1	4
Perchloric acid up to 70%	4	4	3	4	4	4
Phosphoric acid 70+ %	4	4	4	4	4	4
Sulfuric acid 70+ %	1	2	4	2	1	2

	<u>Natural Rubber</u>	<u>Neoprene</u>	<u>Butyl</u>	<u>PVC</u>	<u>Nitrile</u>	<u>Viton</u>
Alkalis						
Ammonium hydroxide up to 70%	1	3	4	2	3	?
Potassium hydroxide up to 70%	4	4	4	4	4	4
Sodium hydroxide 70+ %	4	4	4	4	3	3
	<u>Natural Rubber</u>	<u>Neoprene</u>	<u>Butyl</u>	<u>PVC</u>	<u>Nitrile</u>	<u>Viton</u>
Salt Solutions						
Ammonium nitrate	4	4	4	4	4	4
Calcium hypochlorite	1	3	4	4	3	4
Ferric chloride	4	4	4	4	4	4
Mercuric chloride	3	3	4	3	3	4
Potassium cyanide	4	4	4	4	4	4
Potassium dichromate	4	4	4	4	4	4
Potassium permanganate	4	4	?	4	4	?
Sodium cyanide	4	4	4	4	4	4
Sodium thiosulfate	4	4	4	4	4	4

	<u>Natural Rubber</u>	<u>Neoprene</u>	<u>Butyl</u>	<u>PVC</u>	<u>Nitrile</u>	<u>Viton</u>
Aromatic hydrocarbons						
Benzene	1	1	1	1	1	3
Gasoline	1	1	1	1	4	4
Naphthalene	1	1	1	1	4	4
Toluene	1	1	1	1	1	4
Xylene	1	1	1	1	1	4
	<u>Natural Rubber</u>	<u>Neoprene</u>	<u>Butyl</u>	<u>PVC</u>	<u>Nitrile</u>	<u>Viton</u>
Aliphatic hydrocarbons						
Diesel fuel	1	2	1	2	3	4
Hexanes	1	1	1	1	4	4
Kerosene	1	3	1	3	4	4
Naphtha	1	2	1	3	4	4
Pentane	1	1	1	1	3	4
Petroleum ether	1	1	1	2	3	4
Turpentine	1	1	1	1	2	4

	<u>Natural Rubber</u>	<u>Neoprene</u>	<u>Butyl</u>	<u>PVC</u>	<u>Nitrile</u>	<u>Viton</u>
Halogenated hydrocarbons						
Carbon tetrachloride	1	1	1	1	1	4
Chloroform	1	1	1	1	1	4
Methylene chloride	1	1	1	1	2	3
Polychlorinated biphenyls (PCB's)	1	4	4	?	2	4
Perchloroethylene	1	1	1	1	2	4</td>

Appendix E : Hazardous Chemical Receipt Log

This log is subject to review by college administration, district EH&S, college management, and/or State and Federal officials. The ordering department is responsible for maintaining an SDS for each hazardous chemical in its inventory and to distribute a copy to the CHO.

Date of Receipt	Chemical Identity	Quantity	SDS Submitted to CHO Y/N	Initials

Appendix F : Employee Report of Injury

SEE FORM ON NEXT PAGE



HUMAN RESOURCES
550 E. Hospitality Lane Suite 200
San Bernardino, CA 92408
www.sbccd.edu

EMPLOYEE REPORT OF INJURY/ILLNESS

SECTION I: EMPLOYEE PERSONAL INFORMATION

Employee Name		Job title	Campus/Department
Home Address			Phone Number
Date of Birth	Last 4 of social security #	Time you began work _____ <input type="checkbox"/> a.m. <input type="checkbox"/> p.m.	
Please check all that apply: <input type="checkbox"/> Full-time <input type="checkbox"/> Part-time <input type="checkbox"/> Classified <input type="checkbox"/> Academic <input type="checkbox"/> Confidential <input type="checkbox"/> Manager <input type="checkbox"/> Substitute/Hourly <input type="checkbox"/> Student			
Type of injury (check one): <input type="checkbox"/> Animal bite <input type="checkbox"/> Struck by or against object <input type="checkbox"/> Repetitive motion (Ergonomic) <input type="checkbox"/> Cut or wound <input type="checkbox"/> Burn <input type="checkbox"/> Fall/slip/trip <input type="checkbox"/> Chemical exposure <input type="checkbox"/> Puncture and/or bodily fluid exposure <input type="checkbox"/> Lifting, pushing, pulling, or other material handling activities <input type="checkbox"/> Other (specify): _____			
Date of Injury/Illness	Location of injury/illness	Time of Injury _____ <input type="checkbox"/> a.m. <input type="checkbox"/> p.m.	
Any witnesses? <input type="checkbox"/> Yes <input type="checkbox"/> No Specific name(s):		Was anyone else injured? <input type="checkbox"/> Yes <input type="checkbox"/> No Specific name(s):	
Was the accident preventable <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, please explain:		Who did you notify regarding this injury/illness?	

SECTION II: REPORT

Describe fully how accident occurred (including events that occurred immediately before the accident):	
Describe bodily injury sustained (be specific about body part(s) affected)	
Recommendation on how to prevent this accident from reoccurring:	
Employee signature	Date