SKIDMORE
COLLEGE

Chemical Hygiene Plan

for compliance with
29 CFR 1910.1450

EMERGENCY CONTACTS

For all emergencies call **Campus Safety** at 518-580-5566

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Purpose

The intent of the Chemical Hygiene Plan (CHP) is to inform individuals at Skidmore College of relevant health and safety policies and procedures, and to inform them of their rights and obligations under federal and state directives. The CHP is intended minimize the risk to personnel, facilities, and the environment from the use hazardous materials. These policies and procedures are based on currently accepted practices and ensures compliance with laws, statutes, and regulations including the Occupational Safety and Health Administration (OSHA) Laboratory Standard found at 29 CFR 190.1450 and the Environmental Protection Agency (EPA) Emergency Planning and Community Right-to-Know Act (EPCRA). The CHP is not intended to be all-inclusive, and cannot address specific handling procedures for all materials, but describes general protective guidelines for working with hazardous materials or a specific category of material.

Scope

Skidmore College is committed to providing a safe and healthy work environment for the entire campus community.

The CHP is intended to help individuals:

- Maintain risk of exposure to hazardous materials at the lowest practical level;
- Minimize risk of work-related injury and illness;
- Minimize risk to the environment;
- Comply with applicable regulations and standards, and,
- Attain the above goals with a minimum burden on teaching and research activities.

Plans and procedures regarding, waste management, biological safety, disposal of regulated medical waste, Institutional Animal Care and Use (IACUC), and radiation safety are not part of the CHP. Questions concerning these other programs should be directed to ehs@skidmore.edu or general information can be found at https://www.skidmore.edu/ehs/.

Applicability

The CHP applies to any individual (including, but not limited to, faculty, staff, administrators, post-doctoral fellows, interns, student employees, research students, visiting scientists, technical staff, maintenance and building trades staff, and Campus Safety staff) who perform work in a space where one or more of the following conditions exist:

- Small quantities of hazardous chemicals are used;
- Chemical manipulations are carried out on a "laboratory scale"
- Multiple chemical procedures or chemicals are used;
- "Protective laboratory practices and equipment" are available and in common use to minimize the potential for employee exposure to hazardous chemicals;
- A satellite accumulation area is present;
- A laboratory type ventilation hood is present

Individuals working in a space that meets one or more of the above requirements (hereinafter referred to as a laboratory or lab) must comply with the OSHA Laboratory Standard and this document.

The CHP applies only to laboratories; however, it is applicable to all spaces that utilize chemicals, regardless of the area of research or laboratory activity. For example, research and teaching laboratories that utilize hazardous chemicals are examples of workplaces where the CHP is applicable. Storage or preparatory areas that stock and supply chemicals in direct support of laboratory operations are also within the scope of this CHP. Non-laboratory workplaces that use or store hazardous materials fall under the scope of the Skidmore College Hazard Communication Program; for example, studio arts, print shops, maker spaces, machine shops, and photo labs.

Roles and Responsibilities

Office of Environmental Health and Safety for Academic Affairs (EHS)

The office of EHS serves as the health and safety resource and administrator of College Academic Affairs safety policies. EHS is responsible for:

- developing, implementing, training, record keeping, and
- maintaining the CHP in compliance with federal, state and local regulations.

Chemical Hygiene Officer (CHO)

The CHO is responsible for the implementation of the provisions of this CHP. Certain aspects of the program may be delegated to others as indicated. However, the overall responsibility for the execution of the CHP rests with the CHO. All students and employees are expected to actively participate in the program to ensure its success. The lead CHO for Skidmore College is:

Kara Cetto Bales
Director, Building Operations for BTCIS
Associate Director, EHS for Academic Affairs
(518) 580-5130
kcetto@skidmore.edu

The CHO will:

- Establish, maintain, and revise the CHP;
- Monitor procurement, use, storage, and disposal of chemicals;
- Conduct regular inspections of the laboratories, preparation rooms, and chemical storage rooms, and submit detailed laboratory inspection reports to administration;
- Maintain inspection, personnel training, and inventory records;
- Assist laboratory supervisors in developing and maintaining adequate facilities;
- Seek ways to improve the chemical hygiene program

Chemical Hygiene Committee

The Chemical Hygiene Committee (CHC) is responsible for providing technical guidance in the development and implementation of the CHP. The CHC is responsible for reviewing the CHP annually.

The CHC is comprised of the following individuals:

- Kara Cetto Bales, Associate Director of EHS for Academic Affairs, Chair
- Jennifer Cholnoky, Senior Lecturer & Chair of Geosciences
- Paul Davis, Art Department Shop Supervisor and Building Safety Coordinator
- Loretta Greenholtz, Director of EHS for Academic Affairs
- Gary Lachance, Building Trades Manager
- Sylvia Franke McDevitt, Assistant Professor of Biology
- Tim Munro, Director of Campus Safety
- Jeremy Sloane, Instructor of Biology

Department Chairs/Program Directors

Each individual department and/or program is responsible for ensuring that lab-specific procedures needed to supplement this plan are developed and implemented in a timely manner. The department or program director will:

- support the implementation of the CHP;
- assist the CHO in maintaining awareness and compliance with the CHP;
- work to remedy any laboratory deficiencies associated with formal or informal EHS audits;
- allocate appropriate resources/funding for laboratory related health and safety equipment, as needed.

Laboratory Supervisors

A laboratory supervisor is anyone facilitating, authorizing and overseeing any type of lab work, including faculty, administrators, and staff members. No one is exempt from the appropriate safety precautions. Lab supervisors must serve as good role models for their technical staff and students by observing all safety rules and recommendations, wearing protective equipment, and being enthusiastic about safety. Lab supervisors are normally presumed to be the subject matter experts for the experiments and research activities they introduce into laboratory settings, and are primarily responsible for the implementation of the CHP in the spaces they oversee. Lab supervisors shall:

- Inform and train their lab workers of the hazards and their control measures;
- Ensure that untrained workers (or students) do not work alone or unsupervised with hazardous chemicals or certain pieces of equipment;
- Implement and enforce rules and standards concerning health and safety in their labs;
- Ensure the availability, and enforce the use, of the appropriate personal protective equipment;

- Remain cognizant of chemicals stored and used in labs, and their associated hazards;
- Conduct internal inspections of their laboratories with the CHO to identify and address health and safety concerns

Laboratory Workers

A laboratory worker is an individual (other than a laboratory supervisor) who may work independently or in an unsupervised fashion. Laboratory workers shall:

- Follow all health and safety standards and rules set by the CHP, College and/or lab supervisor;
- Report all hazardous conditions to their laboratory supervisor;
- Wear or use any prescribed personal protective equipment;
- Report any job-related injuries or illnesses to their laboratory supervisor;
- Refrain from the operation of any equipment or instrumentation without proper instruction and/or authorization

While students in an academic laboratory are not considered laboratory workers by the OSHA Lab Standard, the rules/requirements/procedures outlined herein shall be an integral part of Skidmore's academic learning and research environment to provide for the protection of all personnel.

Laboratory Visitors

Laboratory visitors are individuals who do not normally work in a laboratory but may need to visit a lab to perform assigned work without the laboratory supervisor present. Laboratory visitors include Campus Safety staff, Facilities maintenance and building trades staff, custodial staff, and any other person who enters a laboratory but does not meet the definition of laboratory worker. Responsibilities of laboratory visitors include, but are not limited to:

- Comply with all personal protective equipment and work practices in the spaces they enter;
- Do not disturb any equipment on benchtops or fume hoods;
- Direct any questions to the laboratory supervisor or CHO;
- Report unsafe conditions to their supervisor or CHO

Academic Administrative Assistants

Individuals directly involved with ordering and/or receiving packages involving chemicals and supplies shall:

- Assist faculty and the CHO with the timely procurement and proper storage of necessary chemicals and/or dry good materials to support ongoing teaching/research activities;
- Help ensure that all materials are secured and properly stored until they have been delivered to an authorized user

Undergraduates, High-school students, and non-affiliates

Prior to engaging in any laboratory activities, whether volunteering, shadowing, or otherwise, undergraduates, high school students, and non-affiliates must obtain College approval. This includes

high school students (grades 9-12), registered Skidmore College students during semester breaks, or non-affiliates utilizing College equipment or working in a laboratory. Registration is mandatory, and individuals are bound by the Policy and Guidelines for Undergraduate, High School, and Non-affiliates in Research Laboratories.

Training

The type/level of training required depends on an individual's job function and responsibility. EHS will maintain all training records for individuals working in a laboratory, except laboratory visitors. Training documentation for laboratory visitors will be kept by the respective department.

- General Laboratory Safety
- Advanced Laboratory Safety
- Hazardous Waste Management
- Fire Extinguisher Use
- Radiation Safety
- Laser Safety
- Animal Care
- Biosafety
- Research Ethics
- Hazard Communication

Laboratory Supervisors

All laboratory supervisors must complete the following trainings every 3 years:

- Advanced Laboratory Safety
- Hazardous Waste Management
- Fire Extinguisher Use

If the scope of lab work, as determined by EHS, will involve the use of radiation, lasers, animals or biological materials, the following trainings may also be necessary:

- Radiation Safety
- Laser Safety
- Animal Care
- Biosafety
- Research Ethics

Laboratory Workers

All new laboratory workers (including students in an academic laboratory) must participate in General Laboratory Safety Training and pass a proficiency exam (80% or above) before work begins in the lab. The General Laboratory safety training only needs to be completed once.

If a laboratory worker will at any time work independently without the laboratory supervisor present, the laboratory worker must also complete the following trainings **annually**:

- Advanced Laboratory Safety
- Hazardous Waste Management
- Fire Extinguisher Use

The following trainings may also be required depending on the scope of work, as determined by the laboratory supervisor or EHS:

- Radiation Safety
- Animal Care
- Biosafety
- Research Ethics

Administrative Assistants

At the time of their initial assignment, Administrative Assistants who may be exposed to a chemical as part of their job duties must complete:

- Hazard communication

Additional training will be provided, as necessary, by EHS whenever a new chemical hazard is introduced into their work area.

Laboratory Visitors

Laboratory visitors, who enter labs without the laboratory supervisor, a member of EHS, or the CHO, must be familiar with the hazards typically present in laboratory facilities and understand best practices for working safely in and around these facilities. Annually, laboratory visitors are required to complete:

- Hazard communication
- Additional training as required by job duties (e.g. biosafety)

General Safe Work Practices

Respect and understand the inherent safety and health hazards (chemical, biological, and radiological) associated with the lab environment at all times. Even if you are not actively working, others in the lab may be.

- Familiarize yourself with the location, and proper use, of all emergency response equipment (fire extinguisher, fire alarm pull station, spill kit, safety shower, eye wash, emergency exit, telephone).
- Report unsafe lab conditions and work practices immediately, such that appropriate action can be taken to remedy the condition or practice.
- Avoid horseplay, practical jokes, or other behavior which might confuse, startle, or distract other workers in the laboratory.
- Music in the laboratory. While in the laboratory, you must be fully aware of your surroundings

and the events taking place around you. The volume of sound may never impede awareness of laboratory activities. The use of headphones/ear buds is prohibited.

- Plan ahead. Determine the potential hazards of the experiment before you begin.
- Read all labels carefully. Be certain that the proper chemical is being dispensed. Check the warning labels for toxicity/hazards, and refer to the Safety Data Sheet (SDS).
- Heed warning signs for areas where unusual hazards may be present, such as radiation, lasers, and use of carcinogens/highly toxic chemicals.
- Fume hoods must be used whenever an activity involves production of hazardous vapors or when specified by the SOP. Always confirm the hood is operational before you begin.
- Flames (i.e. Bunsen burners) should never be left unattended.
- Never place glass in the trash can. Broken glass containers are available in each laboratory for proper disposal of these materials. Any contaminated glass must be disposed as "waste".
- Waste must be collected in the Satellite Accumulation Area (SAA). Policies and guidelines regarding waste management can be found at https://www.skidmore.edu/ehs/.
- For all emergencies contact Campus Safety at 518-580-5566 (or x5566 from a campus phone).
- Accidents and injuries must be reported and filed with EHS.

Service Animals in Laboratories and Studios

In accordance with the Americans with Disabilities Act (ADA), individuals with disabilities may be accompanied by a service animal in laboratory and studio spaces. A service animal is defined as a dog that is individually trained to perform tasks directly related to a person's disability.

Due to the presence of hazardous chemicals, sharp tools, open flames, or other safety risks that may endanger the animal or others safety risks found in these environments, **a prior safety assessment is required.** Individuals intending to bring a service animal into these spaces must contact the EHS office at ehs@skidmore.edu and the area supervisor in advance. The assessment will evaluate whether reasonable accommodations can be made to ensure the safety of the service animal, its handler, and all occupants. Alternative arrangements may be necessary if risks cannot be adequately mitigated.

Emotional support animals and pets are not permitted in laboratory or studio spaces under any circumstances.

Personal chemical hygiene

Good personal chemical hygiene habits minimize chemical exposure.

- Wash your hands frequently during the use of lab facilities even if you were wearing gloves.
- Always wash your hands after contact with any hazardous material, and before eating, drinking, or applying cosmetics.
- Long hair must be tied back/secured.
- Wearing contact lenses in the laboratory is discouraged as the lens material may absorb and concentrate many chemicals.

- Wear appropriate clothing (and shoes) to protect your skin in the event of an accidental spill.

Housekeeping

An unorganized, cluttered laboratory increases the likelihood of chemical spills and splashes due to tripping or knocking over chemical containers.

- Keep areas around safety equipment such as fire extinguishers, safety showers, and eyewashes clear/unobstructed.
- Avoid clutter and keep walkways clear.
- Have designated storage areas for chemicals and hazardous waste.

Food and drink in the laboratory

- Never consume food or beverages, chew gum or apply cosmetics in labs or chemical storage areas.
- Do not store food or beverages in labs (including refrigerators) or chemical storage areas.
- Rooms that are adjacent, but separated by floor-to-ceiling walls, and do not have any chemicals or other hazardous materials present may be used for food consumption/preparation at the discretion of the laboratory supervisor responsible for the area.

Basic chemical handling and storage procedures

- Know the hazard properties of the chemicals used or produced in your laboratory. Consult Safety Data Sheets or other appropriate references prior to using an unfamiliar material.
- Determine the potential hazards and develop appropriate standard operating procedures before beginning any new operation.
- Implement procedures that will reduce the likelihood of exposure to any material, as most laboratory chemicals have not been fully characterized with respect to their toxicity.
- Minimize chemical exposure through the use of fume hoods and personal protective equipment.
- Avoid working alone in the laboratory when handling hazardous chemicals, carrying out chemical reactions, or performing other high-risk operations.
- Use cautious judgment when leaving operations unattended: i) post signs to communicate appropriate warnings and precautions, ii) anticipate potential interruptions of electric, water, or other services and provide containment and/or shielding for release of toxic substances.
- Always assume that unknown materials are toxic, and that a mixture is more toxic than its most toxic component.
- Use proper labeling practices for materials transferred from the original manufacturer's container into a secondary container (e.g. beaker, flask, or bottle):
    - Materials in use: labeled with the contents
    - Storage of materials: labeled with the contents, corresponding pictograms, and if applicable the chemical concentration.
- Chemical storage areas need to be labeled.

- Chemicals should never to be stored under a sink, directly on the floor, or in a corridor.
- Minimize the storage of chemicals in work areas, such as on a lab bench or in a fume hood.

Working alone in the lab

Working in a laboratory alone or in isolated areas presents unique risks and hazards. Laboratory personnel are at an increased risk when working alone, as accidents have the potential to go undetected. Working alone is discouraged in all laboratories containing potentially hazardous materials and is strictly prohibited if the individual is handling or manipulating hazardous chemicals or substances with which, in the event of an accident, the user would require immediate assistance from another person.

If a lab worker must work alone in the laboratory one of the following supervisory systems must be implemented:

1. Visual Checks

   When one or more persons are working in isolation within the same facility, workers can carry out visual checks (at least hourly) by visiting neighboring rooms.
2. Communication Checks

   If no other workers are present on site, prior to working alone, inform Campus Safety (518-580-5567) of your work schedule and arrange with them to carry out regular checks (at least hourly). Contact should be made at prearranged intervals, by radio, phone or e-mail.

Standard Operating Procedures (SOPs)

SOPs are step by step procedures on the proper use and handling of equipment and/or hazardous materials. SOPs are useful for preventing accidents and responding to emergencies.

- Laboratory supervisors are responsible for developing SOPs that cover the hazards present in their laboratories.
- Laboratory supervisors are responsible for training individuals on the SOP.
- SOPs must be read and an acknowledgement of understanding is required by the trainee (and trainer) before individuals are authorized to work independently.
- Copies must be made available to each person performing the task and to EHS upon request.
- Copies must be maintained by the laboratory supervisor and revised when significant changes are made.
- SOPs should be systematically reviewed on a periodic basis, e.g. every 1-2 years, to ensure that the policies and procedures remain current and appropriate, or to determine whether the SOPs are even needed.

A SOP can be for a generic or specific process/procedure or chemical/chemical class and should include:

1. Lab and SOP descriptive information

- Process or chemical name/class of chemicals
- Laboratory supervisor name
- Date when SOP was finalized/updated
- Building/room number where work is designated

2. Hazards
    - Equipment or physical hazards
3. Engineering controls and personal protective equipment
    - Description and location of lab-specific controls/equipment to reduce exposure
    - Include specific PPE or combination required for operation
4. Protocol/procedure
    - Include step-by-step instructions
    - Outline special handling and storage requirements
    - Describe restrictions on procedure/quantity/work equipment/work locations/unattended operations, etc.
5. Spill and accident procedures
    - Describe specialized spill clean-up procedures for materials used in the SOP
    - If applicable describe any specialized emergency procedures
6. Waste disposal procedures
    - Specific information on the waste streams generated, storage location, and any special handling/storage requirements.
7. Documentation of training
    - Signature of all users is required

Procedures/chemicals requiring SOPs include, but are not limited to, the use of:

- Extremely low temperatures devices
- Ultraviolet (UV) light sources
- Intense visible light sources (including lasers)
- Acutely toxic chemicals (see EPA P-list chemicals)
- Strong oxidizers
- Equipment under vacuum
- Air contaminants (see OSHA Z-2 Table)

Safety Data Sheet (SDS)

In 2012, OSHA mandated the use of a single format for safety data sheets, a format which features 16 sections in a strict ordering. Sections 1-8 include general information about the chemical such as hazards, safe handling practices, and emergency control measures (like personal protecting equipment and firefighting). Sections 9-11 & 13 contain technical and scientific information, such as physical and chemical properties, as well as, stability and reactivity information. The remaining sections (sections 12 & 14-16) pertain to packaging and transport of materials.

- SDSs must be readily accessible to all individuals.
- SDSs can be found on the chemical vendors' website (e.g. Sigma, Fisher, etc.) or by searching "SDS of xxx" in your web browser, where xxx is the chemical name.
- All persons entering spaces where hazardous materials are used or stored must know how to access an SDS for those chemicals/materials.
- Individuals should be familiar with the information contained in an SDS and how the information on container labels is related to the SDS.

Personal Protective Equipment (PPE)

The use of PPE in the laboratory is necessary for certain procedures to prevent exposure to toxic or corrosive materials. SDSs should be reviewed to confirm appropriate PPE for the task at hand. All lab workers, including students enrolled in research and/or teaching courses will be required to use PPE when they are present in a lab where hazardous chemicals are being handled/manipulated or in any lab where an active SAA is present. If, however, the active SAA is secured behind an explosion resistant barrier and hazardous chemicals are safely stored, the judgment of the laboratory supervisor regarding appropriate PPE will be accepted. Outlined below are the minimum PPE requirements:

Body protection

Laboratory workers are expected to always wear a long sleeved (with sleeves rolled down), buttoned lab coat that extends below their mid-thigh when handling hazardous chemicals. In addition to a lab coat, laboratory workers must wear clothing that fully covers their legs; however, tight fitting leggings are not recommended.

Lab coats

Hazard evaluation must be made to determine appropriate coat material (i.e. cotton, polyester, flame retardant).

- Cotton lab coats are recommended for general laboratory work,
- Cotton reacts rapidly with acids; therefore, rubberized aprons and/or chemical resistant sleeves are recommended to be worn over cotton lab coats when working with concentrated acids or other highly corrosive chemicals.
- When working with large quantities of flammable materials a fire-resistant lab coat should be worn.
- Lab coats are to be removed when leaving the laboratory for breaks, meetings, etc.
- Lab coats should be cleaned routinely by general laundering. If chemical contamination occurs, special cleaning is provided through EHS. Contaminated lab coats should be removed immediately upon contamination, bagged, and brought to the EHS office for cleaning.

Foot protection

Low-heeled closed-toe shoes that completely cover the foot should always be worn in spaces where chemicals are used or stored. Shoes with open toes or constructed of woven material are not

recommended. Chemical resistant overshoes or boots may be used to avoid possible exposure to corrosive chemicals or large quantities of solvents that might penetrate normal footwear (e.g. during spill cleanup), but may not be used in place of proper footwear.

Eye protection

Safety goggles/glasses must have side shields that have shatter-resistant lenses and provide eye protection against physical, biological or chemical hazards. The use of chemical splash goggles is highly encouraged in teaching laboratories. For those who wear prescription eyeglasses, safety glasses or goggles should be worn over the glasses or the prescription eyeglasses must have side shields.

A face shield should be worn over safety eyewear when working with large quantities of highly corrosive chemicals, operations significantly above or below ambient pressure, or other high-risk operations. A face shield should never be used in place of safety glasses or goggles.

Contact lenses

It is recommended that the laboratory supervisor and other laboratory personnel be notified when contact lenses will be worn in the laboratory. Contact lenses should be removed at the first sign of eye redness or irritation which is thought to be associated with the laboratory environment. An optometrist or ophthalmologist should be consulted regarding continued use of contact lenses in the laboratory. In the event of a chemical splash to the eye, contact lenses should be removed immediately and the eye(s) thoroughly flushed.

Hand protection

Appropriate gloves must be worn when there is a potential for skin contact with hazardous materials. Consult chemical permeation glove selection charts to choose the glove materials that is appropriate for the intended task. Inspect gloves carefully for leakage. Replace any glove that is damaged or discolored. Always wash hands thoroughly and dry completely before donning a new glove. Never reuse disposable gloves.

To minimize cross-contamination of objects, always remove gloves before:

- Leaving the laboratory
- Touching objects expected to be "clean" (i.e. door handles, telephones, etc.).
- Before contacting items that will be removed from the lab (i.e. lab notebooks, laptops, etc.).

Respiratory protection

Respiratory protection is not normally required during laboratory operations if the work is performed in a properly functioning laboratory hood. Respiratory protection may be necessary if operations cannot be performed in a hood or involve highly volatile chemicals. In these circumstances, all personnel must be medically evaluated, fit-tested, and trained prior to using respiratory protection (for more information, see Skidmore's respiratory protection program). If you believe you need a respirator to perform a specific task, contact the EHS office.

Flame-resistant face coverings

A face covering used to reduce the spread of respiratory droplets do not replace other required PPE necessary for research or teaching activities. Individuals wearing face coverings must use a flame-resistant or 100% cotton mask when working in an area where open flames, pyrophoric, water-reactive, or flammable materials are used. The flame-resistant masks are considered PPE and as such must be removed or replaced for regular cloth or KN95 masks when leaving the lab.

Labeling Requirements

All chemical materials/containers must be labeled so that any person that enters the lab can determine the identity of the contents and its hazards (i.e. full chemical name and pictogram). Chemical structures or formulas are not permitted as forms of labeling. Containers should be inspected periodically for appropriate labeling and container integrity.

Hazard identification and labeling

The Globally Harmonized System of Classification and Labeling of Chemicals (GHS) is an internationally standardized approach to hazard communication (see Skidmore's Hazard Communication Program for more information). Any chemical that is manufactured in or distributed from countries that follow the GHS will have standard labeling that includes a set of pictograms to allow for quick recognition of chemicals that are characterized as hazardous. The GHS pictograms can be reviewed on the OSHA QuickCard for HCS Pictograms and Hazards.

- Laboratory supervisors must ensure that labels on incoming containers of hazardous chemicals are not removed or defaced. If any part of the label is obscured or removed, that information must be replaced. It is recommended that incoming containers be labeled with the PI's name and date of receipt.
- When chemicals or mixtures are transferred into a different container (i.e. secondary container), that container also must also be labeled with the name(s) of the chemical(s) and any associated hazards.

When labels are missing or unclear, the cost of having even a small amount of an "unknown" chemical analyzed prior to disposal will far exceed the purchase prices of an entire container of the chemical.

Safe Handling and Storage Requirements

Chemicals should be stored according to compatibility and storage areas must be appropriately signed.

- Consult SDSs for appropriate storage recommendations.
- Storage area signs are available through EHS (https://www.skidmore.edu/ehs/forms/waste-container-delivery-request.php)
- Flammable liquids that need to be cold may only be stored in flammable and explosion-proof refrigerators/freezers.
- No chemicals may be stored directly on the floor; proper secondary containment is required.

- Chemicals should never to be stored under a sink.
- A fume hood should not be used for long-term chemical storage.
- Gas cylinders are to be stored upright and be secured at all times; have the protective cap or regulator in place when not in use and be away from heat, flame or spark.

Peroxide forming materials

- All peroxide-forming materials need to be labeled with the date the container was received and the date it was opened.
- Materials should be checked periodically for formation of peroxide. Peroxide test strips are available through EHS.
- After the expiration date, the material must be tested for peroxides or disposed of properly.
- Containers should be kept tightly closed and protected from moisture, light and air.
- All potential peroxide formers should be kept away from ignition sources and stored in a cool, dry place.
- A list of potential peroxide forming solvents can be found here.

Highly hazardous substances

Carcinogens, mutagens, and reproductive poisons that pose a serious health risk must be stored in appropriately posted areas and signed, WARNING CANCER SUSPECT AGENTS. Access to this area must be limited to personnel specially trained in the safe handling and use of these materials. OSHA has listed the permissible exposure limits (PELs) of such toxic and reactive materials on Table Z-2 and include benzene, carbon tetrachloride, chloroform, and vinyl chloride.

EHS must approve the use of these substances to assure appropriate precautions are observed and necessary equipment and facilities are available. Before these substances are used, any laboratory worker using them must be fully aware of the risks involved and procedures for proper handling, storage and disposal.

Chemicals developed in the laboratory

The following requirements apply to chemical substances developed in the laboratory:

- Materials should only be produced exclusively for the laboratory's use.
- If the composition of the chemical substance that is produced is known, the laboratory supervisor, to the best of their knowledge, must determine if it is a hazardous chemical. The hazard properties of the material can be determined based on literature of similar substances.
- If the chemical is determined to be hazardous, the laboratory supervisor must provide appropriate training to protect all lab workers.
- If the chemical produced is a product or a byproduct whose composition is not known, the laboratory supervisor must assume that the substance is hazardous and must comply with the requirements of the CHP.

Moving/Transporting chemicals either inside or outside a building

If a laboratory needs to move a few chemicals within a building, follow the guidelines below. If a laboratory needs to move large number of chemicals or materials outside the building, STOP and contact ehs@skidmore.edu for appropriate guidance.

- Lab personnel are responsible for using appropriate safety carriers (secondary containment) when transporting chemicals.
- Carts are preferred for transporting chemicals.
- The appropriate PPE needed to safety handle the chemicals being transported should be moved with the chemicals. In the event of a spill the PPE should be donned.
- Chemicals must be segregated as flammables, oxidizers, acids, or bases, with liquids and solids in each hazard class segregated and in separate transport containers.
- Leak-proof plastic containers are recommended for the transport of liquids.
- Liquid containers should be cushioned to prevent breaking during transport.
- When moving gas cylinders, the protective cap must be in place and the tank must be transported with the aid of a hand truck.

Protecting Laboratory Personnel

Controlling exposures to hazards in the workplace is vital to protecting workers. The National Institute for Occupational Safety and Health (NIOSH) has established a hierarchy of controls as a way of determining which actions will best control exposures. The hierarchy of controls has five levels to lower worker exposures and reduce the risk of illness or injury. The preferred order of action based on general effectiveness is:

1. Elimination: physical remove the hazard
2. Substitution: replace the hazard with a method or chemical that is less hazardous
3. Engineering controls: isolate people from the hazard
4. Administrative controls: change the way people work; e.g. use of SOPs
5. PPE: protect the worker

Engineering controls

Engineering controls reduce or prevent hazards from coming into contact with workers. EHS in conjunction with Facilities Services will ensure that equipment is functioning properly and inspected regularly. Contact EHS if you believe there are maintenance issues in your area.

Equipment and service/inspection schedule (responsible party indicated in parenthesis):

- Fume hoods: performance tested annually (Adirondack Air Balance Co., Inc.)
- Fire extinguishers: visually inspected monthly (Facilities Services); certified yearly (New York Fire & Security)
- Showers: visually inspected weekly (EHS); performance tested annually (Facilities Services)
- Eyewash stations: performance tested weekly (EHS)
- Spill control kits: inspected annually (EHS)

Exposure and medical monitoring

Monitoring of the lab environment and/or personal exposure may be required if a toxic or hazardous material is listed on one of the OSHA Z-tables. EHS will conduct monitoring as appropriate to ensure that a laboratory worker's exposure to does not exceed the action level (or, in the absence of an action level, the PEL) specified by OSHA (see 29 CFR 1910.1450(d)). Any person with a reason to believe that exposure levels for a substance are unsafe, may request monitoring through the CHO or EHS office. EHS is responsible for coordinating exposure monitoring requests and determining when monitoring is no longer necessary and can be terminated.

- **Initial monitoring** will be done by EHS to measure worker exposure whenever there is reason to believe that exposure levels for a substance routinely exceed the permissible levels for Z-1 substances or for any exposure to Z-2 substances.
- **Periodic monitoring** will be conducted by EHS if the initial monitoring performed discloses worker exposure over the allowed levels.
- **Notification of monitoring results** will occur within 15 working days after the receipt of any monitoring results. Individuals will be notified by EHS of the results in writing.

Medical monitoring

Certain situations or exposure conditions may warrant medical consultation or medical monitoring of individuals. All consultations and monitoring are provided at no cost. Examples include medical evaluation for individuals exposed to concentrations of a hazardous substance above the OSHA action level, the PEL or the Short-Term Exposure Limit (STEL).

Recordkeeping

The following records must be maintained:

- Records of any measurements taken to monitor worker exposure are maintained by EHS for at least the duration of employment plus 30 years;
- Records of any medical consultation and examinations are maintained for at least the duration of employment plus 30 years;
- Accidents and injury report forms are maintained by the Risk Management office;
- All training records (except SOPs) are maintained by EHS;
- Fume hood evaluations are maintained by EHS for 3 years;
- Records of laboratory audits are maintained by EHS for 3 years.
- SOP training logs are maintained by Laboratory Supervisors for a minimum of two years past the past the discontinuation of the protocol, procedure, or the use of the equipment.

Chemical Inventory and Barcoding

A complete chemical inventory is required annually to be provided to various organizations in accordance with EPCRA. Chemical inventory is tracked using Vertere, a web-based inventory management system.

Reduce chemical purchases by checking the chemical inventory prior to ordering a material. Only purchase the quantity you need. Unused, unwanted, or expired chemicals typically constitute 25% or more of the waste generated. When disposal costs are considered, it is more economical to purchase only the quantities of chemicals that will be used. Furthermore, long-term storage of expired or reactive unused chemicals increases the risk of accidents. In addition to this, if small bottles do break, there is less spillage, making clean-up safer, easier, and less expensive.

Vertere

Every chemical or material with an SDS (regardless of hazards) is required to be added to Vertere and can be accessed from https://skidmore.vimenterprise.com/Login.aspx. To login, enter the ID (guest) and password (chemical1922). For detailed instructions on how best to search for materials in Vertere, visit https://www.skidmore.edu/ehs/documents/secure/vertere-instructions.php.

Barcodes

When a material arrives on campus the bottle is tagged with a unique barcode. To maintain an accurate record, barcode numbers need to be deleted from the inventory when the materials are depleted. When the chemical container is empty, write the barcode number on the *Material Disposal Barcode Sheet,* along with the material name. EHS will periodically collect the sheets and delete the barcodes from the inventory.

Hang tags

In addition to being barcoded, all compressed gas cylinders must have a hang tag with the user's name and account number. If a cylinder is missing a hang tag, please contact EHS.

Laboratory Waste Disposal Policies

The characterization, management storage and disposal of laboratory wastes (i.e. chemical waste including hazardous and non-hazardous solid waste, radioactive or mixed waste, biohazardous and medical waste, and universal waste) is regulated and requires strict compliance with regulatory obligations. All materials collected in the laboratory must be considered laboratory and/or regulated (medical or radioactive) waste unless written approval is obtained to dispose of the materials as "normal" waste in the sewer or landfill. EHS coordinates the collection of all types of wastes with a licensed waste contractor. There is no direct charge to departments/programs for disposal of waste materials. Any questions or requests for disposal should be directed to the EHS office.

Chemical waste collection

In accordance with the College's commitment to protecting human health and the environment and strict adherence to hazardous waste regulations, all hazardous waste must be collected and properly disposed. Since the definition of hazardous waste is broad and it can be difficult to determine if the waste that is produced is hazardous, the College adheres to a strict "No Drain Disposal" policy (including household materials) unless prior written approval is obtained. Additionally, the Sewer Use Ordinance of Saratoga County Sewer District and the City of Saratoga Springs, NY prohibits and/or

restricts discharges as they each own part of the collection system to which Skidmore College discharges wastewater. As such, we are required to submit a chemical discharge request and obtain approval prior to discharging any material regardless of its hazard classification. If approval is not received, unwanted or waste chemicals and products must be collected in the SAA and treated as hazardous waste.

Requesting drain discharge approval

A formal written request for drain disposal must be made to the EHS office.
The request must contain:

- Name, department, and title of requestor
- Materials or solutions for disposal (for aqueous solutions the concentration and pH)
- The volume for disposal and frequency of discharge (e.g. amount per month, semester, or year)
- The standard operating procedures for how solutions were prepared or any other pertinent lab protocols in which the materials/solutions are utilized
- All corresponding SDSs

Drain disposal requests will be reviewed by EHS and sent to the City of Saratoga Springs and Saratoga County for approval. Until written authorization is obtained, no drain disposal is permitted under any circumstances. The requestor will be notified in writing once approval has been received. An approval is valid until a change in the protocol or volume/frequency of discharge occurs, at which time a new disposal request must be submitted.

All persons working in a lab with a satellite accumulation area should be familiar with the information outlined in the Skidmore College Waste Management Policy and Guidelines.

Biohazard or Regulated medical waste

Any individual that has routine exposure to blood-borne pathogens, should be familiar with the information outlined in the Bloodborne Pathogen Exposure Control Plan, the Biohazardous Waste Management Policy and Guidelines, and complete BSL-1 and/or BSL-2 safety training through CITI.

Radioactive waste

All individuals working with radioactive materials must be approved by the Radiation Safety Committee and comply with the Radiation Safety Protection Plan. All disposal methods of radioactive materials should be strictly followed according to the approved protocols.

Controlled substances

The management of controlled (Schedule I-V) and non-controlled pharmaceutical waste is handled by the EHS in accordance with Skidmore's license issued by the NYS Department of Health.

Emergency Procedures

For all emergencies contact campus safety at 518-580-5566. Campus safety will notify the appropriate resources, such as Emergency Medical Services (EMS), EHS, or the Poison Control Center. For non-life-threatening medical emergencies involving students, students may be escorted to Health Services rather than being transported to the nearest hospital.

Chemicals spilled on the body

Remove all contaminated clothing and wash the affected area under the facet or safety shower (for large areas of the body). It is important to act swiftly to remove the contamination from the skin before the skin is damaged or before a significant amount is absorbed into the body. Do not waste time deferring to modesty. Continue to wash the affected area with water for at least 15 minutes. DO NOT use any neutralizing agents, other chemicals or solvents. Have another individual promptly notify Campus Safety to obtain medical aid. If possible, take a copy of the SDSs.

Chemicals splashed into the eye

Immediately use an eyewash fountain. If one is not available, use a gentle stream of cold tap water. The eye must be washed continuously with a gentle flow of water for at least 15 minutes with the eyelids held apart to afford maximum exposure of the eyeball to the water. If contact lenses are in the eyes, DO NOT attempt to remove contact lenses by hand or with any object. Allow the gentle stream of the eyewash fountain to remove the lenses. NEVER rub the eye or use any neutralizing chemical for eyewash. Get medical attention as soon as possible.

Chemicals inhaled

In case of poisoning by chemical inhalation, immediately call Campus Safety. If the individual is conscious, get them to fresh air. DO NOT let the person walk unassisted or engage in any unnecessary activity that increases the circulation of poison in the bloodstream. If artificial respiration is necessary, take care not to inhale the chemical from the individual.

If a person is found unconscious in the lab, a confined space, or an area where vapors are likely to be trapped, do not enter the area; the individual may have been overcome by toxic gases or asphyxiated by lack of oxygen in the space. Your entry into the same space may lead to your becoming incapacitated as well. Immediately contact Campus Safety.

Chemicals ingested

If a material is accidently ingested, contact Campus Safety who will contact Saratoga Hospital or Poison Control Center (800-222-1222). Do not give the person water, milk or anything else unless directed by a medical professional or SDSs. Also, do not induce vomiting even if the person complains of pain or burning sensation in the mouth or throat. Induce vomiting only if so directed by a medical professional.

Sharps injury
In the event of a needle-stick incident, or any other sharps injury involving potential injection hazards, immediately wash the affected body part(s), and gather any necessary information on the suspected materials or chemicals that may have been injected (such as an SDS). Notify Campus Safety of the incident, and wait for EMS arrival. In cases involving actual or potential chemical injection, it is highly recommended that the Poison Control Center be contacted immediately: 800-222-1222.

Other emergencies
For emergencies involving chemical/hazmat spills, biohazardous material exposures, fires, medical emergencies, and evacuation procedures, see Skidmore's Comprehensive Emergency Management Plan for specific response protocols.

Accidents and Injury Reporting Guidelines

Accidents resulting in injuries requiring more than basic first-aid (typically cleansing and an adhesive bandage) must be reported to the College. Incidents that occur during business hours (8:30am-4:30pm) are to be reported as outlined below. Injuries that take place after hours should be reported directly to Campus Safety (518-580-5566).

Employees (including student employees; excluding Resident Assistants (RA)
Any employee injured in the course of their job duties, must report accidents and injuries to their direct supervisor, and are required to fill out Employee Injury/Accident Report Form and submit it to Human Resources.

Non-employees
Any student, RA, guest, visitor, or employee injured while engaged in an activity outside of their job duties is considered a non-employee. In addition to reporting as outlined below, individuals must fill out the Non-Employee Injury/Accident Report form and submit it to Risk Management.

Organized activities
Injuries sustained during a Skidmore organized activity should be reported to the activity leader.
Examples:

- Injured during organized social activity – report to event organizer
- Injured during a class/lab setting – report to Faculty or staff in charge
- Injured during a college sponsored or academic field trip (off campus) – report to Faculty or staff in charge
- Injured performing a RA task – report to Campus Safety
- Injured during SGA Club activity (on or off campus) – report to Leadership Activities staff
- Injured during private lessons (e.g. riding, crew, sport clinic, fitness program, theater, art, dance, etc.) – report to instructor/coach

Non-organized activities
Injuries sustained on campus while not engaged in any specific activity (e.g. falling down stairs, walking to class, playing frisbee, etc.) – report to Campus Safety.

Athletes
Student Athletes injured during an intercollegiate sports game/practice/training are required to report injuries as outlined in the Sports Medicine Department Policy and Procedures Manual.

If you are uncertain of the reporting mechanism, contact Campus Safety.

Laboratory Audits

The EHS office will conduct periodic visits to each laboratory, as well as, annual laboratory audits to ensure that safe lab practices are being followed. It is strongly recommended that a laboratory conducts its own internal audit and are encouraged to use the laboratory inspection check-list as a guide.

In the event that a violation is cited for an activity or condition in a laboratory, the following procedure will be followed. If EHS determines that a significant health or safety hazard exists, EHS in conjunction with the laboratory supervisor will immediately take measures to eliminate or reduce the hazard. In the event of a non-critical violation, EHS will provide inspection reports to the responsible laboratory supervisors within two weeks of the inspection. Individuals will have 10 days to correct all non-compliant issues or unsafe/unhealthy conditions identified during the inspections. If the violation(s) is(are) not corrected within the specified time, a formal written warning will be issued, and copies will be sent to the Department Chair, the Associate Dean of the Faculty, and the Safety Committee. If no evidence of corrective action remains, EHS will make a formal recommendation to the Associate Dean of the Faculty to close the lab until all compliance issues have been corrected.

Appendix

List of Acronyms/Abbreviations

ACGIH	American Conference of Governmental Industrial Hygienists
BTCIS	Billie Tisch Center for Integrated Sciences
CFR	Code of Federal Regulations
CHC	Chemical Hygiene Committee
CHO	Chemical Hygiene Officer
CHP	Chemical Hygiene Plan
DOT	Department of Transportation
EHS	Environmental Health and Safety (for Academic Affairs) (ehs@skidmore.edu)
EMS	Emergency Medical Services
EPA	Environmental Protection Agency
EPCRA	Emergency Preparedness and Community Right to Know Act
IACUC	Institutional Animal Care and Use Committee
IUPAC	International Union of Pure and Applied Chemistry
NIOSH	National Institute of Occupational Safety and Health
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Level
PPE	Personal Protective Equipment
RA	Resident Assistant
RMW	Regulated Medical Waste
SAA	Satellite Accumulation Area
SDS	Safety Data Sheet
SOP	Standard Operating Procedure
STEL	Short Term Exposure Limit