

# University of Wisconsin Oshkosh Chemical Hygiene Plan

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This document is available electronically at:

[www.uwosh.edu/ehs/campus-health-and-safety/lab-shop-and-studio-safety/chemical-safety](http://www.uwosh.edu/ehs/campus-health-and-safety/lab-shop-and-studio-safety/chemical-safety)

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## 1. Introduction

### 1.1. Acronyms and Other Definitions

Acronym	Meaning
CFR	Code of Federal Regulations
CHO	Chemical Hygiene Officer
CHP	Chemical Hygiene Plan
DOT	Department of Transportation
EHS	Environmental, Health and Safety office
GHS	Globally Harmonized System—a system of hazard communication using pictograms and signal words
HMIS	Hazardous Materials Information Service—a system of hazard communication using a numerical scale and color bands
LMP	Laboratory Management Plan—A document that outlines best practices for managing laboratory wastes.
LSSST	Lab Shop Studio Safety Team
NFPA	National Fire Protection Association—a system of hazard communication using a color coded diamond on point with a numerical scale
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
PPE	Personal Protective Equipment
RCRA	Resource Conservation and Recovery Act—the federal regulations governing hazardous waste
SDS	Safety Data Sheet (replaces older Material Safety Data Sheet or MSDS)
SOP	Standard Operating Procedure
SPS	Wisconsin department of Safety and Professional Services

### 1.2. Purpose

The intent of this chemical hygiene plan is:

- To protect our laboratory employees and students from health hazards associated with the use of hazardous chemicals in our laboratories.
- To ensure that our laboratory employees and students are not exposed to substances in excess of the permissible exposure limits (PEL's) as defined by the Occupational Safety and Health Administration (OSHA) and codified in 29 CFR 1910.1000, Table Z1.

- To assist our laboratories' regulatory compliance with the OSHA Laboratory Standard as codified in 29 CFR 1910.1450 and adopted by Chapter SPS 332, PUBLIC EMPLOYEE SAFETY AND HEALTH.

### **1.3. Scope and Applicability**

The Chemical Hygiene Plan is limited to laboratory settings as defined in the OSHA Laboratory Standard. All campus laboratories must comply with the requirements outlined in this document. This plan does not specifically address protection needed against radiological, biological, or other hazards (electrical, mechanical, laser, etc.). Information relating to non-chemical hazards can be found at [www.uwosh.edu/EHS](http://www.uwosh.edu/EHS). Individual laboratories or departments may address these and other hazards by placing relevant attachments to this Plan as outlined in Appendix A. The necessary forms are included in Appendix B.

### **1.4. Implementation**

The OSHA Laboratory Standard requires the designation of personnel responsible for implementation of the Chemical Hygiene Plan (CHP). Specifically it calls for the assignment of a Chemical Hygiene Officer (CHO). This individual has the responsibility for development of the Campus CHP and oversight of departmental and laboratory Plans.

The CHO works with the departmental Safety Committees and the campus Lab, Shop, Studio Safety Team, (hereafter LSSST) which review this plan and aid in its implementation. Departments should designate a departmental CHO which may be the chair of the departmental safety committee or representative on the LSSST.

### **1.5. Availability of the Plan**

This plan will be available to all employees and students for review, with copies located in the following areas:

- Electronically at [www.uwosh.edu/EHS](http://www.uwosh.edu/EHS)
- Chemical storage rooms
- Department office
- All research and teaching labs
- Office of University Chemical Hygiene Officer (Hereafter CHO)
- Risk Management Office, Campus Services Building, 650 Witzel Ave.

### **1.6. Annual Review of the Plan**

This plan will be reviewed annually by the LSSST and approved by the campus Environmental Health and Safety Committee in consultation with the campus Chemical Hygiene Officer. Departmental and Individual Laboratory Chemical Hygiene Plans will be reviewed annually in a manner of the department's choosing. Significant changes should be reviewed by the campus CHO.

## **2. Roles and Responsibilities**

### **University Chemical Hygiene Officer**

The University Chemical Hygiene Officer (CHO) has the primary responsibility for ensuring the implementation of the campus CHP and overall compliance with chemical safety regulations. The CHO will:

- Review and update the CHP with the LSSST and Departmental Safety Committees.
- Conduct periodic laboratory inspections and other duties. Occasional inspections shall be conducted while employees are present in a laboratory so that the operating procedures may be verified.
- Provide guidance for the safe handling, storage, and disposal of chemicals.
- Facilitate waste minimization by redistribution of surplus chemicals.
- The Chemical Hygiene Officer, in consultation with the department chairperson, shall have the authority to suspend laboratory operations in part, or in whole if deficiencies in laboratory procedures or equipment pose a significant threat to the safety of the laboratory personnel or students.
- If suspension of laboratory operations is necessary, a written report will be filed with the CHO and the chairperson within 24 hours. A copy of the report with a written description of remedial actions taken to allow resumption of operations will be available in the CHO office.
- Retain records as described in this Plan.
- Forward incident reports or other concerns to the appropriate administrative offices.

#### **Departmental Safety Committee/Departmental CHO/Department Chair**

Departmental Safety Committees or CHOs will have the responsibility to:

- Annually review the CHP in consultation with the campus CHO.
- Retain records as described in this plan.
- Report new hires to the CHO for enrollment in training.

#### **Principal Investigator**

The principle investigator has the primary responsibility for providing a safe work environment within their laboratories and for ensuring compliance with the Campus, Departmental, or Laboratory CHPs within their own assigned laboratory space such as:

- Report new hires to the CHO for enrollment in training.
- Maintain standard operating procedures relevant for the work conducted in his/her lab. Provide student training as described in the Chemical Hygiene Plan.
- Retain records of student training as described in this plan.
- Report malfunction of safety equipment to the Department Laboratory Manager and/or Physical Plant personnel.
- Promptly file an accident/incident report with the Chemical Hygiene Officer if an accident or spill occurs.
- Retain records as described in section 15 of this plan.

## **Laboratory instructors**

Laboratory instructors have the responsibility to:

- Maintain safe standard operating procedures and have the authority to revise laboratory procedures as necessary.
- Suspend laboratory operation if ventilation is judged to be inadequate.
- Retain records of student training as described in this plan.

## **Laboratory employees and research assistants**

- Maintain accurate chemical inventory.
- Use acceptable storage methods as outlined in this Plan.
- Comply with the hazard communication plan.
- Maintain SDS files on all chemicals in the inventory as outlined in this Plan.
- Properly dispose of hazardous wastes generated in the laboratories as outlined in this Plan.
- Inspect safety equipment within work areas (for example flushing eye wash stations) on a regular schedule.

## **Physical Plant personnel**

- Physical Plant personnel will conduct annual fume hood inspections and report the results to the CHO.
- Physical Plant personnel will be responsible for monthly fire extinguisher inspections.

### **3. General Laboratory Procedures and Policies**

The following general policies apply for all laboratory operations involving hazardous chemicals.

It is university policy that appropriate PPE must be worn at all times. At a minimum, closed-toed shoes, long pants and eye protection must be worn whenever hazardous chemicals are in use in the laboratory.

It is university policy that no eating or drinking is allowed in laboratories where hazardous chemicals are present.

It is university policy that unnecessary exposure to hazardous chemicals via any route will be avoided through proper use of engineering controls, administrative controls and personal protective equipment.

It is university policy that good housekeeping practice be upheld in all laboratories and that all passageways, exits, utility controls, and emergency equipment remain accessible at all times.

It is university policy that any procedure or operation identified by laboratory or EH&S staff as imminently dangerous must be immediately stopped until corrective action is taken.

#### **3.1. Policies for Students in Laboratories, Shops or Studios**

Students enrolled in laboratory courses should sign and date a written acknowledgement indicating that they have read, understand and accept the policies listed in Appendix B, Form B1. The



acknowledgement can be modified to suit the needs of individual courses. Instructors or departments modifying form B1 should submit the form to the CHO and retain a copy in Appendix A.

### **3.2. Pregnancy or medical concerns in instructional laboratory settings.**

The nature of the work in instructional labs can result in chemical exposure that is beyond the control of the instructor. Students often fail to disclose small chemical spills and may inadequately clean up the area. Furthermore, students may fail to follow instructions which can result in the release of fumes, splashed chemicals or shattered glassware contaminated with chemicals. Such risks in laboratory course work can be mitigated but not eliminated. Additionally, the effects of many chemical hazards on a developing fetus are not well documented. In many cases guidelines for permissible exposure limits for pregnant women do not exist. Therefore students must seriously weigh the risks of laboratory exposure against the perceived benefits of continuing their course of study. If a student is pregnant or becomes pregnant while enrolled in a laboratory course they should notify the instructor or contact the Coordinator for Disability Services in the Dean of Students Office so that accommodations can be made to reduce the risks to the unborn.

Should a student with a known medical condition or pregnancy elect to remain enrolled in a laboratory course, one or more of the following controls may be put in effect. This list is not comprehensive and other controls or accommodations may be used as circumstances warrant.

- The student shall be provided hard copies of safety data sheets for all materials used in an experiment one week in advance of the experiment. The responsibility for providing the SDS shall be assumed by the instructor. Extra scrutiny should be given to sections 2, 8 and 11 of each SDS. The hazards should be reviewed by the student and instructor or chemical hygiene officer. The student is encouraged to review the SDS with their physician.
- In the event of a spill or other uncontrolled release the student shall immediately be removed from lab until the area is secured.
- Gloves (as recommended by the SDS) shall be worn for ALL laboratory work, regardless of the hazards present. The rationale behind this control is to prevent skin contact with previously contaminated surfaces and to obviate decisions regarding the appropriateness of gloves. Double gloving is encouraged.
- A lab coat and chemical splash goggles shall be worn at all times. The lab coat will be provided to the student and laundered as needed by the department.
- Rigorous hand washing after lab is required.
- The student shall NOT manipulate acutely toxic materials, reproductive toxins, teratogens, heavy metals, or select carcinogens. The student shall work with a lab partner who can manipulate these materials while the student observes. Handling of sealed containers of these materials is permitted at the discretion of the instructor.
- The student may, at the discretion of the instructor, handle materials whose primary hazards are oxidizer, corrosive or flammable if they do not present other health hazards and can be handled in a manner that minimizes exposure.
- Lab experiences involving materials or processes that present an inhalation hazard shall be carried out in a fume hood under the following conditions:

- The hood shall not contain laboratory reagents or materials used by other students.
- The hood shall be solely used for student work for the lab in session and shall be located where it is under the direct observation of the laboratory instructor, or qualified designee. Examples of processes requiring this control measure may be (but not limited to) heating under reflux, distillation, thin layer chromatography, or manipulations involving pressure transfers of liquid.
- Due to limitations on laboratory space, some lab sections may be able to meet this requirement. The department will inform the student which sections can accommodate this control.

### **3.3. Working alone or after hours in laboratories**

#### **Academic Laboratories**

Students may not work unsupervised in academic laboratories. The supervision shall be in-person and direct for 100 and 200 level laboratories, the supervision need not be direct in the case of 300 or 400 level laboratories; however, the instructor must be available while the students are working. Direct supervision is required any time there is a significant risk of chemical exposure. Guidelines should be developed by instructors taking into account the nature of the hazards and the logistical requirements of laboratory work. See UW System Policy UWSYS OSH 2006-01.

#### **Research Laboratories**

Due to the diverse nature and functions within a research laboratory, principal investigators in consultation with their department safety committee or chair, shall set their own policy for working alone or unsupervised. The nature of the task, the experience level of the researcher and the availability of potential emergency responders must be taken into consideration. Prior approval (see section 4.7) should be obtained.

### **3.4. Persons not Enrolled or Employed at the University of Wisconsin-Oshkosh**

The following protocol applies to volunteers working in research laboratories at the University of Wisconsin-Oshkosh who are not currently students or employees of the university. Additional steps are required for minors, volunteers under the age of 18, working in a research laboratory.

#### **Consent and Authorization**

- All volunteers over the age of 18 must sign a volunteer letter and an agreement for indemnification, release, and consent for emergency treatment found in Appendix B (Form B2) of this plan. If the volunteer is a minor (under the age of 18), the volunteer's Parent/Guardian must sign the volunteer letter and consent form. The consent form must include appropriate individual information (address, phone, etc.) and emergency contact information. One copy of the form should be kept in the laboratory. Another copy of the form should be given to the campus Risk Manager.
- Authorization for a volunteer to work in the laboratory must be obtained from the campus Chemical Hygiene Officer and the department chair.
- The direct supervisor of the volunteer must also sign the Requirements for Conducting Volunteer Research at the University of Wisconsin-Oshkosh section of the consent form.

## **4. Control Measures to reduce exposure to hazardous chemicals**

### **4.1. Engineering Controls**

Adequate ventilation is essential for maintaining safe levels of exposure. It shall be the responsibility of the laboratory instructor/researcher not to permit laboratory operations to continue if ventilation is judged to be inadequate for any reason such as equipment breakdown or accidental spillage. When air handling systems are being serviced facilities personnel shall contact the department main office OR department chair OR stockroom manager immediately.

Laboratory fume hoods shall be used for all operations which have the potential to produce hazardous levels of aerosols, fumes, gases, or volatile solvent vapors.

Laboratory fume hoods shall not be used for long term (> 1 week) storage of chemicals unless designated solely for chemical storage and (via a sign) not used for experimentation.

### **4.2. Maintenance of fume hoods and other protective equipment**

Fume hoods will be inspected at a minimum of once a year by facilities personnel. Hood face velocities will be determined by use of an anemometer or velometer taken over a grid across the open hood face. Physical plant will maintain records of fume hood inspections. Fume hoods will be tagged with fume hood inspection dates. Copies of fume hood inspections will be sent to the CHO and to Department Chairs.

Air quality monitoring will be performed if laboratory supervisors report conditions which might lead to excessive exposure levels. Results of monitoring will be reported to the CHO.

### **4.3. Administrative Controls**

Chemical inventories shall be kept to a minimum in working laboratories. These minimal inventories shall be stored in a safe manner using chemical safety cabinets for flammable chemicals and acid cabinets (or other appropriate storage) for corrosives. Chemicals shall be segregated by chemical characteristics to avoid incompatibilities. Secondary containment shall be used to mitigate container failures and to separate incompatible materials stored in the same space.

All chemical containers shall be capped or lidded when chemicals are not being withdrawn or added.

No food or beverages may be stored or consumed in the laboratories. If the laboratory experiment involves food or beverages they must be clearly labeled "Not for Human Consumption."

### **4.4. Personal Protective Equipment**

Routine laboratory personal protective equipment should include protective eye wear as designated in Appendix A of this Plan and worn by all persons in the laboratory unless specifically directed by the supervisor/instructor that conditions do not require protective eyewear. Appropriate gloves and a laboratory coat or apron should be worn for work with strong corrosives or with toxic chemicals. As noted above, special procedures may require special protective equipment on a case-by-case basis. Any special procedures required must be documented within the Standard Operating Procedures for a given laboratory by the Principal Investigator.

### **4.5. Fire Extinguishers, Safety Showers and Eyewashes**

Facilities personnel are responsible for monthly fire extinguisher inspections. Any deficiencies of fire extinguishers in terms of number of extinguishers or locations of extinguishers will be brought to the attention of the Superintendent of Facilities Management and the CHO.

Eye wash stations and emergency showers are necessary to minimize exposures in the event of an emergency. The faculty/staff member supervising the laboratory (or their designee) is responsible for the following:

- Plumbed emergency showers and plumbed eye wash station will be activated weekly to verify correct operation.
- Gravity-feed eye wash units shall be maintained according to the manufacturer's instructions.
- All employees who might be exposed to a chemical splash shall be trained in the use of the equipment.

All showers and eye/face wash stations shall be inspected annually by facilities personnel to make sure they meet with ANSI Z358.1 requirements.

Eyewash and safety shower inspections will be documented as described in this plan under Records.

#### **4.6. Particularly Hazardous Substances**

Provisions for additional employee protection must be in place for work with particularly hazardous substances including but not limited to select carcinogens, reproductive toxins, and substances which have a high degree of acute toxicity or present an imminent physical hazard (pyrophoric, explosive) CFR 1910.1450(e)(3)(viii) .

Standard Operating Procedures are required before working with these substances. Provisions for handling these materials will include determining the need for prior approval, designating areas for their use, use of containment devices such as fume hoods or glove boxes, safe removal of contaminated waste and appropriate decontamination procedures as per the Safety Data Sheets (SDS). **Appendix E** lists the materials subject to these requirements.

#### **4.7. Prior Approvals**

Principal Investigators, laboratory supervisors, or Departments must identify operations or experiments that involve particularly hazardous substances (such as "select carcinogens," reproductive toxins, and substances which have a high degree of acute toxicity) and highly hazardous operations or equipment that require prior approval. They also must establish the guidelines, procedures, and approval process that would be required. This information should be documented in the laboratory or departmental SOPs in the CHP. Additionally, Principal Investigators, laboratory supervisors, and Departments are strongly encouraged to have written documentation such as "Documentation of Prior Approval" forms that are completed and signed by the laboratory worker, and signed off by the Principal Investigator or laboratory supervisor and attached to Appendix A of the plan.

### **5. Hazard Communication**

#### **5.1. Chemical Hygiene Plans**

OSHA regulations require the development of a Chemical Hygiene Plan. The Plan sets forth procedures, equipment, personal protective equipment and work practices that are capable of protecting employees from the health and physical hazards presented by chemicals in the workplace.

The campus CHP and Hazard Communication Plan meet many of these requirements. However, some laboratory—specific issues cannot be addressed by the generic campus plan. Therefore, academic departments and Principal Investigators are required to develop laboratory—specific SOPs for hazards unique to their laboratories. These SOPs shall be placed in Appendix A of the Plan. A template of the SOP form is available in appendix B.

## 5.2. Safety Data Sheets and Other Safety Information

The campus will maintain a central SDS file for each hazardous chemical for 30 years after the last date the chemical was used on site. Faculty, staff and students will have access to the SDS file located in the stockroom or via an electronic safety datasheet management program. Copies will be available on written request.

The person responsible for material procurement will have the responsibility of obtaining an SDS for all hazardous substances and notifying the CHO when new materials are received. The CHO will update the SDS management program.

The physical copies of SDS will be kept in chemical storage areas (stockrooms) or department offices. Safety data sheets are also available electronically via the CISPro Inventory System and the University subscription to ChemWatch at <http://jr.chemwatch.net/chemwatch.web/account/login>

Account: Oshkosh

User login: everyone

Password: UWOchemwatch

## 5.3. Exposure Monitoring Results

The State of Wisconsin regulations require exposure monitoring where exposure may occur at or above a published exposure value of OSHA or ACGIH (American Conference of Governmental Industrial Hygienists). If you believe that you are being exposed to levels above the permissible limits, contact EH&S. EH&S personnel will provide consultation and, if deemed appropriate, will perform the necessary exposure monitoring. The affected university staff will be notified of the results within 15 days of the EH&S receipt of the results.

## 5.4. Labeling Chemical Containers

All containers of hazardous chemicals must be labeled by the manufacturer or importer according to the revised Hazard Communication Standard and Globally Harmonized System of Classification and Labeling of Chemicals (GHS). The label created and used by the manufacturer is called the **shipping label**. Chemicals that are transferred from a manufacturer container to secondary containers must be labeled with a **workplace label**.

### Required Label Elements from Manufacturers

Shipped containers which are the original container must be labeled with the **GHS label** which includes the identity of the chemical, signal word, pictogram, hazard statements, precautionary statements and the name, address and phone number of the manufacturer.

### Labeling of workplace containers:

Employees at the University of Wisconsin Oshkosh are responsible for labeling containers of chemicals drawn from the storage containers received from the vendor. The labeling and maintenance

of these workplace containers is the responsibility of any student or employee working with chemicals. Such labels may use the Globally Harmonized System (GHS) format, the Hazardous Materials Information Service (HMIS) format or National Fire Protection Association (NFPA) format. Your lab may choose the system it deems most appropriate, but you should be familiar with all three systems. Further information regarding these label formats can be found at [www.uwosh.edu/ehs/campus-health-and-safety/lab-shop-and-studio-safety/chemical-safety/hazard-communication-1/hazard-classification-labeling-system](http://www.uwosh.edu/ehs/campus-health-and-safety/lab-shop-and-studio-safety/chemical-safety/hazard-communication-1/hazard-classification-labeling-system)

Containers that are for immediate use by an individual do not require a label. If the container will be used beyond a single shift by a single user it requires a label. If the container is used by multiple people it must be labeled. If the container is left unattended it requires a label.

## **5.5. Laboratory Emergency Information Cards**

Appropriate signage will be placed on laboratory doors/entryways, in laboratory areas, and in chemical storage areas. Signage will include words or pictograms:

- The Personal Protective Equipment (PPE) that is necessary to operate safely in the lab.
- Phone numbers of emergency responders.
- The contact information for the person(s) responsible for the lab.
- The NFPA hazard diamond or GHS classifications indicating the hazards posed by chemicals.
- Hazards presented by instrumentation, compressed gases, biological or radiological hazards.

Examples of acceptable signage can be found in Appendix B, forms B8a (outer door card) and B8b (inner door card). Departments may approve other signage and include it in their departmental plan (appendix A).

## **6. Chemical Storage and Inventory**

### **6.1. Chemical Compatibility and Storage**

The most reactive substances should be placed on the lowest shelves within a given storage cabinet. Chemicals should never be stored above eye level (five feet). Shelving above five feet may be used for storage of other inert supplies or equipment where practical.

Ordinary refrigerators can be designated for General Storage only. These models can be used for biological materials, perishable non-hazardous reagents, and grocery items intended for experiments etc. A biohazard label shall be posted on the refrigerator door if such materials may be present.

Laboratory refrigerators are specifically designed with explosion proof motors, and chemically resistant interiors and seals for storing flammable or corrosive materials. Signage shall be placed on the door of the refrigerator indicating the storage categories of the materials therein. Secondary containment will be used to separate incompatible materials.

## 6.2. Storage Classifications

Chemicals shall be separated by storage classification. Color coded labels may be used on storage cabinets or containment tubs to indicate the materials stored therein. The classifications are as follows:

Class	Color code	Description	Examples
0	White	General Storage	low hazard materials like salts, sucrose, amino acids
1	Orange	Inorganic Acids	HF, HCl, H <sub>2</sub> SO <sub>4</sub> etc
2	Yellow	Organic Acids	HC <sub>2</sub> H <sub>3</sub> O <sub>2</sub> , citric acid, etc
3	Neon Green	Oxidizing Inorganic Acids	chloric, nitric, perchloric, etc
4	Blue	Bases	aqueous hydroxides, aqueous ammonia, alkoxide solutions
5	Neon Yellow	Oxidizing agents	salts containing bromate, chlorate, chromate, nitrate, metal peroxides
6	Pink	Toxic	cyanide salts, etc
7	Red-Orange	Flammable	NFPA flammability rating greater than 1
8	Purple	Special Storage	pyrophoric, water reactive, acutely toxic, other imminent hazards

Barcode labels generated by CISPro contain storage classifications for that material. If a barcode label does not appear on the container consult the safety data sheet for proper storage.

Materials of different storage classifications may be stored in the same location if secondary containment (plastic tubs) are used to separate the materials.

## 6.3. Specific storage Guidelines

**Materials in category 0** (General Storage) may be kept on bench tops or open shelving units indefinitely. Materials in Category 0 may also be stored with flammable materials if space permits.

**Materials in category 1-3** (Acids) should be kept in a cabinet designed for corrosive materials and ventilated cabinets are recommended. Each category should be kept separate from the others using secondary containment within the cabinet. Storage of more than five liters of each class (in concentrated form) in a cabinet is discouraged. Solutions of these materials with concentrations below 1.0 molar may be considered as category 0.

**Materials in category 4** (Bases) should be kept in a cabinet designed for corrosive materials and ventilated cabinets are recommended. These materials shall not be stored in the same cabinet as category 1-3 even with secondary containment. Solutions of these materials with concentrations below 1.0 molar may be considered as category 0.

**Materials in category 5** (Oxidizers) should be stored in cabinets. These materials pose a substantial fire or detonation hazard when mixed with other materials such as acetic acid and other organic acids, concentrated mineral acids, flammable and combustible chemicals or wastes, and active metals such as aluminum beryllium calcium lithium magnesium potassium sodium and zinc

**Materials in category 6** (Toxic) should be stored in a locked cabinet. These materials have acute toxicity  $LD_{50} \leq 300$  mg/kg oral OR  $LD_{50} \leq 1000$  mg/kg dermal classifying them as category 1, 2 or 3 toxins under the GHS system of hazard communication.

**Materials in category 7** (Flammable) should be stored in a designated flammable cabinet and ventilated cabinets are recommended. Materials with a flash point  $\geq 200$  °F (93.4 °C) or NFPA flammability rating of 1 are in storage category 0 (General storage). No more than two liters of flammable liquids should be stored on an open bench. The containers shall be placed in secondary containment.

**Materials in category 8** (Special Storage) pose an imminent physical hazard when opened, for example pyrophoric materials or substances that decompose to produce toxic or corrosive gases when exposed to air or moisture. Such materials are to be stored in a designated cabinet, and ventilated cabinets are strongly recommended. Some toxic materials with very low inhalation, vapor, dust or mist toxicity thresholds may also be placed in this category (see GHS category 1 toxins). Only very small quantities (<100g) of these materials should be on hand in a lab.

#### **6.4. Hazardous Chemical Inventory**

A comprehensive inventory of hazardous chemicals will be maintained indefinitely. A hazardous chemical must stay on that list 30 years after the last date the substance was used at this campus.

The hazardous materials inventory will be kept electronically and can be accessed via the internet at <http://accounts.accelrys.com>. Users will be given a username and password to access the system. Instructions for using the system can be found in Appendix D of this Plan.

All employees (and students working for credit) in the department will have the responsibility of maintaining the hazardous materials inventory for laboratories to which they have access. Training on the system must be completed before keyed access to the stockroom will be granted.

### **7. Surplus Chemicals and Waste Disposal**

The Resource Conservation and Recovery Act (RCRA), enacted in 1976, is the principal Federal Law in the United States governing the disposal of Hazardous Waste. RCRA is administered federally by the U.S. Environmental Protection Agency (EPA). Many states, including Wisconsin, have been delegated authority to manage hazardous waste. In Wisconsin the hazardous waste regulations are found in Chapters NR 600—NR679.

The university strives to maintain compliance with all regulations regarding waste disposal while simultaneously minimizing waste through a number of programs. Such efforts include chemical redistribution and inventory reduction programs.

A Quick Disposal Guide has been prepared to answer basic questions about how to dispose of various wastes: <https://www.uwosh.edu/ehs/environmental>. Specific procedures for waste disposal follow.

#### **7.1. Minimizing Hazardous Waste**



Minimization of hazardous material is the easiest way to reduce hazardous waste. There are several ways to reduce the amount of hazardous material, thus reducing the need for hazardous waste disposal.

- Order only what you need. Although this can be difficult, it saves money on both ends by spending less on the initial order and spending less on disposal.
- Substitute hazardous material with non-hazardous material
- Use latex paint instead of oil based paint. Substitute mercury thermometers with alcohol or digital thermometers. Use environmentally friendly chemicals.
- Take advantage of the Surplus Chemical Redistribution program. Unwanted chemicals that are not highly hazardous and still usable will be viewable in chemical inventory and made available to university staff for reuse. You must have a username and password to view the inventory. Contact Environmental Affairs at 424-1488 or [EHS@uwosh.edu](mailto:EHS@uwosh.edu) if you would like more information on the Surplus Chemical Redistribution Program.

## 7.2. On-site Hazardous Materials Management

Environmental Affairs will come directly to laboratories to remove items that can be redistributed, require a more complex disposal procedure, or require disposal at a commercial hazardous waste treatment, storage, and disposal facility. Unwanted laboratory chemicals are not considered hazardous waste until the EH&S office has made that determination.

For a waste to be considered hazardous waste it must be an EPA listed waste or exhibit one of the characteristics of a hazardous waste:

- **Ignitability:** a liquid with a flash point less than 140 Fahrenheit, an ignitable compressed gas or oxidizer, or other material that can cause fire through friction absorption of moisture or spontaneous chemical changes, Common examples include used oil-based paint, used paint thinner, adhesives and mineral spirits.
- **Corrosivity:** a water containing liquid with a pH less than or equal to 2.0 or greater than or equal to 12.5, or a liquid that corrodes plain carbon steel at a rate greater than 6.35 mm per year. Examples include waste rust removers and waste battery acids.
- **Reactivity:** a waste that is normally unstable, readily undergoes violent changes without detonating, reacts violently with water, forms a potentially explosive mixture with water, or generates toxic gases or fumes when mixed with water or noncorrosive materials, is incapable of detonation or explosive reaction, or is a forbidden Class A or Class B explosive.
- **Toxicity:** A waste is TC hazardous if (according to the Toxicity Characteristic Leaching Procedure) it exceeds the regulatory levels for any of the eight metals, six pesticides or 25 organic chemicals listed in the appendix under toxic substances. This list includes metals like chromium, lead, mercury, silver and organic chemicals like benzene, chloroform, methyl ethyl ketone, and butadiene.

If you are unsure if a waste meets the criteria for Hazardous Waste contact Environmental Affairs at 424-1488 or [EHS@uwosh.edu](mailto:EHS@uwosh.edu)

## 7.3. In-Lab Chemical Management

As part of a chemical process, Principal Investigators and laboratory staff are allowed to perform In-Lab Chemical Management of their inventories. Such In-Lab management includes simple disposal procedures that can be done in a lab, such as solvent co-mingling, flushing down the sanitary sewer (for **non-hazardous** chemicals), and elementary neutralization of materials whose only hazard is corrosivity. Contact Environmental Affairs for approved procedures. Environmental Affairs can give advice regarding the disposal of specific chemicals or waste streams and can demonstrate treatment procedures.

### 7.3.1. Sanitary Sewer Disposal

Hazardous materials as described in section 7.2 of this plan may not be poured into drains. Materials being poured down a drain must be water soluble and completely dissolved before going into the sink drain. Materials that block flow, interfere with the treatment process, damage pipes (corrosive), or create an unsafe atmosphere (ignitable or toxic) in the line access points are prohibited by the City of Oshkosh. Contact Environmental Affairs, 424-1488 or [EHS@uwosh.edu](mailto:EHS@uwosh.edu) for specific questions.

### 7.3.2. In-Lab Collection and Storage of Waste

#### Container Selection and filling:

Hazardous waste must be stored in a **sturdy, sealable container, free of leaks**. Any leak-free container that is compatible with the contents is acceptable. Re-using empty chemical containers is a perfectly acceptable practice. Environmental Affairs has a wide variety of free waste containers for almost every need. Contact us at 424-1488 or [EHS@uwosh.edu](mailto:EHS@uwosh.edu) if you are in need of containers.

Containers should have some “head-space” in them. A container should never be more than 90 percent full. **Overfilled containers will not be picked up**. The most common waste containers available are repurposed four-liter glass or high density polyethylene bottles (for liquid wastes) and one-gallon wide mouth polyethylene jars for solid waste. Plastic containers are preferred, as they weigh less and waste disposal is charged by weight. Choose an appropriately sized container for the amount of waste that will be generated over the foreseeable life of the process generating the waste.

Wastes may be co-mingled in a container so long as they are compatible (based on primary hazard).

**Never** mix incompatible chemicals such as acids and bases, flammables and oxidizers, or oxidizers and acids. *Mixing of incompatibles could result in a reaction causing severe injury or death.*

Waste containers must be tightly capped when not in use. It is unacceptable to leave a container open to the atmosphere longer than is necessary to fill that container. Containers may be left open for the duration of a lab period when used in a laboratory course.

### 7.3.3. Labeling Practices

Waste containers will be accompanied with a hazardous waste label (see Appendix B) which is securely affixed to that container. The waste generator must fill out:

- The known hazards. These may be copied from the SDS.

- The department and principal investigator generating the waste. If the waste is generated by a class, the course number should be used.
- The contents of the container must be identified. The proper chemical names and/or CAS numbers must be used. The use of formulas, abbreviations, or symbols to identify a material is unacceptable.
- The date waste was first added to the container.
- Fill out the contents on the label as they are being added.
- Labels (Appendix B) are available from Environmental Affairs. Call 424-1488 if you need labels delivered via campus mail or pick them up in Halsey Science Center room 450. Alternatively, the labels can be downloaded as MS Word document and printed on Avery 5163 (2" x 4") labels or Avery 5164 (3.33" x 4") labels at <https://www.uwosh.edu/ehs/environmental/hazardous-waste>
- If you cannot identify the contents of a container, contact Environmental Affairs to arrange for the hazardous waste contractor to identify the chemical during the next hazardous waste shipment. This is very costly to the university.

#### **7.3.4. Storage**

Every waste generator should identify a location in the lab, studio or shop where waste can be stored until a container is filled. The storage area should be labeled Hazardous Waste Storage. This will serve notice that everything in the area is waste for disposal.

- Only store waste in designated locations.
- All waste containers must be capped and labeled while in storage. Containers of incompatible wastes must be separated from each other using secondary containment tubs.
- The stored waste must be logged on a Hazardous Waste Log Sheet (Appendix B) which is to be kept near the waste. This sheet is collected when the waste is picked up and used to assist in preparing the waste for shipment.
- Hazardous waste is to never be stored in public areas. If you notice what looks to be hazardous waste in or near a trash receptacle, please call Environmental Affairs immediately.
- If waste is generated infrequently or space is limited you can contact Environmental Affairs at 424-1488 or EHS@uwosh.edu whenever a container is filled.

Your department may designate a satellite accumulation area. Make sure that others in the area lab, studio or office know the location of the accumulation site and the rules that govern a satellite accumulation area.

For additional information or for help with any questions regarding accumulation or pick up of hazardous waste, please contact Greg Potratz at 424-1488 or Dan Strey at 424-7008.

### **8. Employee and Student Information and Training**

Each employee covered under this standard will be provided with information and training to inform them of the hazards of the chemicals present in their work area. The training will be provided by the campus Environmental, Health and Safety Office. Enrollment in the program is the responsibility of the employee's supervisor. The training materials will be available through the campus D2L service

or as face to face training upon request. The employee will pass an online quiz to provide documentation of training.

Research Assistants (paid or unpaid) will receive training as regular employees. The research supervisor must request enrollment for their employees and students. Documentation of training will be retained by the CHO in accordance with *General Records Schedule, Risk Management and Related Records* as put forth by Wisconsin Department of Administration and University of Wisconsin System Administration. Specifically, safety training NOT required by law will be retained for five years after the training event. Safety training required by law must be retained for thirty years after the date of training. The records must be kept to verify employees have received the necessary training.

Students enrolled in a laboratory course will be made aware of general laboratory policies during initial laboratory sessions of the course. Such training will be documented via student signature on a policy acknowledgment form. Instructors are responsible for reviewing specific procedures at the time they are introduced in the course. Instructors are responsible for student training and must retain records for one calendar year.

Employee Training will include:

- Making the employee aware of CFR 1910.1450, the Laboratory Standard, and its appendices. A copy of this regulation will be available in HS- 449.
- Informing the employee of the contents, availability, and location of the Campus and Departmental or laboratory specific Chemical Hygiene Plans.
- Hazard Communication Training, as described in this plan and available through the campus Health and Safety Office as classroom training or from the Chemical Hygiene Officer via D2L. Documentation will be provided by completion of a quiz using the campus D2L system.
- Specific information regarding the inventory of chemicals in the laboratory. The chemical inventory is available electronically at <https://accounts.accelrys.com>. Access to the inventory must be requested from the CHO. Instructions for using the system are located in Appendix D.
- Information for accessing the campus ChemWatch subscription which provides access to Safety Data Sheets which is located in Appendix C of this plan.

Documentation of Hazard Communication training will be maintained in the CHO's office. Supervisors or Department Chairs (or their designees) shall contact the CHO when new hires are made to enroll employees in the relevant training.

## **9. Emergency Response**

In the event of an emergency, call 911 then contact the University Police at 424-1212. The university police can respond more quickly to an emergency than municipal first responders. Make yourself familiar with the campus *Emergency Procedures Guide* posted in many locations throughout campus.

### **9.1. Emergency Response Plan for Fires**

If you see fire or smoke in your immediate area, use the **RACE** acronym as a guide:

**R = Remove anyone in immediate danger.**

Advise students, staff and visitors to evacuate the building. Evacuate the building via the closest exit doors located away from the fire. Do not use elevators. Assist handicapped individuals to the nearest stairwell landing and advise police and/or firemen of their location. Move well away from the building (500 feet is recommended).

**A = Activate the fire alarm.**

Pull the nearest fire alarm station. Call the University Police at 424-1212 to report the location of the fire/smoke and any other pertinent information. If the call cannot be made safely from the building, call as soon as you find a safe place.

**C = Confine and contain.**

Close all doors as you leave the building. Do not lock the doors.

**E = Extinguish.**

Only if you know the location of a nearby extinguisher and can do so without endangering your safety. If the fire is not manageable, pull fire alarm and exit the building using stairs, not the elevator. Call campus police (424-1212) if time permits.

If you hear a fire alarm:

- You must evacuate the building. Ensure that all present in your area also evacuate.
- Shut off your room lights and close the door. Do not lock the door.
- Take your backpack, briefcase, purse and coat with you. Do not retrieve these items if doing so would delay your evacuation.
- Evacuate the building via the nearest fire exit and remain well away from the building (at least 500 feet), until informed by a University Police officer that you may re-enter.

## **9.2. Chemical Exposure**

**Eye contact:** Immediately use eye wash to rinse eyeball and inner surface of eyelid with water continuously for 15 minutes. Forcibly hold eye lid(s) open to ensure effective wash behind eyelids. Be sure to remove contacts from the victim. Have another individual contact the University Police at 1212 from any campus hard-wired phone.

**Ingestion:** Call campus police at 424-1212. Follow treatment directions on SDS and/or provide a copy to first responders.

**Body Contact:** Promptly flush the affected area with water using a faucet (for spill on hands) or safety shower for any other area of the body for 15 minutes and remove contaminated clothing. If a symptom persists after washing, seek medical attention. In the event of a catastrophic exposure have another individual contact the University Police, 424-1212, from any hard-wired campus phone to obtain medical attention. Report the incident to your supervisor or instructor and campus EHS after the situation is under control.

## **9.3. Chemical Spill**

When a chemical spill occurs, the response to the spill should be dictated by your knowledge of the material, the ability to adequately protect yourself from the hazards, and the size of the spill.

**You should NOT attempt to clean up a spill if:**

- You are unaware of the hazards of the material spilled
- You lack appropriate PPE to prevent personal injury
- You cannot adequately manage the spill because of the volume spilled or the size of the area affected.
- As a general rule, any spill larger than 1 liter in volume should be managed by a spill response team which may be trained university staff if available or the fire department. That said, as the hazards of the material increase, the volume of a “manageable spill” decreases. Any spill less than 8 oz. (250 mL) is manageable if the appropriate materials are on hand to manage the spill.

**Do NOT attempt to clean up a spill if any of the following conditions apply:**

- More than one chemical has spilled
- The quantity spilled is greater than one liter
- The substance is unknown or you are uncertain of the hazards of the substance
- You are uncomfortable in the situation.

**If you are knowledgeable and comfortable cleaning up a spill** you should manage the spill yourself only if you have a spill kit available to clean up minor spills. That kit should include:

- Instructions and/or Safety Data Sheets for the chemical in use
- Personal protective equipment including gloves, safety goggles and other protective clothing
- Spill pads or pillows sufficient to contain and absorb 1 liter of liquid
- Plastic bags or containers to place spill waste material
- Appropriate neutralizing media for or absorbent for the material spilled. See the Spill Cleanup Quick Reference for a listing of appropriate adsorbents and neutralizing agents for a number of common laboratory chemicals.

**Minor Spill Response (Less than 8 oz. of a Known Material)**

Minor spills may be controlled and cleaned up by employees who work with the substance and understand the hazards of the material following these steps:

- Alert people in the immediate area of the spill;
- Wear protective equipment, including safety goggles, gloves and a long-sleeved shirt or other protective clothing;
- If spilled material is flammable, turn off ignition and heat sources.
- Avoid breathing vapors from the spill;
- Apply spill pillow/pads or other absorbent material, first around the outside of the spill, encircling the material, then absorb to the center of the spill;
- Sweep/shovel up absorbent material and place into a sealed, leak-proof bag or container;
- Dispose of all materials (gloves, brooms, paper towels) used to clean up the spill in a sealed container as well

- Label and dispose of all bags or containers as hazardous waste. Contact Environmental Affairs at ext. 1488 or 7009 for a hazardous waste collection.
- Complete an incident report

### **Major Spill Response (More than 8 oz. or Unknown Material)**

- Attend to injured or contaminated persons and remove them from exposure as practical.
- Alert other persons in the area to evacuate. Close the doors to the affected area.
- Contact the University Police for assistance at 424-1212:
- Give your name, information on the material spilled (name, quantity, etc.) and the exact location of the spill (room, floor, etc.). Be sure to stay on the phone until released by the emergency operator.
- Report to a street side building entrance (the intersection of Elmwood and Vine) to provide information to and/or assist emergency personnel.
- Complete an incident report.

## **10. Exposure Monitoring**

The State of Wisconsin regulations require exposure monitoring where exposure may occur at or above a published exposure value of OSHA or ACGIH (American Conference of Governmental Industrial Hygienists). Examples of such values could include the action level, permissible exposure level, threshold limit value, short-term exposure limit or ceiling limit. If you believe that you are being exposed to levels above the permissible limits, contact EH&S. EH&S personnel will provide consultation and, if deemed appropriate, will perform the necessary exposure monitoring. The affected university staff will be notified of the results within 15 days of EH&S receipt of the results.

## **11. Medical Consultation and Examination**

The Laboratory Standard mandates that employers provide medical attention, examinations, and follow up examinations at the physician's discretion. This medical attention, etc. is required under the following circumstances:

Whenever an employee develops signs and/or symptoms associated with a hazardous chemical to which they may have been exposed; or

Whenever exposure monitoring reveals an exposure level above the OSHA action level or exposure above the permissible exposure level for OSHA regulated substances; or

Whenever an event takes place in the work area such as a spill, leak, explosion, or other occurrence which results in the likelihood of a hazardous exposure. Such an occurrence requires an opportunity for medical consultation for the purpose of determining the need for a medical examination.

The Chemical Hygiene Officer or laboratory supervisor shall provide the examining physician the following information:

- Identity of the hazardous chemical to which the employee may have been exposed,
- A description of the conditions of exposure including exposure date if available,

- A description of the signs and symptoms of exposure, if any, that the employee is experiencing, and
- A copy of the relevant SDS.

The employer shall request a written opinion from the physician including:

- Recommendations for future medical follow up,
- Results of examination and associated tests,
- Any medical condition revealed which may place the employee at increased risk as the result of chemical exposure, and
- A statement that the employee has been informed by the physician of the results of the examination or consultation and told of any medical conditions that may require additional examination or treatment.
- The material returned by the physician shall not include specific findings and/or diagnoses which are unrelated to occupational exposure.

The Chemical Hygiene Officer has responsibility to maintain a file concerning any events and resultant medical examinations or consultations.

## **12. Laboratory Inspections**

Routine laboratory inspections will be conducted by the CHO in consultation with the Faculty/Supervisor responsible for the laboratory. Both individuals will work quickly to address any deficiencies. The schedule of all inspections, checklists, and reports will be kept in the CHO's office.

## **13. Incident/Accident Notification Investigation**

Employees must report any incident involving a personal injury, exposure or illness, property damage, or incidents involving an environmental release of hazardous materials. Near misses, minor injuries requiring first aid, or minor property damage (less than \$1000) should be documented using a Safety Yellow Card found at <https://www.uwosh.edu/ehs/environmental/safety-yellow-cards>. Hard copies of Yellow Cards are also located near first aid kits and can be sent via intercampus mail to the Campus Risk Management Office. An example is included in Appendix B.

The laboratory instructors should report the following incidents:

- Any personal injuries, such as those incurred because of cuts, burns, electric shock, etc.
- Fires that require use of fire extinguishers.
- Mercury spills, including broken thermometers.
- Strong (>6N) acid and base spills exceeding approximately 250 mL.
- All spills of flammable chemicals exceeding 250 mL and toxic chemicals with TLV < 50 ppm exceeding 10 mL. This information can be found on the SDS.
- Large water spills including use of safety showers and eye wash fountains.

The Risk Management office must be contacted directly for injuries requiring medical attention, property loss greater than \$1000, or environmental releases of hazardous materials. The supervisor must be notified and is responsible for contacting Risk Management. Call 424-1009 or email [EHS@uwosh.edu](mailto:EHS@uwosh.edu). The general incident form can be found at <http://www.uwosh.edu/ehs/risk-manage/forms>

## **14. Transportation and Shipping of Hazardous Materials**

### **Shipping of Hazardous Materials**



The requirements to ship hazardous materials off campus are complex and the regulations depend upon the quantities involved, the method of transport and the destination. If you need to ship hazardous materials to an off campus location, please contact Postal Services or the CHO to determine the safest and most cost effective method.

In order to protect the public at large, the US Department of Transportation (DOT) regulates the shipping and transportation of hazardous materials *in commerce* on roadways and airways. All DOT hazardous materials are listed in the DOT's Hazardous Material Table found in 49 CFR 172.101.

The regulations for shipping hazardous materials apply to all individuals involved in the shipping process, including individuals who:

- Arrange for transport
- Package materials
- Mark and label packages
- Prepare shipping papers
- Handle, load, and segregate packages within a transport vehicle

The regulations require that individuals receive training that must be refreshed at a minimum of every three years or when there is a significant change in the regulations.

Small quantity exceptions exist for shipping hazardous materials to laboratories. Contact Greg Potratz, 424-1488, [potratzg@uwosh.edu](mailto:potratzg@uwosh.edu), for questions regarding the shipment of laboratory samples.

### **On-Campus Transportation of Hazardous Materials**

UW Oshkosh is considered a government agency; therefore employees transporting hazardous materials on campus are not placing the materials "in commerce." Employees transporting materials between campus buildings on public roadways are exempt from the DOT Hazardous Material Regulations. Individuals who move hazardous chemicals on campus are still subject to the following university requirements:

- The employee moving the material should be trained and familiar with its hazards and basic handling properties
- Before moving the material, an emergency plan and spill kit must be available in case of an accident or environmental discharge
- Secondary containment of hazardous materials must be used where there is a potential for a spill.
- Only university vehicles may be used for the transportation of hazardous materials.
- Hazardous waste may only be transported by EHS staff and approved contractors.

### **15. Records**

The CHO will maintain the following records:

- Employee Hazard Communication Training for employees in instructional departments and students. A list of employees who have enrolled and completed the training will be provided to department chairs via the Dean of their respective Colleges.
- Laboratory Inspections conducted by the Health and Safety Office or designees
- Fume hood inspections conducted by Physical Plant personnel
- Laboratory accident/incident reports
- Medical consultation for employees exposed to hazardous materials

- Results of air quality monitoring
- Records retained by Departmental Chemical Hygiene Officers
- Departmental Chemical Hygiene Plans
- SOPs for individual laboratories provided by Principle Investigators
- Records retained by Principal Investigators

Departments or Principal investigators with a specific CHP will maintain the following records

- SOPs for laboratory specific hazards
- Laboratory CHPs (if there is no departmental CHP)
- Records of any internal inspections, including shower and eye wash flushes.
- Student and Employee training records.
- Records retained by Laboratory Instructors

Instructors will maintain the following records:

- Signed safety acknowledgements for one calendar year.
- Written safety instructions provided to students. These instructions should appear within the course materials.

Records retained by Physical Plant personnel

- Physical plant personnel will retain records of fume hood inspections and provide the Chemical Hygiene Officer with results annually.