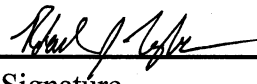


SUBJECT: Laboratory Environmental Management Procedure	Effective Date: 11/14/2014	Procedure Number: emp03-01	
	Supersedes: EMS-WP-001, 1/10, 3/09, 6/05, 10/02, 1/12	Page 1	Of 13
	Responsible Authority: Environmental Management Coordinator 		
	Signature	11/14/2014 Date	

APPLICABILITY/ACCOUNTABILITY:

The following procedures are applicable to all laboratory personnel working with hazardous materials. The laboratories covered under this procedure include, but are not limited to, those in departments, research centers or occupants within leased space who are in:

College of Education and Human Performance
College of Engineering: CECS, EECS, FSI, IEMS, MAE, MSE, SWMA
College of Health and Public Affairs
College of Medicine: BSBS, Molecular Biology and Microbiology, Pegasus Health
College of Nursing
College of Optics and Photonics: CREOL, FPCE, TLI
College of Science: Anthropology, Biology, Chemistry, NCFS, Physics
Office of Research and Commercialization: AMPAC, FSEC, NSTC, BIP, ISTEf, UCF Business Incubation Program

In accordance with University of Central Florida Policy (UCF) FSP EHS0002, UCF Environmental Health and Safety (EHS) is the designated authority for implementing health and safety regulations at UCF. To align with this Policy and ensure campus safety and health UCF EHS requires that laboratory personnel be accountable for controlling environmental and safety aspects during research and teaching activities. The Department of Environmental Health and Safety is the designated office in charge of ensuring compliance and administration of this procedure.

PROCEDURE STATEMENT:

The University of Central Florida has assessed the potential environmental impacts related to chemical use in research and academic laboratories. This procedure has been established to minimize these impacts and to ensure laboratory operations are in compliance with applicable

environmental laws, rules, and regulations. The Environmental Management Coordinator shall be the interface with regulatory agencies pertaining to this procedure.

DEFINITIONS:

Environmental Health and Safety Assistant (EHSA): The integrated web-based software system that manages EHS related data from laboratory identification, space assignment, principal investigator chemical use permits, laboratory hazard analysis tools, chemical inventory, laboratory worker identification and training records, and inspection results and history.

In-line Waste Collection: Any system that accumulates laboratory wastes automatically, periodically or continuously, and is associated with a chemical or instrumental operation in a laboratory.

Laboratory Manager: Person assigned by a department or individual Principal Investigator as the point of contact for departmental or individual laboratory issues.

Laboratory Personnel: Faculty, staff, students (i.e., teaching assistants, research assistants, and laboratory assistants), contractors, and visitors performing duties or tasks physically situated in a UCF laboratory facility.

Non-regulated laboratory waste: Wastes that do not meet the definition of RCRA waste but are still considered toxic or environmentally unfriendly.

Occupant: Includes UCF Departments, research centers and entities and/or UCF affiliated and non-affiliated tenants and/or lessees.

Principal Investigator (PI): Person assigned as point of contact for departmental or individual laboratory space.

RCRA hazardous waste: Waste that meets the definitions of listed or characteristic hazardous wastes per the Resource Conservation and Recovery Act (RCRA).

Satellite Accumulation Areas (SAA): Areas in individual laboratories where waste is collected for removal to the main accumulation area at Building 48. Wastes must stay in the area (laboratory) where they have been generated, be under control of the operator of the process which generated the waste, and contain no more than 55 gallons of hazardous waste or 1 quart of acutely hazardous waste.

Shared laboratory space: A room used for multiple research or academic interests, which is under the control of multiple principal investigators.

PROCEDURES:

1. Identification of Laboratory Activities and Responsibility

Each occupant covered under by this document is responsible for updating the Laboratory Identification form to notify EHS when chemical laboratory room use or space assignments to specific PI's changes. Tenants occupying UCF leased laboratory spaces shall complete the emp03-f02 Environmental Aspect Assessment of Leased Space form.

Information in the Laboratory Identification form includes occupant name, name of chair or director, name of laboratory manager, name of central purchasing agent, lab number, assigned principal investigator(s), and type of activities. Information in the Environmental Aspect Assessment of Leased Space form includes occupant name, location, contact name, emergency contact name, type of activities and an environmental impact assessment.

Updates must be reported 30 days prior to changes in chemical, biological, or radiological hazards, significant renovations or a reassignment of space between departments or PI's occurs.

Laboratory Manager Appointment: Each occupant shall assign a departmental laboratory manager or require principal investigators to assign a dedicated laboratory manager for their individual lab(s). Chairs or PI's shall assign roles under their permit in EHSA.

The Lab Manager will serve as point of contact for laboratory issues and attend the additional EHS training classes as outlined in Training Requirements for Potentially Hazardous Activities.

2. Laboratory Close-Out

Each area is responsible for following guidelines in Laboratory Close-out Procedures whenever an occupant permanently leaves an assigned lab as a result of graduation, resignation, termination, transfer, end of term lease, or in the event of a lab move or renovation.

3. Hazardous Materials Procurement Methods

Each UCF department should identify a centralized purchasing agent. The name of this individual should be listed on the Laboratory Identification form.

Procurement cards are not to be used for hazardous material purchases per University policy 3-107.

Chemicals should be ordered in the smallest possible quantities to reduce waste disposal costs and minimize storage concerns in labs.

Whenever possible, less toxic alternatives should be purchased. Purchases of thermometers, sphygmomanometers, manometers, and barometers must be non-mercury containing unless required by individual research methods.

Donations of chemicals or equipment containing chemicals must be reported and approved by EHS prior to accepting the materials.

4. Hazard Communication and Inventory Requirements

No container shall be accepted by the purchaser without an adequate identifying label. Labels on chemical containers must state the chemical name, the manufacturer name, and hazard information.

Chemical manufacturers are required to send a Safety Data Sheet (SDS) when a chemical shipment is ordered. Departments are required to keep a hard-copy or electronic version of all SDSs in their chemical inventory.

All laboratories are required to maintain their chemical inventory on the University online chemical inventory database in accordance with the Chemical Inventory Procedures. This includes a requirement for the laboratory to perform a review for expired, unwanted, and unlabeled chemicals at least annually. Occupants within leased space on UCF property shall maintain a chemical inventory in general accordance with the Chemical Inventory Policy. Please contact the UCF Chemical Safety Coordinator for the inventory format.

Unknown chemicals and expired chemicals must be disposed of through EHS. Unwanted, usable chemicals should be processed through the chemical redistribution system. Occupants of leased space on UCF property must dispose of waste in accordance with Section 10 of this document.

5. Waste Determination

Initial waste determinations should be performed on all waste streams to determine whether they need to be managed as regulated hazardous waste and to provide guidance on segregation of waste storage. Laboratory personnel are responsible for identifying all components of the waste stream and performing initial waste determination.

Waste determination should be performed using institutional knowledge of the process, Safety Data Sheets, the Waste Determination Flowchart, or other reference materials. EHS recommends documentation of this waste determination.

EHS is responsible for assisting UCF laboratory personnel with waste determinations.

6. In-Laboratory Waste Storage Area Requirements

Hazardous waste must remain at or near the point of generation. Individual labs must designate an area in each laboratory space where chemical wastes are being generated for storage of waste. This space is called the Satellite Accumulation Area (SAA).

Laboratories with SAA's must be locked when personnel are not present.

SAA's must have containment trays that can be used to segregate the hazard classes and contain potential spills. Containment trays shall be able to hold at least 110% volume of the single largest container.

Avoid locating SAA's in fume hoods to minimize loss of usable fume hoods space and the potential for decreased hood effectiveness. Avoid locating SAA's near laboratory exits.

It is forbidden to move hazardous waste from one SAA to another SAA. Once waste leaves an SAA it must come to the EHS 90 day storage area.

7. SAA Storage Limits

Each lab may temporarily hold a total of 208 liters (55 gallons) of individual waste streams with the exception of RCRA acutely hazardous (p-listed) waste. Quantities of unused p-listed waste are limited to 1 quart or 2.2 pounds.

When 55 gallons have been collected or the p-listed quantity has been exceeded the waste must be transferred from the lab to the EHS storage area within 72 hours or be disposed of properly off-site in accordance with Section 10.

Fire Code storage limits of hazardous materials are typically much less than 55 gallons. EHS recommends that labs request waste collection when individual containers are full.

8. Hazardous/Non-Hazardous Waste Container Labeling

Chemical (non-oil) laboratory waste must be labeled with a hazardous waste or non-RCRA regulated waste label. The label must include the word "waste" and the chemical name of all hazardous constituents with estimated percentages in the mixture. Do not use chemical formulas as the chemical name.

Oil should be labeled as "used" rather than "waste".

If the container is too small to hold a label the container shall be placed into a larger container (for example, a larger bottle or plastic bag) then the label shall be placed on the outer secondary container.

If the label is too small to hold the list of components additional labels may be added or laboratory personnel may maintain a log of wastes added to the container. All waste components must be listed on the label as soon as they are added to the container. When the waste container is full the percentages shall be transferred from the log to the label.

Printed labels can be obtained from EHS. Occupants may use their own labels; however they must be approved by EHS.

9. Hazardous Waste Container Requirements

Chemical waste must be in a sealed container that shows no sign of leakage or damage. Spills and residues on the outside of the container must be cleaned up immediately.

Containers sealed with broken or loose caps, stoppers, films, or are otherwise unsealed are prohibited.

Containers must not be overfilled to account for expansion. Fill large containers to within 3 to 5 inches of the mouth of the bottle.

Choose container materials that are compatible with your waste stream. Corrosive materials and halogenated solvents must be in glass or plastic containers. Do not use food or beverage containers for hazardous waste collection.

Halogenated solvent waste must be collected and stored in separate containers from non-halogenated solvent waste.

Waste containers must be securely closed at all times except when wastes are being added to or removed from the container. In-line waste collection containers must be kept closed at all times. If there is a risk of pressurization of the container leave the cap loosely closed and place the container in a fume hood until the reaction is complete. Do not tightly seal the container or relocate waste to the SAA until the reaction is complete.

It is the occupant, individual department or research unit's responsibility to provide waste collection containers. EHS does not stock empty containers for SAA waste collection. Most containers, with the exception of 5-gallon carboys, will not be returned.

In-line waste collection systems must be constructed to prevent the release of laboratory waste into the environment. These systems must provide sealed containment of the waste as it is being collected.

10. Disposal of Waste from the Laboratory

Waste is ready to be removed from the laboratory when the containers are either full, the lab has reached its waste accumulation limits, or the laboratory requests removal.

Check the container for leaks or drips. Make sure the container is completely sealed.

Check to make sure the waste label is accurate and complete.

Go on-line to EHSA (www.ehs.ucf.edu) and enter the waste pickup request details by clicking on the "To Make a Chemical or Radioactive Waste Pickup Request, Click Here" link. It is not necessary to log in.

UCF EHS has authorization from the FDEP to manage Conditionally Exempt Small Quantity Generator waste from specific locations. These areas must follow CESQG Waste Acceptance Procedures. If you are unsure if UCF EHS is authorized to pick up your waste please contact EHS. Businesses occupying leased space on UCF property must dispose of waste in accordance with the Hazardous Waste Management Agreement or must obtain an EPA ID and train, ship and dispose of waste in accordance with all applicable Federal, State and local regulations. Businesses disposing of their waste through EHS will be responsible for removal and disposal cost. The cost list is in the Hazardous Waste Management Agreement. Occupants who choose to manage their own waste must copy EHS on all training, transportation and disposal records.

If your lab is located on UCF Main Campus and certain Research Park Facilities, EHS will pick up your waste based on a set schedule. Off-site locations will have waste collected directly from the laboratory by the UCF hazardous waste vendor within six months of request.

11. Disposal of Unknown Chemicals and Gas Cylinders

Containers with unidentified contents present potential hazards and are expensive to dispose of. Departments should not allow students/staff to vacate a laboratory without first identifying all containers. Follow the Laboratory Close-Out Procedures to avoid future accumulation of unknown materials.

EHS will collect unknowns only during scheduled campus pick-ups by our hazardous waste contractors. If unknowns are listed on the online request you will be notified when the contractor will be on campus.

When labeling unknowns for disposal, use a hazardous waste label and state “awaiting waste determination” along with as much information you have about the process or chemical as possible.

Contact the gas cylinder vendor or manufacturer for removal and disposal. If the vendor cannot be identified, or if the vendor will not accept the cylinder for disposal, create an EHS waste pickup request. EHS will collect gas cylinders during scheduled campus pick-ups by our hazardous waste contractors.

12. Empty Containers

Unless a container has held an acutely hazardous (p-listed) waste, the container is considered “RCRA empty” and not a regulated hazardous waste if:

All wastes that can be removed have been removed using conventional methods (pouring, pumping, e.g.) and

No more than 2.5 centimeters remain on the bottom of the container or

No more than 3 percent of the capacity of a container equal to or less than 119 gallons remain or

No more than 0.3 percent of the capacities of a container greater than 119 gallons remain

Containers with acutely hazardous (p-listed) residues must be labeled with a hazardous waste label reading "Container contaminated with _____" (state name of highly toxic residue) and disposed of following hazardous waste disposal procedures.

Containers considered RCRA empty, but which still contain some free material, should not be recycled. This can present a hazard to recycling workers, and the receiving facility doesn't want containers still holding hazardous materials. These containers should be managed by EHS as hazardous waste. An example of a container which would fall into this category is a metal solvent can, which is difficult to empty entirely.

If containers are completely emptied of their contents they may be sent out through recycling or the regular trash.

Laboratories managed by UCF Facilities Operations can recycle their empty containers through housekeeping by placing them in the regular recycling. They should have their labels defaced to include the chemical name and any hazard symbols, and the word "Empty" written on them.

Laboratories not managed by UCF Facilities Operations should follow the above steps, but should check with their laboratory manager for container recycling procedures specific to their location.

13. Contaminated Lab Debris

Chemically contaminated lab debris (gloves, paper towels, wipes, absorbent paper, gels, etc.) must be evaluated for proper disposal. Pipette tips are considered delivery devices and are not "containers"; they may be disposed of as solid waste. Other transfer vessels are considered containers; see section 12 for disposal guidelines.

In general, lab debris does not have to be collected as hazardous waste as long as it is not grossly contaminated with hazardous chemicals (no free liquids or solids) unless it falls into one or more of the following categories:

Contaminated spill clean-up materials.

Debris contaminated with p-listed chemicals.

Debris contaminated with greater than the regulated quantities of TCLP contaminants.

Collect debris that is either grossly contaminated or falls into one of the above categories separately from non-hazardous debris and dispose of as hazardous waste. Contain the debris in a sealed bucket, can or hazardous material bag compatible with the waste stream. Label appropriately.

14. Disposal or Transfer of Laboratory Equipment Containing, or Contaminated with, Hazardous Materials.

UCF equipment that has been used to store or handle hazardous materials must be free of hazards prior to disposal, transfer to another campus location, or transfer to Surplus property. The equipment owner is responsible for draining oil, removing hazardous components (batteries, switches), discharging capacitors, depressurizing, etc. unless the equipment is being sold for reuse and needs to remain operable. If the equipment was used to store chemicals, biological material, or radioisotopes the user shall decontaminate the equipment prior to EHS assessment. Decontamination shall be per EHS's Laboratory and Equipment Decontamination Procedures. Once decontaminated contact EHS to provide an assessment of the equipment prior to surplus or disposal per the Environmental Assessment of Equipment Prior to Surplus, Salvage or Disposal procedure.

Non-UCF owned equipment is the lessee's responsibility. If the Lessee wishes to transfer the equipment to UCF then decontamination shall be per EHS's Laboratory and Equipment Decontamination Procedures. Once decontaminated contact EHS to provide an assessment of the equipment prior to transfer, surplus or disposal per the Environmental Assessment of Equipment Prior to Surplus, Salvage or Disposal Procedure.

15. Treatment and Evaporation of Hazardous Wastes

Laboratories are allowed to adjust the pH of corrosive waste streams by neutralizing in a container for drain disposal as long as the waste does not exhibit any other hazardous waste characteristic. If a chemical is neutralized it should be tested to ensure that it falls in the allowable pH range (see page 10) before drain disposal.

Laboratories are prohibited from all other hazardous waste treatment intended to render waste non-hazardous including deliberate evaporation or dilution of hazardous waste.

16. Drain Disposal

Collect all chemical waste for disposal per Section 10. Drain disposal of laboratory chemicals is restricted in the followings cases:

More than de minimis (residual) amounts of RCRA hazardous waste from cleaning glassware or

Any amount of RCRA acutely hazardous (p-listed) hazardous waste or

Prohibited discharges set by local pollutant limits (e.g. the City of Orlando (Chapter 30

Pretreatment of Wastewater)) including, but not limited to: dyes and stains that may cause excessive discoloration; petroleum oils, fuels, lubricants, non-biodegradable cutting oil; and detergents, surface-active agents, or other substances which may cause excessive foaming.

City of Orlando (Chapter 30 Pretreatment of Wastewater), Local Pollutant Limits:

Constituent	Maximum Uniform Concentration Limit (mg/l)
Antimony	0.35
Arsenic	0.35
Beryllium	0.15
Boron	1.0
Cadmium	0.25
Chlorides	250
Chromium (Total)	0.50
Cobalt	0.65
Copper	0.75
Cyanide	0.35
Lead	0.25
Lithium	0.50
Manganese	2.50
Mercury	0.001
Molybdenum	0.25
Nickel	1.1
PH	5.5 to 10.5
Phenols (Total)	3.0
Selenium	0.20
Silver	0.12/BMP
Sodium	300
Zinc	1.40

17. Transportation

EHS or an EHS approved hazardous waste vendor will remove hazardous waste from laboratories. No laboratory workers can transport laboratory waste to another laboratory or the main accumulation area, unless authorized by EHS.

Hazardous wastes must stay in the SAA at the point of generation until collection by EHS or the approved hazardous waste vendor.

Reactive wastes unsuitable for transport will stay in the lab until the hazardous waste disposal vendor is on campus for a scheduled pick up.

Off-campus departments not approved by FDEP for EHS collection will have the opportunity to have waste collected by the UCF hazardous waste vendor on at least a bi-annual basis.

Movement of DOT regulated hazardous materials on non-contiguous University property must be done in accordance with Policy Number FSP 2012 EHS0003 Hazardous Materials Shipping, Receiving, and Transportation.

18. Chemical waste mixed with biomedical waste or radioactive waste

Do not use biohazard, biomedical, sharps, or radiation waste containers for chemical waste unless the waste displays both chemically hazardous and infectious or radioactive properties.

In the event that wastes types are mixed, label the biohazard or radiation container with a laboratory hazardous waste label. Keep the mixed waste separate from other biohazardous or radioactive materials and contact EHS for disposal information. See the Radiation Safety Manual and Biological Safety Manual for additional disposal procedures.

19. Emergency Preparedness and Response Procedures

Incidental Spills

All laboratories are supplied with a spill kit to control small spills (4L or less) of known substances that are not acutely hazardous. The spill kits contain absorbent materials that can be used on a wide range of chemicals. Laboratories with hydrofluoric acid are required to purchase spill control materials specific to hydrofluoric acid. Laboratories with mercury are required to purchase spill control materials specific to mercury. Never respond to a spill alone.

Lab Personnel are expected to respond to small (4L or less) spills of chemicals as long as:

He/she has knowledge of the chemical's physical and health hazards.

The spill does not involve highly toxic, reactive or multiple chemicals where the reaction by-products are unknown.

There has been no fire, explosion, or injury.

The clean-up procedures are known and appropriate materials are readily available.

Waste generated from spill response should be disposed of in accordance with section 10 of this document.

Emergency Spills

An Emergency Chemical Release is defined as quantities larger than four liters of hazardous materials where local fire department response is required. These spills may involve injury, fire, explosion, acutely hazardous materials, unknowns, or multiple containers, or may result in uncontrollable releases to waterways or soil.

Contact your supervisor or lab manager and evacuate the area if the spill:

- Is Larger than 4 L or

- Involves multiple chemicals where the reaction by-products are unknown or

- Involves mercury that may have spread or

- The clean-up procedures are not known or appropriate materials are not readily available.

Call 911 and evacuate the area if the spill:

- Involves injured personnel or

- Involves a highly toxic, reactive material, explosion or

- May endanger the environment

Call Work Control Center at 3-5223 after contacting appropriate emergency responders.

All spills must be reported to EHS.

20. Training

All laboratory personnel must receive initial and annual training commensurate with their job responsibilities in accordance with Training Requirements for Potentially Hazardous Activities. Specifically:

Anyone working with hazardous materials must complete the online Laboratory Safety Series and attend a Laboratory Safety Practical. Review of the online Laboratory Safety Series is required annually.

Additionally, laboratory managers must attend the annual advanced hazardous materials course.

21. Inspections and Audits

Annual laboratory audits of UCF managed labs will be performed by EHS in accordance with the Laboratory Safety Manual. Periodic inspections will be performed by EHS and Triumvirate Environmental, Inc. (TEI) during routine laboratory or SAA visits. For businesses leasing from UCF, occupants shall allow EHS and TEI personnel to perform an audit of their space to ensure compliance with this procedure. TEI will also perform chemical inventory of laboratory spaces.

When violations are identified, EHS will notify the PI or laboratory manager with a request for corrective actions to be performed. The PI or departmental laboratory manager must provide corrective actions within 30 days. Any violation not resolved within 30 days will be submitted to the department chair/director. Violations not resolved in 90 days may be reported to the University provost.

Unscheduled inspections from outside regulatory agencies may occur at any time. Departments, individual researchers and businesses are responsible for fines incurred for improper environmental management practices in their assigned lab space including failure to provide adequate training to lab workers.

Related Documents:

CESQG Acceptance Procedures
Chemical Inventory Policy
Chemical Release Procedures
Environmental Management Program
Environmental Aspect Assessment of Leased Spaces
Environmental Assessment of Equipment Prior to Surplus, Salvage or Disposal Procedure
Hazard Communication Program
Hazardous Materials Shipping, Receiving, and Transportation Policy
Hazardous Waste Management Agreement
Laboratory Close-out Procedures
Laboratory and Equipment Decontamination Procedures
Laboratory Identification Form
Laboratory Safety Manual
Possession of Prescription Drugs and Controlled Substances Procedures
Radiation Safety Manual
Training Requirements for Potentially Hazardous Activities
Waste Determination Flowchart

References:

40 CFR Parts 260-262

City of Orlando Chapter 30 Local Pollutant Limits

UCF Policy 3-107 Procurement, Use, and Possession of Hazardous Materials