



CALIFORNIA STATE UNIVERSITY
Stanislaus
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Chemical Hygiene Health & Safety Plan

[College]
[Department Name]

*Per Federal Regulation 29 CFR 1910
and California Code of Regulations Title 8 Section 5191*

PLAN REVIEW

This sheet should be completed each time the Chemical Hygiene Health & Safety Plan is reviewed and/or modified. The Director for Safety & Risk Management is responsible to review and approve this plan annually or more frequently as needed per Federal Regulation 29 CFR 1910 and California Code of Regulations Title 8 Section 5191.

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If changes were made, to which sections? (List below)	
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2. Added Plan Review page	
3. Corrected grammatical and punctuation errors	
4. Added sections to coincide with the University CHP	
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1.0 Policy and Scope

The purpose of the Chemical Hygiene Health & Safety Plan (HASP) is to outline laboratory work practices and procedures which are necessary to ensure that members of the university community are protected from health hazards associated with chemicals with which they work.

This HASP is a resource for and appendix to the University Chemical Hygiene Program (CHP) and the Injury and Illness Prevention Plan (IIPP). The CHP provides a foundation and direction to college and department specific Safety & Health Plans and addendums. The IIPP is the comprehensive safety policy for the entire university (all locations, including laboratories). Ultimate authority for enforcement of adherence to standards set forth in this Chemical Hygiene & Safety Plan rests with the President of the University, as described in the IIPP.

2.0 Definitions

- Biological Safety – A specialized area within the field of Occupational Safety and Health, Biological Safety or “biosafety” has as its goal the protection of workers from hazards created by the manipulation of biological life forms.
- Cal/OSHA – Under the California Department of Labor, Cal/OSHA is the primary state agency that is charged with implementation and enforcement of worker safety and health standards as set forth by the California Code of Regulations and federal Occupational Safety and Health Administration.
- Chemical Hygiene Plan (CHP) – Required by Federal Regulation 29 CFR 1910 and California Regulation Title 8, Section 5191, the Chemical Hygiene Plan established safety standards for workers exposed to hazardous chemicals in laboratories. A written plan to implement control measures, training, and other protective measures is required of laboratories meeting specified criteria.
- Department Safety Coordinators (DSC) – Individuals within departments or colleges who have been appointed by their supervisors or administrators to assist in implementing the IIPP in their respective areas.
- Inspections – Periodic audits of the workplace environment, including equipment, chemicals, building structure, documents procedures, records, and employee knowledge of job requirements and hazards. Inspections may be undertaken for the purpose of departmental self-evaluation or by Safety & Risk Management (S&RM) or outside agencies for analysis of compliance with health and safety regulations.
- Medical Monitoring – A program whereby the health of workers is monitored through regularly scheduled and post-incident medical examinations. Medical monitoring may be required to determine the suitability of workers to perform a certain type of job (for example, to wear a respirator), to establish a baseline medical status of a worker, or to identify potential changes in the overall health status of workers.

- Permissible Exposure Limit (PEL) – The maximum amount or concentration of a chemical to which a worker may be exposed.
- Personal Protective Equipment (PPE) – Equipment worn or used by workers to protect themselves from exposure to hazardous materials or conditions. The major types of PPE include respirators, eye protection, ear protection, gloves, hard hats, protective suits, etc.
- Principal Investigator (PI) – Individuals (usually faculty members) who are responsible for directing or supervising research on specific projects or in specific laboratories.
- Responsible Person – The individual at a place of employment who has the responsibility and authority to implement the IIPP on behalf of the business or institution. At Stanislaus State, the President has delegated the Vice President for Business and Finance the responsibility for implementing the IIPP. The California State University Executive Order #1039 further describes the responsibilities including Deans, Chairs, Department Safety Coordinators, PI's, staff, and students.
- Safety Data Sheets (SDSs) – Literature prepared by a chemical or chemical product manufacturer that contains hazard and safety information about the product. Information typically includes a list of hazardous ingredients, safety precautions for handling, spill or release response procedures, and first aid instructions. S&RM files these sheets as part of the Hazard Awareness and Communication Program.
- Training – Classroom instruction, job-site safety meetings, on-the-job training, web-based courses, and written materials provided to employees to make them aware of workplace hazards and how to prevent accidents and illnesses.

3.0 Responsibilities

While the overall responsibility for University health and safety rests with the President, the immediate responsibility for laboratory health and safety belongs to each employee working with chemicals. All employees are responsible for knowing how to handle the chemicals that they work with in a safe manner. If one is unsure of the hazard, or proper procedure, they should seek assistance prior to proceeding.

3.1 Deans and Department Chairs

It is the responsibility of Deans and Department Chairs whose classrooms, laboratories, and/or workroom activities include the use of hazardous chemicals or substances ensure the development, implementation, and effective management of a Health & Safety Plan as they relate to operations under their control. Specific areas include employee and student education and training, identification and correction of unsafe conditions, and recordkeeping. Responsibilities include, but are not limited to:

- a. Develop or adopt written department-specific Health & Safety Plan and standard operating procedures and ensure that faculty, students and staff follow adopted procedures.

- b. The formation of a college or department Chemical Hygiene Health & Safety Committee.
- c. Designate a Department Safety Coordinator (DSC).
- d. Appoint two representatives to the University Chemical Hygiene Committee; one of which shall be the DSC.
- e. Develop or adopt and implement an education and training program designed to instruct faculty and students in general safe work practices specific to their lab activities. Such education and training shall take place prior to the faculty or student being assigned to potentially hazardous work or exposure and every 3-years after the initial training.
- f. Establishing exposure monitoring and medical surveillance for affected employees where exposure monitoring reveals an exposure level above the action level (or in the absence of an action level, the exposure limit) for a Cal/OSHA regulated substance as prescribed by the particular standard.
- g. Instruct or seek instruction for faculty and students in the recognition and avoidance of unsafe conditions, including hazards associated with non-routine tasks and emergency operations. Permit only those employees or students qualified by training to operate potentially hazardous equipment. Do not assume that newly hired, newly assigned or reassigned employees or students comprehend all safety procedures associated with the new job duties.
- h. Develop and maintain a system of recordkeeping to document all employee and student education and training activities, including a system of sharing such records with S&RM. Such records should include, but not be limited to, training given, employee and student injuries, incident reports, and complaints or grievances involving safety issues. Records should be readily available in electronic or paper format such as a sign-in sheet.
- i. Develop and maintain an inventory of hazardous materials present in all work areas within the department using the Risk & Safety Solutions (RSS) Chemicals module.
- j. Ensuring chemical procurement policies are followed by faculty, staff, principal investigators, and students, including when ordering suspected hazardous materials or equipment. Request on the Requisition a SDS (where one is not already available) or equipment safety procedure.
- k. Ensure chemical waste is disposed of in accordance with the University's Hazardous Materials Management procedures and all federal and state requirements.
- l. Ensure accurate hazardous chemical and substance inventories are maintained.
- m. Ensure safety assessments and inspections using RSS modules are completed in a timely manner.
- n. Post in a conspicuous location appropriate safety notices or procedures.
- o. Providing necessary resources, oversight and/or support to ensure:
 - Faculty and staff are provided the appropriate personal protective equipment.
 - Faculty and staff are provided appropriate medical monitoring.
 - Laboratories have appropriate emergency response equipment.
 - Compliance with safe chemical and material storage practices.
- p. Develop methods, as appropriate, to inform outside contractors' employees who work in areas under department jurisdiction of the hazards to which those employees may be exposed.

3.2 Course Instructor/Principal Investigator (PI)

Faculty members and principal investigators are responsible to educate about, promote and enforce all applicable safety and health rules, regulations, policies, procedures, and safe practices with respect to their research, classes and/or other operations. Responsibilities include, but are not limited to:

- a. Develop or adopt local area procedures to ensure effective compliance with the IIPP and department Health & Safety Plan as it relates to operations under their control. Specific areas of responsibility include student safety training, identification and correction of unsafe conditions, and recordkeeping.
- b. Complying with University and college environmental health and safety policies, programs, procedures, and practices.
- c. Comply with the written department Health & Safety Plan and standard operating procedures.
- d. Ensure that each student adheres to adopted procedures.
- e. Authorize and document unsupervised access to laboratories by using the Laboratory Access Authorization form (Appendix B).
- f. Ensure authorized unsupervised lab users receive appropriate health and safety training specific to the activities and equipment being used.
- g. Enforcing the prohibition of the storage, preparation, and consumption of foods and beverages meant for human consumption in areas where chemical and/or hazardous substances are used and/or stored.
- h. Ensuring laboratory assessments and inspections are completed using the RSS modules in a timely manner.
- i. Annually reviewing the department Health & Safety Plan inclusive of the standard operating procedures for accuracy and appropriateness and submitting suggestions for updates/changes to the DSC.
- j. Participating in environmental health and safety training, including but not limited to, Lab Safety Fundamentals every 3-years.
- k. Ensuring all chemical and substance containers are labeled in accordance with the University's Hazard Communication Program.
- l. Ensure the proper disposal of all hazardous materials according to the University Hazardous Waste Management procedures and all federal and state requirements.
- m. Conducting and documenting new laboratory worker safety training within 14 days of the worker's start date and prior to allowing them to work with hazardous chemicals or substances.
- n. Ensuring routine environmental health and safety training for faculty, staff and/or students working/learning under their supervision, including but not limited to, Lab Safety Fundamentals every 3-years.
- o. Complete safety inspections at least once per semester using the RSS Inspect module [T8 CCR §5191 Appendix A (D) (4) (b)].
- p. Ensure a safe, healthful, and orderly environment, inclusive of offices, classrooms, laboratories, waste storage areas, and supply rooms.
- q. Ensure only approved service animals and laboratory animals are allowed in the laboratories and workshops.

- r. All shared laboratories are supervised by a University employee at all times.
- s. Appropriate safety information and warning signs are posted and kept visible in classrooms, laboratories, stockrooms, and supply rooms.
- t. Employees and students under their supervision receive medical consultation and/or examination when an exposure to hazardous chemicals or substances occurs.
- u. Wearing appropriate personal protective equipment in the prescribed manner.
- v. Reporting suspected exposure to hazardous chemicals or substances to the Dean and S&RM.
- w. Properly documenting all injuries or sudden illness incidents that occur in campus facilities using the online report an injury, illness or incident form.

3.3 Department Safety Coordinators (DSCs)

Department Safety Coordinators report to the Dean or Department Chair of their assigned college and are accountable, with respect to chemical hygiene matters, to the University Chemical Hygiene Plan and department Health & Safety Plan. Responsibilities include, but are not limited to:

- a. Developing and maintaining:
 - A department Health & Safety Plan.
 - An inventory of chemicals and substances using the RSS Chemical Inventory module.
- b. Distributing the department Health & Safety Plan as necessary.
- c. Ensuring:
 - The development of appropriate standard operating procedures (Appendix E) for the use of hazardous chemicals, substances, and operations and including them in the department Health & Safety Plan.
 - Meeting agendas and minutes are maintained for the college's Chemical Safety Sub-Committee and providing the agendas and minutes to the Dean and S&RM as requested or appropriate.
 - Documented University Chemical Hygiene Program and department Health & Safety Plan orientation training is completed by all faculty, staff, and principal investigators in the department.
 - Appropriate, initial safety and health training is documented and conducted including but not limited to Lab Safety Fundamentals every 3-years.
 - Faculty, lab technicians, and/or principal investigators submit documented laboratory assessments using the RSS Assess module.
 - Faculty, lab technicians, and/or principal investigators submit documented safety inspections using the RSS Inspect module.
 - The maintenance of accurate chemical inventories for the department.
- d. Review annually the department Health & Safety Plan, inclusive of the standard operating procedures for the use of hazardous chemicals, substances, and operations for accuracy and appropriateness and updating it as needed.
- e. Ensuring all department chemical and hazardous material procurement requests follow procurement policies.
- f. Reviewing requests to procure unauthorized hazardous chemicals and substances with the Dean and S&RM to ensure appropriate action is taken.

- g. Coordinate and facilitate the development and effective operation of an ongoing Chemical Safety Sub-Committee for the College.
- h. Participating on the University's Chemical Hygiene Committee.
- i. Conducting and documenting random safety inspections, that include laboratory emergency response equipment, using the RSS Inspect module.
- j. Educating employees about, monitoring and enforcing compliance with:
 - Safe chemical and material storage practices.
 - Standard operating procedures for the use of hazardous chemicals, substances, and operations.
- k. Working with S&RM:
 - To ensure laboratory fume hoods are routinely inspected.
 - To ensure that hazardous waste is disposed of in accordance with the University's Hazardous Materials Management Program and federal and state requirements.
- l. Maintaining an appropriate SDS for each chemical used within the department.
- m. Educating employees about and enforcing compliance with the University Chemical Hygiene Plan and department Health & Safety Plan.
- n. Facilitating the provision of medical consultation and examination for employees who report an exposure to hazardous chemicals or substances.
- o. Providing treating physicians with required information when employees require medical consultation and/or examination.
- p. Informing employees/students who submit chemical hygiene safety concerns of the results of any reviews, findings, and any further actions.

3.4 College or Department Chemical Hygiene Health and Safety Committee

- a. Annually review and provide updates on all department safety policies and procedures.
- b. Review annual safety inspections of all laboratories, providing the primary users of the laboratories with a list of any deficiencies. Provide follow-up to ensure corrections have been made.
- c. Ensure that appropriate training records are maintained and retained.
- d. Ensure that technical staff in the college receive appropriate regular safety training (and certification where appropriate) – this training shall be the first priority use of college staff development funds.
- e. Communicate to the dean and department chairs the relative importance of safety risks and concerns that have been identified as well as the relative urgency of remedial actions.
- f. Document safety concerns identified in the college, including accidents and “near misses.”
- g. Summarize safety concerns and share the summary with the faculty and staff of the college.
- h. Establish a Chemical Safety Sub-Committee.
- i. Schedule annual reviews of all labs and hazardous work spaces in the college.
- j. Review departmental Health and Safety Plans.
- k. Address other health and safety issues as they arise.
- l. Maintain committee records.

3.5 Chemical Safety Sub-Committee

- a. Provide a report at each regular meeting of the Chemical Hygiene Health & Safety Committee.
- b. Recommend to the Chemical Hygiene Health & Safety Committee a schedule for inspecting labs and other hazardous work space in the college.
- c. Conduct and document scheduled lab safety reviews such that all labs in the college are inspected annually by at least two members of the subcommittee.
- d. Members of the review team will typically have representation from the department in which the lab is located. Faculty labs and prep-rooms shall be included in the scheduled inspections.
- e. Report to the Chemical Hygiene Health & Safety Committee the results of all inspections conducted since their prior report.

3.6 Safety & Risk Management (S&RM)

It is the responsibility of S&RM to develop, maintain, and administer the University Injury & Illness Prevention Program and therefore the University Chemical Hygiene Plan (CHP). Further responsibilities are outlined below:

- a. Provide consultation to Deans, Department Chairs, Department Safety Coordinators (DSCs) regarding program compliance, including but not limited to issues of hazard identification and evaluation, procedures for correcting unsafe conditions, systems for communicating with employees, holding regularly scheduled safety meetings, providing employee training programs, regulatory compliance strategies, and recordkeeping.
- b. Reviewing and updating the University Chemical Hygiene Plan annually for accuracy and appropriateness.
- c. Reviewing and approving departmental Health & Safety Plans and standard operating procedures for the use of hazardous chemicals, substances, and operations.
- d. Provide technical consultation to the colleges with the Risk & Safety Solutions (RSS) modules.
- e. Provide centralized monitoring of campus wide activities, on a consultative basis, in the areas of biological safety, chemical hygiene, emergency preparedness, fire safety, hazard communication, hazard identification, hazardous materials management, industrial hygiene, occupational safety, pest management, public health and sanitation, radiation safety, risk management, and safety education and training.
- f. Working with the College of Science, College of Arts, Humanities, and Social Sciences, Facilities and any other department subject matter experts to maintain a master list of hazardous chemicals and substances used at the University.
- g. Developing and facilitating the operation of a University Chemical Hygiene Sub-committee of the Campus Safety Committee.
 - Ensuring:
 1. The University Chemical Hygiene Committee meets regularly.
 2. The agendas and minutes are maintained appropriately.
- h. Maintain centralized environmental and employee medical monitoring records, allowing employee access as directed by law.

- i. Serve as the principal point of contact with regulatory agencies on matters of chemical hygiene at the University.
- j. Dispose of chemical wastes generated from laboratories in accordance with the University Hazardous Waste Removal Guidelines.
- k. Perform periodic chemical hygiene and lab safety inspections using the RSS Inspect module and maintain inspection records, and notify Deans and Department Chairs of the results of these inspections.
- l. Arrange for general safety inspections and safety equipment testing as required under state and federal regulations to include, but not be limited to: showers, ventilation, and fume hoods.

3.7 Students

Students, although not employees, may be at risk of exposure to hazards associated with laboratories and classroom activities that involve hazardous chemicals and substances. Therefore, students are responsible for:

- a. Complying with:
 - The University's CHP and department Health & Safety Plans, procedures, and practices.
 - Standard operating procedures for the use of hazardous chemicals, substances, and operations, as well as other safe work practices.
 - All posted safety information and warning signs.
 - The prohibition of the storage, preparation, and consumption of foods and beverages meant for human consumption in areas where chemical and hazardous substances are used and/or stored.
 - Protocols to provide for the safety and health of approved service animals permitted in the laboratories and workshops.
 - University policy upon enter a laboratory; unsupervised access is prohibited unless appropriately authorized by a course instructor or PI.
 - b. Obtaining appropriate authorization prior to entering areas where hazardous chemicals and substances are used or stored.
 - c. Participating in lab safety training prior to entering areas where hazardous chemicals and substances are used or stored.
 - d. Wearing appropriate personal protective equipment in the prescribed manner in areas where such personal protective equipment is required.
 - e. Submitting requests to the Dean for the use of any service animals in laboratories and workshops.
- *The Student Safety Handbook is available at...*
 - *Students must read and sign...*

4.0 Standard Operating Procedures

Standard operating procedures shall be based on a hazard analysis conducted to identify anticipated and potential health and physical hazards associated with hazardous chemicals and substances, both expected and reasonably unexpected, that may result from the use and handling and storage of chemicals

and substances. Standard operating procedures shall include a description of appropriate control measures needed or appropriate to eliminate or reduce the risks identified in the hazard analysis.

4.1 General Principles/Housekeeping

- a. Learn the locations of the nearest fire extinguishers, safety showers, first aid kit, eye-wash fountain, and phone, so that you can use them quickly in the case of an emergency.
- b. Personal protective equipment (PPE) should be available and used whenever chemicals are present.
- c. Never use mouth suction to fill pipettes. Use a mechanical device to fill pipettes.
- d. Do not eat, drink or smoke in the lab. Do not store food in refrigerators located in laboratory rooms. Do not eat ice from the laboratory ice machines. Never eat or drink from laboratory glassware.
- e. Label containers to identify their contents. Label wash bottles as “water” or “acetone” or “ethyl alcohol”, etc., not with abbreviations. If appropriate, include an NFPA designation label.
- f. All chemicals must be collected in proper containers for waste disposal. Before you use a chemical, find out how you will dispose of the waste. No chemicals may be put down the drains in the laboratories.
- g. If you have HOT glassware, place it on a mat to cool, or place protective gloves next to it; this will signify to all laboratory personnel that the glassware is hot.
- h. Do not force glass tubing into rubber stoppers. Lubricate the tubing and introduce it gradually and gently. Protect your hands with a towel when you are inserting lubricated tubing into a stopper. In clamping glass tubing or glassware for apparatus setups, don't tighten the clamps any more than necessary to hold the glass in place (i.e. do not squeeze the glass).
- i. Confine long hair, dangling jewelry or clothing.
- j. Be extremely cautious when you are lighting a Bunsen burner. Most laboratory fires can be smothered if done immediately. A cloth towel should be kept handy for this purpose. In the event of a fire, immediately turn off the gas cock that feeds any burner. If necessary, use a fire extinguisher to put out the fire (fire extinguishers should be used by trained personnel, contact S&RM for training (209) 667-3035).
- k. Do not wear open-toed shoes or shorts when handling chemicals or other hazards. They do not provide enough protection to the body.
- l. Avoid wearing contact lenses in the labs when working with chemicals that produce vapors or dust. If you must wear contacts, protect your eyes with tight fitting goggles.
- m. Point a test tube containing a reacting mixture away from yourself and other personnel. Use a test tube holder when a reaction in a test tube is anticipated.
- n. Do not work alone while using hazardous materials. Have someone remain nearby in case of an emergency.
- o. Read the label carefully before removing a chemical from its container.
- p. Students are responsible for keeping their own work areas clean. The facilities staff empties trash routinely, but does not clean labs.
- q. If a lab needs to be mopped, there is damaged furniture, or you find faulty plumbing or electrical fixtures, floors or ceiling tiles, call Facilities Services at 667-3211 and schedule a repair.

- r. Lab work areas such as benches, shelves, tables, etc., should be orderly, clean and uncluttered before lab work even begins. Clean your work bench area, put away all equipment and reagents, and wash your hands at the end of each work session.
- s. Place broken glass into dedicated waste containers labeled “Glassware Only.” when full, tape the container shut and place it in the hall for disposal.

4.2 Signage/Labeling

- a. Each department shall ensure that each storage container of hazardous substances in the workplace is labeled, tagged or marked with the following information:
 - Identify the hazardous substance(s) contained therein; and
 - Appropriate hazard warnings.
- b. Departments may use alternative signs, placards, or operating procedures in lieu of affixing labels as long as the contents are identified and appropriate hazard warning is obviously conveyed. Always use permanent ink (such as Sharpie pens).
- c. Departments are not required to label portable containers into which hazardous substances are transferred from labeled containers if intended only for immediate use by the employee who performs the transfer and not stored in that container between periods of use.
- d. No one shall remove or deface existing labels on incoming containers of hazardous substances.
- e. All hazardous wastes must be clearly marked with the specific chemical name (no formulas or abbreviations). See Section 4.6 for complete instructions for hazardous waste handling.

4.3 Chemical Fume Hoods and Biosafety Cabinets

Some laboratory workers refer to Biosafety Cabinets (BSCs) as “hoods.” It is important to know the difference between a BSC and a chemical fume hood. BSCs are designated to protect the individual and the environment from biological agents and to protect the research materials from contamination. Chemical fume hoods, however, are designed solely to protect the individual from exposure to chemicals and noxious gases. Since chemical fume hoods are not equipped with HEPA filters, they must not be used for work with biohazardous materials.

- a. Fume hoods are important pieces of safety equipment in a laboratory. They should not be used as an “out of the way” storage space. Chemicals should never be stored in a fume hood.
- b. The sash should remain closed when not in use.
- c. Prior to using a hood, check to make sure that exhaust fan is operating and that air is entering the hood.
- d. Avoid placing your head inside the hood. Also, keep hands outside of the hood as much as is practical (within limits of the procedure).
- e. Always work as far back in the hood as possible. Work with materials that produce fumes **AT LEAST 6"** behind the front sash.
- f. Keep hoods clean and organized. Clean up spills immediately. Periodically clean hood interiors. Replace burned out light bulbs to maintain maximum illumination.
- g. If corrosive or volatile materials are used, the hood exhaust system must be in operation at all times.
- h. Avoid blocking off baffle exhaust slots with bottles or equipment.

- i. Always keep the sash positioned as low as possible, when working with hazardous materials.
- j. Air disturbances may draw fumes out of hoods. Block all cross drafts, and keep personnel from walking directly in front of hoods as much as possible while you are working in the hood.
- k. **DO NOT** place large, bulky objects directly on the hood working surface. Block them up 2" to 3" to allow a flow of air under the object and into lower exhaust slot in the back of the hood.
- l. Periodically check for proper air flow by hanging a wipe or piece of tissue paper from the front sash. If there is not sufficient air flow to draw the tissue into the hood, check to see that the exhaust fan is operating. If the fan is not working properly, contact the DSC.

4.4 Sterilizer Safety

Sterilizers pose potentially serious hazards. They use high-pressure steam, which can cause severe or even lethal burns. Fortunately, the new sterilizers have built-in safety devices to prevent accidents, but when using them you still should adhere to a few simple rules.

- a. No one should use the autoclave unless specifically trained by the Biosafety Technician (BST).
- b. Always wear safety equipment (goggles and thermal gloves) when operating the sterilizer.
- c. Make sure that caps are loose on all bottles and other vessels. A tightly closed bottle may implode under pressurization. Worse, if a vessel is pressurized during sterilization, but does not vent pressure during the exhaust phase, it may explode as it is removed from the chamber.
- d. Be careful not to touch the walls of the sterilizer chamber. Though not as great a risk as the steam, the chamber walls can still burn you seriously.
- e. Always select the 'liquids' cycle if any component of the load contains liquid. Never sterilize containers filled with liquids that are more than ½ full, they may boil over and create a mess in the autoclave. It is fine to sterilize dry goods like instruments or empty bottles on the liquid cycle; it will not hurt them.
- f. Always make sure that the door is seated before turning on the steam.
- g. NEVER open the door until the display screen prompts the operator. If opened when the pressure or temperature is higher, the rush of steam can burn your hands, face or body. The pressurized steam may even penetrate the cloth of uncoated thermal gloves, or condense on disposable latex gloves.
- h. When unloading, be especially cautious of vessels that contain liquids. Superheated solutions may boil over as soon as the vessel is touched or moved. Large volumes of liquid are more likely to be superheated than small-volume solutions. If the liquid shows any signs of boiling, let it sit for a few minutes before attempting to move the vessel.
- i. When finished, always leave the door closed and in the Standby condition.
- j. The Biological Sciences Department currently has 2 autoclaves. The one in Room N335 and the other in N235.

4.5 Centrifuge Safety

Centrifuges are used to separate liquid and solid materials, or non-miscible liquids. Centrifuges present a laboratory hazard because of the high-speed rotor mechanism, and because the

materials being separated are often in glass tubes. Although centrifuges seem simple to use, you should adhere to some important rules.

- a. Before starting, it is essential to make sure that the tubes used are of equal weight, and are positioned symmetrically across the rotor. If a rotor becomes unbalanced due to uneven weight, it can ruin the centrifuge, as well as hurl dangerous metal or glass debris at anyone nearby.
- b. Tubes should be weighed to make sure that they are equal in weight, with the caps included in the weight.
- c. Be sure that lids are tightly closed, so that no leakage occurs during centrifugation.
- d. Tubes should be placed in the rotor, so that tubes of equal size and weight or volume are directly across from each other. This is particularly important when using a swinging bucket rotor.
- e. If there is one, be sure that the lid to the rotor is screwed on tightly.
- f. BEFORE beginning centrifugation, use the charts that indicate the maximum rotor speed. **Never exceed the rated maximum speed for a rotor; if you do, the rotor can shatter!**
- g. After starting a centrifugation run, stay close enough to make sure that the rotor reaches the correct speed and that the centrifuge is operating properly.
- h. When the centrifuge is finished, let it completely stop before opening it. Most centrifuges have mechanisms that prevent lock the lid until the centrifuge stops completely stopped. There may be an emergency override mechanism for the lid locks. Do not use this override to open the centrifuge just because you are impatient.
- i. After removing tubes, check for leakage and condensation in the rotor. If there is either, remove and rinse the rotor with water or appropriate soap, if needed.
- j. If there are chemical or radioactive spills, then use appropriate decontamination procedures.
- k. After washing, invert and let the rotor dry before returning it to the centrifuge.

4.6 Other Mechanical Lab Equipment Safety Procedures

4.7 Chemical Handling and Storage

[Each dept. should add their own specific procedures; biological sciences information is used below as an example.]

a. Safe Use of Compressed Gas Cylinders

In the Biology Department there is a relatively small variety of compressed gas cylinders, mostly carbon dioxide (CO₂) and some oxygen (O₂) and nitrogen (N₂) gases. The Biology Department owns all of their gas cylinders, but on occasion may rent. When a gas cylinder is empty and needs to be ordered contact the technician. The local gas company's delivery person will pick up the empty gas cylinders and install the refilled cylinders to the regulators. Follow these general guidelines when using compressed gas cylinders.

1. Leave the identifying labels on cylinders.
2. Store flammable gases like hydrogen away from oxidizers and corrosives, like oxygen and hydrogen chloride gas or ammonia.

3. **DO NOT** use inappropriate hose material as dispensing tubes from gas cylinder regulators. Corrosive gases may destroy rubber or latex tubing. Use Tygon tubing or some other durable material.
4. When cylinders are no longer in use, take off their regulators, cap them, and call the biology support technician for removal. Don't allow unused cylinders to accumulate in your laboratory.
5. Cylinders that have corroded valve stems, gas line fittings, or regulators are dangerous and should be removed or exchanged.
6. Handle gas cylinders with extreme care. The contents are under a high pressure and they become powerful missiles when the valve stem is sheared off. This often happens when they are dropped, especially if the valve stem falls against something on the way down. Prevent this by keeping the valve cap **ON** while moving a cylinder.
7. **NEVER** leave cylinders unstrapped in the lab. By law, they must be secured to a wall with heavy straps or a chain.
8. **DO NOT** grease or oil the thread of a cylinder valve. If the valve is rusted, don't use the cylinder. Oil on a gas cylinder thread will soon be under high pressure. If the gas reacts at all with organic material, this could lead to an explosion. Teflon tape can be used for gas line threading, but it is best not to use it on the primary fitting connection between the regulator and the cylinder.
9. **NEVER** open a cylinder without a regulator attached.
10. Flashback can occur when flames actually travel through a gas line back to the cylinder outlet. To prevent flashbacks, add "flashback arresters" to oxygen and hydrogen cylinders used to feed glassblowing, glass-working, or other torches.
11. **DO NOT** over-tighten a hand-valve on a gas cylinder. If hand tightening will not completely close the valve, call the gas cylinder company immediately.
12. **NEVER** completely expend a compressed gas cylinder. Leave approximately 20–25 psi in the cylinder prior to recycling.

b. Using Liquid Nitrogen Safely

Liquid nitrogen (LN₂) can cause freezing burns of unprotected skin or eyes. It also creates a moderate danger of asphyxiation. In the Biology Department, liquid nitrogen is stored in small, insulated storage tanks especially designed to reduce warming and evaporation. Generally, these storage tanks are refilled from larger tanks purchased by the technician for individual labs. It is the primary user's responsibility to monitor liquid nitrogen levels and request refilling using the appropriate form. To work with liquid nitrogen safely:

1. Always wear thick thermal gloves (e.g. Cryo-gloves) and goggles when handling materials being removed from or placed into the storage tanks and when dispensing liquid nitrogen from the storage tank for external use.
2. Liquid nitrogen splashes and spatters very easily, especially when pouring it between vessels, or placing warm materials into storage tanks. Always wear goggles and a lab coat while working with open containers of liquid nitrogen.
3. Keep your work area well ventilated. Keep the lab door open while working with liquid nitrogen. This reduces the chance that evaporating nitrogen will displace enough room air to cause you to faint.

4. Keep the cap of all storage tanks in place as much as possible. Depending on the atmospheric conditions of the laboratory, liquid nitrogen may evaporate quickly. Liquid nitrogen is too expensive to waste because of careless handling.
5. Check the level of liquid nitrogen in storage containers weekly. Allowing all of the liquid nitrogen to evaporate can destroy irreplaceable research work.
6. Even if there is still ample nitrogen in a storage tank, it should be completely refilled at least every two months. This reduces the chances that a storage tank inadvertently runs dry.
7. Brief skin contact with liquid nitrogen is relatively harmless. However, if liquid nitrogen is allowed to stay on the skin, serious skin damage occurs. If your skin comes in contact with liquid nitrogen, remove it immediately! If a burning sensation develops, seek medical attention (by calling 9-1-1 from any campus phone); you may have been injured severely.
8. In the event of a large liquid nitrogen spill, leave the room until the liquid nitrogen has completely evaporated. Do not stay and try to clean up, because you risk suffocation and death.

4.8 Hazardous Waste Management

Hazardous wastes are highly regulated and must be handled properly before being disposed of. All hazardous wastes are removed from campus by a certified hauler contracted by the University through S&RM. Department personnel must adhere to the following procedures for hazardous waste:

- a. Hazardous chemical wastes must be kept in closed, appropriately labeled containers which are in good condition.
- b. Biohazardous Waste should be disposed of properly (see Appendix D)
- c. A correct hazardous waste label must contain the following six (6) pieces of information:
 1. The label must bear the words "HAZARDOUS WASTE"
 2. The label must contain a SPECIFIC DESCRIPTION OF THE WASTE:
 - a) Chemical name or common name (no formulas or abbreviations)
 - b) Proportions of constituents or chemical mix (percents, parts per million, molarities, etc.)
 3. The label must contain a STATEMENT OF WHAT THE HAZARD IS:
 - a) "toxic," "reactive," "flammable," and/or "combustible"
 - b) "corrosive" (please specify acid or alkaline)
 - c) "radioactive"
 4. The label must say whether the waste in the container is SOLID, LIQUID OR GAS
 5. The label must list the START DATE for that container of waste (when first amount was added to empty container).
 6. The label must state the NAME AND ADDRESS OF THE GENERATOR. At CSU Stanislaus this means: "CSU Stanislaus, One University Circle, Turlock, CA 95382."
- a. Once a waste container is ready to be disposed of
 1. Complete a hazardous waste collection form (see Appendix C)
 2. Contact S&RM at (209) 667-3035 or email the S&RM Director at althomas@csustan.edu

3. Transport the properly labeled waste containers to the temporary hazardous waste storage room on the first floor of Naraghi Hall (N135).
4. Do not leave waste in N135 without first contacting the S&RM Director (209) 667-3035.

4.9 Emergency Response Procedures

If there is a spill, leak or fire involving hazardous material, the following steps should be taken immediately:

- a. Evacuate the room (all occupants)
- b. Close the door(s)
- c. Pull the nearest fire alarm box on your way out of the building
- d. If there is no fire alarm pull box in the area, call 9-1-1 from a phone in a safe location, to report the fire
- e. If you use a fire extinguisher, call the University Police Department (UPD) as soon as possible to report the fire, 9-1-1

In case of injury or medical emergency, the following steps should be taken immediately:

- a. CHECK the scene for safety and assess the situation
- b. CALL 9-1-1
- c. CARE with First Aid (if you are trained and have permission)
- d. If the injury is a result of chemical contact, then immediately flush the affected area with water by faucet, eyewash or shower for at least 15 minutes.

4.10 Other Specific Departmental Safety-Related Procedures

[Insert any other College safety-related standard operating procedures, may vary by Department]

5.0 Personal Protective Equipment

PPE shall be appropriate to mitigate the hazards identified in the SDS, applicable hazard analysis, conducted during the development of the applicable standard operating procedures and control measures.

5.1 Laboratory Clothing

Laboratory clothing includes lab coats, smocks, and gowns. In circumstances where it is anticipated that splashes may occur, the garment must be resistant to liquid penetration to protect clothing from contamination. If the garment is not disposable, it must be capable of withstanding sterilization in the event it becomes contaminated. Protective clothing must be removed and left in the laboratory before leaving for non-laboratory areas.

The following clothing must be worn in laboratories when hazardous materials are present:

- a. Long-sleeved garments should be used to minimize the contamination of skin or street clothes
- b. Long pants/trousers or long skirts
- c. Shoes that are close-toed and completely cover the feet from falling objects or hazardous materials

5.2 Gloves

- a. Must be worn when working with biohazards, toxics and other physically hazardous agents. As a general rule, always wear gloves with any hazardous chemicals that require the use of safety goggles.
- b. Must be selected based on the hazards involved and the activity conducted. For assistance in glove selection, use the glove selection guide (Appendix A), contact the Department Safety Coordinator (DSC) or S&RM at (209) 667-3035.
- c. When working with hazardous materials, the gloves should overlap the lower sleeve and the cuff of a laboratory garment.
- d. Gloves must be disposed of when contaminated. Discard biohazardous gloves into red bags.
- e. Disposable gloves must not be reused or washed.
- f. Do not use powdered latex gloves if allergic to latex.

5.3 Eye Protection

- a. Always use goggles or a face shield when working with any chemicals.
- b. Goggles or safety glasses with solid side shield in combination with masks or chin-length face shields or other splatter guards are required for anticipated splashes, sprays or splatters of hazardous materials.
- c. Application or removal of contact lenses is not permitted in the laboratory setting.
- d. If contact lenses must be worn, cover your face with tight-fitting safety goggles.

5.4 Filtering Facepiece Devices and Respirators

- Disposable filtering facepiece devices must be used for chemical operations that may generate particulate matter, dust, aerosols or other air-borne toxic material.
- When respiratory protection, greater than a filtering facepiece device, is needed contact the Department Safety Coordinator (DSC) or S&RM for assistance in selection of equipment and training/fit requirements.

6.0 Hazard Communication and Training

The Hazard Communication Program identifies the components designed to inform about chemicals or materials in the workplace. Each department or area should have an inventory of all chemicals or materials that are used within their area. Faculty and Staff may access a web-based SDS and label service at: <https://msdsmanagement.msdonline.com/site-notification/?guid=8511b604-100d-449a-9a6b-366eff19da04>. The inventory must be updated at least annually and copies should be sent to S&RM. Review the Safety Data Sheet (SDS) before starting work with a new chemical. Labels are also a critical

component of the Hazard Communication Program standard. The information required on a label includes the name of the material, the physical hazard, and the health hazard presented by the material. Most original manufacture labels have this information but, if not, an appropriate label must be added as soon as the material is received.

6.1 Training

It is necessary to provide training for employees and lab workers (students) concerning general safe work practices as well as specific instruction with respect to hazards unique to each employee's job assignment. It is the policy of the California State University to provide training for employees in compliance with Federal and State Law.

- Faculty will ensure that all students receive general and specific training prior to new assignment in a lab.
- Deans and Department Chairs will ensure that Instructors/PI's are trained whenever new substances, processes, procedures or equipment are introduced to the workplace which represent a new hazard or whenever the supervisor receives notification of a new or previously unrecognized hazard.
- All training will be documented in writing. Subject matter, participants and dates will all be recorded and kept on file within each department, along with copies provided to S&RM office.

7.0 Use Authorization and Approval Process

[Insert College process, may vary by Department]

8.0 Medical Monitoring

The University has an [Employee Medical Monitoring Program](#) for employees who are exposed to hazardous chemicals or substances in accordance with Proposition 65 statutes and the Cal/OSHA requirements as noted in Title 8, Article 110. Departments using any regulated carcinogens have additional reporting and recordkeeping requirements under Cal/OSHA.

The University recognizes that employees, their designated representatives, and authorized representatives of the Chief of the Division of Occupational Safety and Health (Cal/OSHA) have a right of access to relevant exposure and medical records. Such access is necessary to yield both direct and indirect improvements in the detection, treatment and prevention of occupational disease. Whenever an employee or designated representative requests access to a record, the University shall assure that access is provided in a reasonable time, place and manner.

Employee exposure to hazardous materials records may be obtained by contacting the Director of S&RM. Medical Records are accessible by contacting the Human Resources office. Any employee or designated employee representative may request access to any legally obtainable information. The requested information will be provided within 5 working days if available. Copies may be obtained by written request and will be completed within 5 working days.

8.1 Exposure Control Program

The goal of this program is to limit occupational exposure to blood and other potentially infectious materials since any exposure could result in transmission of blood borne pathogens which could lead to disease or death. The primary feature of this program is a written Exposure Control Plan which incorporates the following major components:

Exposure Determination	Control Methods
Post-Exposure Evaluation and Follow-up	Infectious Waste Disposal
Tags, Labels and Bags	Housekeeping Practices
Laundry Practices	Record Keeping
Training and Education of Employees and Students	Personal Protective Equipment

The written campus Exposure Control Plan (available online at: <https://www.csustan.edu/safety-risk-management/environmental-health-safety/injury-illness-prevention-program>) outlines the actions to be taken by the University in response to and prevention of employee and student exposure to infectious materials

9.0 Use of Highly Hazardous Materials

[Insert College process, may vary by Department]

10.0 Inspections

The entire campus is subject to periodic inspection and review. Those areas with the greatest potential for problems will be inspected with greater frequency. Every workplace shall be inspected on a regular basis. Those areas with potentially greater hazards will be inspected more frequently as necessary by request, new equipment, through risk assessments.

The inspections may be conducted by departmental members, safety committee members, and/or S&RM. Inspection records will be conducted and maintained within the RSS Inspect module.

a. Scheduled Safety Inspections

- It is the responsibility of each department to ensure that a regular and systematic inspection process be scheduled for all departmental areas.
- The frequency of safety inspections varies by regulation and equipment maintenance requirements.
- Additional inspection checklists are available from RSS; contact S&RM for information.

b. Unscheduled Workplace Inspections

- Departments will conduct, or have conducted, an inspection whenever new substances, processes, procedures or equipment which represents a new occupational safety and health hazard are introduced.
- Departments will conduct an inspection whenever notification of a new or previously unrecognized hazard is received.

- S&RM will conduct periodic unscheduled inspections to help ensure the maintenance of a safe and healthful workplace.
- S&RM, in conjunction with departmental representatives, will conduct a health and safety inspection in the event of an occupational injury, occupational illness, or exposure to hazardous substances as defined by Cal/OSHA.

11.0 Record Keeping

Each department DSC is responsible for maintaining the records that document the steps taken to comply with the University Chemical Hygiene Plan and the College Health and Safety Plan. S&RM will monitor the maintenance of those records.

Each organizational unit is responsible for maintaining its records and the reports it receives. Records will be stored in a secure location and will be accessible, on demand, to ensure the information is immediately available to the Dean and S&RM.

Records will be maintained in accordance with the following table:

Document	Minimum Length of Retention
IIPP & Safety Inspections	One year
Employee Training	Three years
Enrolled Student Training	Three years
Employee Medical Records	Length of employee of monitored employees plus 30 years
Incident Investigation	Length of employee of monitored employees plus 30 years

APPENDICES

Appendix A – Glove Selection Guide

Appendix B – Laboratory Access Authorization form

Appendix C – Hazardous Waste Collection Form

Appendix D – Biohazardous Waste Guidance Chart

Appendix E – Standard Operating Procedures Outline

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Appendix A – Glove Selection Guide

Consult this chart for an overview of commonly used glove types for laboratory use and their general advantages and disadvantages.

Note: These photos are examples. Glove colors and appearances will vary. Many other models are commercially available in each glove category. UC Berkeley EH&S does not intend inclusion of any specific glove to be an endorsement.

Glove material	Intended use	Advantages and disadvantages	Example Photos
Latex (natural rubber)	Incidental contact	<p>Good for biological and water-based materials.</p> <p>Poor for organic solvents.</p> <p>Little chemical protection.</p> <p>Hard to detect puncture holes.</p> <p>Can cause or trigger latex allergies</p>	
Nitrile	<p>Incidental contact (disposable exam glove)</p> <p>Extended contact (thicker reusable glove)</p>	<p>Excellent general use glove. Good for solvents, oils, greases, and some acids and bases.</p> <p>Clear indication of tears and breaks.</p> <p>Good alternative for those with latex allergies.</p>	
Butyl rubber	Extended contact	<p>Good for ketones and esters.</p> <p>Poor for gasoline and aliphatic, aromatic, and halogenated hydrocarbons.</p>	
Neoprene	Extended contact	<p>Good for acids, bases, alcohols, fuels, peroxides, hydrocarbons, and phenols.</p> <p>Poor for halogenated and aromatic hydrocarbons.</p> <p>Good for most hazardous chemicals.</p>	

<p>Norfoil</p>	<p>Extended contact</p>	<p>Good for most hazardous chemicals. Poor fit (Note: Dexterity can be partially regained by using a heavier weight Nitrile glove over the Norfoil/Silver Shield glove.</p>	
<p>Viton</p>	<p>Extended contact</p>	<p>Good for chlorinated and aromatic solvents. Good resistance to cuts and abrasions. Poor for ketones. Expensive.</p>	
<p>Polyvinyl chloride (PVC)</p>	<p>Specific use</p>	<p>Good for acids, bases, oils, fats, peroxides, and amines. Good resistance to abrasions. Poor for most organic solvents.</p>	
<p>Polyvinyl alcohol (PVA)</p>	<p>Specific use</p>	<p>Good for aromatic and chlorinated solvents. Poor for water-based solutions.</p>	

<p>Stainless steel</p> <p>Kevlar</p> <p>Leather</p>	<p>Specific use</p>	<p>Cut-resistant gloves.</p> <p>Sleeves are also available to provide protection to wrists and forearms.</p> <p>(If potential for biological or chemical contamination: wear appropriate disposable gloves on top of your cut-resistant gloves and discard after use).</p>	 
<p>Cryogenic Resistant Material</p> <p>Leather</p>	<p>Specific use</p>	<p>For use with cryogenic materials.</p> <p>Designed to prevent frostbite. Note: Never dip gloves directly into liquid nitrogen.</p>	

Appendix B – Laboratory Access Authorization form

CALIFORNIA STATE UNIVERSITY, STANISLAUS
COLLEGE OF SCIENCE
LABORATORY ACCESS AUTHORIZATION FORM

The laboratories at California State University, Stanislaus (“University”) are open during the scheduled laboratory class periods to enable students to conduct the laboratory experiments under the supervision of a faculty or staff member to ensure safety.

In order for a student or a visitor (i.e., research collaborator, volunteer, or other persons who are not paid or are not employees of the University) to have unsupervised access to laboratories (“Lab User”), the appropriate faculty or staff (“Lab Supervisor”) must submit the completed request below to the College of Science Dean’s Office no later than seven (7) calendar days prior to the first date of unsupervised lab access.

The faculty member who authorizes access to a lab (Lab Supervisor) is primarily responsible for the person or persons who are given access. The Lab Supervisor must ensure that the Lab User receives appropriate safety training and training in the specific activities and equipment.

REQUEST FOR UNSUPERVISED LABORATORY ACCESS

I, _____, (Laboratory Supervisor or Program Director), request unsupervised access for the student/visitor _____, (“Lab User”) during the hours of _____ for the laboratories specified below.*

The Lab User has received proper safety and equipment training including (list all training completed by the student, and cite how it has been documented e.g.; signed training record on file with Biology Department):

Justification for Special Access: _____

Description of unsupervised activity that will be performed: _____

Date(s) and time(s) of unsupervised access: _____

Building and lab room number(s): _____

Authorizing Faculty or Staff Name (print) Signature Date

Department Chair Name (print) Signature Date

*Hours cannot conflict with the University Facility Use Policy, Section V. N. 1.

CALIFORNIA STATE UNIVERSITY, STANISLAUS
COLLEGE OF SCIENCE
LABORATORY ACCESS AUTHORIZATION FORM

LAB USER DECLARATION OF COMPLIANCE FORM

The undersigned Lab User declares that I 1) have received and successfully completed the safety training specified above, and 2) agree to abide by the responsibilities stated in the University's policies and procedures.

RELEASE OF LIABILITY, PROMISE NOT TO SUE, ASSUMPTION OF RISK AND AGREEMENT TO PAY CLAIMS

In consideration for being allowed to participate in this Lab Activity, on behalf of myself and my next of kin, heirs, and representatives, I release from liability and promise not to sue the State of California, the Trustees of The California State University, California State University, Stanislaus, and their employees, officers, directors, volunteers and agents (collectively "University") from any and all claims, including claims of the University's negligence, resulting in any physical or psychological injury (including paralysis and death), illness, damages, or economic loss or emotional loss I may suffer because of my participation in this Lab Activity, including travel to, from and during the Lab Activity.

I am voluntarily participating in this Lab Activity. I am aware of the risks associated with traveling to/from, participation in this Lab Activity, which includes but are not limited to physical or psychological injury, pain, suffering, illness, disfigurement, temporary or permanent disability (including paralysis), economic or emotional loss, and/or death. I understand that these injuries or outcomes may arise from my own or other's actions, inaction, or negligence; conditions related to travel, and dancing; or the condition of the Lab Activity location(s) or facilities. Nonetheless, I assume all related risks, both known or unknown to me, of my participation in this Lab Activity, including travel to, from and during the Lab Activity.

I agree to hold the University harmless from any and all claims, including attorney's fees or damage to my personal property, which may occur as a result of my participation in this Lab Activity, including travel to, from and during the Lab Activity. If the University incurs any of these types of expenses, I agree to reimburse the University. If I need medical treatment, I agree to be financially responsible for any costs incurred as a result of such treatment. I am aware and understand that I should carry my own health insurance.

I am 18 years or older. I understand the legal consequences of signing this document, including (a) releasing the University from all liability, (b) promising not to sue the University, (c) and assuming all risks of participating in this Lab Activity, including travel to, from and during the Lab Activity.

I understand that this document is written to be as broad and inclusive as legally permitted by the State of California. I agree that if any portion is held invalid or unenforceable, I will continue to be bound by the remaining terms.

I have read this document, and I am signing it freely. No other representations concerning the legal effect of this document have been made to me.

Lab User Name (print)

Signature

Date

Appendix D – Biohazardous Waste Guidance Chart

Biohazardous Waste Guidance Chart

The chart below provides information on how to handle most, if not all, of the items that frequently are collectively referred to as “biohazardous waste”. Biohazardous waste is a term that encompasses a number of distinctly different waste streams, including biological waste, infectious waste, and medical waste. To make it easier for departments & laboratories to understand how these wastes must be handled in the laboratories and disposed of as waste the chart below gives clear information on specific items that are likely to be in your biohazardous waste stream. Please adhere to this chart and do not dispose of any material in any manner other than as described in this chart. Improper release of this waste into regular trash, dumpsters and landfills can expose the University and potentially your laboratory and department to substantial financial penalties by regulatory authorities and jeopardize funding from granting agencies.

Syringes and Needles

Disposal Container	On-Campus Treatment	To remove waste from your department.	Obtaining “sharps” waste containers	Comments
Red plastic “sharps” containers ONLY	NONE	Complete a Request for Hazardous Waste Collection form, then call the Director of S&RM at x3035	Departments will obtain own containers from a vendor. For guidance call the Director of S&RM at x3035	All syringes and needles are considered “medical waste”. NEVER manually detach a needle from the syringe, discard the entire system.

Broken glass contaminated with potentially infectious materials (human blood, body fluids, culture)

Disposal Container	On-Campus Treatment	Requesting waste removal from your lab	Obtaining “sharps” waste containers	Comments
Red plastic “sharps” containers ONLY	NONE	Complete a Request for Hazardous Waste Collection form, then call the Director of S&RM at x3035	Departments will obtain own containers from a vendor. For guidance call the Director of S&RM at x3035	Use extreme care when picking up contaminated broken glass. Use tongs or forceps. Never use your fingers!

Cloth contaminated with potentially infectious materials (human blood, body fluids, culture)

Disposal Container	On-Campus Treatment	Requesting waste removal from your lab	Obtaining red “biohazard” waste bags	Comments
Red plastic BioHazard bags ONLY	NONE	Complete a Request for Hazardous Waste Collection form, then call the Director of S&RM at x3035	Call the Director of S&RM at x3035	Use extreme care; always handle with latex gloves and dispose of gloves along with cloth into red bag.

Scalpels

Disposal Container	On-Campus Treatment	To remove waste from your department.	Obtaining “sharps” waste containers	Comments
Red plastic “sharps” containers ONLY	NONE	Complete a Request for Hazardous Waste Collection form, then call the Director of S&RM at x3035	Departments will obtain own containers from a vendor. For guidance call the Director of S&RM at x3035	Scalpels are considered “medical waste”. Never place these in the “regular” trash.

Glass slides and cover slips

Disposal Container	On-Campus Treatment	To remove waste from your lab	Obtaining “sharps” waste containers	Comments
Red plastic “sharps” containers OR Use a recycled cardboard box with sides and top labeled “Broken Glass”.	NONE	Complete a Request for Hazardous Waste Collection form, then call the Director of S&RM at x3035	Departments will obtain own containers from a vendor. For guidance call the Director of S&RM at x3035	Do Not place these items in the “broken glass” container. Never place these in the regular trash.

Razor Blades

Disposal Container	On-Campus Treatment	Requesting waste removal from your lab	Obtaining “sharps” waste containers	Comments
Red plastic “sharps” containers ONLY	NONE	Complete a Request for Hazardous Waste Collection form, then call the Director of S&RM at x3035	Departments will obtain own containers from a vendor. For guidance call the Director of S&RM at x3035	Do not leave razor blades out in the open and uncovered. Never place these in the “regular trash”.

Glass Pasteur pipettes

Disposal Container	On-Campus Treatment	Requesting waste removal from your lab	Obtaining “sharps” waste containers	Comments
Red plastic “sharps” container ONLY	AUTOCLAVE 121 degrees C for 60 minutes	Complete a Request for Hazardous Waste Collection form, then call the Director of S&RM at x3035	Departments will obtain own containers from a vendor. For guidance call the Director of S&RM at x3035	Do Not place in regular trash. Do not place in “broken glass” container.

Broken and unbroken glass with no contamination

Disposal Container	On-Campus Treatment	Removing this waste from your lab	Obtaining "broken glass" containers	Comments
<p>"Broken Glass" box supplied by vendor.</p> <p>OR</p> <p>Use a recycled cardboard box with sides and top labeled "Broken Glass".</p>	<p>All glass must be clean and uncontaminated by any biologicals, body fluids, radioactives, or visible chemicals.</p> <p>No liquids can be present in any pipettes or vials, etc.!!!!</p>	<p>When box is full, securely tape the box closed; make sure it is labeled <i>broken glass</i> and leave outside door for custodial staff.</p>	<p>"Broken Glass" containers may be purchased from approved vendors. Or you may use any durable cardboard box and prominently label sides and top "Broken Glass".</p> <p><i>Put Room Number on container!</i></p>	<p>Use "common sense":</p> <p>Never fill the box so that glass objects protrude from the open end.</p> <p>If you use a large box it will be very heavy once filled with glass, keep the box size modest.</p> <p>Ensure that the box used is in good shape and can handle the weight of the glass.</p> <p>Use durable tape when sealing the box.</p>

Non-Pasteur plastic pipettes and tips contaminated with potentially infectious materials (human blood, body fluids, culture)

Disposal Container	On-Campus Treatment	To remove the waste from your lab	Obtaining appropriate waste containers	Comments
<p>Red plastic "Biohazard" Bag</p> <p>OR</p> <p>Clear plastic "Biohazard" bag</p>	<p>AUTOCLAVE</p> <p>121 degrees C for 60 minutes</p>	<p>After autoclaving, place the sterilized bag inside of the building dumpster.</p>	<p>The Biology Instructional Support Tech. has correctly labeled bags, contact x3486.</p>	<p>Individuals responsible for autoclaving waste must follow appropriate autoclave safety protocols.</p> <p>All autoclave waste must have autoclave tape affixed to the bag. Waste sterilization must be entered into the autoclave log</p>

Plastic ware or other items contaminated with potentially infectious material (blood, body fluids, cultures)

Disposal Container	On-Campus Treatment	To remove the waste from your lab	Obtaining appropriate waste containers	Comments
<p>Red, plastic autoclavable “Biohazard” bag</p> <p>OR</p> <p>Clear, plastic autoclavable “biohazard” bag</p>	<p>AUTOCLAVE</p> <p>121 degrees C for 60 minutes</p>	<p>After autoclaving place the sterilized bag inside of the building’s dumpster as regular trash.</p>	<p>The Biology Instructional Support Tech. has correctly labeled bags, contact x3486.</p>	<p>Individuals responsible for autoclaving waste must follow appropriate autoclave safety protocols.</p> <p>All autoclaved waste must have autoclave tape affixed to the bag</p> <p>Waste sterilization must be entered into the autoclave log.</p>

Glass test tubes contaminated with potentially infectious materials (blood, body fluids, culture)

Disposal Container	On-Campus Treatment	To remove the waste from your lab	Obtaining appropriate waste containers	Comments
<p>Red, plastic autoclavable “biohazard” bag</p> <p>OR</p> <p>Clear, plastic autoclavable “biohazard” bag</p>	<p>AUTOCLAVE</p> <p>121 degrees C for 60 minutes</p>	<p>After autoclaving, place the sterilized bag inside of the building’s dumpster as regular trash</p>	<p>The Biology Instructional Support Tech. has correctly labeled bags, contact x3486.</p>	<p>Individuals responsible for autoclaving waste must follow appropriate autoclave safety protocols.</p> <p>All autoclaved waste must have autoclave tape affixed to the bag.</p> <p>Waste sterilization must be entered into the autoclave log.</p>

All other lab glass *Not Contaminated* with Infectious Material

Disposal Container	On-Campus Treatment	To remove the waste from your lab	Obtaining appropriate waste containers	Comments
<p>Cardboard glass disposal box, pre labeled by vendor</p> <p>OR</p> <p>Ordinary cardboard box With each side prominently marked "Broken Glass".</p>	<p>All glass items MUST be empty, no liquid volumes allowed.</p>	<p>Seal the box closed with durable tape, duct tape works well. Ensure box is marked "Broken Glass" Place with regular trash.</p>	<p>Obtain pre-labeled boxes from University approved vendors</p> <p>OR</p> <p>Recycle cardboard boxes from your building.</p>	<p>Be mindful that these boxes are very heavy when full. No glass objects may protrude beyond the box. Place for custodial pick-up when 2/3 full.</p>

Capillary Tubes

Disposal Container	On-Campus Treatment	To remove the waste from your lab	Obtaining waste containers	Comments
<p>Red Sharps container</p>	<p>NONE</p>	<p>Complete a Request for Hazardous Waste Collection form, then call the Director of S&RM at x3035</p>	<p>Call the Director of S&RM at x3035</p>	<p>Capillary tubes break easily and pierce all bags used for collection of waste. Never place these in the ordinary trash</p>

Contaminated and Uncontaminated Serological Pipettes (Plastic, long pipettes)

Disposal Container	On-Campus Treatment	To remove the waste from your lab	Obtaining appropriate containers	Comments
<p><u>Contaminated:</u> Pipette autoclave boxes</p> <p><u>Uncontaminated:</u> Regular cardboard boxes</p>	<p><u>Contaminated:</u> Autoclave at 121 degrees C for 60 minutes. Be sure autoclave tape is on the container!</p> <p><u>Uncontaminated:</u> None, dispose in dumpster.</p>	<p><u>Contaminated:</u> after autoclaving, dispose in dumpster</p> <p><u>Uncontaminated:</u> when cardboard box is full, dispose in dumpster.</p>	<p><u>Contaminated:</u> Pipette autoclave boxes are available from the Biology Instructional Support Tech, x3486.</p> <p><u>Uncontaminated:</u> Use cardboard shipping boxes, recycle!</p>	<p>Custodians do not like to see these items in regular trash. The pipettes puncture regular trash bags.</p> <p>Red and clear autoclave bags shrink when autoclaved, serological pipettes will puncture those bags if they are autoclaved. Use pipette containers!</p>

All Culture Plates

Disposal Container	On-Campus Treatment	To remove waste from your lab	Obtaining appropriate waste containers	Comments
<p>Red, plastic autoclave bag</p> <p>OR</p> <p>Clear, plastic autoclave bag</p>	<p>AUTOCLAVE 121 degrees C for 60 minutes</p> <p>Be sure autoclave indicator tape is on the bag.</p>	<p>After autoclaving, place the sterilized bag inside of the building's dumpster.</p>	<p>The Biology Instructional Support Tech. has correctly labeled bags, contact x3486.</p>	<p>Individuals responsible for autoclaving waste must follow appropriate autoclave safety protocols.</p> <p>All autoclaved waste must have autoclave tape affixed to the bag.</p> <p>Waste sterilization must be entered into the autoclave log</p>

Tissue Culture Media

Disposal Container	On-Campus Treatment	To remove waste from your lab	Obtaining appropriate waste containers	Comments
Place in liquid container, Preferably non-breakable	NONE	Place containers in the Science Building temporary hazardous waste room.	The Biology Instructional Support Tech. has correct containers, contact x3486.	These items are not decontaminated on campus.

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Animal Carcasses

Disposal Container	On-Campus Treatment	To remove waste from the lab	Obtaining appropriate waste containers	Comments
<p>Do not place animals inside red biohazard bags unless the animals are infectious, diseased, or have been inoculated with a pathogen contagious to humans or other animal populations.</p> <p>Animals may be consolidated in five-gallon plastic buckets with screw-top lids closures.</p>	<p>NONE</p>	<p>Double-bagged animals shall be stored in laboratory freezers.</p> <p>Do not store in refrigerators or in open room!</p> <p>The Biology Instructional Support Tech. removes these items to a local incinerator facility.</p>	<p>The Biology Instructional Support Tech. is the only person who will handle this waste, contact x3486.</p>	<p>“Animals” shall mean mammals, birds, reptiles, amphibians, etc.</p> <p>Crustaceans, “shellfish”, small fish, insects, etc., shall not be included in this category. These items may be placed in dark ordinary trash bags and disposed of in the building’s dumpster.</p> <p>Animals that have been kept in preservatives must have all preservatives drained from the container by laboratory staff. The preservative must be identified. Preservatives shall be treated as chemical wastes and should be removed from the lab following safety procedures.</p>

Plastic Ware, Gloves, and other items that are not contaminated with Infectious Materials or only used for media preparation

Disposal Container	On-Campus Treatment	To remove the waste from your lab	Obtaining appropriate waste containers	Comments
Regular trash container	No treatment required	Ordinary trash for routine custodial pick-up	Ordinary trash receptacle, obtained by lab.	Be mindful of heavy objects and long plastic pipettes that may puncture or tear the trash bag.

For “Biohazardous” waste items not identified in any of the charts in this reference, please contact Safety & Risk Management for guidance at: 667-3035.

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Appendix E – Standard Operating Procedures Outline

INSTRUCTIONS FOR COMPLETING STANDARD OPERATING PROCEDURES

Each department Health and Safety Plan shall include standard operating procedures (SOP) for the hazardous chemical, hazardous substance, and hazardous operations used in the department. Faculty, principal investigators, and staff managers should work with their college's Chemical Hygiene Committee, department DSC and Safety and Risk Management in the development of SOPs.

Below are instructions for completing laboratory specific SOPs with a corresponding template. Please contact S&RM with any questions or comments you may have while completing your SOPs. Completed SOPs are reviewed by the department DSC.

1. Type of SOP

Specify the type of SOP at the top of the document. There are three types of SOPs:

- **Process:** This SOP will be for a particular process such as distillation, synthesis, etc.
- **Hazardous chemical:** This SOP will be for an individual chemical such as arsenic, formaldehyde, nitric acid, etc.
- **Hazard class:** This SOP will be for a hazard class of chemicals such as oxidizer, flammable, corrosive, etc.

2. Describe the Process, Hazardous Chemical, or Hazard Class

- **Process:** Briefly describe the process and name all the hazardous chemicals or substances used in the process
- **Hazardous chemical:** Provide the name of the chemical. Include the chemical abstract service number, the full name, the common name, and any abbreviations used for the chemical.
- **Hazard class:** Name the hazard class and list the names of the chemicals in this hazard class used or stored in your laboratory

3. Potential Hazards

In this section, describe:

- All the potential for both health and physical hazards for each process, hazardous chemical, or hazard class
 - For health hazards include:
 - Acute toxicity (any route of exposure)
 - Skin corrosion or irritation
 - Serious eye damage or eye irritation
 - Respiratory or skin sensitization
 - Germ cell mutagenicity
 - Carcinogenicity
 - Reproductive toxicity
 - Specific target organ toxicity (single or repeated exposure)
 - Aspiration hazard

- The criteria for determining whether a chemical is classified as a health hazard are detailed in Appendix A of the Hazard Communication Standard (Section 5194) and Section 5194(c) (definition of “simple asphyxiant”).
- The potential for chronic and/or acute health hazard effects of the chemical(s).
- Physical hazards include:
 - Explosive
 - Flammable (gases, aerosols, liquids, or solids)
 - Combustible liquid
 - Oxidizer (liquid, solid, or gas)
 - Self-reactive
 - Pyrophoric (gas, liquid or solid)
 - Self-heating
 - Organic peroxide
 - Corrosive to metal
 - Gas under pressure
 - In contact with water emits flammable gas
 - Water-reactive
 - Combustible dust
 - The criteria for determining whether a chemical is classified as a physical hazard are in Appendix B of the Hazard Communication Standard (Section 5194) and Section 5194(c) (definitions of “combustible dust,” “combustible liquid,” “water-reactive” and “pyrophoric gas”)
 - Radioactivity
 - Cryogenic
 - High temperature reactions
 - Electrical
 - UV light
 - Ionizing radiation
 - Laser
 - Unstable

4. Circumstances Requiring Prior Approval for Particularly Hazardous Chemicals or Processes

Discuss the circumstances under which this particular process, hazardous chemical, or hazard class will require prior approval (if any) from the Dean, principal investigator/laboratory coordinator, or Chemical Hygiene Officer. Consideration will be given to the following list of provisions when the special procedures are developed:

- Establishment of a designated area for the use of the high hazard chemicals and substances.
- Signage and access control to the work area where the chemical or substance is used.
- Special precautions, such as use of glove boxes or other containment devices.
- Enclosure or isolation of contaminated equipment.
- Practicing good laboratory hygiene.
- Safe transportation of very toxic chemicals and substances.
- Planning for accidental releases and spills.
- Special storage and waste disposal practices.

Some examples of circumstances that may require prior approval include unattended or

overnight operations, use of explosives or pyrophorics, use of highly toxic gas in any amount, use of large quantities of toxic or corrosive gases or use of carcinogens.

5. Personal Protective Equipment (PPE)

Identify the required PPE for the process, hazardous chemical, or hazard class. PPE includes, but is not limited to, gloves, aprons, laboratory coats, safety glasses, chemical splash goggles, masks, respirators, face shields, and lead aprons.

6. Engineering Controls

Describe or list the engineering controls that will be used to prevent or reduce employee exposure to hazards. Examples of engineering controls include, but are not limited to, fume hoods, target fume extractors, glove boxes, interlocks on equipment, and shielding devices.

7. Special Handling and Storage Requirements

- Describe the handling and storage requirements for hazardous substances including, but not limited to:
 - special containment devices
 - special temperature requirements
 - special storage areas or cabinets
 - chemical compatibility storage requirements
- State the policy regarding access to the substance(s).
- Provide the exact storage location in the laboratory.
- Describe any special procedures, such as:
 - dating chemicals on receipt
 - opening
 - disposal
 - testing after an appropriate amount of time has passed
 - safe methods of transport, such as:
 - in a secondary container
 - low, stable cart
 - using two hands to carry the chemical container

8. Spill and Accident Procedures

Describe special procedures for spills, releases, and/or exposures. Indicate how spills, accidental releases and exposures will be handled. List the location of the following emergency equipment, including but not limited to:

- chemical spill clean-up kit
- first aid kit
- emergency eyewash and deluge shower
- fire blanket
- fire extinguisher

9. Decontamination Procedures

Describe specific decontamination procedures for contaminated equipment, glassware, and/or work areas.

10. Waste Disposal Procedures

Describe:

- the anticipated waste and byproducts
- how and where the waste will be collected
- how and when the waste will be disposed

11. Designated Area

Indicate the designated area established for experiments using particularly hazardous substances and/or procedures will be conducted. Be specific, such as a portion of a laboratory bench, a piece of equipment, the fume hood, or the entire laboratory.

12. Safety Data Sheet (MSDS) Location

Describe where:

- SDSs for the chemicals and hazardous substances are kept.
- Where other pertinent safety reference materials and information are located.

13. Protocols

Insert a copy of, or describe in detail, your specific laboratory procedures for the process, hazardous chemical, or hazard class.

SOP TEMPLATE

Standard Operating Procedures

Department: _____ Date: _____

Principal Investigator: _____

Chemical Hygiene Officer: _____

Laboratory Phone: _____ Office Phone: _____

Emergency Contact: _____

(Name and Phone Number)

Location(s) covered by this SOP: _____

(Building/Room Number)

1. Type of SOP (check one)

Process Hazardous Chemical Hazard Class

2. Describe Process, Hazardous Chemical or Class:

3. Potential Hazards:

4. Circumstances Requiring Prior Approval:

5. PPE:

6. Engineering Controls:

7. Special Handling & Storage Requirements:

8. Spill & Accident Procedures:

9. Decontamination Procedures:

10. Waste Disposal Procedures:

11. Designated Area:

12. SDS (MSDS) Location:

13. Protocol(s):