THE UNIVERSITY OF AKRON
WASTE MANAGEMENT PLAN
June 2005

I. INTRODUCTION

Waste is the responsibility of the generator from cradle to grave. The University of Akron generates non-hazardous, hazardous, and universal waste. U.S. EPA and Ohio EPA regulate these types of waste under the Resource Conservation and Recovery Act (RCRA). Infectious and radiation wastes are under the Ohio Department of Health and form two separate categories. Hazardous wastes are either listed (40 CFR 261), or must be declared by the generator based on the characteristics of flammability, corrosiveness, reactivity, and toxicity. The University is a Large Quantity Generator (LQG; U.S. EPA ID No.: OHD045207552) with a license to store hazardous waste for 90 days in the LQG site located in the "Waste Room" in KNCL-131 and in the adjacent hazardous waste ("Hazmat") trailer. The University of Akron does not treat waste except to adjust the pH in a laboratory prior to transfer to the Waste Room. The University can transport waste on campus without a license (as long as they do not cross public roadways). Outside companies contract and assist The University of Akron in managing, transporting and disposing of our hazardous waste. This waste is incinerated, used as fuel in cement kilns, or is otherwise treated to become non-hazardous by state and federal permitted waste management facilities.

Ohio EPA issues site licenses at the point of generation and ultimate disposal, and U.S. DOT requires a license for transportation. U.S. EPA, Ohio EPA, and U.S. DOT require manifest documentation for the transport of hazardous waste. The University also has licenses to store waste behind the Grounds Shop (a Small Quantity Generator site; U.S. EPA ID No.: OHD987056439), at Folk Hall (a Conditionally-Exempt Small Quantity Generator [CESQG] site; (U.S. EPA ID No.: OHD987056447), and at Wayne College (also a [CESQG] site; (U.S. EPA ID No.: OHD987056454). The University of Akron also generates various universal wastes as well, such as batteries, lamps, pesticides, and mercury-containing equipment. It is anticipated that computers and related equipment will also fall under this waste category soon. Finally, The University generates many types of non-hazardous waste, including, e.g., construction and yard debris, paper, plastic material, and glass, which goes to permitted solid waste landfills.

II. GENERAL POLICY ON HAZARDOUS WASTE

The Department of Environmental and Occupational Health and Safety (EOHS, x-6866) oversees the management and disposal of all laboratory wastes. OAC Rule 3745-52-34(C) allows a generator to temporarily accumulate hazardous waste in containers at the point of generation (your lab) without a permit for up to 55 gallons. Such an area is called a Satellite Accumulation Area (SAA) and must be managed according to RCRA Regulations.

Generators may not sewer any chemical wastes without permission from EOHS. Soluble organic salts, sugars, amino acids, nucleotides, nucleosides, vitamins, acids, amines, surfactants, and soluble salts combinations of various ions must be properly labeled and removed from the laboratory.

III. GENERAL HAZARDOUS WASTE CONSIDERATIONS

Key considerations for effective hazardous waste management include the following:

- All hazardous waste must be clearly and plainly identified (unknowns are not acceptable);
- All hazardous waste must be properly segregated;
- All hazardous waste containers must be closed tightly;
- All hazardous waste containers must have accurate inventory;
- All requests for waste disposal (or waste containers) must be submitted online to EOHS utilizing request forms specific to the type of waste generated (go to The University's website/Health & Safety [under Business Unit drop-down box]/ Departments/Chemical/Waste/Hazardous Waste Management System/**Waste Pickup Form**); and,
- Only qualified EOHS personnel will transport (to The University's permitted wastes storage facilities), store (temporarily, in accordance with U.S. EPA RCRA regulations), package, manifest, and ship (in accordance with RCRA and U.S. DOT hazmat regulations), document, and otherwise handle and manage The University's hazardous (and otherwise regulated) waste.

IV. HAZARDOUS AND OTHER REGULATED WASTES

The University of Akron generates numerous types of wastes from many waste streams. These include:

A. Aqueous Solutions

1. Aqueous solutions with inorganic chemicals (keep in a clearly/adequately labeled, appropriate reclaimed bottle or in a white five-gallon, durable, polyethylene jug).
2. Basic solutions without organic chemicals (neutralize and keep in a clearly/adequately labeled, appropriate reclaimed bottle or in a white five-gallon, durable, polyethylene jug).
3. Acidic solutions without organic chemicals (neutralize and keep in a clearly/adequately labeled, appropriate reclaimed bottle or in a white five-gallon, durable, polyethylene jug).
4. Corrosive solutions with organic solvents (neutralize and keep in a clearly/adequately labeled, appropriate reclaimed bottle or a red five-gallon, durable, polyethylene jug).
5. Aqueous solutions with organic solutes (keep in a clearly/adequately labeled, appropriate reclaimed bottle or a red five-gallon, durable, polyethylene jug).

(Note: Label all containers clearly, with capital letters, and in indelible ink.)

B. Flammable Organic Solvent Waste

Red five-gallon durable polyethylene jugs must be used to collect flammable organic solvents and their solutes, and these jugs must be affixed with "Hazardous Waste" labels. Only organic solvent waste of neutral pH is acceptable in these jugs. Separate jugs are used for halogenated and non-halogenated wastes. EOHS provides these jugs. Generators are responsible for attaching accompanying clipboards and/or waste forms. The following should be considered when adding waste to solvent jugs:

1. Keep the jug in a well-ventilated area.
2. Keep the jug securely capped at all times.
3. Wear your gloves, goggles, and a lab coat when handling waste.
4. Place the jug in the fume hood before you open it.
5. Cap the jug before you remove it from the fume hood.
6. Use a funnel as necessary.
7. If you pour the wrong hazardous substance into a jug, mark it down on the form.
8. Record all additions to the jug on the accompanying form.
9. Record accurately the inventory of solvents into the jug.
10. Do not put the following chemical compounds in red waste jugs:

- Acetaldehyde nitrate esters;
- Acid chlorides nitrite esters;
- Alkynes nitrosamines;
- Amines nitrosoureas;
- Anhydrides nitrosourethanes;
- Aziridines non-metal halides and oxyhalides;
- Bromine organic solids in solution;
- Carbon disulfide perfluoroaliphatic acids;
- Chloroformate esters peroxides;
- Chloromethylsilanes phosphines;
- Chloropicrin phosphate esters;
- Collodion polychlorinated biphenyls (PCBs);
- Cyanohydrins phosphite esters;
- Dienes polymer solutions;
- Formic acid polynitro-substituted compounds;
- Furan propargyl bromides;
- Haloalkynes pyrocarbonate esters;
- Alpha-halocarbonyls pyrrole;
- Hydrazines;
- Hypochlorite esters alkaline metal alkyls;
- Isocyanates aluminum alkyls and hydrides;
- Isocyanides boron alkyls and hydrides;
- Metal halides sulfate esters;
- Mercaptans sulfite esters;
- Mercury sulfonate esters;
- Mercury compounds thallium ethoxide;
- Metal-containing aqueous solutions thiocarbonyls;
- Mineral acids thiophene; and,
- Monomers oxyhalides.

C. Laboratory Solid Waste

Non-hazardous solids must be double-bagged and properly identified. Hazardous solids must be capped in a glass container and identified.

D. Unused, Leftover, and Out-of-Date Chemicals

1. Assign a number to each container.
2. Complete the appropriate waste inventory form (e.g., Halogenated Waste Generation List and Non- Halogenated Waste Generation List).

3. Complete the appropriate online **Waste Pickup Form** (go to University website/ Health & Safety/Departments/Chemical/Waste/ Hazardous Waste Management System/Request for…Pickup Form).

E. Unknowns

Collection of hazardous waste with unknown identity is not acceptable. If you do not know the identity of the waste chemical:

1. Consult with other knowledgeable personnel (e.g., the Principal Investigator, Chemical Hygiene Officer, and/or EOHS).
2. Provide a general class of the chemical (sulfur compound, polymer, aromatic, etc.) and all other pertinent information (identification of the chemical, any noteworthy hazards, location, and contact persons and telephone numbers) on the waste pick up form.
3. Label and close the container.

F. Chemicals Not to be Neutralized

- Acid anhydrides.
- Acid chlorides.
- Chlorosulfonic acids.
- Fuming nitric acid.
- Fuming sulfuric acid.
- Commercial strength hydrochloric acid.
- Commercial strength bases.
- Liquid halides of boron, silicon, tin, etc.

However, secure, seal, and provide all pertinent information on the EOHS online **Waste Pickup Form**.

G. Lab Ware Decontamination

After pouring waste into the waste jug, empty and rinse lab ware with an appropriate solvent or detergent two or three times. Let dry. Transfer the rinsing solution into the proper waste container.

H. Mercury Thermometers

1. No longer purchase Hg thermometers.
2. Call EOHS if the Hg bulb is broken for immediate cleanup.
3. If the bulb is not broken, put the other broken pieces in a beaker, place in a fume hood, and then call EOHS.

I. Oils

Return oils from centrifuges, diffusion pumps, and vacuum pumps to original containers and mark as **"**Waste Oil".

J. Aerosols

Place in a container and complete the appropriate online **Waste Pickup Form**.

K. Polymers

EOHS will sort chemicals in the Polymer Engineering area first before disposal. All material with a hazardous label, all liquids, and all powders must be separated from the non-hazardous flakes, granules, beads, plastics, etc.

L. Ballasts and Transformers

EOHS will check transformer oil for PCBs then manifest the waste appropriately through University contractors.

M. Pesticides

EOHS will manifest these wastes as hazardous waste.

N. Paints and Paint Residues

As appropriate, EOHS will manifest these wastes as hazardous waste.

O. Lamps

EOHS crushes, accumulates (in a SAA, in accordance with RCRA regulations—no more than 55-gallons in volume and a maximum of three days storage once the container [drum] is full), and ships fluorescent (along with proper waste manifests) to a permitted RCRA hazardous waste/recycling center.

P. Hazardous Material-Containing Equipment

1. Arsenic-containing equipment (e.g., switches, circuit boards, relays).
2. Mercury-containing devices (manifested as hazardous waste, e.g., barometers, gas flow regulators, switches, manometers, thermometers, thermocouples).
3. EOHS will take the equipment apart, manifest the hazardous waste portion, then transfer the scrap to the scrap metal dumpster for recycling. Before leaving the University, all equipment must be inspected carefully. The generator must drain all fluids and remove all devices containing hazardous substances. If there are radiation labels attached to the equipment (or there are any other radiation-related issues), the generator must contact the Radiation Safety Officer (x-6866).

Q. Tires

Tires collected on campus are taken to local tire recyclers at cost.

R. Refrigerators

HVAC drains the freon and the scrap is sent to a metal recycler. Consult EOHS' website
for the refrigerator disposal form.

S. Toner

The generator must recycle toners through Central Stores (x-7579) or Computer Solutions (x-5308). Only non-recyclables or defective toners and cartridges are manifested as hazardous waste.

T. Computer Equipment

The Generator must recycle computer and related equipment through Property Accounting and Central Stores. Working computers could be sold to the public pending a Right-To-Know Release Form signed by the new "Owner". The University will donate all other computers to the Ohio Penal Industries. EOHS will keep all shipping papers accompanying each transfer. Property Accounting and Central Stores will remove all University tags and specify the numbers of CPUs, keyboards, and terminals
for each shipment.

V. INSPECTIONS

In accordance with OAC Rules 3745-66-74 and –65-33 regarding container storage and emergency equipment, EOHS staff conduct inspections of the LQG Waste Room are weekly. These written inspections include the following checklist items:

- Waste containers closed?
- Container conditions.
- Spill/leak prevention procedures/precautions.
- Compatibility of containers with waste.
- Container labeling, including accumulation date.
- Storage time (i.e., relative to 90 days).
- Adequate aisle and ingress/egress space?
- Separation of incompatible wastes.
- Alarm status.
- Radio status.
- Fire extinguisher status.
- Spill kit and emergency response equipment status.
- Water source status.
- Inspector's name.
- Comments, recommendations, etc.

VI. HAZARDOUS WASTE CONTINGENCY PLAN AND EMERGENCY NOTIFICATION

Consistent with U.S. EPA RCRA requirements, The University of Akron has prepared a Hazardous Waste Contingency Plan (HWCP; dated December 2004). (Note: this is a separate document from the plan provided herein.) Copies of this emergency response document are maintained in the LQG Waste Room and adjacent Hazmat Trailer, at the SQG and the two CESQG sites, and EOHS' office. This plan includes the following:

- Instructions for EOHS first responders.
- Instructions for The University of Akron Police Department (UAPD) following confirmation of a hazardous waste incident.
- Instructions to be provided by EOHS to all building workers and occupants, bystanders, and subsequent responders.
- Spill containment and cleanup procedures for EOHS personnel.
- Instructions for the Hazardous Waste Emergency Response Coordinator, including a list of contact information for governmental/regulatory

environmental and health and safety organizations and a list of information to be collected and reported to these agencies in the event of an incident.
- A list of emergency supplies and personal protective equipment to be available.
- A description of emergency evacuation routes from each of the permitted hazardous waste sites.

In addition to the HWCP, EOHS maintains copies of Ohio EPA's/State Emergency Response Commission's instructions (including contact phone numbers) for Release Reporting of a Hazardous Substance in each of the permitted hazardous waste sites and at its office.

In the event of a spill incident or other hazardous waste-related emergency (or fire [activate the closest fire alarm!]), UAPD dispatch must always be contacted first, from a campus phone at x-7123 (or 911) or from a cell phone at 330-972-7123 (for campus-related incidents, never 911 from a cell phone!). In the event of reportable event (in general, any immediate or significant potential threat to human heath and/or the environment), Ohio EPA's 24-hour release reporting phone number is: 1-800-282-9378 (or 1-614-224-0946). U.S. EPA's/U.S. Coast Guard's 24-hour release reporting phone number is: 1-800-424-8802 (for CERCLA hazardous substances [per RQs listed in 40 CFR Part 302, Table 302.4] or oil released to navigable waters). Only authorized University personnel (e.g., UAPD, EOHS) should contact emergency, environmental, or other governmental departments or agencies.

VII. WASTE MINIMIZATION

Consistent with U.S. EPA's National Waste Minimization Program, The University of Akron attempts to consistently promote environmentally sustainable efforts to reduce the amounts of waste generated and lower the toxicity and persistence of those wastes that are, of necessity, generated. The University's waste minimization program is attempting to place the greatest emphasis on the reduction of chemicals in wastes that, due to their chemical properties, can be harmful to human health and the environment over long periods of time if released to the environment. Therefore, a clear priority of our waste minimization program is the reduction of chemicals that have the properties of persistence, bioaccumulation, and toxicity. These "priority chemicals" (31 specific organic and inorganic chemicals as identified by U.S. EPA [see the U.S. EPA's waste minimization website]) should be reduced or eliminated wherever possible to lower the potential long-term effects of the release of these chemicals via waste generation. If they cannot be eliminated, they should be contained within a use-reuse cycle wherever possible to eliminate their release.

The University of Akron's overall goals include the following:

- Eliminate priority chemicals or substitute for, wherever possible.
- Minimize the amount of priority chemicals used whenever elimination or substitution is not possible.
- Maximize recycling whenever elimination, substitution, or minimization is not possible, creating closed loop materials management systems that eliminate or constrict release pathways to the environment.
- Promote "cradle-to-cradle" waste management instead of "cradle-to-grave" waste management.
- Reduce raw material losses.

- Reduce raw material purchase costs.
- Reduce waste management recordkeeping and paperwork burden.
- Reduce waste management costs.
- Reduce accidents and exposure.
- Reduce the potential for regulatory compliance violations.
- Reduce environmental liability.

VIII. DOCUMENTATION AND RECORD KEEPING

The following waste-related documentation and records are maintained by EOHS:

- Waste Pickup Forms for the LQG site—maintained by EOHS and indicating the name of the waste, its origin, volume, and other pertinent information.
- Weekly inspection sheets (see Section V above).
- U.S. DOT waste manifests—distributed as required by receiving states and copies maintained at EOHS' office.
- Annual hazardous waste report for LQG—prepared by The University of Akron, EOHS for Ohio EPA using data and information from the hazardous waste manifests.

IX. TRAINING

The University of Akron, EOHS Department, annually provides training to its staff relative to RCRA waste management procedures (consistent with those described in the plan provided herein) including, among others: proper handling, storage, shipping, and record keeping practices. In addition, EOHS hazmat workers and emergency responders participate in annual OHSA HAZWOPER 8-hour updates and HAZCOM training. Finally, consistent with U.S. DOT regulations, EOHS hazmat workers receive refresher training every three years (along with IATA air transport training every two years).