

# Goldwater Environmental Lab (GEL)

## Guidelines and Policies

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### ***Access to GEL Resources ([See list of Equipment and Services](#))***

- Access to GEL resources is categorized into two levels.
  - Level 1 (External Customer & Assisted User) - user submits samples for analysis and/or assists Goldwater Environmental Lab (GEL) staff with analysis.
    - Users may remain at Level 1 status and may request that analyses be performed for them by GEL staff.
  - Level 2 (Standard Users) - user may operate instruments/equipment under the supervision of GEL staff. When proficiency is developed, users may work unsupervised during, and in some cases, after, normal business hours.
    - Frequent, routine use of any instrument/equipment requires training to Level 2 status by the GEL staff. Contact GEL staff for the procedures involved with training on a specific instrument.
- Normal business hours are from 8:00 AM - 5:00 PM, Monday – Friday. All lab doors are equipped with the ISSAC door access system. According to University policy, all lab doors must be kept closed and locked at all times. Propping doors open is not permissible. ***Sharing a SUNCard is prohibited by university policy and could result in termination.***

### ***Registration***

- All new users must be registered in the [iLab](#) system
- Level 2 users must fill out an agreement form in iLab which includes completion of all applicable Environmental Health and Safety training. See the “Safety” section below for more information.
  - Details for SUNCard access to labs is also described on this page. Access will be granted to Level 2 users after completion of the agreement form in iLab and demonstration of proficiency with the instrumentation/equipment.

## *Scheduling*

### *All use of GEL resources must be scheduled through iLab*

- Level 1 use requires the coordination of instrument and GEL staff scheduling. Level 2 use requires only an instrument scheduling. This limitation makes advanced planning more critical for Level 1 users.
- **Reservations** are scheduled via [iLab](#) system and are based on a first-come first-served policy.

## *Sample Preparation*

- The facility offers a variety of sample prep equipment. Prep that requires consumables such as filters, dialysis membranes, etc. should be performed in the user's lab with user's materials prior to bringing the samples to the GEL. Some instruments require samples to be poured / weighed into specialized vials / capsules. Consult the [instrument pages](#) and each individual instrument's page for more detailed protocols.

## *Sample Storage*

*GEL accommodates **PRE-ANALYSIS** sample storage **ONLY!** Long term storage (> 1 week) is not available without prior explicit permission from GEL staff.*

- All samples awaiting analysis must be stored in an organized manner (within a box, etc.) and must be clearly labeled with the date, owner's name, and telephone number.
- Refrigerated samples are to be stored on metal shelving units. Room temp samples are to be stored in cabinets or on shelves, NOT on bench top.
- Users must remove samples when all analyses have been completed. **Unidentified and unclaimed samples (> 1 week) will be disposed of without further notification.**

## *Analysis*

- Follow instructions provided by GEL staff and online instrument procedures, where applicable. Deviation from instructions can cause damage to the equipment and harm to

the operator. Please consult staff before attempting any deviations or customizations.

- **Under NO CIRCUMSTANCES should a user attempt to open, dismantle, alter, or modify equipment without prior explicit approval from GEL staff.**

### *Cleanup*

- *Dispose of or remove your samples from the GEL and dispose of working (non-stock) reagents.* We cannot accommodate long-term sample storage. Consult GEL Staff for proper handling/disposal of hazardous waste.
- *Clean glassware, instrument / equipment, countertop(s), and anything else that you have dirtied. The ISSAC door system tracks each lab entry. This has been useful for addressing problems that occur during after-hours use. Please be considerate of others and maintain clean & safe working conditions.*

### *Logging Use*

*All use (scheduled or unscheduled) must be logged in iLab.*

### *Data*

*GEL is not responsible for storage of user data.* To preserve data long-term, copy files to portable storage devices and/or email files from lab PC's.

### *Safety*

1. All routine users of the laboratory facilities must complete the OSHA required *Lab Chemical Safety* and *Fire Safety and Prevention* courses offered by Environmental Health and Safety. See registration information [here](#).
2. Users must comply with all laboratory safety policies. Non-compliance will result in discontinuation of GEL use. Users must also **read** the [Goldwater Environmental Lab Chemical Hygiene Plan and General Laboratory Safety](#) document indicating that they understand and agree to abide by the safety policies set forth.
3. Lab Certification placards are located outside the entrance to each lab. These provide information about the hazards found in each lab, emergency contacts, and location of

MSDS binders and electrical circuit boxes. A complete chemical inventory can be found in front of each MSDS binder.

4. Users should become familiar with all emergency procedures, evacuation routes, location of First Aid station and emergency (eyewash, showers, fire extinguishers & alarms) and personal protective equipment. See the [GEL Emergency Evacuation Plan and Emergency Equipment Locator](#) for this information.

## ***General Laboratory Procedures***

### *Handling Glassware*

To prevent contamination, never touch inside or the rim of any test tube, beaker, flask, or bottle. Do not touch stoppers (glass or otherwise) or the inside of caps. Avoid resting stoppers on the bench top as they can pick up unwanted contaminants.

### *General Glassware Use*

1. As stated above, **all users are responsible for cleaning their own glassware immediately after use.** See "[Glassware Washing Procedures](#)" for instructions. Soap should **not** be used to clean general-use glassware.
2. Users must clearly label glassware with their initials and the contents before use. Use a Sharpie but **DO NOT mark on the white spot.** No tape labels are to be used.
3. Glassware cabinets must be closed immediately after removing glassware.
4. Glassware should be rinsed with either Nanopure water or liquid to be contained before using.
5. DO NOT use general-use glassware to contain surfactants (SDS, SLS, and Soaps), oils, or other difficult-to-remove substances.

### *Special Purpose Glassware*

1. Glassware dedicated to contain a certain solution or reagent, *especially those containing surfactants*, should be kept separate and not used for anything else. Such glassware should be permanently labeled. In most cases, these require only rinsing between usages, not acid washing.
2. Glassware used for organic analyses such as TOC, TN, TP, GC (except volumetrics) should be heat-treated per analysis protocol.

### *Adjustable Pipettors*

*Before using pipettors, users must either demonstrate proficiency or receive proper training from GEL staff. Pipet tips are available free of charge for preparing solutions*

*and adding reagents where one tip is used repetitively. If a project requires a large number of pipet tips (ex. dispensing 10+ samples using a fresh tip for each) users must provide their own supply.*

1. Do not use pipettors labeled "Acids Only" when preparing calibration standards.
2. Checking accuracy of pipettors using Nanopure water and the analytical balance (calibrated first) before use is strongly recommended.
3. Fill pipet tip with smooth release of plunger from first stop so as not to cause "splashing" of reagent into pipettor. Dispense with even, smooth motion, to second stop for accurate volumes.
4. Whenever possible, tips should be rinsed at least once with the solution to be pipetted; this is especially important for standards.
5. To prevent damage and contamination, **NEVER** lay pipettor down with liquid in tip....not even small droplets!
6. To prevent contamination, **NEVER** pipet directly from a stock solution...always pour an aliquot into a temporary vessel to pipet from.
7. Keep pipet tips in closed containers. Store pipettors upright on rack.
8. Read the instructions and practice using autopipettors before use.

#### Acids / Bases

1. All acids & bases >1N are to be stored in designated hoods/cabinets.
2. Handle concentrated acids /bases only with proper gloves. Work in hood and follow all safe handling practices (wear protective clothing, equipment, etc.). Rinse outside of bottle before and after use - and remember - **ADD ACID TO WATER not vice-versa.**

#### Dry Chemicals & Liquid Reagents

1. Most dry chemicals are stored alphabetically in GWC 637 above balances.
2. Record the date a new chemical is received /opened on its container.
3. Use clean spatulas or (better) tap chemical onto weighing paper or weigh boat. Do not put excess chemical back into stock bottle if there is a risk of contamination; dispose of properly. Return chemical to proper position on shelf when finished.
4. **Clean bench and balance properly (brush, wipe) when finished weighing.**
5. Never place anything (pipets) into a stock liquid reagent bottle. Pour a small amount into cap or beaker and then measure out what you need. Do not return the excess to the bottle-- discard it.

6. Date and initial all reagents that you prepare. Also include the full name of all ingredients and concentration / expiration date where applicable. Do not use expired chemicals.
7. Discard old reagents and rinse bottle with a small amount of fresh reagent before refilling bottle with fresh reagents.
8. If you inadvertently fail to refrigerate a reagent that requires refrigeration, discard and remake.
9. After pouring a reagent, carefully wipe any drips from the outside of the bottle, especially the neck and the threads. Be careful not to contaminate the reagent with the material used to wipe.
10. Users are required to prepare reagents that must be made fresh daily at the time of their analysis. If given ample advance notice, Lab personnel can prepare reagents that can be stored for  $\geq 1$  week.
11. Users must alert GEL staff when a reagent or dry chemical is getting low. **Do not wait until it is empty** since another user may be depending on this.

### Standard Solutions

1. In preparing stock standards, use utmost precision in weighing out chemicals, clean (acid-washed, ashed, etc.) bottles, and clean glassware. Stock standard solutions are only to be made up by laboratory personnel.
2. Users are required to prepare standards that must be made fresh daily at the time of their analysis. If given ample advance notice Lab personnel can prepare standards that can be stored for  $\geq 1$  week. Users must notify GEL Staff when a standard is getting low.
3. See "[Standard Solution Preparation](#)" for instructions on how to prepare working standards.
4. After pouring a standard, carefully remove any drops from the neck, threads, and cap since these will crystallize and affect the concentration of the next volume poured from the bottle. Be careful not to contaminate the standard with the material used for cleaning.

### Lab Supplies/Consumables

1. Supplies required for performing standard analyses are provided by GEL and account for a portion of the instrument charge. Users are responsible for providing any additional or specialized supplies required for their own analyses. Examples include, but are not limited to ultrapure acids, filters, conical tubes, sample storage containers, reagents used to pre-process samples before analysis (ex. persulfate digestion).

2. When a consumable supply is getting low, alert GEL staff immediately so that it can be restocked and remain available for all users.

Refrigerators

1. Keep all refrigerators clean and uncluttered.
2. No uncovered vessels, food or drinks are to be stored here.