Annual Safety Training
28 August 2017
Outline

1) PI and Lab Responsibilities
2) Employee Responsibilities
3) Lab Safety Procedures
4) Emergency Procedures

5) Earth Science Specific Hazards

6) Lab Close out / Start up

ESCI Safety Web Page
Use the buddy system
Work as a team
Look out for each other
Safety is everyone's responsibility.

Note that in each of the previous “humorous” slides there was more than one person involved – not one of them asked “is this really a good idea?”

Safety should be an everyday topic of discussion.
C. Supervisors/Principal Investigators
Immediate supervisors of laboratory employees are responsible for:

• Assure potential hazards of specific projects have been identified and addressed before work is started.

• Ensure effective safe operating procedures are completed for lab activities involving high hazard materials and activities.

Are there better alternatives?
C. Supervisors/Principal Investigators
Immediate supervisors of laboratory employees are responsible for:

- Identify and provide necessary safety supplies and personal protective equipment.

- Discuss and reinforce safe work practices and PPE use, provide coaching and disciplinary action as necessary.

Don’t use worn or damaged gear

Don’t repurpose PPE
Have the right gear for the job
C. Supervisors/Principal Investigators
Immediate supervisors of laboratory employees are responsible for:

• Conduct continuous inspection of the research space under the supervisors control, ensure that unsafe conditions are identified and corrected.

• Ensure that all accidents, injuries, and spills are reported to DEHS.

• Investigate laboratory incidents, identify root causes, and implement appropriate solutions.

Small problems don’t go away
Fix them before they become big problems
Spark-pressure-gauge-caused-University.html
C. Supervisors/Principal Investigators
Immediate supervisors of laboratory employees are responsible for:

• Actively participate in safety improvement efforts.

• Provide initial and annual update training for lab workers regarding hazards in their area and associated with their work.

• Maintain documentation of initial and annual training to laboratory personnel.

• Objectively evaluate direct reports on their safety involvement and continuous improvement efforts.

http://www.dehs.umn.edu/PDFs/Lab_Specific_Log_2712.pdf
Lab-Specific Safety Training Record

The University requires documentation that all laboratory personnel have received Lab-Specific Safety Training. This training is provided by the Principal Investigator (PI) or their designee.

Principal Investigator:  
Date:  
Department:  

This checklist will assist the PI or Lab Supervisor in providing training as described in the OSHA Laboratory Safety Standard and the University’s Research Safety Program. It is the Principal Investigator’s responsibility to ensure all research laboratory personnel (employees, students, visiting researchers) are trained. This training must be provided initially, annually, and anytime there is a major procedural change. This record should be used as a guide to the contents you should cover in the training. You must address all hazards that are applicable to your research, including: chemical, biological, and radiation safety. Please keep this record for 5 years as documentation of the training.

In addition, the Department of Environmental Health and Safety (DEHS) requires employees to take general safety refresher training annually. Please contact your Departmental Safety Officer for information regarding this training. Additional task-specific training topics should be covered based on the hazards in your lab as appropriate. Training resources are provided on the [DEHS website](http://www.dehs.umn.edu).

**Review the following:**

<table>
<thead>
<tr>
<th>General:</th>
<th>Yes</th>
<th>No</th>
<th>N/A</th>
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<tbody>
<tr>
<td>1. Lab-specific standard operating procedures (SOPs) for the safe handling and use of chemical, biological, and radioactive materials</td>
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<td>2. Physical and health hazards (acute and chronic) associated with the materials</td>
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<td>3. Signs and symptoms associated with exposures to hazardous materials in the lab</td>
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<td>4. Methods and observation techniques to determine the presence or release of</td>
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D. Employees

Employees who have significant responsibility for directing their own laboratory work are responsible for assuring that potential hazards of specific projects have been identified and addressed before work is started. All laboratory employees however, are responsible to:

- Complete required safety training.
- Read and understand lab standard operating procedures.
- Follow safe work practices applicable to the procedures being carried out.
- Actively identify, report, implement, and make suggestions for safety improvements.

Be alert to things that don’t seem right

Ask questions if you don’t understand a procedure
D. Employees

Employees who have significant responsibility for directing their own laboratory work are responsible for assuring that potential hazards of specific projects have been identified and addressed before work is started. All laboratory employees however, are responsible to:

- **Assure required safety precautions are in place before work is started.**
- **Follow University lab dress code and wear PPE required for procedures.**
- **Notify DEHS of accidents, spills or conditions that may warrant further investigation and/or monitoring.**
Figure 1: Short pants or skirts and sandals, open shoes, ballet flats or shoes with cut-outs.

Figure 2: Long pants (or skirts) as well as shoes that have a closed toes and heels.

Figure 3: Some departments require extra PPE, such as lab coats, to enter the lab. Also, some lab work may require the use of additional PPE.
OSHA Citation: Compressed Air Nozzles

Incorrect (nozzles without relief holes)

Correct (nozzles with relief holes, or star-tipped)

Incident
In May of 2015, the Minnesota Occupational Safety and Health Administration (OSHA) conducted an inspection on the St Paul Campus and found an air nozzle operating at a pressure greater than 30 psi when dead-ended. This was considered a serious violation and a regulatory citation was issued which included a $1,200 fine.
AUTHORIZED PERSONNEL ONLY!
THE FOLLOWING HAZARDS ARE PRESENT

Organic Peroxides  Corrosives  Carcinogens  Oxidizer

Radioactive Material  Biohazard

Permit Holder: P. I. Faculty  BSL 2

REQUIREMENTS:
No Food or Drink in Lab
Long Pants/Skirts and Closed-toe Shoes Required
Minimum PPE Required to Enter: Labcoat and Goggles

EMERGENCY CONTACTS:
Peter I. Faculty 220-666-8888
Janet Staff 220-555-4444
Paul Student 220-777-1111

Call 911 for all emergencies!

Updated: 9/31/2014
Chemical and Building Emergency Contact Information

Police, Fire, Ambulance, Spills involving injuries 911

Chemical Spills and Environmental Emergencies 612-626-6002
after 4:30pm weekdays, weekends or holidays 911

Hazardous Waste Disposal 612-626-1604
Hazardous Materials Service 612-624-8855
Environmental Health and Safety 612-626-6002
W-140 Boynton Health Science Bldg
www.dehs.umn.edu, e-mail: dehs@umn.edu

Hydrogeochemistry Laboratory (Tate S102)
Scott Alexander, 2E, alexa017@umn.edu 612-626-4164

Pillsbury Hall Safety Committee
Scott Alexander, alexa017@umn.edu 612-626-4164
Cell phone 651-470-1917
Mark Griffith, Tate S74, griff062@umn.edu 612-624-4069

Chemical Hygiene Plan and Material Safety Data Sheets
www.esci.umn.edu/Departmental-Resources
Monitoring Safety Equipment

Fume hoods must be monitored daily by the user to ensure that air is moving into the hood. Any malfunctions must be reported immediately to Facilities Management (612-624-2900).

The hood should have a continuous reading device, such as a pressure gauge, to indicate that air is moving correctly.

Users of older hoods without continuous reading devices should attach a strip of tissue or yarn to the bottom of the vertical sliding sash.

The user must ensure the hood and baffles are not blocked by equipment and bottles, as air velocity through the face may be decreased.

DEHS staff will measure the average face velocity of each fume hood annually with a velometer or a thermoanemometer. A record of monitoring results will be made.
Eyewash Posting

Requirements
Eyewashes must be readily accessible in areas with a fume hood, corrosive materials, formaldehyde, and battery changing areas, BSL-2 or BSL-3 spaces.

Eyewashes must be flushed weekly to ensure that the eyewash is working and to prevent bacteria buildup. Records must be readily available and kept for 1 year.

Instructions for Use
In the event of an eye exposure:

Injured person:

1) Call for help from those nearby
2) Immediately, make your way to eye wash.
3) Turn on eye wash and keep flushing for 15 minutes or instructed otherwise.
4) Seek medical attention for every eye injury. Eyewashes are first aid only.

Witness/Aid:

1) Help injured person get to eyewash
2) Keep track of time. MINIMUM 15 minutes of flushing or until emergency responders arrive
3) Call 911
4) Put on gloves and help injured party keep their eyes open and head down.
5) Instruct them to:
   a. “Keep flushing you have ___ more minutes”
   b. “Hold your eyelids open” while the water flows over the eyeballs.
   c. “Roll your eyes all around” so the water touches all of the surfaces and gets under the lids.
   d. “Wash both eyes” even if you think you only contaminated one.
   e. “Remove contact lenses” during the flushing.
   f. “Don’t rub your eyes” or try to dislodge objects from your eye.

Weekly Check
Once a week

- Run eyewash until water is clear and colorless. (important to inhibit bacterial growth may take up to 15 min)

Check:
- accessibility
  o area around the eyewash station is clear of obstruction, debris or tripping hazards
- eyewash station operates correctly:
  o activating arm operates smoothly and remains open when released
  o water flows continuously, with each nozzle expelling water in roughly equal amounts and equal height
  o Report any problems to Facilities Management at 612-624-2900.
Laboratory Emergency Procedures
Building: Pillsbury Hall  Room: nnn  Lab Phone Number: 612-555-5555
The following emergency equipment is located in this room:
Safety Shower, Eyewash, Fume Hood, First Aid Kit

FIRE
1. If you see smoke and suspect a fire, activate the closest fire pull station. Fire pull stations are located (Main Hallway).
2. Perform “Critical Laboratory Shutdown Procedures” if you are not in immediate danger.
3. Evacuate the building using the emergency evacuation route described below. Warn everyone on your way out.
4. Call 911 and provide information asked by the dispatcher.
5. Proceed to the designated evacuation meeting area (Nolte Hall).

Emergency Evacuation Route:

SEVERE WEATHER

CHEMICAL SPILL
All containers labeled in English
All the time

Safety Data Sheets
for all reagents

Reagents properly stored

Don’t forget to carry a file
for reagents used in the field
DHMO Safety Data Sheet

SAFETY DATA SHEET FOR DIHYDROGEN MONOXIDE

SECTION 1 – CHEMICAL PRODUCT
Product Name: DIHYDROGEN MONOXIDE
Common Synonyms: Dihydrogen Oxide, Hydric Acid, Aqua Pura, Adam’s Ale
Product Codes: 4218, 4219

SECTION 2 – COMPOSITION, INFORMATION ON INGREDIENTS
CAS NO.: 07732-18-5, 100% Solution, Formula Wt: 18.1528
NIOSH/RTECS NO.: ZC0110000

SECTION 3 – HAZARDS IDENTIFICATION
Appearance and Odor: Clear colorless liquid, Odorless.
Warning! Causes adverse response in respiratory tract. Can cause drowning.
Warning! May produce explosive gases upon electrolysis.
Warning! Can cause surfaces to become slippery leading to falling injuries.
Avoid lacustrine and marine environments without proper protective equipment (see Section 8)
Target Organs: Lungs.

Potential Health Effects
Falls: Slippery surfaces may lead to falls including broken limbs, head injury and concussions.
Skin: May cause prunation of extremities.
Ingestion: Ingestion of large quantities may lead to electrolyte imbalance causing dizziness, disorientation, unconsciousness, coma and possibly death.
Inhalation: Inhalation of high concentrations may cause drowning and death.
Chronic: Long term exposure may lead to production of mold and mildew in storage area.
Chemical Waste Disposal Procedures

The UHS Regulated Waste Division provides chemical waste pickup and disposal services at no cost to University of Minnesota departments. To have chemical waste picked up from your work area, follow the Chemical Waste Pickup Procedures listed below:

1. Chemical waste must be placed in an appropriate container and kept closed at all times except when adding or removing waste. Liquid waste containers must be stored in secondary containment (e.g., tub, tray, bucket) as illustrated in Figure 1.

2. Chemical waste containers must be labeled with the words “Hazardous Waste,” an accurate description of the waste, the primary hazard(s) associated with the waste, and a start date. UHS recommends that the label illustrated in Figure 2 be used (contact UHS to receive these labels free of charge).

3. Submit waste using Chematix, which is the University of Minnesota’s online chemical waste pickup system. Visit the CHEMATIX homepage linked below and click the “Waste” tab for detailed submission instructions.

[Chematix Online Hazardous Waste Pickup Request]

Figure 1

Figure 2
Make sure all safety equipment is accessible
Mark Griffith
Facilities Liason

Tate Hall S74
griff062@umn.edu
612-624-4069

THIS IS A VELOCIRAPTOR-FREE WORK PLACE

It has proudly been
25,932,750,285
days since the last Velociraptor incident.
Stelvio Pass Road
Italy
UNIVERSITY OF MINNESOTA
DEPT. OF EARTH SCIENCES
VEHICLE TRIP REPORT

Driver_______________________________
Vehicle___________________________
Date Out: __________ Date Return: _______
Mileage Out: __________ Mileage Return: ______

The items on this inspection sheet should be checked when picking up the vehicle and before a long return trip home. Place an X by any item that needs attention. Place a check mark by the rest. Any discrepancies should detailed on the bottom of this sheet.

Daily Vehicle Inspection
Vehicle: _____________________________
Vehicle walk-around, kick tires, check oil, check under vehicle for fluid leads, note any new scratches/dents. Check fuel level.

yymmdd  Initials    Daily Notes
Pre and Post Trip Checklist

_____Ignition Key/Fuel Charge Card
_____Visual Inspection for Exterior Damage/Leaks under vehicle
_____Check inside Engine compartment for Leaks/loose items
_____Oil Level
_____Washer Fluid Level
_____Coolant Level
_____Power Steering Fluid Level
_____Start Engine and check Transmission Fluid Level (Fluid should be hot)
_____Check for Air Gauge
_____Check Tires for wear and pressure LF_____LR_____RF_____RR_____
_____Check Horn
_____Check Heater/Defroster/AC
_____Check Windshield for cracks/chips, wipers/washers
_____Check Headlights/Signal lights/4way flashes/Tail lights/Backup lights
_____Check Mirrors for damage and adjustments
_____Check Fuel Level (Should Not be Less Than ½ Tank)
_____Check First Aid Kit on board and stocked
_____Check Fire Extinguisher on board/Gauge showing charged, proper seal & pin
_____Check Gear Stowed and Secure
_____Check Trailer Tires/Lights
_____Check Receiver Hitch – Ball Secure, Clevis Pin with locking clip, Safety chains
_____As you drive, continually be alert to any strange smells, sounds, vibrations,

- or Anything that does not feel right.
Urban Legend?

A compressed gas cylinder can propel itself through a cement block wall.
Poison ivy gives most people an itchy rash. It's also a tricky plant to identify: it varies in size, shape, and color, and looks different depending on the season and location. It can carpet the ground, form bushes, and climb trees. So how can you avoid an unpleasant encounter? One way to learn to identify this plant is through sheer experience - to see it in its many forms, as well as similar-looking plants. You normally do this by tromping through the woods.

Pictures by Rosemary Mosco
The parsnip (Pastinaca sativa) is a root vegetable closely related to the carrot and parsley.

After handling the fruit, flowers or leaves of Wild parsnip, humans can develop dermatitis. Aided by sunlight, chemicals in the plant cause inflammation of the skin. Mild cases cause burning sensations and reddening of the skin. Severe cases can lead to blistering and extreme burning sensations. Wild parsnip reactions often present as long spots or streaks on the skin and are commonly confused with the effects of poison-ivy.

For more information:
Pastinaca sativa
In the United States, Lyme disease is caused by Borrelia burgdorferi and Borrelia mayonii bacteria, carried primarily by blacklegged or deer ticks. The ticks are brown and, when young, often no bigger than a poppy seed, which can make them nearly impossible to spot.

For more information:  http://www.mayoclinic.org/
Minneapolis East Bank Clinic
410 Church St SE

Monday: 7:45 a.m. – 4:30 p.m.
Tuesday: 7:45 a.m. – 4:30 p.m.
Wednesday: 7:45 a.m. – 4:30 p.m.
Thursday: 9 a.m. – 4:30 p.m.
Friday: 7:45 a.m. – 4:30 p.m.
Closed Saturday, Sunday, and University holidays.

The Boynton Health Pharmacy offers bike safety gear.
Helmets ($19.95)
Bike lights ($19.95)
Helmet & bike light ($34.95)
High-visibility vests ($10)
U-style locks ($25)

http://pts.umn.edu/bike/bikesafety.html
Laboratory Close-out Procedure and Checklist

Proper disposition of all hazardous materials used in laboratories is the responsibility of the principal investigator or laboratory director to whom a laboratory is assigned and their respective department. If improper management of hazardous materials at closeout requires removal services the responsible department will be charged for this service along with any consequential regulatory action or fines.

Proper disposition of hazardous materials is required whenever a responsible individual leaves the University or transfers to a different laboratory. ("Responsible individual" can include faculty, staff, post-doctoral and graduate students.)

http://www.dehs.umn.edu/ressafety_lsforms.htm
**OSHA Implements Massive Fine Increase**  
Aug. 25 2016

Starting this month, the Occupational Safety and Health Administration (OSHA) has increased fines by 78 percent. The dramatic increase comes due to a provision included in the 1,600-page “Bipartisan Budget Act of 2015” passed by Congress and signed into law by President Barack Obama last November.

The mandatory price bump was designed to adjust penalties issued by government agencies for inflation over the past 25 years. States with their own Occupational Safety and Health plans in place are also required to adopt maximum penalty levels in line with the federal agency.

Under the new fine structure, a company found guilty of willful or repeated safety violations can now be issued a maximum fine of $124,709, instead of $70,000. Lesser offenses will increase to $12,471 per day versus the old rate of $7,000 per day. OSHA announced that they will continue to provide penalty reductions based on the size of the employer and other factors.
To see safety precautions as a drag on research is an irresponsible and counterproductive attitude, but one that is hard to change.

….too many researchers see safety officers as ‘police’ to skirt round, rather than experts with whom to collaborate.

Accidents in Waiting
Editorial: Nature 2011 472:259
Make time to get safety right
Lab Safety Plan for Department of Earth Resources

Department Safety Officer: Scott Alexander
Tate Hall 385-15
alexa017@umn.edu
612-626-4164 (office)
651-470-1917 (cell)

Building Manager: Mark Griffith
Tate Hall S74
griff062@umn.edu
612-624-4069