
Laboratory Waste Management

Environmental Health and Safety

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1. Introduction

The purpose of this program is to comply with the provisions of 40 CFR Subpart K – Alternative Requirements for Hazardous Waste Determination and Accumulation of Unwanted Material for Laboratories Owned by Eligible Academic Entities. The Subpart K regulations provide an easier method to manage laboratory waste generated in the labs as well as other benefits compared to general industry hazardous waste management regulations. The University and this policy will refer to the chemical waste generated in lab areas as “Lab Waste”. All laboratories shall operate under this program. This policy acts as a Lab Management Plan (LMP) and covers all laboratories as one group. This LMP will address how labs will comply with the Subpart K regulations.

This policy applies only to chemical waste created in laboratories on campus. All other waste generators on campus must operate under the UNCG Hazardous Waste Policy.

<https://safety.uncg.edu/wp-content/uploads/2018/06/Section-0060.pdf>

What is considered a laboratory under Subpart K?	YES	NO
Teaching and research labs	√	
Art studios	√	
Photo labs	√	
Field labs	√	
Diagnostic labs in teaching hospitals	√	
Areas that support labs (e.g. chemical stockrooms, prep rooms)	√	
Chemical stockrooms that do not support labs		√
Vehicle maintenance areas		√
Custodial storage rooms		√
Machine shops		√
Print shops		√
Purchasing storage and excess		√
Service and Stores trade shops		√
Commercial photo processing		√
Power plants – Heat/Chill		√
Dining establishments		√
Sport/Recreational Facilities		√

UNC Greensboro operates as a small quantity generator (SQG) of hazardous waste. The management and storage of lab waste is regulated from initial generation to treatment and disposal. The University may be audited by the NC Department of Environmental Quality Division of Waste Management (NCDEQ DWM) and the U.S Environmental Protection Agency (EPA) Hazardous Waste Section.

2. Definitions

COLLEGE/UNIVERSITY means a private or public, post-secondary, degree-granting, academic institution, that is accredited by an accrediting agency listed annually by the U.S. Department of Education. UNCG meets this definition.

ENVIRONMENTAL HEALTH AND SAFETY DEPT (EHS) means the UNCG Environmental Health and Safety Department. This is inclusive of references to the EHS Environmental Affairs Manager, and contractors who have primary responsibility for compliance with waste management at UNCG.

ELIGIBLE ACADEMIC ENTITY means a college or university, or a non-profit research institute that is owned by or has a formal written affiliation agreement with a college or university, or a teaching hospital that is owned by or has a formal written agreement with a college or university. Formal written affiliation agreement for a non-profit research institute means a written document that establishes a relationship between institutions for the purpose of research and/or education and is signed by authorized representatives, as defined by 40 CFR § 260.10, from each institution. A relationship on a project-by-project or grant-by-grant basis is not considered a formal written affiliation agreement. A formal written affiliation agreement for a teaching hospital means a master affiliation agreement and program letter of agreement, as defined by the Accreditation Council for Graduate Medical Education, with an accredited medical program or medical school. UNCG meets this definition and is an *Eligible Academic Entity*.

LABORATORY means an area owned by an eligible academic entity where relatively small quantities of chemicals and other substances are used on a nonproduction basis for teaching and research (or diagnostic purposes at a teaching hospital) and are stored and used in containers that are easily manipulated by one person. Photo laboratories, art studios, and field laboratories are considered laboratories for the purposes of the regulation and this Plan. Areas such as chemical stockrooms and preparatory laboratories that provide a support function to teaching and research laboratories (or diagnostic laboratories at teaching hospitals) are also considered laboratories.

LABORATORY CLEAN-OUT means an evaluation of the laboratory of chemicals and other materials in a laboratory that are no longer needed or that have expired and the subsequent removal of those chemicals or other unwanted materials from the laboratory. A clean-out may occur for several reasons. It may be on a routine basis (e.g., at the end of a semester or

academic year) or as a result of a renovation, relocation, or change in laboratory supervision/occupant. A regularly scheduled removal of unwanted material as required by 40 CFR § 262.208 does not qualify as a laboratory clean-out.

LABORATORY WORKER means a person who handles chemicals and/or unwanted material in a laboratory and may include, but is not limited to, faculty, staff, postdoctoral fellows, interns, researchers, technicians, supervisors/managers, and principle investigators. A person does not need to be paid or otherwise compensated for his/her work in the laboratory to be considered a laboratory worker. Undergraduate and graduate students in a supervised classroom setting are not laboratory workers.

REACTIVE ACUTELY HAZARDOUS UNWANTED MATERIAL means an unwanted material that is one of the acutely hazardous commercial chemical products listed in § 261.33(e) for reactivity.

REMOTE FACILITY means UNCG research units, field laboratories, and other sites/facilities located off the UNCG Main Campus EPA ID#.

TRAINED PROFESSIONAL means a person who has completed the applicable RCRA training requirements of 40 CFR § 265.16 for large quantity generators; or is knowledgeable about normal operations and emergencies in accordance with 40 CFR § 262.34(d)(5)(iii) for small quantity generators and very small quantity generators. A trained professional may be an employee of the eligible academic entity or may be a contractor or vendor who meets the requisite training requirements.

UNWANTED MATERIAL means any chemical, mixtures of chemicals, products of experiments or other material from a laboratory that is no longer needed, wanted or usable in the laboratory and this is destined for hazardous waste determination by a trained professional. Unwanted materials include reactive acutely hazardous unwanted materials and materials that may eventually be determined not to be solid waste pursuant to 40 CFR 261.2., or a hazardous waste pursuant to 40 CFR 261.3.

WASTE CONTRACTOR means, for purpose of this Plan and RCRA hazardous waste management on the UNCG campus, the chemical waste vendor retained by UNCG to assist in hazardous waste determinations, pick-ups, bulking, packaging, labeling, and transportation for proper off-site disposal of hazardous and non-hazardous chemical and biological wastes. The *field chemists* employed by this contractor meet the minimum qualifications as *trained professional* under this Plan.

WORKING CONTAINER means a small container (i.e., two gallons or less) that is in use at a laboratory bench, hood, or other work station, to collect unwanted material from a laboratory experiment or procedure.

3. Part I: Enforceable Requirements

This section defines the minimum requirements for labeling containers of Lab Waste in UNCG laboratories, studios/workshops, remote facilities, and support areas.

Laboratory chemicals that are no longer needed, wanted, or usable and meet the definition of an “unwanted material” (40 CFR 262.200) are considered “Lab Waste” at UNCG. Information about Lab Waste is communicated by use of a completed UNCG Lab Waste label (See Section 3 for labeling process). Properly labeled Lab Waste must be submitted for pick up by each lab within **12 months** of the accumulation start date. These procedures are detailed in Part II of this plan and comply with 40 CFR 262.214(a).

4. Part II: Lab Waste Management Procedures

When a chemical has no further use in the lab, lab personnel must identify the material as a Lab Waste by affixing a completed UNCG Lab Waste label to the container. These labels are available in the Chemistry stockroom and through EHS.

4.1 Responsibilities

Many faculty and staff are involved in generating and managing Lab Waste in labs across campus. It is required that all individuals working with Lab Waste be trained in this policy to effectively and properly manage waste generated within their lab.

Laboratory workers’ responsibilities include:

- Operate in compliance with this policy.
- Receive training on this program

The Principle Investigators (PI) and studio supervisors in Art are supervisors and assume additional responsibilities that include:

- Ensuring overall compliance in their laboratory.
- Ensuring that training requirements of this policy are met.
- Correcting compliance issues in a timely manner.

EHS’s responsibilities include:

- Waste determinations
- Safe transfer of unwanted material from labs to the CAA.
- Proper packaging and management of unwanted material prior to transport off campus to an off-site treatment and disposal facility.

- Maintaining training records.
- Assist in providing training to lab workers.
- Laboratory inspections to promote compliance in this program.

4.2 Container Labeling

Lab Waste accumulated either during the operation of a process or otherwise accumulated in the laboratory must be placed into containers that are in good condition and compatible with the collected waste.

Any container used to collect or accumulate Lab Waste must be labeled with a completed UNCG Unwanted Material label; listing the contents, identifying hazard(s) on label, and writing the accumulation start date on the label. If assistance is needed in completing the label requirements, please contact EHS. The label must be affixed to the container prior to any waste being added. If at any time during the waste accumulation process, the content of the waste container changes, the label must reflect those changes.

Additional Requirements for Container Labeling:

- Use full chemical names of each component in the waste container (no formulas, abbreviations, or structures).
- Please estimate percentages of contents if possible
- Note if the lab waste has been used or unused
- If the laboratory waste consists of several components, please list the most hazardous components. Contact EHS if you have questions regarding the listing of components.

Below is an example of the UNCG Lab Waste label. These labels are available through EHS or the department's chemical stockroom.

Lab Waste

Accumulation Start Date: ____ / ____ / ____

Toxic Corrosive Flammable Reactive Oxidizer

Used Unused

Contents _____

Department _____ Building/Room# _____

Generator _____ Phone _____

PROPERLY LABEL AND KEEP CONTAINER CLOSED
For Emergencies, contact the UNCG PD 334-4444
EHS 334-4357

4.3 Container Management

Laboratory workers are responsible for proper management of containers of Lab Waste. This management includes safe storage to prevent leaks, spills, emissions to the air, adverse chemical reactions, and dangerous situations that may result in harm to human health or the environment. Containers used to collect or accumulate Lab Waste must be managed in the following manner:

- Manage containers to assure safe storage to prevent leaks and spills.
- Containers should be kept clean with no visible chemical contamination on the outside of the container and markings or labels on the container must be readable and not defaced. Please replace damaged or unreadable labels immediately.
- Provide proper spill-containment of materials being stored, which should include secondary containment when feasible.
- Do not store incompatible waste together in order to prevent adverse chemical reactions that may harm human health and the environment. Please provide separation of incompatible wastes.
- Containers should not be overfilled. “Full containers” should have at least a 10% head space to allow for vapor expansion.
- Laboratory beakers, flasks, or plastic milk cartons are not acceptable as waste containers. Glass or plastic reagent bottles are the most convenient to use.
- Containers must be maintained and in good condition. Damaged containers must be replaced, overpacked, or repaired.
- Containers must be compatible with their contents.
- Containers must be kept closed at all times with secure fitting lids or caps, except:
 - for adding, removing, or bulking laboratory waste.
 - for venting of the container is necessary.
 - for the proper operation of lab equipment, such as with in-line collection of laboratory waste from HPLC equipment.
 - to prevent dangerous situations such as build-up of extreme pressure.
- A “working container” is defined as a small container (two gallons or less) that is in use at a laboratory bench, hood, or other work station to collect Lab Waste from a lab experiment or procedure. A working container may be open until the end of the procedure or work shift, or until it is full, whichever comes first, at which time the working container must either be closed, or the contents emptied into a separate container that is then closed.
- Containers must be submitted for pick up within 12 months of the accumulation start date.
- Laboratories are allowed to store up to 55 gallons of Lab Waste (or 1 quart/1 kg of Acutely Hazardous Lab Waste). If these quantities are exceeded, the date of surpassing the 55 gallon quantity (or 1 quart/1 kg) must be written on the label. The material must be removed within 10 calendar days from the date the quantity was exceeded or at the next scheduled removal, whichever comes first.

5. Reactive Acutely Hazardous Lab Waste Management

If a laboratory accumulates more than 1 quart of Reactive Acutely Hazardous Lab Waste (see below), it must be removed from the laboratory within 10 calendar days of the date that the 1 quart was exceeded or the next scheduled pick up, whichever is sooner. Contact EHS for removal of reactively acutely hazardous unwanted material.

P006	Aluminum Phosphide
P009	Ammonium Picrate
P065	Mercury Fulminate
P081	Nitroglycerine
P112	Tetranitromethane
P122	Zinc Phosphate (>10%)

6. Unknown and Obsolete Lab Waste

Chemicals identified as obsolete (no longer needed) by the laboratory and that are unused, unopened, or unknown is to be considered a Lab Waste and **must be removed from the laboratory no later than 12 months after being designated as no longer needed.**

- An obsolete chemical is a chemical or substance that will no longer be used for its intended purpose and needs to be discarded.
- Containers holding obsolete or unknown chemicals or substances in waste accumulation areas must be labeled as outlined in Section 3.1 of this Plan.
- Laboratories are advised to conduct routine reviews of inventories and chemical stocks to identify any obsolete chemicals or substances at least once per semester.
- Any obsolete chemical or substance should be removed from shelves or other storage areas and placed into the laboratory's Lab Waste storage area.

Unknown chemicals present a challenging and potentially very dangerous and costly disposal problem. Unknown material possesses unknown characteristics, which can be potentially dangerous. Waste disposal companies require certification of the waste characterization by the generator. The generator should make all attempts to correctly identify the contents of the Lab Waste. If the generator is unable to identify the waste, a laboratory analysis is required. Depending on the hazard class associated with the unknown waste, the cost to sample, analyze, treat and dispose of this waste (after it has been identified) can be significant.

EHS provides periodic identification and removal of unknown waste by a qualified high hazard specialist. Exercise every precaution to avoid generating unknowns in the lab. If you discover

unknown chemicals in the lab, please contact EHS for assistance and handling information. If the unknown material appears to be highly dangerous, contact the UNCG PD at 334-4444 for chemical response action.

7. Characterization and Removal of Lab Waste

All efforts should be made by laboratory workers to ensure the chemical constituents of the Lab Waste are identified and listed accurately and in accordance with the University's waste collection procedure which is summarized below.

As stated in Section 3, Lab Waste must be removed from laboratories, studios, and support areas within 12 months of the accumulation start date listed on the Lab Waste label.

1. When a laboratory worker deems a material a Lab Waste or begins accumulating Lab Waste in a container, the laboratory worker must affix a completed UNCG Lab Waste label to the container and note the accumulation start date on the label.
2. If the container is a non-accumulation container, the container can be submitted for pick up.
3. An empty chemical container that held highly hazardous or reactive material (P-listed material), such as sodium azide, osmium tetroxide or cyanides, must be submitted for proper disposal through EHS.
4. Lab Waste submittals are reviewed and evaluated for chemical constituents and characteristics. Persons submitting the waste may be contacted for additional information to aid EHS in proper disposal.
5. Departmental pickup schedules: (note: not all departments participate in scheduled pickups.)

Department	Pickup Schedule
Chemistry and Biochemistry	Weekly
Art	Weekly

6. To submit a pick-up request for Lab Waste, please use the online Lab Waste Pickup Request on the EHS website.
7. EHS personnel will inspect containers prior to removal from a laboratory ensuring they are sealed, in good condition, and compatible with contents.
8. Once the Lab Waste is collected from the laboratories, EHS personnel will:
 - Collect, sort, segregate, and place waste in containers for transport off campus (drums or boxes), consistent with compatibility concerns and in accordance with the Department of Transportation requirements for hazardous materials transportation.

- The Lab Waste is delivered to the Central Accumulation Area for storage, packaging, or consolidation and transfer off-site.
- Upon delivery, a waste determination is performed on all waste (must be performed within 4 days) and is segregated according to chemical compatibility, hazard, and anticipated processing.
- The waste is then bulked or consolidated and transported off-site for final disposal.

It is the responsibility of the Principal Investigator, area supervisor, manager, or other designated personnel to ensure the chemical constituents of the Lab Waste are identified correctly and listed in accordance with the University's waste collection procedure.

8. Laboratory Worker Training

Laboratory workers (see definition in Section 2) must complete the "Laboratory Waste Management" on-line training course at the time they begin work in the laboratory and every two years thereafter. Training records will be maintained by EHS. Training for lab workers must be commensurate with their duties so they understand the requirements in this policy and can implement them. Online training modules will be offered by EHS through Canvas.

Some departments on campus offer training seminars on Lab Safety and Waste Management. **Laboratory personnel who attend a departmental Laboratory Safety Seminar which includes training on Lab Waste will be deemed as receiving the required training.** This will be documented using the seminar training roster.

Supervisors or Principal Investigators are responsible for ensuring that all lab personnel receive the appropriate training before the commencement of work activities and when job duties change.

All personnel should review their job duties, general training information, and speak with their supervisor regarding the training that is needed to work safely within their department.

9. EHS Professional Training

Persons working in the EHS Waste Program are required to receive training specific to hazardous waste activities and will receive appropriate supplemental training for any additional duties such as emergency services, hazardous materials transportation, and other areas related to waste management. The training program is administered and

reviewed by the Environmental Affairs Manager or their designee and may be adjusted to meet the changing needs of personnel and programs.

10. Laboratory Clean Out Procedures

Laboratory cleanout exemptions are allowed for each lab once per 12 month period with limited requirements. The process is as follows:

- The laboratory will contact EHS to schedule the clean out.
- Laboratory personnel will submit all Lab Waste using a Lab Waste Pickup Request form writing “LAB CLEANOUT” on the top of the form. EHS will separately maintain the paperwork for this material from normal pickup requests. The material list will include the laboratory room number, beginning and end dates for the cleanout, and a list of materials removed from the lab. The material list will include chemical names (and concentrations if applicable) and the quantities.
- If the volume of Lab Waste exceeds 55 gallons (or 1qt/1kg of acutely hazardous lab waste), then the lab is not required to remove all waste within 10 days from the accumulation start date. Instead, the lab must remove the Lab Waste within 30 calendar days from the start of the lab cleanout.
- For the purposes of on-site accumulation, the University is not required to count a hazardous waste that is an unused commercial product generated solely during the lab cleanout toward our waste generator category.
- A Lab Waste that is generated prior to the start of the lab cleanout and is still in the lab at the beginning of the lab cleanout must be counted toward the hazardous waste generator category.
- EHS must document the activities of the lab cleanout. The documentation must identify the lab being cleaned out, the date the lab cleanout begins and ends, and the volume of hazardous waste generated during the cleanout.
- EHS will schedule the laboratory cleanout with the PI or designee.
- The documentation records must be maintained for a minimum of 3 years from the date the lab cleanout ends.
- For lab cleanouts conducted during the same 12-month period, the University is subject to all applicable requirements of Subpart K.
- EHS personnel will collect and transport the laboratory cleanout materials to the central accumulation area at the Chemical Safety Facility for final packaging and shipment. It will be packaged separately from routine material for tracking purposes. Lab cleanout material should also be noted on the shipping documents as a way to keep weights separate.

11. Emergency Preparedness

In **EMERGENCY** situations requiring POLICE, FIRE DEPARTMENT, or AMBULANCE services, **CALL UNCG POLICE at 336-334-4444**.

In the event of a chemical spill, release or other accident, UNCG employees will adhere to the procedures outlined in the HazMat response procedures on the UNCG Emergency Management website <http://emg.uncg.edu/>.

Small spills (< 1 L) shall be cleaned immediately by laboratory personnel and/or the lab supervisor. EH&S HAZMAT Response personnel are available at any hour for consultation or assistance with spill clean-up. EH&S HAZMAT Response personnel can be reached at 336-334-4357 or after-hours via campus police at 336-334-4444.

Large spills (> 1 L) or spills of particularly hazardous substances must be reported to the lab supervisor immediately. Spills may be cleaned by trained lab personnel or by contacting EH&S HAZMAT Response personnel for assistance. An incident report must be submitted to the EH&S Department upon the conclusion of the event.

Notify the EH&S Department immediately of any release of:

- Chemicals to the sanitary or storm sewer;
- Hazardous chemical fumes or vapors to unrestricted areas of the building;
- Select carcinogens, reproductive toxins, or highly toxic materials to the environment without appropriate filtration.

Reporting

Incident reports for large spills, releases, and incidents resulting in injury or exposure to personnel must be sent to the EH&S Department as soon as feasible. Personnel are also encouraged to report near misses and other concerns, which can be made anonymously. Reports can be submitted by:

- Calling EH&S at 336-334-4357
- E-mailing the Laboratory Safety Manager (staff directory at <https://safety.uncg.edu/>)
- Submitting a Spartan Safety Concern (link at <https://safety.uncg.edu/>)