

# Environmental Engineering Laboratory

Site-specific Safety and Hazards Communication

(August 2023; last update 8/13/25)



# Lab-specific Safety Information & Hazards

Part 1 - The Safety System at NAU

Part 2 - Routine Considerations

Specific to this lab

Part 3 - Special Considerations

Other Project activities



# Part 1. Safety at NAU

- Its starts with OSHA (Occupational Safety and Health Administration)
  - Laboratory Standard (29 CFR 1910.1450)
  - Labs working with small quantities of chemicals
  - Non-production labs (e.g., Research, development, teaching)
- NAU Office of Environmental Health and Safety (EH&S)
  - Environmental compliance
  - Biological, chemical, and field safety
  - Occupational health and Industrial hygiene
  - Hazardous wastes and hazard communication



# Part 1. Safety at NAU

- EH&S
  - provides overall framework used across campus
  - oversees all health and safety programs
- Local laboratories
  - required to develop local policies and procedures
  - implement compliance requirements



# Part 2. Routine ENE Lab Considerations

- Lab-specific policies and procedures
  - [https://www.ceias.nau.edu/~teb/amb1/amb1\\_SOPs.html](https://www.ceias.nau.edu/~teb/amb1/amb1_SOPs.html)
  - 001A Requesting use of ENE Lab or services
    - *Rapid Request* to initiate this process is now online
    - [Rapid Request - Environmental Engineering Lab \(nau.edu\)](#)
  - 002A ENE Laboratory Standard (site-specific CHP)
    - Download [EnE Laboratory Site-specific Safety Training Verification](#)
  - 002G Reporting incidents
    - Incident reporting by using online form
    - [Incident Report - Environmental Engineering Lab \(nau.edu\)](#)
  - 0053A Good Laboratory Work Practices



# Part 2. Routine ENE Lab Considerations

- Lab Safety Training (updated every 12 months)
  - Tracked by course instructor or project supervisor or ENE Lab Staff
- SciShield System <https://nau.scishield.com/>
- Your name will be entered into SciShield, which should then send you an email and link if you have never completed the training before
  - NAU Chemical Hygiene and Safety
  - Biological Safety
  - Field Safety (waived unless you do field work)



## Part 2. Routine ENE Lab Considerations

### **NO FOOD – NO DRINK**

Eliminates direct oral exposure route.





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### **NO FOOD – NO DRINK**

Eliminates direct oral exposure route.

Empty food or drink containers and bags or wrappers are evidence of a violation.



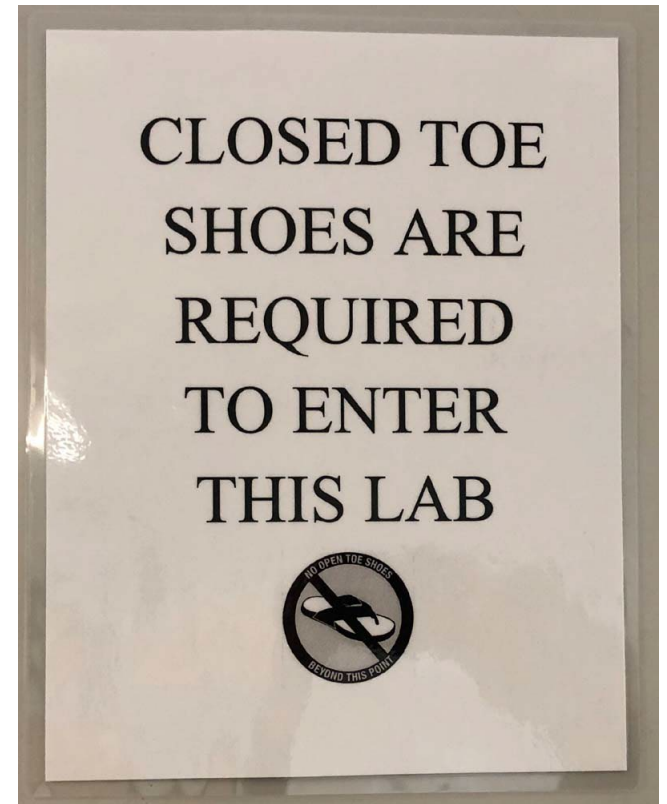


## Part 2. Routine ENE Lab Considerations

- **No Open-toed Shoes or Other Clothing Allowing Skin Exposure**

- Lab coats and gloves can cover hands and arms
- Shorts and skirts exposing legs are not allowed

The goal is to Minimize direct dermal contact exposure





## Part 2. Routine ENE Lab Considerations

- **PPE – Glasses/Goggles, lab coats, gloves, and aprons**

Same coat and goggles used the entire semester. Gloves are disposable.

5-gallon zip bag available.

You wear it – you wash it. Heavily contaminated coat must be replaced.

Keep your goggles clean & disinfect surfaces when necessary.



# Part 2. Routine ENE Lab Considerations

## Eyewash-Safety Shower Stations

- Rooms 239, 241, 242 & 245



Room 245





## Part 2. Routine ENE Lab Considerations

### Eyewash-Safety Shower Stations

- Rooms 239, 241, 242 & 245

No floor drain – secondary hazard is slipping in area wetted by shower



Room 245





# Part 2. Routine ENE Lab Considerations

## First Aid Kits

- Rooms 239 & 245





# Part 2. Routine ENE Lab Considerations

## Fire Extinguisher & Fume Hoods

### Fire Extinguisher:

- In hallway outside of lab
- In Room 239 next to exit door

### Fume Hoods:

Rooms 236, 241, & 245

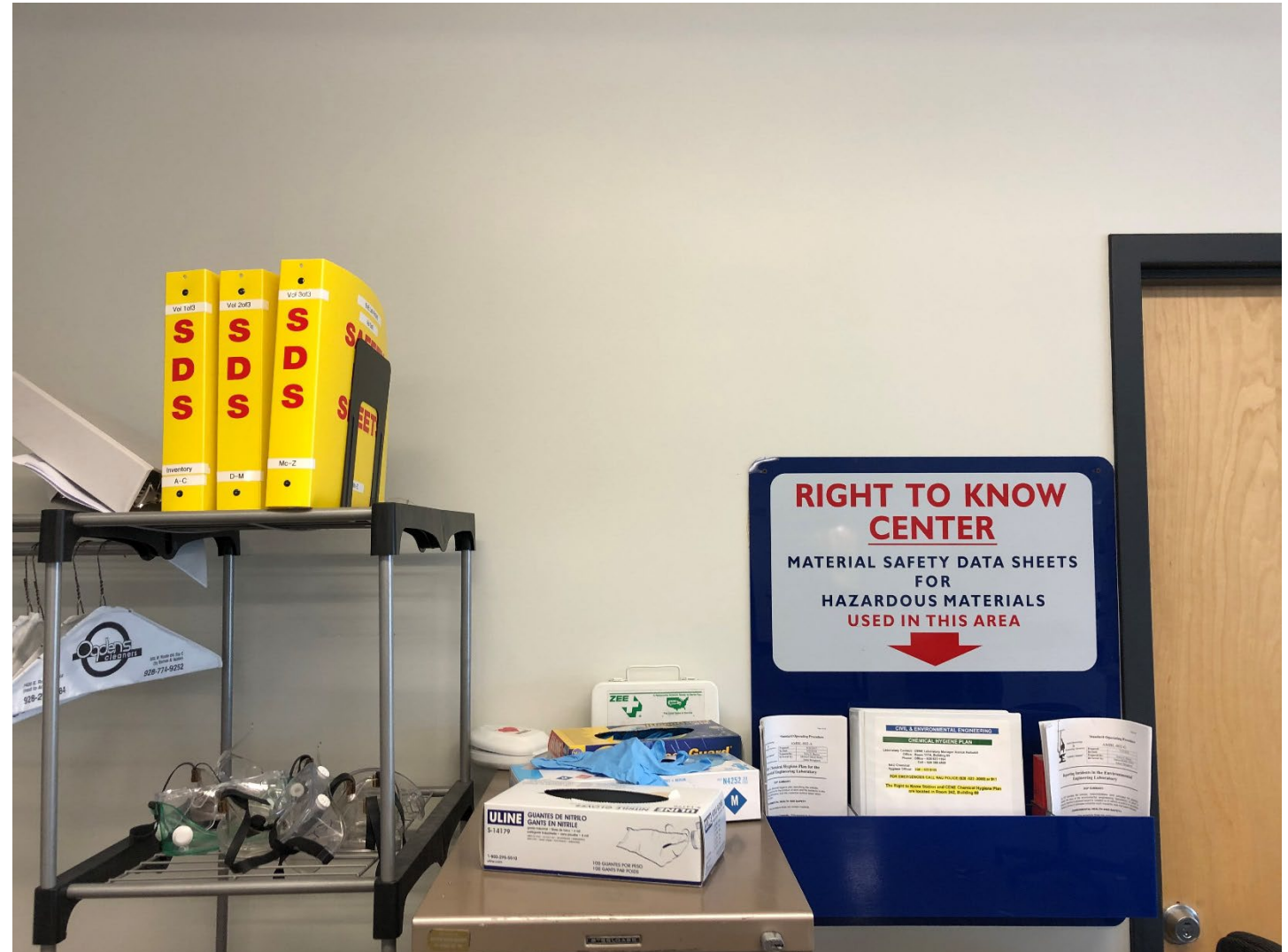


# Part 2. Routine ENE Lab Considerations

## Hazards Communications

- Room 245
- Online [Chemical Information \(SDS\) | Environmental Health and Safety \(nau.edu\)](https://www.nau.edu/ehs)

**Know Your Comfort Level!**





# Part 2. Routine ENE Lab Considerations

## Chemicals in Use

- Room 245
- Room 239





# Part 2. Routine ENE Lab Considerations

## **Clean up – wet and dry material spills**

- All Rooms

Clean up spills as they happen. Contact instructor when help needed.

Use blue pads on bench work area.

Wipe down bench and disinfectant for biologicals/wastewater.

Contact instructor for disposal of pads, wipes, dry materials, etc.

Report all incidents involving spills.



# Part 2. Routine ENE Lab Considerations

## Hazardous Wastes & Disposal

- Coordinate all hazardous waste with your instructor or supervisor
- Separate unsecured staging location no longer available

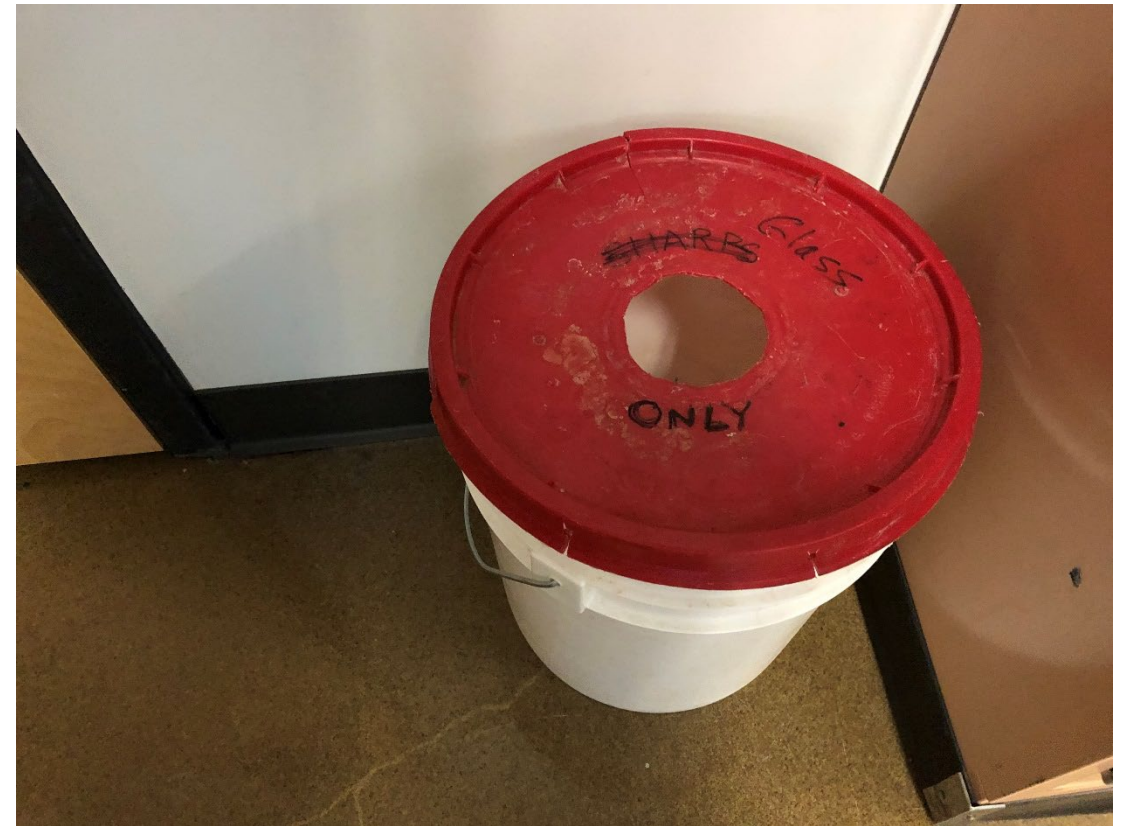




# Part 2. Routine ENE Lab Considerations

## Broken Glass Disposal

- Room 241

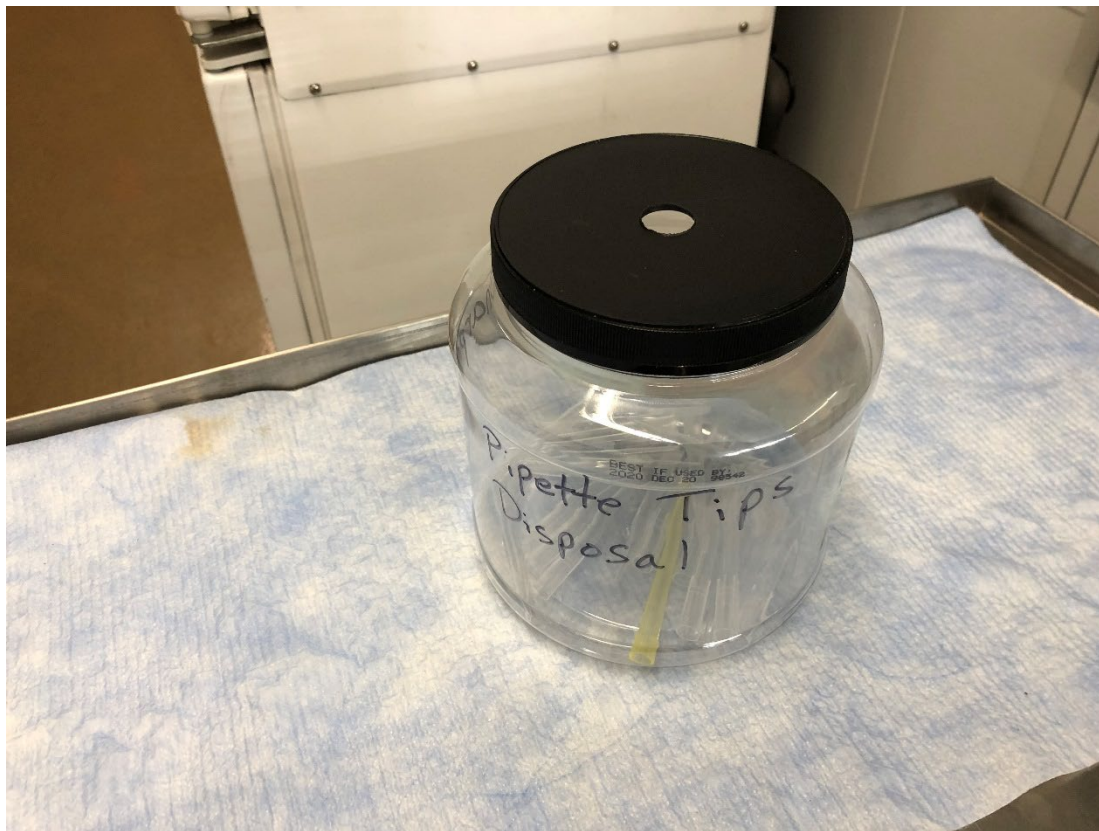




## Part 2. Routine ENE Lab Considerations

### Sharps & Cover Slips Disposal

- Provided where needed





# Part 2. Routine ENE Lab Considerations

## Hand Washing

- All Rooms

Considered good practice to . . .

Wash hands after entering lab and before you begin work.

! Although required when working with biologicals !

Considered required practice to . . .

Wash hands after work is finished or before you leave the lab.



# Part 2. Routine ENE Lab Considerations

## Clean Area

- Rooms 245/242
- No dry chems
- No liquid chems
- No PPE on surfaces
- No gloves on hands if you will be touching surfaces, notebooks, etc.





# Part 2. Routine ENE Lab Considerations

## Leaving & Returning to Lab

- All Rooms

Before leaving:

Remove PPE & wash hands.

Make sure door is closed.

Returning:

Ring the 245 bell to be let back in.

Wash hands & “PPE up” if continuing work.



# Part 2. Routine ENE Lab Considerations

## Lab Egress

- In case of an emergency (fire, toxic gas or vapor release, etc.)

Move away “with caution” from impacted area toward nearest door.

Exit door to hallway

Exit door to an adjacent lab and then exit door to hallway

Do not exit into another lab unless that is your only egress

Do not cross or go near impacted area to retrieve belongings.

Move away from lab and if necessary, leave the building.



# Part 2. Routine ENE Lab Considerations

## Working with Others in the Lab

- We are not alone! Be considerate and consider others.

We share many of the instruments, glassware, and workspaces.

Clean up after yourself

- Trash, spills, and containers
- glassware, spatulas, and other supplies used
- clean and turn off instruments

Be consistent with where you put “things” for others to find

Don't leave DI water nozzle in the sink or touching a surface

If you borrow it, return it

Do not be the distraction



# Part 2. Routine ENE Lab Considerations

## Equipment Use

- Instruments and Other Equipment have a place

Some instruments/equipment have a specific storage location

- Turbidity meters, DO meters, sir plates, hot plates, ring stands, etc.

Other instruments/equipment are assigned to a bench location and are used there – do not move these!

- All spectrophotometer/pH instruments in Rooms 239 & 241, centrifuge, ovens, muffle furnace, etc.



# Part 2. Routine ENE Lab Considerations

## Equipment Check-out & Avoiding Contamination

There is a check-out/check-in process

- Any field work requiring equipment or supplies
- Contact Adam Bringham or Terry Baxter

Prep samples away from the instrument

Move open sample cells in and out of instrument slowly

Keep a box of Kimwipes near the instrument - Don't move the Kimwipes to another location



# Part 3. Other Projects Review

## Active Projects, Activities and Their Hazards

### Algal Culture Maintenance & biogas scrubbing (room 239)

- Mixer (mechanical hazard, minor) in oxidation ditch photobioreactor setup (currently off-line for cleaning)
- Acid gas displacement fluids (corrosive hazard)

### Anaerobic Digesters (room 239)

- Acid gas displacement fluids (corrosive hazard)
- All units currently removed for cleaning

### Moisture Based CO<sub>2</sub> Capture (room 239)

- Acid titration of carbonate in porous carbons and ion exchange resins (corrosive hazard)



# Part 3. Other Projects Review

## Active Projects, Activities and Their Hazards

### Dr. Calvo Research Lab Space Setup (241)

- Active setup activity
- Chemical and physical hazards

### CENE 281L & 410L (rooms 241, 242, 245)

- Chemicals & wastewater (toxic, corrosive, & biological hazards)

### Method Development (rooms 239 & 241)

- Chemical hazards

### Biofilm Sensors (room 239)

- Wastewater (biological hazard)



# Finally . . .

## Failure to Follow Safety Procedures and Policies

### **Incidents that are to be documented (SOP 002G)**

- Used primarily to identify areas where improved training & communication is needed
- Allows us to track & document infractions and improve training
- Incident reporting has moved online; still requires follow up

### **Retraining is conducted in most cases**

### **Worse case**

- You are not allowed to enter the lab again after multiple repeat infractions



Finally . . . and . . .

**Complete the Verification and Waiver forms & return them to your instructor or immediate supervisor.**

**These are submitted to the Laboratory Manager, scanned and stored.**

**EHS requires ability to confirm at any time that these records are being maintained.**