

# University *of* Idaho

## **Chemical Waste Guide**

For Facilities Services

February 2012

# Chemical Waste Guide

For Facilities Services

## Table of Contents

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<b>Introduction</b>	3
<b>General Information</b>	
Chemical Hazards	4
Waste Accumulation	5
Empty Containers	6
Chemical Spills	7
Resources and Contacts	8
<b>Specific Information</b>	
Aerosol Cans	9
Antifreeze	10
Batteries	11
Filters	12
Floor Sweep Compounds and Absorbents	13
Fluorescent Lamps	14
Gas Cylinders	15
Lamp Ballasts	16
Mercury-Containing Devices	17
Oil	18
Paint	19
Parts Washers	20
Pesticides	21
Refrigerants	22
Shop Towels/Rags	23
Sumps, Neutralization Tanks, Plumbing Pipe	24
<b>Employee training worksheet</b>	25
<b>Appendix A: Maximum Concentration of Contaminants     for the Toxicity Characteristic</b>	26
<b>Appendix B: Solvents on the F-List</b>	27

# Chemical Waste Guide

For Facilities Services

## Introduction

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### Purpose

This guide contains instructions for specific shop-related wastes as well as general guidance for spills and disposal. The guide was written for University of Idaho Facilities Services shops. Other groups on campus, such as Auxiliary Services, laboratories, and art studios that produce the chemical wastes discussed in this guide, are welcome to also use it as a reference tool.

The last page of this guide is a training worksheet that should be filled out and kept in the personnel file of all employees who handle hazardous waste. Hazardous waste training is required under state and federal law, and state inspectors may ask to see it during an audit. Audits occur every two to four years.

For chemical wastes commonly related to maintenance and construction projects, such as asbestos, lead-containing debris, wash water, PCB-containing oil, mercury in p-traps, contaminated soils and more, please refer to the EH&S web site at <http://www.uidaho.edu/ehs>. Laboratory staff should also refer to the UI Laboratory Safety Plan and the UI Hazardous Materials sections on the EH&S web site for instructions specific to laboratory waste.

This guide applies to all UI campuses, Research & Extension Centers, and other UI-owned sites.

### Regulatory Requirements

The University must comply with federal, state, and local hazardous waste regulations. The Idaho Department of Environmental Quality (DEQ) governs chemical waste management. Local city and county governments regulate discharges to the sanitary sewer systems and solid waste landfills. Disposal of hazardous waste in drains, trash cans or by evaporation is a serious violation punishable by fines or imprisonment. The U.S. Environmental Protection Agency (EPA) regulates the use and disposal of toxic substances such as PCBs.

### Environmental Health & Safety (EH&S) Responsibilities

EH&S designates, collects, transports and arranges for the disposal or recycling of hazardous wastes. EH&S also provides departments with information and training about waste accumulation and minimization.

### Waste Generator Responsibilities

The waste generator is responsible for identifying which wastes are hazardous wastes and managing them according to the rules outlined in this guide.

### Waste Minimization

Avoid the use of hazardous chemicals when possible to minimize hazardous waste and exposure. Substitute less hazardous chemicals or use less of the chemical.

### Quick “Rules of Thumb”

- Do not dispose of anything in the normal trash before making a hazardous waste determination.
- Do not dispose of any “free liquids” in the normal trash or down the drain.
- Unless empty, keep all containers closed when not in use.

The regulatory definition of solid waste includes any discarded material that is not excluded; note that the material can be solid, liquid, gaseous, or sludge and still be a “solid” waste. Hazardous waste is a subset of solid waste. A chemical waste is hazardous if it is a listed waste and/or if it has at least one of the following characteristics:

## **Flammable/Ignitable**

Materials with flashpoints below 140°F. These chemicals are volatile and flammable, and their vapors can catch on fire when exposed to spark or flame. Examples are acetone, propane, acetylene, mineral spirits, some oil-based paints, starter fluid, and many solvents. A Material Safety Data Sheet (MSDS) will normally provide the flashpoint under the section pertaining to “Fire-Fighting Measures.”

## **Corrosive**

Wastes with a pH less than or equal to 2 or greater than or equal to 12.5. Examples are muriatic acid and corrosive cleaning solutions that contain sodium hydroxide. A Material Safety Data Sheet (MSDS) will normally indicate the pH for aqueous solutions under the “Physical and Chemical Properties” section.

## **Reactive**

Reactive wastes can become unstable or react violently with water to evolve flammable or toxic gases. They are generally used only in laboratories. A Material Safety Data Sheet (MSDS) will normally indicate reactivity hazards in the “Stability and Reactivity” section.

## **Toxicity**

The toxicity characteristic applies to waste materials that have very low concentrations of such constituents as metals (for example, arsenic, barium, chromium, lead, and mercury), pesticides (for example, 2,4-D, 2,4,5-TP, and Lindane), and organic compounds (such as chloroform, creosote oil, methyl ethyl ketone, pentachlorophenol, and tetrachloroethylene). Lead-based paint debris, used welding rods, used brake cleaning fluid, and spent wood preservatives often are hazardous waste because of the toxicity characteristic. Refer to Appendix A for a complete table of contaminants for the toxicity characteristic.

## **Listed Hazardous Wastes**

Listed wastes include both spent materials (for example, xylene used to clean paint brushes) and unused commercial products (such as rodenticides that contain zinc phosphide as the sole active ingredient). Refer to <http://www.uidaho.edu/ehs> for lists of hazardous waste.

## **Local Sewer Discharge Limits**

In addition, wastewater is regulated by the City of Moscow to protect pipes, biosolids from the wastewater treatment plant, and water quality. Local discharge limits exist for flammable liquids and other types of waste, such as fats/oils/grease, pH, settleable solids and heavy metals. These limits are on our website at <http://www.uidaho.edu/ehs>. However, most cleaning products are okay for discharge to sewer when used as intended. Contact EH&S if you have any questions about disposal of other materials. If you discharge to a septic system, pour only septic-safe chemicals down the drain.

### **Waste Accumulation**

Hazardous waste is usually accumulated in shops prior to collection by EH&S. Up to fifty-five gallons per waste stream can be accumulated at or near the point of generation. When your 55-gallon drum is nearly full, contact EH&S for pickup. Do not overfill containers; for example, leave a two inch headspace for a 55-gallon drum. Do not start a second drum if it will cause you to go over your storage limit. Flammable wastes cannot exceed the storage limit specified by the local fire department, which in most cases is 10 gallons outside of a flammable storage cabinet. Call the EH&S at 208-885-6524 for storage limits in your area if you accumulate large amounts of flammable waste.

Hazardous waste must also be:

- under the control of the individual generating the waste or the area must be kept locked and secured. The generator must be able to prevent improper waste from being added to the container.
- in compatible containers with no signs of deterioration or leaking.
- in containers marked with the words "Hazardous Waste" or with other words that identify the contents of the containers, such as "Waste Oil Based Paint" or "Hazardous Waste Aerosol Spray Cans."
- labeled with the completed UI "Chemical Waste" label before collection.
- in closed containers except when waste is being added.
- stored away from floor drains, storm drains and sinks and/or in secondary containment.

### **Waste Collection and Disposal**

To request a pickup of your hazardous waste, submit an electronic Chemical Waste Collection Request by accessing the EH&S website <http://www.uidaho.edu/ehs/ehscontent/wastecollection>. The same process is used for rechargeable batteries, pesticides, used oil, oil-based paint, mercury switches and thermostats, and other hazardous or special wastes.

Do not drop off hazardous waste at EH&S or the Hazardous Materials Storage Building (HMSB) unless instructed by EH&S to do so. You may drop off PCB ballasts in the locked bin located at the southeast corner of the HMSB. Contact EH&S if you do not have a key to the bin. DO NOT leave ballasts outside of the bin.

### **Waste Removal by Independent Contractors**

Service agreements which involve Hazardous Waste removal, transport, treatment or disposal by other vendors must be approved and coordinated by EH&S. Do not make arrangements with outside vendors for collecting Hazardous Waste without first contacting EH&S. For example, EH&S must approve vendors that manage spent solvent from parts washers or dispose of lead-based paint debris or recycle lead-acid batteries.

### **What is "Empty"?**

It can be difficult to remove all the contents from a container. A container is legally "empty" if:

- you have used "normal, no-nonsense means, such as inverting and draining, shaking, scraping, or scooping" to empty the container, and
- no more than 3% of the contents remain.

However, if the container held a "P-listed" or acutely hazardous waste, you must triple-rinse the container, collecting the rinsate for hazardous waste disposal.

Do not leave containers open to evaporate the contents. They may be left open only when they are **EMPTY**.

### **Reuse**

Consider reusing the empty container for hazardous waste disposal of that same chemical or other compatible chemicals. If you do this, completely deface or remove the label on the container and then fill out and affix a hazardous waste label to the container. Defacing and labeling are required by law and also help others know that the container contains hazardous waste, not the original chemical.

### **Recycling**

Containers for non-toxic chemicals can be recycled if they are emptied and dried completely and their labels are defaced. Do not put these containers in public area bins; instead, take them to the nearest recycling location outside the building or to the Surplus Building at Facilities Services. Building Services will not recycle them for you. All metal containers are recyclable but only certain shapes of plastic containers (bottles with neck and shoulders and tubs) are recyclable. Contact EHS at 208-885-6524 or the Recycling/Surplus/Solid Waste division at 208-885-2091 for more information.

### **Disposal**

To dispose of an empty container, follow these directions:

- Dry the container in a well-ventilated area.
- With a Magic Marker, cross out or black out the labels on the container.
- Leave the container uncapped. Throw the cap away separately.
- Place the container in or next to the trash.

Do not leave empty containers in hallways or on loading docks unless you have arranged for pickup.

### **Pesticide Containers**

By law, empty pesticide containers must be triple-rinsed and the rinsate disposed as hazardous waste. Also, poke a hole in the container or otherwise make it so that the container cannot be used again. Then follow the directions above for disposal.

### **Spill Preparedness**

All shops and departments must have spill kits appropriate to the types of chemicals that they stock. Include gloves, goggles and anything else needed to clean up spills safely.

Respirators may be necessary for cleanup of spills of volatile, toxic chemicals. However, the use of a respirator requires prior medical evaluation, training and fit testing. In many cases, outside contractors are used to clean up these types of spills. Call the EH&S Hazardous Materials staff at 208-885-6524 for more information.

### **Emergencies**

Consult with your supervisor or manager on your specific emergency procedures. EH&S suggests that paper copies of MSDSs be available for fire and medical emergencies. To request emergency response services for hazardous materials releases, follow these guidelines:

- A. For hazardous material releases occurring after normal working hours, that require evacuation of a building, are highly toxic or hazardous, or affect a large area, call 911.
- B. For hazardous material releases occurring during normal working hours AND are small releases (e.g. a broken thermometer, a leaking light ballast, a broken fluorescent light tube, etc.), contact EH&S at 208-885-6524.
- C. For facilities located outside of Moscow, contact your local emergency response services to determine their capability to respond to a hazardous material spill. Contact EH&S (208-885-6524) for assistance if needed.

### **Exposures**

In the event of a chemical exposure, use a safety shower or eye wash, if available, to rinse the chemical off. Call 911. If you are unsure of what to do, call 911.

### **Spill Cleanup**

Hazardous material spills that do not endanger anyone may be cleaned up by employees who are properly equipped and trained to do so. Collect the spill cleanup debris for disposal as hazardous waste.

Hazardous material spills that cannot be safely cleaned by Facilities Services staff must be cleaned up by EH&S or a private contractor. Call Environmental Health and Safety (208-885-6524) during business hours with any questions about cleaning up spills or to arrange for a cleanup contractor. If you need assistance from EH&S or the spill contractor after hours or on weekends, call 911. If you call the UI Steam Plant at 208-885-6271, ask they contact the on-call EH&S staff person. When in doubt about whether you need help, contact your supervisor or call the EH&S number above during business hours.

### **Spill to Storm Drain or Sanitary Sewer**

Stop the spill if possible. During business hours, call EH&S at 208-885-6524 for spill assistance and for state-required spill reporting. After hours or weekends, call 911.

**Information and Forms**

More information about the hazardous waste collection process, and all the forms you need, are available on the EH&S website at <http://www.uidaho.edu/ehs>. Detailed information is provided in the “Hazardous Materials Management and Disposal Policy and Procedure” document (<http://www.uidaho.edu/ehs/topics/hazmatpolicies>), which is incorporated by reference from the University of Idaho Administrative Procedure Manual 35.40 – Hazardous Waste Management (<http://www.uihome.uidaho.edu/default.aspx?pid=84885>).

**Regulatory Guidance**

Idaho Department of Environmental Quality (DEQ), [Waste Management and Remediation](#)  
US Environmental Protection Agency (EPA), [RCRA Guidance, Policy and Resources](#)

**Specific waste questions**

Tom Hicks: [thicks@uidaho.edu](mailto:thicks@uidaho.edu) or 208-885-6524

Mark Borth: [borth@uidaho.edu](mailto:borth@uidaho.edu) or 208-885-6524

Many products come in aerosol spray cans, including cleaners, lubricants, coolants, paints and starting fluids. Aerosol containers often contain hazardous materials that are flammable or toxic and require management and disposal as Hazardous Waste. Plus, the propellant in the aerosol can creates a physical hazard that makes the spray can a hazardous waste for its reactive characteristic.

Avoid purchasing aerosol containers when possible. Consider using refillable pump aerosol containers and purchase aerosol products that use nitrogen or air as the propellant instead of propane, butane or CFCs.

### **Empty Containers**

Whenever possible, use aerosols for their intended purpose until empty. Then, collect the empty containers in a plastic-lined container for disposal by EH&S. EH&S will properly dispose of the aerosol can.

### **Accumulation**

If an aerosol container is no longer needed or cannot be used for its intended purpose, collect it as you would an empty aerosol can. It must be placed in an accumulation container that is lined with a heavy duty inner plastic bag and have a tight fitting lid. The aerosol cans should be placed in the waste accumulation container in such a way as to prevent any release of remaining contents.

The accumulation container must be labeled with a University of Idaho Hazardous Waste Label that reads "HAZARDOUS WASTE AEROSOL SPRAY CANS."



Given the physical properties of ethylene glycol, new antifreeze is typically not ignitable, corrosive, or reactive, nor does it contain one of the 40 toxicity characteristic constituents. It is not a P-listed or U-listed waste. Consequently, unused antifreeze is probably not a hazardous waste. If it cannot be reused, dispose the antifreeze through EH&S.

On the other hand, used antifreeze may be a hazardous waste due to benzene, lead or other heavy metal content, picked up from the radiator or other system components. When drained from radiators, antifreeze may be commingled in a single container, such as a 30-gallon drum, before shipping to a recycler.

### **Collection**

Keep used antifreeze separated by type (e.g. ethylene glycol, propylene glycol, and extended life antifreeze). DO NOT mix used antifreeze with used oil, since this would severely limit recycling options. If you have smaller quantities, collect in the original antifreeze container. Larger, batch quantities can be collected in drums that are provided by EH&S. Label the collection container "Used Antifreeze Only." Submit all antifreezes for collection by EH&S.

### **Best Management Practice**

The Automotive Recyclers Association recommends that following "best management practices" for handling engine coolant:

- Use separate equipment for the collection of used antifreeze (funnels, pads, storage containers).
- Label used antifreeze collection equipment and containers "Used Antifreeze Only." Collect different types of antifreeze separately. Include additional descriptive information on the label, such as "Ethylene Glycol" or "Propylene Glycol" or "Extended Life Antifreeze."
- Drain antifreeze from radiators and heater cores as soon as possible.
- Keep waste antifreeze free from cross-contamination with other wastes, including used oil, fuels, degreasers or radiator flush chemicals.
- Determine if the antifreeze is waste fluid or reusable and can be recycled.
- Employ the following procedure for antifreeze spills on floors:
  - Mop up the antifreeze immediately using a dedicated cloth mop. Transfer collected antifreeze to the properly labeled used antifreeze container.
  - Use rags to dry the floor. Place used rags in properly labeled waste containers and submit to EH&S for disposal. Do not saturate the rags; otherwise, you will have drips on the floor as you transfer them to the waste containers.
  - Use a wet mop only if necessary for final cleaning. Use mild, non-caustic detergent.

**Do not dispose of antifreeze in the sanitary sewer system, down storm drains, in septic tanks, dry wells or on bare ground.**



Many batteries contain hazardous materials and must not be disposed of in the regular trash. However, alkaline and carbon/zinc batteries may be disposed in the municipal waste.

To avoid arcing, the terminals on lead acid and lithium batteries must be taped or the batteries must be in separate plastic bags. Keep batteries away from flammable chemicals.

Larger batteries should be repacked in the heavy cardboard boxes they are purchased in. By law, used batteries cannot be kept on site for longer than one year.

### **Battery collections**

Used batteries are managed as “Universal Wastes.” Label the battery “Universal Waste – Battery” and mark the date. Small batteries can be placed in a plastic bag, then label the bag. If you have more than one used battery, you can label each battery or you may place them in a cardboard box and label the box “Universal Waste – Battery” and mark the date. Deliver used batteries to the recycling station at Recycling/Surplus or request collection through EH&S. To request collection by EH&S, use the online [Chemical Waste Collection Request](#) system.

### **E-media program**

The University of Idaho Sustainability Center has implemented a collection system for household batteries that are commonly used in cellphones, laptops and other portable data equipment. These containers are intended for personal batteries: do not place waste in these containers that was generated by University activities. The E-media bins are also used for cell phones (unless UI property), inkjet cartridges, and electronic media such as CDs and tapes. Recycle all electronic University-owned equipment through the Recycling/Surplus/Solid Waste division.

### **Leaking batteries**

Batteries rarely leak, but if you find a leaking battery, put it in a plastic bag or container. Wear gloves and wash your hands after handling. Fill out an on-line [Chemical Waste Collection Request](#), attach the waste label to the container, and EH&S will pick it up as hazardous waste. For a leaking lead acid battery (in UPS units and similar), we advise that you neutralize the leaking acid with baking soda (sodium bicarbonate.) Wear gloves and wash your hands afterwards, and be careful with your clothing and shoes. Put the battery and spill debris (paper towels, gloves) in a container and fill out the request as above for battery and debris. If you have any questions, call EH&S at 208-885-6524 during business hours.



Whether or not a used filter is a hazardous waste depends on both the nature of the filter medium and the contaminants that are trapped on the filter. For example, activated charcoal filters may be a hazardous waste even if they have never been used. Spray booth paint filters could contain toxic contaminants from the various paints that are used. In most cases, sampling and analysis of a used filter will be necessary to determine if it is a hazardous waste. Thereafter, used filters from identical processes can be disposed in accordance with the analytical results.

### **Filters from Air Handling Units**

Normally, supply and exhaust filters will be disposed in the municipal trash. However, used filters from such locations as the Agricultural Biotechnology Building and Renfrew Hall may need decontamination or analysis before disposal. If the used filters are from a typical office building or a residential hall, they may be disposed in the normal trash. If the used filters are from a science or engineering building, contact EH&S (5-6524) at least two weeks prior to filter change-out. EH&S will sample and analyze the filter material. Once this is completed for a particular building, future filter disposal will depend on the analytical results provided that no major change occurs in the building use.

### **Oil filters**

Non-terne plated used oil filters are not a hazardous waste if the filters have been gravity hot-drained by: (1) removing the filter from an engine at operating temperature; (2) puncturing the filter anti-drain back valve or the filter dome; and (3) allowing it to drain until it no longer drips any oil. Collect the used oil as specified elsewhere.

Terne-plated used oil filters contain a tin/lead alloy that will exhibit the toxicity characteristic for lead. Terne may be used on filters found in heavy trucks or equipment. These filters must be collected for disposal as hazardous waste.

Other types of filters, such as fuel filters, transmission oil filters, hydraulic fluid filters, and specialty filters, must be managed as a potential hazardous waste. Contact EH&S to discuss disposal.

### **Paint spray filters**

These filters must be sampled and analyzed a sufficient number of times to develop a characteristic profile of the used filters. Thereafter, the filters can be disposed in a manner that is consistent with the analytical results until the "process" changes; that is, until the types and/or quantities of paint products vary significantly from when the filters were sampled. Contact EH&S to arrange for sampling of the filter material before disposal.



Floor sweep compounds and absorbents are typically made from diatomaceous earth (DE), clay, sawdust, polypropylene, and other materials. Normally, unused products are not hazardous wastes. However, used products may contain toxic constituents such as solvents and heavy metals, depending on what was absorbed with the sweeping compound. For example, if an absorbent was spread on a spill of battery acid, the collected material would have to be disposed as hazardous waste. On the other hand, if floor sweep compound was used on a concrete floor for general cleaning, it is unlikely to be a hazardous waste.

EH&S is in the process of characterizing various floor sweeping compounds after they have been used, and requests your assistance during this process.

### **Accumulation**

Collect used floor sweeping compounds and place in a plastic bag. If visible liquid is present, seal the bag and put it in a plastic or metal container. If visible liquid is not present, seal the bag; put the bag in a cardboard box if it is heavy enough that the bag may burst. Submit a [Chemical Waste Collection Request](#) to EH&S and attach the printed collection request label to the container.

### **Comments**

As EH&S gathers information on the typical constituents in used floor sweeping compounds and absorbents, procedural changes will be disseminated to the campus.





A variety of lamps can contain hazardous materials, mainly the toxic metals mercury and lead, and must be managed as a regulated waste. Included in this category are fluorescent, compact fluorescent, UV, high intensity discharge, neon, mercury vapor, high pressure sodium, and metal halide lamps.

Lamps fall into two categories – traditional, and the newer “environmentally friendly” lamps, some of which may be identified by their green markings.

- A) Environmentally friendly or TCLP compliant lamps - these lamps are manufactured to not meet the definition of a hazardous waste. Lamps listed below may be managed as non-hazardous and can be disposed of in the normal trash:

TCLP Compliant Lamps	
Manufacturer	Designation
General Electric	Ecolux® or ECO
Philips	Alto and Alto II™
Sylvania (Osram)	Ecologic or ECO



Only the lamps listed above may be managed as non-hazardous. If you have a lamp that you believe is environmentally friendly but is not listed above, please contact the EH&S, 208-885-6524, for verification. Otherwise:

- place the used lamp(s) in a box or other container, separating by type,
  - label the container with the words “Lamps – Normal Trash,”
  - contact the appropriate custodial service for collection.
- B) Traditional lamps - these lamps must be collected by:
- placing them in a box or other container that can be closed, separating by type,
  - dating the container with the date that the first lamp was placed in the container,
  - labeling the container with the words “Universal Waste - Lamps”, and
  - delivering the lamps to the Recycling/Surplus/Solid Waste Center (RSSWC) for disposal within six months of the date placed on the container.
- \*NOTE:** Always keep the container closed except when adding lamps.\*

**Managing broken lamps**

- A) Environmentally friendly or TCLP compliant lamps - scoop up or sweep up glass fragments and powder and dispose of as you would any broken glass.
- B) Traditional lamps - follow these procedures if only one fluorescent lamp is broken:
- using gloves, carefully pick up or scoop up the glass fragments and powder with a stiff piece of paper or cardboard,
  - use sticky tape to pick up glass fragments or powder,
  - if a hard surface, wipe the area clean with a wet paper towel,
  - place all items in a heavy duty plastic bag, and
  - submit to EH&S for disposal.

For all other broken lamp situations, leave and secure the area, and contact EH&S at 208-885-6524.

**General**

Gas cylinders include returnable units that normally carry a deposit (e.g. argon, nitrogen, oxygen and larger propane tanks) and single-use disposable units (e.g. lecture bottles, small propane cylinders, MAPP gas, and calibration gases). The cylinders are considered empty when the internal pressure reaches atmospheric pressure. However, most scrap metal recyclers and solid waste disposal companies will not accept any cylinders until they are demonstrated empty by removal of the valve or valve stem.

**Procurement**

When purchasing your gas cylinder from a vendor, make sure that the manufacturer will take back any unused portion of gas to avoid having to dispose of the cylinder as hazardous waste, which is very expensive. Retain all return instructions, including the return agreement.

**Storage**

Compressed gas cylinders should be stored in an organized, ventilated, well-lit place away from combustible materials. Gas types should be separated from incompatibles and the areas marked. No manufacturer-applied labels, decals, or cylinder content information should be damaged or removed from the cylinder. Any storage area must be protected from excessive heat, open flame, or ignition sources. Storage outside should be above grade, dry, and protected from weather conditions. Store cylinders so oldest products get used first. Larger cylinders must be properly secured to prevent toppling. All cylinders must be protected from damage.

**Disposal**

Normally, cylinders are owned by a vendor and are returned to them, full or empty. Cylinders of toxic or flammable gas that are not empty and cannot be returned to a vendor must be disposed of as hazardous waste through EH&S. In some cases, the cost of disposal will be charged back to the generating department. Cylinders of oxygen, nitrogen or other normal constituents of air may be vented. Empty, non-returnable cylinders should be de-valved or should have the valve stem removed, and disposed of as scrap metal; or dispose the empty, non-returnable cylinders through EH&S.



For the past several years, the University of Idaho has had a voluntary PCB ballast removal program. Ballasts manufactured prior to 1978 commonly contain polychlorinated biphenyls (PCBs). PCBs are in the capacitor oil and in the tar-like "potting compound" that surrounds the capacitor. These older ballasts are being replaced by energy efficient, non-PCB electronic ballasts. PCBs are regulated under the federal Toxic Substances Control Act (TSCA). For a number of years, EPA required ballast manufactures to mark non-PCB ballasts with the words "No PCBs". Unfortunately, this requirement is no longer enforced.

**PCB-containing ballasts**

PCB-containing ballasts should be managed as hazardous waste. Submit a Chemical Waste Collection Request or drop-off non-leaking ballasts in the lockbox by the Hazardous Materials Storage Building. Make sure to relock the lockbox after placing any ballasts in it.

**Older unlabeled ballasts**

Assume that ballasts which contain no statement regarding PCB content contain PCBs. Non-leaking ballasts that are marked "No PCBs" can be disposed in the normal trash.

**Electronic ballasts**

Electronic ballasts with plastic covers can go into the normal trash. Electronic ballasts with metal covers should go to scrap metal recycling.

**Leaking ballasts**

If the ballast contains PCBs, they are inside the capacitor. If the capacitor breaks open due to ballast failure, the PCBs will contaminate the surrounding material and leak out of the fixture. The capacitor does not always leak when the ballast fails, but when it does, measures should be taken to limit or avoid personal exposure. If you discover a leaking ballast, notify EH&S at 208-885-6524 as soon as possible. If the leakage has escaped the light fixture and contaminated furnishings below, restrict entry into the area. EH&S personnel can coordinate the removal of a leaking ballast and perform a small cleanup.

*Clockwise from upper left: PCB ballast, electronic ballast with metal cover, electronic ballast with plastic cover, older unlabeled ballast.*





Mercury-containing equipment means a device or part of a device that contains elemental mercury integral to its function (40CFR273.9). This term does not apply to equipment and devices from which the mercury-containing components have been removed. For example, older thermostats contained mercury switches; when the ampules of mercury are removed, the remaining components are no longer regulated for disposal. Also the term does not apply to equipment that is not yet a waste. In other words, we are not

required to remove a piece of equipment from service simply because it contains mercury. Other types of mercury-containing equipment include thermometers, barometers, manometers, natural gas safety relays, blood pressure cuffs, and tilt switches in older appliances and automobiles.

Mercury is toxic, and in its elemental form, volatilizes easily. If the mercury from a broken thermostat ampule was allowed to evaporate in a small room, the air concentration of mercury could exceed occupational exposure limits.

Mercury-containing equipment is regulated as a “universal waste.” As with other universal wastes (lamps, batteries, and pesticides), mercury-containing equipment must be managed in a way that prevents releases to the environment.

### **Accumulation**

- Do not remove mercury ampules from thermostats or other electrical switches.
- Place the mercury-containing equipment in a resealable plastic bag and seal it.
- Mark the bag “Universal Waste – Mercury Containing Equipment.”
- Mark the date on the bag.
- If there is any evidence of leakage, spillage, or damage to the device, place the device in plastic container, such as a 5-gallon bucket, put the lid on the container, and seal it with electrical tape.
- Submit a [Chemical Waste Collection Request](#) to EH&S. Attach the printed label to the bag or other container.
- Mercury-containing equipment may not accumulate for longer than one year from the date the waste is generated.

### **Spills**

- Small spills involve amounts that may have been released from a broken thermometer.
- Spills larger than about 2 tablespoons may require notification to regulatory agencies.
- Contact EH&S (885-6524) immediately.
- Do not use a vacuum cleaner, broom, or mop to clean up the spill.
- Contain the spill by putting pieces of duct tape over the mercury droplets.
- Open exterior windows.
- Seal off the area and advise others of the spill (e.g. post a sign “Caution – Mercury Spill”).
- If anyone is contaminated, have them wait in a nearby area until they can change their clothing.
- Double-bag all contaminated material and label it “Mercury Contaminated Waste”. The waste must be disposed as hazardous waste.



<b>USED OIL</b>
GENERATOR INFORMATION
COMPANY _____
ADDRESS _____
CITY, STATE, ZIP _____
SOURCE _____
CONTACT _____

Oil includes any petroleum-based or synthetic oil. Oils used as lubricants, compressor oils, transmission fluids, refrigeration oil, hydraulic fluids, cutting fluid and heat transfer fluids are considered used oil and not managed as hazardous waste, unless contaminated with PCBs or high levels of halogens.

“Used Oil” does not include animal or vegetable oils, kerosene, mineral spirits, solvents or degreasers used to clean oily parts, brake fluid, or antifreeze. These materials, along with contaminated oil, are managed as hazardous waste.

### Accumulation

Store used oil in a sturdy, leak-proof, closed container labeled “Used Oil.” EH&S can provide 30-gallon drums for this purpose. Keep containers on covered, impermeable surfaces away from drains, preferably indoors. Use secondary containment such as spill pallets.

You may consolidate different types of used oil (for example, engine oil and transmission fluid) into the same container. HOWEVER, collect used refrigeration oil and used metal-working oils/fluids in separate containers.

Have spill cleanup supplies readily available. Spill pads and diatomaceous earth (e.g. “Floor-Dry™”) work well. Clean up any spills immediately! Call EH&S for assistance at 208-885-6524.

Avoid contamination of the used oil with other chemicals. **Do not mix any other chemical waste with the used oil.**

### Used oil filters

Non-terne-plated oil filters that have been gravity hot-drained are excluded from the RCRA hazardous waste regulations and used oil regulations. “Hot-drained” means that the oil filter is drained near engine operating temperature. To qualify for this exclusion, puncture the filter dome or filter anti-drain back valve and allow the filter to drain into a used oil collection container until used oil no longer drips from the filter. The drained filter can be disposed as normal waste without performing a hazardous waste determination.

Terne-plated used oil filters do not qualify for the exclusion because the terne plating contains a tin/lead alloy. Terne may be used on filters found in heavy trucks or equipment. Collect these as a hazardous waste.

### Recycling used oil

Recycle the oil via EH&S using the Chemical Waste Collection Request system.

### Contaminated oil

Manage oil contaminated with metals, PCBs, or other chemicals as hazardous waste.



Paint shops regularly generate wastes that are flammable and toxic, including leftover paint, lacquers, epoxy resins and hardeners, aerosol cans, waste ink, cleanup sludges, rags, filters, and unused solvent. Some highly colored pigments in paints may contain heavy metals such as arsenic, cadmium and chromium. Paints purchased before 1977 may contain lead in the pigment. Check product MSDSs for information about ingredients and hazards.

### **Latex paint**

Older latex paints may contain mercury as a fungicide. Check with EH&S if you are uncertain whether a latex paint could be a hazardous waste. Avoid “leftover” paint. Buy only what you will use. Find new uses for paint that wasn’t used for its original purpose.

Full or partially full cans or pails of unwanted latex paint are recycled or disposed through EH&S. Keep paint in its original container and seal the lid tightly.

To dispose of small amounts of latex paint (less than ¼ of one gallon of paint), use kitty litter, commercial paint solidifier, or vermiculite to absorb the paint. Mix the paint and absorbent until it is the consistency of cottage cheese. Then place the open container in the dumpster.

An “empty” latex paint can has less than ½ inch of paint in it. Allow the paint to dry a few days before you place empty paint cans in the dumpster. No free liquids can be disposed in the municipal trash. Minimize latex paint wash water. Use or remove and save as much latex paint as possible before washing equipment.

### **Oil-based paint, lacquers, epoxies**

Avoid the use of oil-based paint. It requires the use of hazardous solvents and is not recyclable. Any leftover oil-based paint must be disposed of as hazardous waste through EH&S. Keep containers tightly sealed unless they are “empty”. “Empty” means that you have removed as much of the product as possible by normal means (e.g. pouring, pumping, aspirating, scraping, etc.) AND no more than one inch of residue remains on the bottom of the container.

### **Solvents**

Solvents include acetone, lacquer thinner, mineral spirits, VM&P Naphtha, xylene, and others. Prevent evaporation; keep solvent containers tightly closed.

Dispose of solvent as hazardous waste when it loses its cleaning effectiveness, not just because it looks dirty.





Parts washers are commonly used in our maintenance operations to clean parts or components. Parts washers use cleaning solutions that eventually become spent and must be disposed or recycled. Spent parts washer cleaning solutions may be a hazardous waste.

Cleaning solutions used in parts washers include solvents and aqueous (water-based) cleaners. Solvents may be petroleum-based such as mineral spirits, Stoddard solvent, or petroleum naphtha; or they may be organic such as tetrachloroethylene, trichloroethane, trichloroethylene, benzene, and xylenes. Aqueous cleaners are pH-neutral or alkaline (high pH) water-based solutions.

Spent parts washer solutions are hazardous wastes if one or more of the following applies:

- It meets the definition of a listed waste because the spent solution contains one or more of the solvents in the listing description for waste codes F001 – F005. See Appendix B.
- It is ignitable by having a flashpoint less than 140°F. For example, spent Stoddard solvent would likely meet this characteristic.
- It is corrosive. Some of the water-based solutions have a pH greater than 12.5.
- It is reactive. The parts washer solutions are unlikely to have this characteristic.
- It contains toxic metals or organic chemicals above the regulatory limits for certain constituents (see Appendix A).

#### **Solvent-based parts washers**

Many commonly used solvents have flashpoints below 140°F, making them an ignitable hazardous waste. Spent solvents may also be hazardous waste because they contain toxic metals such as cadmium, chromium, and lead from parts and equipment cleaned in the parts washer. Spent solvents may also meet the definition of an F-listed waste (Appendix B).

#### **Aqueous parts washers**

Aqueous cleaners are often advertised as non-hazardous. This may be true before the solutions are used; but after use, they can become hazardous waste because they can contain toxic metals from the parts that were cleaned. Also, they could be contaminated with the solvent-based cleaners applied to the parts before washing, such as brake or carburetor cleaners.

#### **Disposal**

Contact EH&S when you are ready to change the parts washer solution. EH&S can provide the right size collection containers for your need. EH&S will need to know what the solution is by having you provide an MSDS. EH&S will also ask if the spent solution could be contaminated with other solvents, and if so, what those solvents are. In addition, EH&S will probably need to sample the spent solution and have it analyzed for waste characteristics, such as flashpoint, pH, and toxic constituents. A second sample may be necessary if the accumulated sludge in the bottom of the parts washers is to be removed at the same time.



<sup>1</sup> Adapted from Idaho Department of Environmental Quality Fact Sheet, "Properly Managing Parts Washer Waste," latest edition.

One of the primary purposes of the University's Integrated Pest Management Program is the wise use of pesticides. You must also ensure that pesticides and fertilizer products, rinsate and wash waters are prevented from being spilled or otherwise released into the environment in an uncontrolled manner. Always **READ AND FOLLOW THE PESTICIDE LABEL!**

### **Waste minimization**

Eliminate or reduce the generation of contaminated water. Any contaminated water should be prevented from moving off site to minimize the amount of environmental impact.

Mix only enough for immediate use to avoid leftover material.

Mix and use the chemical products as directed by the container labeling.

Triple rinse or pressure rinse pesticide containers as soon as they are emptied and pour the rinsates into the spray tank. If measuring equipment needs rinsing, put rinsate in the spray tank.

### **Storage**

Store pesticides in a locked area, preferably indoors. Use secondary containment in case of leaks and spills.

### **Empty containers**

To dispose of empty containers, triple rinse the container, collect the rinsate as hazardous chemical waste, remove labels and render the container unusable. Plastic and plastic-lined paper bags can be triple-rinsed. Cut out both ends of paper bags to prevent reuse. Then dispose of in the regular trash.

### **Disposal**

Rinsates should be collected in a sturdy plastic container. Rinsates from different pesticides can be added to the same container, but separate by compatibility and type (herbicide, insecticide, fungicide, etc.). Label the container "Waste Pesticide Rinsates." Keep a log of what pesticides and concentrations are added to the container. Unused or recalled pesticide products should be kept in their original container for disposal through the annual Idaho Department of Agriculture Pesticide Disposal Program; EH&S coordinates this disposal in early spring. For both rinsate containers and unused product, submit an electronic disposal request to EH&S.



Most refrigerants are potent greenhouse gasses. Some refrigerants also contain chemicals that destroy the earth's protective ozone layer. Therefore, regulations have been developed governing the maintenance and disposal of refrigerant-containing appliances.

### **Maintenance**

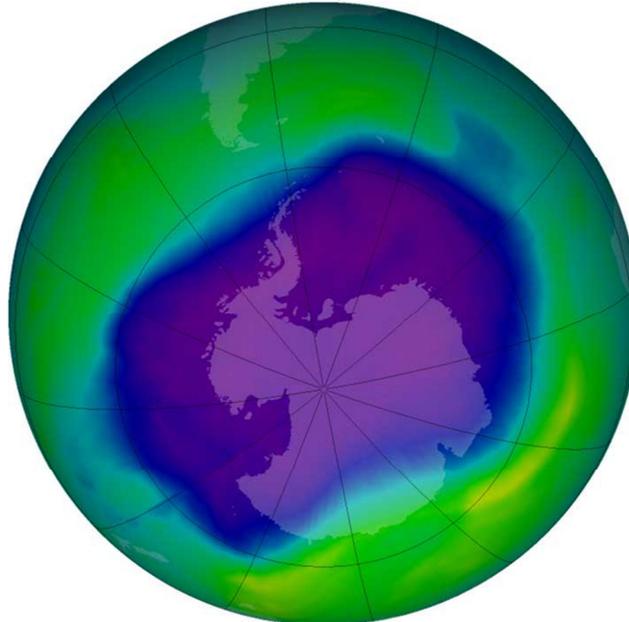
It is unlawful to vent any refrigerant to the air. Federal and state rules require that persons working on refrigeration equipment, including automotive air conditioning systems, obtain training and pass a certification exam. Large refrigeration appliances that contain more than 50 pounds of refrigerants are subject to special rules. For a list of requirements applicable to large appliances, please see the EPA compliance factsheet online at <http://www.epa.gov/Ozone/title6/608/608fact.html>.

### **Disposal**

If you have an appliance that you no longer need, dispose of it through the Facilities Services Recycling/Surplus/Solid Waste Division. They will make sure the unit is offered for sale if it is still working; otherwise, it will be sent out for proper disposal. Do not put refrigerant-containing appliances or bottles of refrigerant in the trash.

Refrigerant disposal is governed by the federal Environmental Protection Agency regulations. Special procedures apply to the disposal of refrigerants on the University of Idaho campus. Refer to the Idaho Department of Environmental Quality website at <http://www.deq.idaho.gov/waste-mgmt-remediation/recycling.aspx> for a list of refrigerant recyclers that service Latah County and the surrounding area. Spent refrigerants that cannot be reclaimed or recycled are subject to all the applicable requirements of hazardous waste and must be managed as hazardous waste. The EH&S Hazardous Materials staff manages disposal of hazardous waste.

Ozone hole over Antarctica, September 2006. Credit: NASA



Shop towels and rags are commonly used with cleaners or solvents to remove oil, dirt and grease. Many cleaners and solvents are ignitable and/or toxic. Also, the oils and metals that are being cleaned up can be ignitable and/or toxic. Therefore, shop rags must be managed according to hazardous waste rules.

### **Collecting used shop towels**

Make sure that used shop towels contaminated with hazardous chemicals are collected in closed, fire-safe containers. The containers must be in good condition and labeled with the words "Contaminated Shop Towels" or "Used Shop Towels".

Often, shop towels are collected in cans near each work station. This is okay; however, all of these cans must be emptied into the main shop towel accumulation area by the end of each day.

Containers holding used shop towels must be sufficiently separated from all sources of ignition. "No Smoking" signs must be posted at all accumulation areas.

Remove free liquids from the towels before tossing soiled shop towels in containers. Free liquids should be reused or disposed of as hazardous waste. Do not pour used solvents into the shop towel containers. **Put only used shop towels in the collection containers.**

Keep towels with incompatible wastes separate (e.g. solvents and acids).

EH&S collects the used shop towels on a weekly basis. You do not need to submit an electronic collection request.

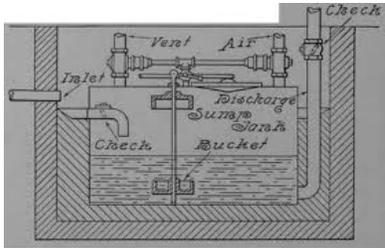
### **Rags contaminated with used oil**

Rags that have been wrung out to the extent possible such that no visible signs of free-flowing oil remain are not "used oil" and are not subject to used oil regulations. Instead, the wrung-out rags are solid waste; therefore, a hazardous waste determination must be made for them just like any other solid waste. Since used oil is not a "listed waste," the only way the wrung-out rag could be a hazardous waste is if it exhibits a characteristic or if it was mixed with a listed waste (for example, the rag was also used to absorb some toluene). The used oil wrung from the rags would continue to be managed under the used oil regulations. Thus, collect these rags for hazardous waste disposal by placing them in the fire-safe container.

### **Waste minimization**

As always, minimize the amount of ignitable and toxic chemicals you use with shop towels by using only the amount that gets the job done. Avoid chlorinated solvents. Whenever possible, use the least hazardous solvent.





### Sumps

Most of the sumps on campus include an oil/water separator that then drains to either the sanitary sewer or storm sewer. Chemical contaminants may be collected in the sumps. Before the sumps can be pumped out, it is necessary to evaluate the sludge for hazardous waste characterization. Contact EH&S prior to cleaning out a sump. EH&S will sample the liquid and sludge in the sump and determine if the material needs to be managed as a hazardous waste.

### Neutralization tanks

Some of the campus buildings include neutralization tanks at the downstream end of the plumbing system. When the limestone beds of these tanks are depleted or obstructed, it is necessary to remove the contents. In the past, the waste from some of these tanks has been found to contain heavy metals and insoluble organics that make the debris a hazardous waste. Contact EH&S prior to cleaning any of these neutralization tanks. EH&S will sample the material in the tank to determine if it needs to be managed as hazardous waste. If the project is contracted, refer the contractor to EH&S, 298-885-6524.



### Plumbing pipe



Many of our science buildings have acid-waste drainage systems that are composed of glass or PVC piping. Over the years, sediment collects in the piping, especially at sink traps. Sometimes this sediment will contain water-insoluble materials such as chromium and mercury. In this case, the sediment may be a hazardous waste. Since it is difficult to dissolve the sediments, it is usually easiest to dispose of the entire section of pipe as a hazardous waste. If you are removing sections of pipe from the acid-waste system, contact EH&S prior to conducting the work. EH&S will assist in making a hazardous waste determination and will dispose of any piping that is likely to be a hazardous waste.

**Employee name:**

**Signature:**

**Supervisor name:**

**Signature:**

**Date(s) of training:**

**Topics covered:**

**General Information for all employees**

- Introduction
- Chemical Hazards
- Waste Accumulation
- Empty Containers
- Chemical Spills
- Resources

**Specific information according to waste(s) generated by employee:**

- Aerosol Cans
- Antifreeze
- Batteries
- Filters
- Floor Sweep Compounds and Absorbents
- Fluorescent Lamps
- Gas Cylinders
- Lamp Ballasts
- Mercury-Containing Devices
- Oil
- Paint
- Parts Washers
- Pesticides
- Refrigerants
- Shop towels/rags
- Sumps, Neutralization Tanks, Plumbing Pipe

**Any additional topics:**

**Maximum Concentration of Contaminants for the Toxicity Characteristic**

<b>EPA HW Number</b>	<b>Contaminant</b>	<b>Regulatory Level (mg/L)</b>
D004	Arsenic	5.0
D005	Barium	100.0
D018	Benzene	0.5
D006	Cadmium	1.0
D019	Carbon tetrachloride	0.5
D020	Chlordane	0.03
D021	Chlorobenzene	100.0
D022	Chloroform	6.0
D007	Chromium	5.0
D023	o-Cresol	200.0
D024	m-Cresol	200.0
D025	p-Cresol	200.0
D026	Cresol	200.0
D016	2,4-D	10.0
D027	1,4-Dichlorobenzene	7.5
D028	1,2-Dichloroethane	0.5
D029	1,1-Dichloroethylene	0.7
D030	2,4-Dinitrotoluene	0.13
D012	Endrin	0.02
D031	Heptachlor	0.008
D032	Hexachlorobenzene	0.13
D033	Hexachlorobutadiene	0.5
D034	Hexachloroethane	3.0
D008	Lead	5.0
D013	Lindane	0.4
D009	Mercury	0.2
D014	Methoxychlor	10.0
D035	Methyl ethyl ketone	200.0
D036	Nitrobenzene	2.0
D037	Pentachlorophenol	100.0
D038	Pyridine	5.0
D010	Selenium	1.0
D011	Silver	5.0
D039	Tetrachloroethylene	0.7
D015	Toxaphene	0.5
D040	Trichloroethylene	0.5
D041	2,4,5-Trichlorophenol	400.0
D042	2,4,6-Trichlorophenol	2.0
D017	2,4,5-TP (Silvex)	1.0
D043	Vinyl chloride	0.2

### Solvents on the F-List

**F001** Spent halogenated solvents used in degreasing:

Carbon tetrachloride	Tetrachloroethylene
Chlorinated fluorocarbons	1,1,1-Trichloroethane
Methylene chloride	Trichloroethylene

**F002** Spent halogenated solvents:

Chlorobenzene	1,1,2-Trichloroethane
Methylene chloride	Trichloroethylene
ortho-Dichlorobenzene	Trichlorofluoromethane
Tetrachloroethylene	1,1,2-Trichloro-1,2,2-trifluoroethane
1,1,1-Trichloroethane	

**F003** Spent non-halogenated solvents:

Acetone	Methanol
Cyclohexanone	Methyl isobutyl ketone (MIBK)
Ethyl acetate	n-Butyl alcohol
Ethyl benzene	Xylene
Ethyl ether	

**F004** Spent non-halogenated solvents:

Cresols	Nitrobenzene
Cresylic acid	

**F005** Spent non-halogenated solvents:

Benzene	Methyl ethyl ketone (MEK)
Carbon disulfide	2-Nitropropane
2-Ethoxyethanol	Pyridine
Isobutyl alcohol	Toluene