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| **Title:** Laboratory Waste Management Plan  **Document #:** EHS-0023 **Issued:** 1/16/2018  **Approved By:** Director EHS **Version:** 1 |

# Purpose

The purpose of this Laboratory Waste Management Plan (LWMP) is to outline the requirements for the management and disposal of materials by all laboratory and research personnel that must be followed in accordance with The Pennsylvania State University’s requirements under the Resource Conservation and Recovery Act (RCRA). As a steward for environmental resources, Penn State adheres strictly to the regulations set forth by the Environmental Protection Agency (EPA) and Pennsylvania Department of Environmental Protection. Penn State’s Environmental Health and Safety (EHS) department interprets and implements these regulations for the many different programs and operations on all of its campuses.

In 2017, updates to RCRA under the Generator Improvements Rule required better identification of hazards for waste and unwanted materials. These improvements necessitated change to Penn State’s waste management program, specifically for university laboratories. To minimize effects on our waste generators, university laboratories will now follow the 40 CFR 262.200-216 Subpart K, Academic Laboratories Rule, referred to as Subpart K throughout this document. Under Subpart K, waste generators in university laboratories will be held to different container labeling, accumulation time limit, and training requirements in laboratory satellite accumulation areas.

# Scope

The EPA defines an eligible academic entity as:

*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.*

As Penn State meets this definition, it can manage its laboratory materials under Subpart K. The following LWMP applies to laboratories as defined by the EPA. This does not include other operations that do not directly support research activities. Generators of waste that are not academic laboratories will continue to follow the regulations of 40 CFR 262 pursuant to their generator status and the University’s Hazardous Waste Program.

## Applicability of LWMP

The following are considered laboratories under Subpart K: teaching and research labs, art studios, photo labs, field labs, diagnostic labs in teaching hospitals, and areas that support labs (e.g., chemical stockrooms, prep rooms). The areas that do not fall under Subpart K which will continue to follow the regulations of 40 CFR 262 pursuant to their generator status are: chemical stockrooms that do not support labs, vehicle maintenance areas, custodial storage rooms, machine shops, print shops, service and stores trade shops, commercial photo processing, power plants, dining establishments, and sport/recreational facilities.

This LWMP has been developed in accordance with the Subpart K requirements. It defines the management of all regulated waste materials generated in laboratories (educational and research) and art studios or workshops within the premises of all Penn State locations and EPA ID numbers. A revised U.S. EPA Notification Form was submitted to the EPA notifying those agencies that Penn State had elected coverage under Subpart K for the University locations that have eligible areas.

# Responsibility

Budget Executive and Budget Administrator – has the primary responsibility to maintain a safe work environment within his/her jurisdiction, by monitoring and exercising control over his/her assigned areas.

Generator – responsible for following all aspects of this LWMP. They must provide information on wastes that are generated to EHS or their designate to ensure a proper waste determination can be performed. They are required to complete a chemical waste pickup request in the EHS Waste Management System to initiate the waste pickup process.

Safety Officer – assist with the implementation of the LWMP and serve as a resource to ensure all generators follow the LWMP. Serve as liaison for EHS if more information is needed to safely pick up waste or complete the waste determination.

Trained professional / Waste Vendor – responsible to ensure unwanted materials are picked up from generating locations and transported properly to the Central Accumulation Area (CAA). At the CAA, they perform the waste determination of all materials and ensure they are labeled and stored properly. They ensure all materials are packaged and labeled properly for off-site shipments.

EHS – responsible for managing the University’s hazardous waste program, including all areas covered under the LWMP. EHS will periodically evaluate for compliance and serves as main point of contact for all regulatory inspections.

# Definitions

*Central Accumulation Area* – Penn State’s onsite 90-day accumulation facility for all waste on the University Park campus as defined in 40 CFR 262.34.

*College / University* – 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. The Pennsylvania State University meets this definition.

*Eligible Academic Entity* – 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.

*EHS Waste Management System* – web based software managed by EHS that allows generators to submit requests for chemical unwanted material disposal.

*Environmental Health and Safety (EHS)* – Penn State Environmental Health and Safety department

*Generator* – Any laboratory worker, researcher, or Principal Investigator (PI) who in the course of their operations generates unwanted material to be collected by EHS.

*Laboratory* – 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 or research.

*Laboratory Cleanout* – the removal of the inventory of chemicals and other materials in a laboratory that are no longer needed or that have expired, outside the course of a regularly scheduled removal of material.

*Laboratory Worker* – See “Generator”.

*Reactive Acutely Hazardous Unwanted Material* – an unwanted material that is one of the acutely hazardous commercial chemical products listed in 261.33(e) for reactivity.

*Trained Professional* – 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 conditionally exempt 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* – any material from a laboratory that is no longer needed or used in the laboratory.

*Waste Vendor* – A RCRA trained professional contracted by Penn State to collect, manage, and dispose of the University’s unwanted materials to meet all necessary regulatory standards.

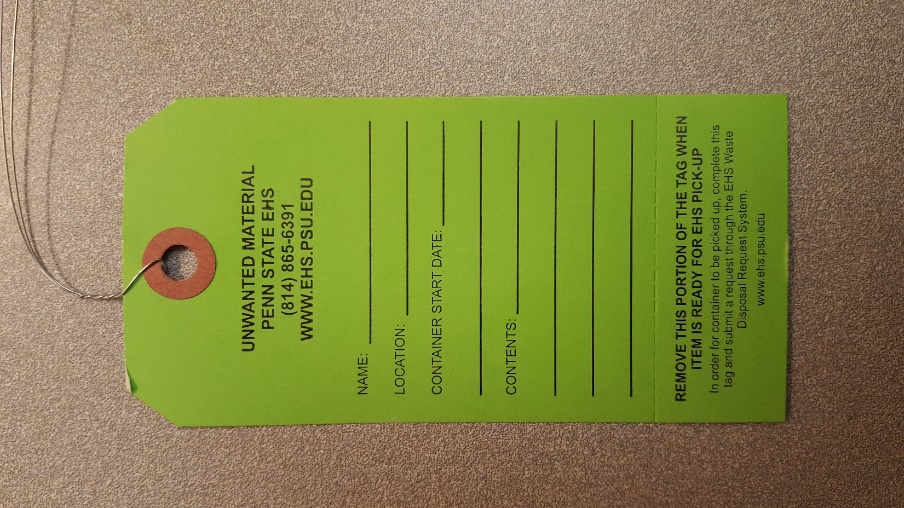
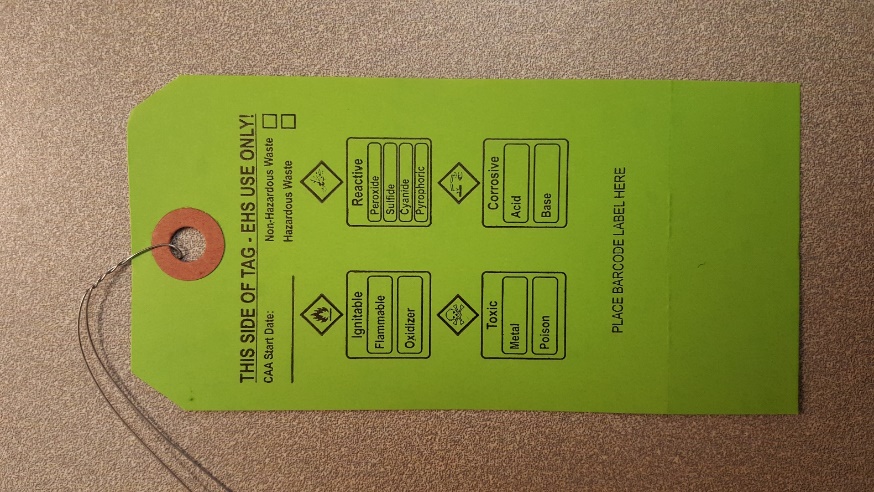
*Working Container* – A small container used by a laboratory worker in the course of their research to collect unwanted material from a laboratory experiment or procedure.

# Laboratory Waste Management Plan Program – Part I

## Container Labeling

All waste containers must be labeled at the point and time of generation, meaning as soon as the first volume of waste goes into the container. Penn State will consider all materials that are no longer wanted or used for research that are ready to be collected for disposal as unwanted materials, and will refer to them as such. These unwanted materials will be labeled with an EHS provided waste tag. This waste tag must be attached to all waste containers in academic laboratories. **It is the responsibility of the generator to ensure all containers are properly labelled.** The following figure illustrates the EHS waste tag for academic lab use.

**Figure 1: EHS Waste Tag Front and Back**



As a compulsory requirement under 40 CFR 262.206, the waste tag includes the term “Unwanted Material” to make it clear that this material is considered waste and no longer to be used for its original purpose in the lab.

### Waste Tag

The generator is responsible for accurately labeling their unwanted material. The generator must include their name, the location of the waste including Building Name and Room Number, the container start date (the date the first volume of unwanted material was added to the container), and the contents of the container. If unable to fit the contents onto one tag, please attach an additional tag or paper that continues listing the remainder of the contents. These contents must be accurate as they are an indication of the hazard of the contents of the material and necessary in order to make a proper waste determination.

### Additional Information

Any additional information that may not fit onto the waste label must be attached to the tag using an additional tag or attachment, and must be included in the waste pickup request submitted into the EHS Waste Management System. This includes any additional notes on the contents of the container.

### Labeling Unused or Expired Products

A waste tag must be used on all unwanted lab materials, including expired and unused product, unless generated during a lab cleanout. Due to the large volume of laboratory waste received, EHS requires confirmation from the generator that the material in the bottle is the same as that listed on the original label.

## Accumulation Time Limit

All containers of unwanted material will be removed from the laboratory within 12 months of the container’s accumulation start date. **The generator is responsible for notifying EHS with at least one month’s notice in order to collect the unwanted materials from the laboratory space before the 12 month time limit expires.** The generator is expected to monitor and document this accumulation time limit through their satellite accumulation area (SAA) weekly inspection form (found on the EHS website), and notify EHS when the waste is within one month of reaching the time limit. The generator can notify EHS by submitting a request for waste disposal through the EHS Waste Management System. This information will be verified on the EHS laboratory and research safety self-inspection (found on the EHS website), and confirmed during Laboratory and Research Safety Inspections.

## Quantity Limit

Should the volume of waste in a laboratory’s SAA exceed 55 gallons of unwanted material and/or 1 quart of the reactive acutely hazardous materials listed below, the unwanted material must be removed within 10 calendar days of the date that the limit was exceeded, regardless of accumulation time limit. Generators must mark the corresponding date for when the quantity limit was exceeded on the containers and notify EHS immediately.

The generator is expected to monitor this accumulation quantity limit through their SAA weekly inspection form**,** and notify EHS when the waste is within 10 gallons of reaching the quantity limit. This information will be verified on the EHS laboratory and research safety self-inspection, and confirmed during Laboratory and Research Safety Inspections.

Should generators decide to dispose of the following six reactively acutely hazardous unwanted materials, EHS must be notified immediately, as there is a 10 day period for removal should 1 quart of the waste be exceeded:

* P006 – Aluminum phosphide (CAS 20859-73-8)
* P009 – Ammonium picrate (CAS 131-74-8)
* P065 – Mercury fulminate (CAS 628-86-4)
* P081 – Nitrogylcerine (CAS 55-63-0)
* P112 – Tetranitromethane (CAS 509-14-8)
* P122 – Zinc Phosphide (>10%) (CAS 1314-84-7)

# Laboratory Waste Management Plan Program – Part II

The following section outlines the best management practices required of all academic laboratories that fall under Subpart K. The responsibilities outlined in this section fall upon the personnel of the laboratories to uphold, with EHS offering support as necessary. EHS will provide oversight and guidance through inspections, audits, and documentation to ensure labs are following best practices in management of their unwanted materials.

## Satellite Accumulation Area Signage

A satellite accumulation area sign must be posted in the vicinity of the satellite accumulation area. This sign contains information on storage and spill response requirements. Sign templates can be downloaded from the EHS website.

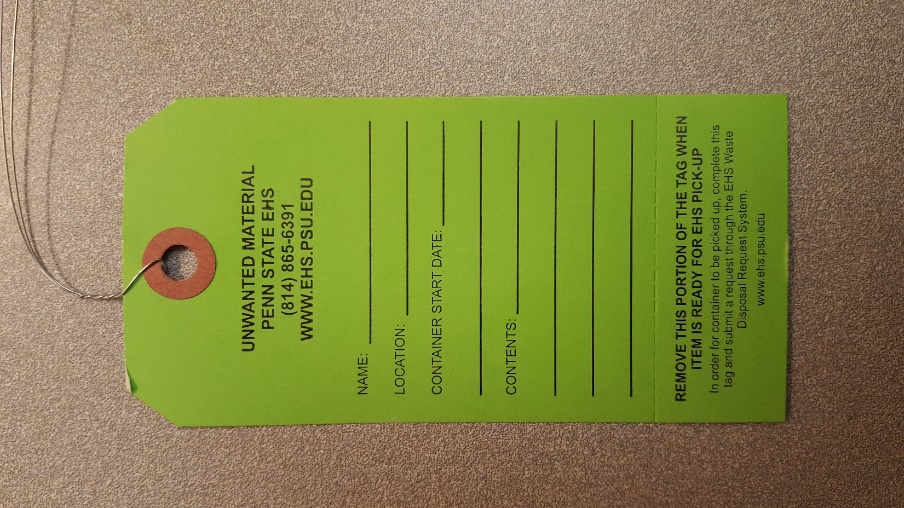
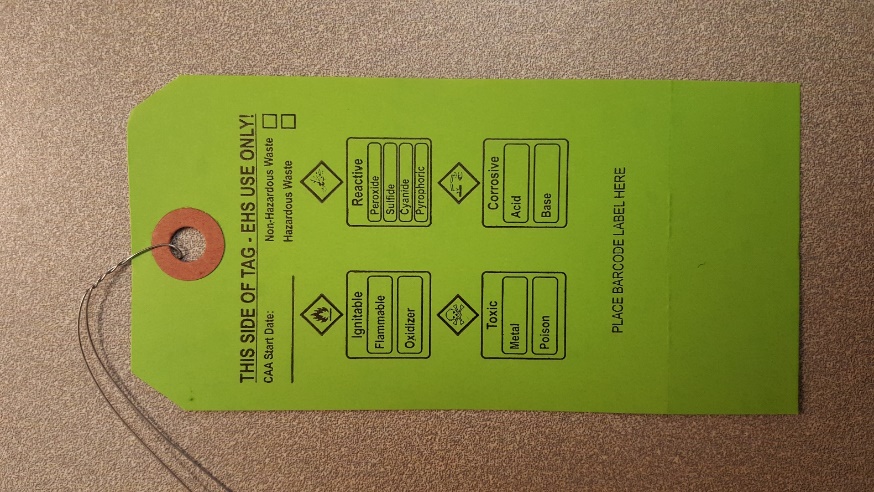
## Container Labeling and Management

As described in Section 5, Laboratory Waste Management Plan Program – Part I, of this LWMP, Penn State requires the use of an EHS waste tag on all containers of unwanted materials. It is the responsibility of the generator to properly manage their laboratory unwanted materials to meet the requirements of 40 CFR 262.206.

To obtain more waste tags, please contact the EHS office at (814) 865-6391 or by using the “Contact Us” form on the EHS website at www.ehs.psu.edu. Waste tags can also be requested in the notes section of the EHS Waste Management System.

## Waste Tag Labeling

Instructions for filling out the label are as follows:



*FRONT:*

**Name**: Fill out the name of the person generating the waste.

**Location:** Include Building name and room number at minimum. If your lab has additional information, i.e., bench number, hood number, etc., please include that information in this section.

**Container Start Date:** The date the first volume of waste was added to the container.

**Contents:** The chemical composition of all of the waste in the container. This should include percent composition for mixtures. If all of the information regarding the chemical contents cannot fit onto the EHS waste label, it should be included on an additional tag or attachment, and on the EHS waste pickup request form so the information is associated with the waste container.

**“Remove this portion of the tag when item is ready for EHS Pick-up”:** When a pick up request has been submitted into the EHS Waste Management System, please remove the tear-off portion of the tag so it is clear which containers need to be removed from the SAA.

*BACK:*

Generators do not fill out the back of the waste tag. The back portion of this tag is to be completed by a trained professional at EHS or the waste vendor **ONLY**.

### Management of Containers

#### Condition of Containers and Working Containers

Waste must only be stored in compatible containers that are in good condition. Good condition includes, but is not limited to, no excess rust, no dents, and no waste on the outside of container. The generator must ensure that all containers in the SAA are closed properly, not leaking, and being stored in/on proper containment. Any leaking containers must be replaced immediately, and the container must be disposed of properly. Working containers must be closed at all times unless waste is being added or removed, except when venting is a necessity, or for the proper operation of lab equipment, such as with in-line collection of unwanted materials from high performance liquid chromatographs.

#### Secondary Containment

Secondary containment is required for the storage of all unwanted materials in the SAA. Secondary containment is necessary to reduce and prevent leaks or spills, mixing of incompatible substances, and damage to materials. Containers should be separated into different secondary containment based on compatibility. Container compatibility is discussed in detail in the Laboratory and Research Safety Plan and should be referenced as necessary. Should additional secondary containment be needed, EHS can provide it.

#### Weekly Satellite Accumulation Area Inspection

Container condition, secondary containment, proper storage, and accumulation time and volume limits will be verified by the generator in their weekly inspection of the SAA. Any discrepancies or issues must be addressed and corrected immediately.

## Training for Generators

Training for generators must be commensurate with their duties. Generators such as lab workers, technicians, faculty, students, and staff must comprehend the training and be able to apply it to the scope of their work in the laboratory. All generators must complete the EHS Laboratory and Research Safety Training (Initial), as well as the annual refresher training.

### Training Availability

Laboratory and Research Safety Training (Initial) is a combination of both online and classroom training. Classroom training is provided by trained professionals, and attendees are tracked through an attendance sign-in sheet. Refresher training must be completed annually for those who continue working in a laboratory. This training is completed online and tracked through EHS online course management system.

## Training Requirements for Trained Professionals

Required training for trained professionals will be provided through in person and online training to meet the RCRA training requirements for 40 CFR 262.34(a) and 262.17 for large quantity generators.

## Removing Unwanted Materials from the Laboratory

The primary method of removal of unwanted material will be based on the 12 month accumulation time limit outlined in 40 CFR 262 208(a)(2), where unwanted materials are removed from each laboratory within 12 months of each container’s accumulation start date. EHS picks up material on a regular schedule from labs on campus, which gives laboratories multiple opportunities to submit their unwanted material for removal before reaching the accumulation or quantity limit. This regular pickup schedule is available on the EHS website. Should unwanted material in a SAA approach the time limit, lab personnel should notify EHS within one month from the date of the accumulation time limit. Lab personnel should be verifying these dates on their SAA weekly inspection form to ensure materials will not exceed the accumulation limits.

### Exceeding Quantity Limit

EHS should be notified immediately when the generator exceeds the accumulation quantity limit. Generators should be aware of the volume accumulating in their waste area by completing their SAA weekly inspection and alerting EHS personnel when the volume limit is over 55 gallons of waste and when beginning to accumulate reactively acutely hazardous unwanted materials.

Should a quantity limit be reached, EHS must remove the unwanted material within 10 days of exceeding accumulation limits. Materials must be labeled with the date when the volume exceeded the maximum limit. The containers must be monitored to ensure that they will be removed within this 10 day period. EHS must be notified immediately in order to arrange a date for a prioritized pickup by a trained professional. The trained professional will pick up the material, take it to the CAA, and make the hazardous waste determination.

## Hazardous Waste Determinations

EHS is responsible for making accurate hazardous waste determinations. These determinations are done by trained professionals at EHS and through the University’s contracted waste vendor using information provided by the waste generators. This vendor works with EHS to coordinate timely waste pickups and transfer that material to the CAA where the waste determination will be made according to the University’s waste determination process. This determination will be made within 4 calendar days of the material arriving at the CAA, and will be labeled in accordance with 40 CFR 262.211 for University Park locations (PAD003403953). For all other EPA ID numbers and locations, the waste determination will be made prior to the removal of material from the laboratory.

## Laboratory Cleanouts

Laboratory cleanouts are done periodically as necessitated by lab closure, building remodel, etc., and will be coordinated with EHS personnel. These cleanouts are not mandatory, and a cleanout amount in excess of 55 gallons (or 1 quart of liquid acutely hazardous unwanted material), can only be performed one time per 12 month period per laboratory. Should this level of cleanout occur, Penn State will have 30 calendar days to remove unwanted materials from the laboratory from the start of the cleanout.

The laboratory or department is responsible for providing a full chemical inventory for the cleanout to be submitted through the EHS Cleanout Tracking Form. Only EHS approved cleanouts can be submitted through the tracking form in place of using the EHS Waste Management System. These must be discussed with EHS personnel prior to the cleanout. EHS will evaluate the inventory and determine the schedule for removal of the unwanted materials.

## Emergency Prevention

The following signs and labels are required for **all** laboratories in University facilities:

* A Laboratory Information Door Sign shall be posted outside all laboratories, either on the outside of the door or on the wall beside the door. This sign provides information on specific hazards in the lab and telephone numbers of responsible faculty and staff. The information shall be updated as necessary.
* A Laboratory Emergency Contact Information sign shall be posted in a prominent location inside the lab, near the door or telephone. This sign provides emergency numbers in case of an emergency.

### Chemical Inventory

University Safety Policy SY39 – Hazardous Chemical Inventory Management – requires that all work areas maintain a chemical inventory in the Chemical Inventory Management System (CHIMS).

Regular use and required annual updates of the chemical inventory is an essential part of Penn State's efforts to comply with various regulations (e.g., Department of Homeland Security, Uniform Fire/Building Code, Emergency Planning and Community Right-to-Know, etc.) as well as to provide critical information to emergency responders entering an area where hazardous chemicals are present.

Work areas are also required to maintain a hard copy of their CHIMS chemical inventory in the Laboratory Research and Safety Plan binder.

### Chemical Hazards

It is the responsibility of the generator to verify the condition of the chemical containers in the laboratory. They should review these containers as part of their inspections and assess them periodically. Any containers in poor condition, that are expired or about to expire, should be submitted for disposal as unwanted materials before further risk develops. Unknown materials should also be submitted to EHS for appropriate testing prior to disposal.

## Availability of Laboratory Waste Management Plan

This plan is available to generators, staff, and faculty, and any others at the University as requested. The plan is posted on the EHS website and updated with revisions as needed.