Updated: 11/1/2013

CHEMICAL HYGIENE PLAN: CENTER FOR LIMNOLOGY

Hasler Limnology Lab
680 North Park Street
University of Wisconsin-Madison

The general intent of the Chemical Hygiene Plan for the Center for Limnology is:

1. To provide CFL workers with an overview of laboratory safety issues and to protect employees from health hazards associated with the use of hazardous chemicals.

2. To supplement the **UW Madison Laboratory Safety Guide** by providing information specific to the Center for Limnology and the Hasler Limnology lab. The UW Laboratory Safety guide serves as the main safety manual for the laboratory. All laboratory users have a copy of this manual available (Rooms 101, 106 and 117) as a reference and should be familiar with the manual's contents.

The plan will be available to all employees for review and a copy will be posted on a bulletin board in Room 117 and on the CFL web page:
https://sites.google.com/a/wisc.edu/cfl_userguide/

The plan will be reviewed annually by the Lab Safety Officer and updated as necessary.

I. STANDARD OPERATING PROCEDURES to be followed in the laboratory relevant to safety and health when using chemicals.

A. Spills and Accidents

1. In the event of a spill or any kind of lab accident, personal safety is always given priority (e.g., washing off any chemicals from skin contact). If you have been exposed to a hazardous chemical, flush contacted area immediately. In addition to sinks in labs, rest rooms, and in the 2nd floor hallway, eye washes are located in each lab, and emergency showers are located in the first floor hallway and in the locker room in the basement. Additionally, jumping into the lake may be a fast and effective way to flush chemicals or burns (seriously). If you are cut, inform your supervisor- even if it a small cut- then seek appropriate first aid. Call 911 for serious injuries.

2. For large spills or spills of a particularly hazardous chemical, call 911 or 9-911 and specify the nature of the spill. Chemical adsorbents should be used immediately to contain minor spills. Spill adsorbent materials (green and white boxes) are available under the sink in Room 101 and on the bottom shelf in Room 119, and a spill kit is located on the north wall in Room 117. For acid spills, sodium bicarbonate is also available in a plastic container in 119. *Note that bicarbonate and acid will generate CO_2, causing respiratory problems!* Refer to directions in the UW Safety Manual for other ways of dealing with spills. Immediately contact Colleen Sylvester, David Harring, or one of the faculty members for instructions on dealing with a contained spill.

3. All accidents resulting in injury or possible exposure to chemicals must be reported to the individual's supervisor (who in turn will inform the Safety Officer and other appropriate personnel through an accident report).

B. Avoidance of Routine Exposure

1. All work with volatile compounds should be done in a fume hood. Use disposable gloves when the potential for skin contact is present. Special care must be taken for those chemicals which have a skin notation listed on the container label or Material Safety Data Sheet (MSDS).

C. Choice of Chemicals

1. Wherever a procedure allows a choice of chemicals, the least hazardous chemical should be used (e.g., salicylate should be used instead of phenol for manual analysis of ammonium).

D. Eating, Drinking, Smoking etc.

1. Smoking is not allowed anywhere in the building. Eating and drinking are allowed only outside of laboratory areas. Lab coats must be removed before entering areas where eating and drinking are allowed.

E. Glassware and sharps

1. "Sharps" or broken or unwanted glassware, pieces of metal, needles, razor blades, etc. should be disposed of either by placing it in a cardboard box, taping the box closed, and putting it into the dumpster (large items) or putting it into an officially designated sharps disposal (small items). Do not overfill sharps containers. See the Safety Officer if your sharps container is full. See the UW Safety Manual for safety procedures related to glassware (Section D, page.6D).

F. Exiting (Fire and Emergency Evacuation Plan)

EACH EMPLOYEE MUST KNOW THE LOCATIONS OF FIRE DOORS, EXITS, CLOSEST FIRE ALARM BOX, AND FIRE EXTINGUISHERS AND SHOULD KNOW HOW TO GET OUT OF THE BUILDING IN THE EVENT OF AN EMERGENCY.

1. General instructions for fire or fire drill.

    a. In case of a fire or situation requiring evacuation, pull the fire alarm. This action notifies the Madison Fire Department and UW Police and Security. If time allows, call 911 or 9-911 and provide details.

    b. All windows, fire doors, and room doors should be closed if time allows.

    c. Lights may be left on and doors do not need to be locked.

    d. Leave the building in an orderly manner by the nearest available exit. Know your main (fastest) route and an alternate route.

    e. In the event that a corridor is blocked, be aware of the location of other exits and the routes to them. Thinking through escape routes may save you from an injury or worse.

    f. Once outside, move more than 100 feet away from the building. Meet in the parking lot if possible.

    g. Evacuation drills will be conducted annually by the Madison Fire Department and UW Safety Department.

2. Alarm System

a. Familiarize yourself with the location and operation of the fire alarm devices.

G. Heedless Actions

1. There are many potential hazards present in a lab. All incidents of intentional or heedless disregard for safety will not be tolerated. A professional decorum is expected of all employees. In short, use your common sense, don't goof around in labs, and be alert and careful.

H. Mouth Suction

1. Mouth pipetting is strictly prohibited. Contact Colleen Sylvester, David Harring, or one of the faculty members for instructions on non-mouth suction methods.

I. Personal Apparel

1. A discussion of acceptable personal apparel can be found in the UW Laboratory Safety guide (section 4.3, pg 86-90). In accordance with the UW Safety Manual, the goal for all laboratory workers should be zero skin contact with laboratory chemicals.

a. Safety glasses are a requirement in the laboratory when using chemicals. Wisconsin law requires eye protection for all laboratory workers. Eye protection is recommended but not required at all times for persons entering wet or instruments labs. If you are not performing a lab procedure or analysis, eye protection is not required.

b. Regular shoes must be worn at all times in the lab. Open toed shoes are inappropriate.

J. Personal and Chemical Housekeeping

1. Good housekeeping can not only lower the number of accidents, but an orderly, well maintained laboratory can increase your work area and the quality of your work. See the UW Laboratory Safety guide for personal and chemical housekeeping information (Chapter 4, pg 75-124).

2. ***STORE STRONG ACIDS ONLY UNDER OR IN AN EXHAUSTING FUME HOOD OR DESIGNATED ACID***

STORAGE CABINET! Be sure to wipe counters with a bicarbonate wash and flush the working area after using acid.

K. Personal Respiratory Protection

1. Respirators are not available for staff, as they require special training to be used safely. If toxic or potentially toxic fumes are encountered, the area should be immediately evacuated. The emergency telephone number (911 or 9-911) should be called to deal with an emergency requiring respiratory protection.

L. Unattended Operations

1. Equipment that must be left unattended must be clearly marked with a name of someone still in the lab who is aware of what is happening or a phone number where such a person can be reached. Before leaving equipment running unattended overnight, the operator must assure that adequate safety precautions have been taken to deal with any foreseeable complications such as power failures, lightening strikes, loss of cooling water flow, and loss of air or gas pressure. ***Hot plates are particularly dangerous items to leave unattended.***

M. Proper Use of Laboratory Hoods

1. See the UW Laboratory Safety guide for proper use of laboratory hoods (Section 4.4a, pg 90-95).

N. Vigilance

1. Laboratories inherently contain many opportunities for hazardous situations to arise. It is therefore important for laboratory personnel to be constantly thinking about the safety and health implications of what they are doing and act accordingly.

O. Waste Disposal and Storage

1. Chemical wastes shall be disposed of as per the UW Laboratory Safety guide (Chapter 7 and Appendix A).

Q. Working Alone

1. Working alone with chemicals is not allowed without permission of the supervisor or the Safety Officer. If at all possible, at least one other person should be working in the area in order to allow a "buddy" system to be in effect. However, given the nature of graduate

research, working alone is often unavoidable. For this reason it is all the more important to talk over proposed work with supervisors and to be familiar with chemical safety procedures for laboratories as presented in the UW Laboratory Safety guide (Chapter 4).

R. Corrosives and Electrical Apparatus

1. Information on safe handling of corrosives and electrical apparatus can be found in the UW Laboratory Safety guide (pg 20 and 102 for information on corrosives, pg 113 for electrical safety).

II. Criteria for Use of Control Measures to Reduce Exposure.

A. Fume Hoods

1. All work with volatile compounds.

2. Any procedure that potentially produces toxic vapors, including work involving strong acids, bases, volatile organic compounds and pesticides.

3. Do not use fume hoods for general storage of acids and solvents. These chemicals can be put into the hoods while they are in use, but when the analysis is completed, chemicals should be returned to the appropriate storage location.

B. Biological Safety Cabinets

1. The Center for Limnology does not handle materials that are biological hazards. If a researcher is interested in research involving biohazards, he/she must gain the approval of the Safety Officer and appropriate faculty member.

C. Chemical Storage Units

1. Flammable chemicals (organic solvents, fuels) should be stored in a yellow flammables cabinet in 101 or in the motor room in the boat slip.

2. Acids should be stored in the blue acid cabinet in 119.

D. Respirators

1. Respirators are ***NOT*** used in the CFL laboratories in the Hasler Limnology Laboratory.

E. Appropriate Protective Apparel

1. Personal protective equipment compatible with the required degree of protection for the substances handled shall be used. Information on appropriate apparel may be found in the UW Laboratory Safety guide (Section 4.3c, pg 87).

F. Eyewash and Safety Showers

1. Employees will be instructed on the location and use of eye wash stations and safety showers during new employee orientation.

G. Fire Extinguishers

1. All employees will be instructed on the location of fire extinguishers, blankets and evacuation routes during new employee orientation and thereafter at safety updates.

III. Employee Information and Training

A. Training

1. Each employee will be provided with information and training so that they are appraised of the hazards of chemicals present in their work area.

B. Additional Safety Resource Materials

1. The contents of the OSHA Laboratory Regulations (CFR) 1910.1450 and its appendices or the comparable regulations adopted by the state. A copy is contained in the UW Safety Manual, (Appendix B-1, pg 291-302).

2. Information on Material Safety Data Sheets are located in Room 119 and online: https://sites.google.com/a/wisc.edu/cfl_userguide/

C. New Employee Checklist

1. Supervisors or their designees are responsible for conducting this training.

2. Each employee will sign the checklist documenting that they have: (a) Read this Chemical Hygiene Plan, (b) have been apprised of potential hazards associated with his/her work, (c) been shown the locations of safety resources, including the UW Chemical Safety Guide, first aid kits, fire extinguishes, fire alarm boxes, eye washes, and showers.

3. Occasional special training will be conducted as needed (such as when a new procedure is implemented). This training will be documented and placed in the employee file.

4. Occasionally safety memorandums may be issued by the Safety Officer to remind staff about safety procedures.

IV. Prior Approval for New Lab Procedures

A. Checklist of Supervisor-Approved Tasks

1. New procedures or analyses of unknown samples that are suspected to present a hazard require prior approval by the supervisor and completion of or additions to a ***CHECKLIST OF SUPERVISOR APPROVED TASKS*** form before work can begin. The intent of this directive is to make certain that the person performing the task has been given the appropriate MSDS and training for all tasks.

   Examples of specific and general new procedures include:
   - -Heating large quantities of solvents or corrosives.
   - -Working with compressed gases for the first time.
   - -Analytical standard preparation for ICP, GC, etc.
   - -Use of materials classified as biohazards

V. Additional Protection for Work with Select Carcinogens, Reproductive Toxins, and Chemicals with High Acute Toxicity

Carcinogens, reproductive toxins, and chemicals with high acute toxicity are not routinely used by researchers at the CFL. However, should this change, it is imperative that they be treated with appropriate safety procedures.

A. Chemical Disposal: Only chemists properly trained in these procedures shall do disposal and/or neutralization of wastes such as acids, chromic acid digestion solutions, cyanide wastes and solvents. Disposal must be done in accordance with the UW Laboratory Safety guide (Appendix A).

B. Acids: Employees using strong (>2N) acids must use (in addition to wearing protective gloves, protective eyewear, and lab coats) a free standing safety shield, a full face shield, or the hood sash lowered as far as possible to protect the face from splashes and spattering.

C. Select Chemicals: Of the chemicals specified under the OSHA Chemical Hygiene Plan Regulations as regulated substances (see UW Laboratory Safety guide, Appendix D), the following are the ones most likely to be used in the Hasler Limnology Laboratory:

<u>Select Carcinogens</u>

Cadmium compounds
Formaldehyde
Phenol
Silica, crystalline

<u>Metals</u>

Cadmium

<u>Solvents</u>

Acetone

VI. Responsibilities Under the Chemical Hygiene Plan

Colleen Sylvester is designated as the Safety Officer for the Water Chemistry Program. Members of the Safety Committee for the 2011 Academic year include Ted Bier, Ken Morrison, Tim Cline, Pam Montz, Mike Pecore and Emily Stanley. The Safety Committee is equivalent to the Chemical Hygiene Committee.

Employee Safety Check List – Laboratory of Limnology[1]

Supervisors are responsible for training new employees as described in Section IV, pages IV-1,2 of the Chemical Hygiene Plan.

Employee	Date Trained	Employee Signature	Supervisor Signature

[1]The Safety Check list is kept by the Chemical Hygiene Officer (Liz Droessler).