

# UNIVERSITY OF TOLEDO

SUBJECT: UNIVERSAL WASTES, WASTE  
MINIMIZATION AND POLLUTION PREVENTION

Procedure No: HM-08-033

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## PROCEDURE STATEMENT

Chemicals, used materials or spent materials generated at the University of Toledo shall be collected, redistributed and/or recycled within or outside the institution, through University's current hazardous waste vendor, or other approved outside entity whenever possible.

## PURPOSE OF PROCEDURE

To minimize hazardous and other waste disposal into the environment, lower the costs of hazardous waste disposal and to comply with OEPA and USEPA pollution prevention initiatives.

## PROCEDURE

The Environmental Health and Radiation Safety Department makes scheduled chemical pick-ups throughout the institution in response to requests from individuals disposing of hazardous and other materials. Some of these materials are obviously wastes while others are still in a usable/reclaimable condition, and/or are unopened. For the purposes of this policy, the following definitions and disposition procedures will be used to differentiate between hazardous wastes, universal wastes and orphan chemicals for determining the method that best meets the institution's goal of waste disposal and/or minimization.

## DEFINITIONS

### **Hazardous Waste**

Any and all materials determined to be a hazardous waste in accordance with the EPA's Resource Conservation and Reauthorization Act, or deemed a waste by the Environmental Health and Radiation Safety Director or designee.

**Disposition:** Collected by Environmental Health and Radiation Safety and/or removed by contracted hazardous waste disposal company.

### **Orphaned/Unused Chemicals**

**Opened:** Any chemicals that have been opened, but are still in their original containers and are either expired and/or uncontaminated that may have some beneficial use.

**Disposition:** Offered to other University of Toledo labs before being inventoried as a waste. If not reclaimed stored as "waste" for later disposal. Contracted hazardous waste disposal firm may still reclaim the product if they determine it to fit their criteria.

**Unopened:** Any chemicals that are closed and/or sealed with original factory supplied tape and are either expired and/or uncontaminated that may have some beneficial use.

**Disposition:** Offered to University of Toledo labs before being inventoried and being offered for disposal

### **Universal Wastes**

These materials are those considered by the USEPA or OEPA not to be hazardous waste but as a waste stream that should be reclaimed or recycled by approved vendors. These include fluorescent bulbs and batteries.

**Disposition:** Collected by Facilities and Environmental Health and Radiation Safety and removed by contracted recycling company.

### **Universal Waste Lamps**

Is defined as the bulb or tube portion of an electric lighting device. A lamp is specifically designed to produce radiant energy, most often in the ultraviolet, visible, and infrared regions of the electromagnetic spectrum. Examples of common universal waste electric lamps include, but are not limited to, fluorescent, high intensity discharge, neon, mercury vapor, high pressure sodium, and metal halide lamps.

**Disposition:** Collected by Facilities and Environmental Health and Radiation Safety and removed by contracted recycling company.

### **Universal Waste Batteries**

Is a device consisting of one or more electrically connected electrochemical cells which are designed to receive, store, and deliver electric energy. An electrochemical cell is a system consisting of an anode, cathode, and an electrolyte, plus such connections (electrical and mechanical) as may be needed to allow the cell to deliver or receive electrical energy. The term battery also includes an intact, unbroken battery from which the electrolyte has been removed.

**Disposition:** Rechargeable batteries are collected by Facilities and Environmental Health and Radiation Safety and removed by contracted recycling company. Non-Rechargeable batteries (alkaline) are disposed in the solid waste stream.

### **Universal Waste Electronics**

Is any device which contains electrical circuitry/circuit boards.

**Disposition:** Universal waste electronics are collected by Facilities, Information Technology and Environmental Health and Radiation Safety and removed by an approved recycling company.

#### Approved Universal Waste Electronic Recycling Companies

Environmental Recycling  
527 East Woodland Circle  
Bowling Green, OH 43402  
419-354-6110

CleanLites  
665 Hull Road  
Mason, MI 48854  
517-676-0044

AIM Ecycling  
5656 Opportunity Drive  
Toledo, OH 43612  
Phone: 419.517.2055

### **Universal Waste Light Ballasts**

A device that electrically controls fluorescent light fixtures and that includes a capacitor containing 0.1 kg or less of dielectric.

**Disposition:** PCB containing ballasts are collected by Facilities and Environmental Health and Radiation Safety and removed by contracted recycling company. Electronic light ballasts and those which “contain no PCB’s (as identified on the label) are disposed in the solid waste stream.

### **Additional Waste Minimization Activities:**

In an effort to minimize waste and the use of extremely toxic materials at University of Toledo the following steps are taken:

- Whenever possible a less toxic substitute is suggested (i.e., mercury containing equipment including thermometers are replaced with environmentally friendly options)
- Researchers are encouraged to perform experiments involving hazardous materials, on the “micro scale”
- Every 90 days the contracted hazardous waste disposal company removes of all waste from the campus. During this process, they may re-designate some of the waste as usable and redistribute it to other organizations.

## **Elimination of Mercury Containing Devices from the Institution**

It is recognized that mercury is a hazardous substance that can be found throughout most industries, including healthcare. University of Toledo will make any and all efforts to eliminate mercury from any source throughout the institution.

Mercury-containing patient care thermometers were eliminated from use at University of Toledo Medical Center in 1996. They have been substituted with electronic thermometers or non-mercury thermometers.

Mercury containing sphygmomanometers were eliminated from use over the period of 1998 through 2005. All devices will have been replaced with aneroid sphygmomanometers at that time.

Remaining sources of mercury that have been identified in 2000:

- Built-in thermometers on certain hospital storage refrigerators and as units fail they will be replaced.
- Various thermometers on steam lines in the mechanical rooms and penthouse that are removed as they fail and replaced with non-mercury devices.
- Fluorescent light bulbs throughout the institution. Many will be replaced with LED lamps as they fail.
- Mercury containing switches, including those found in thermostats.
- Mercury containing equipment, including thermometers in research water baths, manometers and vacuum gauges.

University of Toledo will continue mercury elimination efforts through the evaluation of non-mercury alternatives; the following plan put into place in January 2005 to schedule replacement actions; the development of a clear purchasing policy indicating that University of Toledo Medical Center does not purchase devices, materials, chemicals or other products that contain mercury and putting vendors on notice about this policy. Specific actions will include:

- Mercury switches on alarms and vacuum pumps will be replaced as they fail;
- Lab refrigerators will be replaced with refrigerators without mercury containing thermometers as they are retired from service;
- The mercury containing boiler switches, which are built into the boilers, will be removed with the boilers when the boilers are replaced;
- All mercury containing devices that are removed from service will be collected by the Maintenance Staff, or Environmental Health and Radiation Safety, or by designated staff who have received adequate training. They will be disposed of by a contractor licensed to dispose of hazardous materials retained by the Environmental Health and Radiation Safety Department.
- All mercury containing devices, when possible, will be tagged with a label clearly identifying them as mercury.
- All fluorescent bulbs will be reprocessed through the vendor retained by the Environmental Health and Radiation Safety Department. When commercially available, bulbs will be replaced with mercury-free bulbs.
- Research staff will be encouraged to replace mercury containing equipment with non-mercury containing equipment wherever possible.

## **Mercury Spill Response**

During the time when there are mercury containing devices located anywhere on the grounds of University of Toledo (with the exception of fluorescent bulbs), the annual safety test for all employees on hazardous materials, will include information on the recognition of the hazards of mercury, and address spill response.

Spill response for mercury spills will be in accordance with Environmental Health and Radiation Safety Procedure [HM-08-013](#).

## Virtual Elimination

It is the policy of University of Toledo to work toward the total elimination of mercury; it is acknowledged that some sources will be phased out only during major re-tooling (e.g., boiler replacement) or as a result of technology innovation (non-mercury fluorescent bulbs). Short of these events, it is the intention of the UT to take all other feasible actions to eliminate all other sources by the close of 2005. In research areas (not including UTMC), efforts will continue into the foreseeable future to completely eliminate mercury.

Records of materials in program and related activities will be maintained by the Environmental Health and Radiation Safety Department for one year.

## PROCEDURE FOR UNIVERSAL WASTE

The University of Toledo will manage universal wastes according to rules and laws promulgated by the USEPA, the Ohio EPA, and the City of Toledo Environmental Services.

### Training

#### Schedule

- A mandatory initial training for employees will be presented.

#### Content

- Introduction to universal wastes
- What are universal wastes?
- List of universal wastes at University of Toledo
- Specific Hazard
- Universal waste handling and storage procedures
  - Closed containers
  - Labeling of containers
  - Description
  - Date the material became waste
  - Remove the entire mercury-containing device
    - Protect from breaking
    - Transport in a leak-proof container
    - Notify Haz waste coordinator to arrange for pickup

#### Storage locations

- Plant Operations Building
  - Mercury
  - Batteries
  - Lamps
- Haz Shed
  - Mercury
  - Batteries
- Facilities and Construction Facility
  - Lamps
  - Batteries

#### Inventory Management

- Inventory/Record Sheet and Manifest Records
- Dating of containers and Manifest Record

- Inspections of accumulation areas

#### Fluorescent Lamps

- Used boxes
- Broken lamps
  - Provided container
  - Keep lid closed
- Pallets
  - Stack boxes on pallets
- Rented containers
  - Use the provided fiber drums for loose lamps

#### Review of hazardous waste regulations

### **WHAT ARE UNIVERSAL WASTES?**

Universal Wastes at University of Toledo may include

- Mercury Thermostats
- Mercury-containing devices
  - Mercoïd® controls and similar types
  - Mercury-containing electrical relays
  - Mercury float switches
- Batteries
  - Sealed lead acid
  - Wet lead acid
  - NiCad
  - Lithium
  - Button cells
- Pesticides
- Fluorescent Lamps
- High Intensity Discharge Lamps (metal-halide)
- Any equipment which contains electronic circuitry.

Employees who are expected to possibly handle universal wastes

- Maintenance Repair Workers (fluorescent lamps, thermostats)
- Air Quality Technicians (thermostats, Mercoïd controls)
- Grounds Staff
- Life Safety Technicians (sealed lead acid batteries)
- Plumbers (float switches)
- Electricians (float switches, HID lamps)
- Auto mechanics (switches in automobiles)
- Storekeepers (batteries from radios)

### **PROCEDURE FOR SPENT FLUORESCENT LAMPS**

The University of Toledo Main Campus will manage spent fluorescent lamps as universal waste according to rules and laws promulgated by the USEPA and the Ohio EPA.

Main, Westwood, and Scott Park Campuses

- Package lamps to minimize breakage. Original shipping containers may be used for this purpose.
- Ensure that the end flaps of the boxes are closed or taped shut.
- Loose lamps must be transported in a manner that prevents breaking.
- Transport lamps to the Facilities and Construction Complex
- Place box on pallet for used lamps.

- Apply the identifying labels provided to the end of the package.
- Write the date that the box was put into storage on the provided label.
- Place loose lamps into the containers provided. DO NOT TAPE the loose lamps together.
- If lamps are broken in the course of storing them, place the broken glass and aluminum caps into the container provided.
- Lamps will be accumulated for approximately one year.
- A representative of Environmental Health and Radiation Safety will contact a used lamp recycling vendor and arrange transportation.
- Shipping papers will be kept on file in the Main Campus Environmental Health and Radiation Safety Department for at least three years.
- Inventory control will consist of maintaining dated fluorescent lamp containers and dated shipping records.

#### Approved Fluorescent Lamp Recycling Vendors

Environmental Recycling  
527 East Woodland Circle  
Bowling Green, OH 43402  
419-354-6110

CleanLites  
665 Hull Road  
Mason, MI 48854  
517-676-0044

#### **PROCEDURE FOR METAL CUTTINGS AND SHAVINGS**

The University of Toledo Main Campus will recycle cuttings and shavings from departmental machine shops in order to divert waste from landfills.

The College of Physics and Astronomy and the College of Engineering at the University of Toledo operate machine shops for the creation of one-off designs by the faculty or staff of those departments.

The Environmental Health and Radiation Safety Department will provide dedicated scrap metal containers to the machine shops on campus. The containers will be gray and dedicated to the metal recycling efforts.

The container will bear labeling indicating that the container is to be used for scrap metal only.

The containers will be monitored by the machinist(s) in control of the machine shops. When the container has accumulated approximately one-half to two-thirds of its capacity, the machinist will notify the Office of Environmental Health and Radiation Safety. Contact information will be provided on the container.

UT Recycling Services will pick up the container and transfer the contents to the container provided by the vendor contracted to provide metal recycling services to the University. The container will be immediately returned to the originating machine shop.



**MIME Machine Shop North Engineering Room 1091**



**Physics and Astronomy Machine Shop McMaster Hall Room 1521**



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