DEPAUL UNIVERSITY

Waste Disposal Guide

Environmental Health & Safety

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1.0 INTRODUCTION

We are all aware of the importance of taking safety precautions when working with hazardous substances. Those risks do not simply disappear when the task is completed – they remain in the form of hazardous wastes. Proper hazardous waste handling is critical to the health and safety of the DePaul community and beyond. Environmental Health & Safety (EHS) works to provide for the disposal of hazardous waste in a safe, efficient and ecologically sound manner. We need your cooperation to achieve this goal. Please abide by the guidelines set forth in this document for all waste generated.

2.0 RESTRICTIONS

Employees must not accept any hazardous substances or items containing hazardous substances as gifts or donations on behalf of DePaul without first obtaining approval from The Office of Advancement and EHS prior to the transfer. See the Gift Acceptance and Processing policy for more information.

Employees must not give, sell, or otherwise transfer hazardous substances from DePaul's possession outside of the procedures in this guide without the written preapproval of EHS.

DePaul does not permit hazardous waste to be drain disposed or vented in fume hoods. Even if materials are not hazardous waste, many cannot go down the drain due to water treatment facility restrictions. There is an exception for aqueous waste which is hazardous only due to being corrosive which allows for it to be pH adjusted and drain disposed provided certain criteria are met. EHS must approve of any department wishing to utilize this exception.

In the event that unknown waste is generated, the generating department may be required to cover the cost of testing and disposal.

3.0 HAZARDOUS WASTE DEFINED

It is important to be familiar with the types of hazards exhibited by wastes you generate. The EPA places hazardous waste into 2 main groups: characteristic and listed wastes.

3.1 Characteristic Wastes

Characteristic wastes exhibit one or more of the following qualities:

Corrosivity: Includes aqueous wastes with a pH less than or equal to 2, greater than or equal to 12.5, and/or based on the liquid's ability to corrode steel.

Ignitability: Includes liquids with flash points below 140°F (60°C), non-liquids that cause fire through specific conditions, ignitable compressed gases and oxidizers.

Reactivity: Includes wastes that may be unstable under normal conditions, react with water, give off toxic gases or are capable of detonation or explosion under normal conditions or when heated.

Toxicity: Includes wastes that are harmful when ingested or absorbed, or may leach from waste and pollute groundwater. Determined by the Toxicity Characteristic Leaching Procedure (TCLP).

3.2 Listed Wastes

Listed wastes are generated by specific industries and processes and are automatically considered hazardous based on the process that generated them, regardless of whether they exhibit any of the "characteristic" qualities. DePaul does not generate much listed waste but because of some facility processes and our use of laboratory chemicals it is important to list them here.

The F-list (Non-specific source wastes): Includes wastes from common manufacturing and industrial processes, such as solvents that have been used in cleaning or degreasing operations.

The K-list (Source-specific wastes): Includes wastes from specific industries, such as organic chemicals manufacturing. DePaul currently does not generate any K-listed waste.

The P-list and U-list (Discarded commercial chemical products): Commercial chemical products that are considered acutely hazardous (P-list) or hazardous (U-list) when discarded. For a waste to be considered P- or U-listed, it must:

- Contain one of the chemicals on the P or U list
- The chemical in the waste must be unused
- The chemical in the waste must be in the form of a commercial chemical product (100% pure, technical (e.g. commercial) grade, or the sole active ingredient in a chemical formulation)

4.0 WASTE CONTAINERS AND STORAGE

4.1 Recommended Containers

Acids, Bases, Flammable Liquids	Glass bottles, high density plastic containers
Aqueous waste	Glass bottles, sturdy plastic bottles
Solid waste	Plastic/metal containers, thick plastic bags

Instead of ordering new containers, you can also create your own. EHS encourages the reuse of old bottles and containers. Many everyday household containers can make perfectly fine waste containers. However, proper precautions must be exercised before using homemade containers. Make sure they are compatible with the waste in question and only use those that have tight sealing caps and no leaks. If you have doubts about the container, err on the side of caution and use a new one instead.

EHS can provide you with 5, 15, 30 or 55 gallon containers made of plastic (translucent or opaque) or metal. These can either be closed-top style with a small opening for liquid waste, or open-top style for larger items. If you need containers of a different size, contact your lab coordinator.

4.2 Container Condition

Waste containers must be in good condition. Leaking or damaged containers are not acceptable. If a container is leaking or damaged, place it in another container (secondary containment) and contact EHS for assistance. Containers should always have a properly fitting cap or lid. Makeshift covers such as tape to hold down a screw cap or a rag stuffed into an opening are unacceptable. Funnels are not acceptable lids and must be removed after adding waste. Plastic bags, where acceptable as containers, should be double bagged, free of punctures or tears and tightly sealed. Bags must never

be used as primary or secondary containers for hazardous liquid waste. It is a best practice to inspect waste containers in your lab at least weekly for any signs of deterioration.

4.3 Chemical Compatibility

Accidental mixing of incompatible wastes may result in dangerous chemical reactions generating toxic gases, excessive heat, fire, explosions, overflowing and/or rupturing containers. Proper precautions must be taken at all times when mixing wastes in containers. Do not mix any wastes whose compatibility you are uncertain about. Refer to safety data sheets (SDSs) and check out the following resources for additional guidance. Reach out to EHS if you are still uncertain.

- EPA's Chemical Compatibility Chart
- University of Illinois Urbana-Champaign Compatibility Guidance

4.4 Empty Containers

Chemical containers are considered empty, and not hazardous waste, when all waste that can be removed has been removed by common methods such as pouring, pumping or aspirating, AND no more than 1 inch of material OR no more than 3% by weight remains. Residues left on the sides and bottom of containers are not typically considered to pose a hazard to human health or the environment. An exception is 55 gallon drums previously used to store flammable liquids – these must be disposed of through our vendor.

Empty chemical containers (including waste containers) can be defaced and disposed of in the regular trash. To deface, rip/scratch off labels, use dark markers or any tools at your disposal to render all markings unreadable.

An exception to this is P-listed chemical containers as all are considered acutely hazardous. Examples include pure arsenic oxide, methyl hydrazine and sodium azide. Please see page 112 of these Illinois EPA regulations for the complete P-list. Containers that held these substances must be disposed of as hazardous waste regardless of how full they are.

4.5 Satellite Accumulation Areas

We encourage you to utilize your hood as a satellite accumulation area (a temporary waste storage area) until containers are full or ready to be picked up and brought to a waste room. Designate an area of the hood to be used for waste, and use secondary containment. The total amount of hazardous waste that may be collected in a satellite accumulation area is 55 gallons, with the exception of acutely hazardous waste (all P-listed waste and select others) of which there may only be 1 quart. Once these quantities are exceeded, you have 3 days to transfer the items to a waste room. Containers in satellite accumulation areas do not need to be dated. They can be stored there until the volume limit is reached. With that said, avoid accumulating large amounts of waste in fume hoods. Please see the Fume Hoods Manual for more information.

5.0 ACCUMULATION LIMITS

DePaul is considered a small quantity generator (SQG) by the Illinois EPA. As a result, the University is allowed to generate no more than 2200 lbs. of hazardous waste in any calendar month and no more than 13,200 lbs. total hazardous waste on site for up to 180 days (or 270 days if waste will be shipped more than 200 miles). Items in waste rooms (not satellite accumulation areas) must be

labeled with the date they were placed there. It is this date that starts the clock for the 180/270 day storage limit.

6.0 WASTE STREAMS

6.1 Hazardous (Chemical) Waste

Much of the chemical waste generated on campus is considered hazardous. It is important to label all chemical wastes properly. Every label must contain:

- The words "Hazardous Waste"
- Owner/Lab #
- All chemical contents, estimate percentages if possible

EHS can provide you with labels or you may create your own. Writing directly on containers is also fine as long as it is legible.

Precautions must be taken to avoid the generation of unknown waste. Unknown waste can be a result of:

- Discarded/inherited chemicals
- Bottle/label degradation
- Lack of labeling on user-created containers
- Lack of communication between faculty/staff/students

Contact EHS or your lab coordinator at any time to have items transferred to one of our waste rooms.

6.2 Biohazardous Waste

6.2.1 Definitions

DePaul uses the term "biohazardous waste" to refer to items considered potentially infectious medical waste (PIMW) by the Illinois EPA and regulated waste by OSHA, as defined below. Animal specimens in Carosafe™ or a similar preservative are not biohazardous and must be collected separately.

Potentially Infectious Medical Waste (PIMW): The following types of waste generated in connection with the diagnosis, treatment (i.e. provision of medical services), or immunization of human beings or animals; research pertaining to the provision of medical services; or the provision or testing of biologicals:

Cultures and stocks. This waste shall include but not be limited to cultures and stocks of agents infectious to humans, and associated biologicals; cultures from medical or pathological laboratories; cultures and stocks of infectious agents from research and industrial laboratories; wastes from the production of biologicals; discarded live or attenuated vaccines; or culture dishes and devices used to transfer, inoculate or mix cultures.
Human pathological wastes. This waste shall include tissue, organs, and body parts (except teeth and the contiguous structures of bone and gum), body fluids that are removed during surgery, autopsy, or other medical procedures; or specimens of body fluids and their containers.

Human blood and blood products. This waste shall include discarded human blood, blood components (e.g. serum and plasma), or saturated material containing free flowing blood or blood components.
Used sharps. This waste shall include but not be limited to discarded sharps used in animal or human patient care, medical research, or clinical or pharmaceutical laboratories; hypodermic, intravenous, or other medical needles; hypodermic or intravenous syringes; Pasteur pipettes; scalpel blades; or blood vials. This waste shall also include but not be limited to other types of broken or unbroken glass (including slides and cover slips) in contact with infectious agents.
Animal waste. Animal waste means discarded materials, including carcasses, body parts, body fluids, blood, or bedding originating from animals inoculated during research, production of biologicals, or pharmaceutical testing with agents infectious to humans.
Isolation waste. This waste shall include discarded materials contaminated with blood, excretions, exudates, and secretions from humans that are isolated to protect others from highly communicable diseases (those identified as Class 4 etiologic agents in Ill. Admin. Code tit. 35, § 1420.102).
Unused sharps. This waste shall include but not be limited to the following unused, discarded sharps: hypodermic, intravenous, or other needles; hypodermic or intravenous syringes; or scalpel blades.

Regulated Waste: Liquid or semi-liquid blood or other potentially infectious materials (OPIM)*; contaminated items that would release blood or OPIM in a liquid or semi-liquid state if compressed; items that are caked with dried blood or OPIM and are capable of releasing these materials during handling; contaminated sharps; and pathological and microbiological wastes containing blood or OPIM.]
*this is separately defined by OSHA. For more information, see the Exposure Control Plan.

6.2.2 Container Requirements

All containers used for biohazardous waste (other than sharps) must be closable, labeled properly, constructed to contain all contents and prevent leakage of fluids during handling, storage, transport or shipping.

Labels must be fluorescent orange or orange-red with lettering/symbol in a contrasting color, include the word “Biohazard” or “Biohazardous” and the universal biohazard symbol, and be affixed securely. Labels meeting these requirements are widely available and typically come on containers purchased for these purposes. Red bags or red containers may be substituted for labels, but it is recommended that red color-coding be used in addition to labeling. Containers must be closed prior to removal to prevent spillage or protrusion of contents during transport/shipping. If a container’s exterior is contaminated, it must be placed within a secondary container.

EHS provides large (~40 gallon) biohazardous waste bins (“bio bins”) upon request. Each bio bin comes with a liner. Place all waste inside this liner and make sure it does not slip down. It must be tied shut before the bin is transported off-site.

If another size is needed, EHS’s biohazardous waste vendor may be able to supply it, or departments may obtain their own through other vendors. You may contact EHS at any time to pick up a full bin, whether EHS-provided or not.

6.2.3 Deactivation

Items routed for bio bins do not need to be autoclaved unless there is reason to believe this should be done as an extra precaution. The contents of bio bins are autoclaved when they reach our vendor's facility. It is acceptable to only autoclave glassware and other equipment you will reuse. If you do autoclave biohazard bags, do not overfill them and place them in a secondary container. Autoclaved items must still be disposed of in bio bins.

Diluted bleach and other chemicals may be used to treat liquid wastes to render them non-biohazardous. Small quantities of liquids deactivated with bleach may then be able to be drain disposed. Proper contact time for the materials must be used.

6.3 Sharps

A sharp is an item that can penetrate the skin. Sharps may be biohazardous, chemically contaminated, radioactive, or not contaminated.

6.3.1 Biohazardous Sharps

Biohazardous sharps are those that have been in contact with BSL 1 or 2 materials (includes human blood and most body fluids), or recombinant or synthetic DNA/RNA.

Biohazardous sharps must be placed into a biohazardous sharps container as soon as possible after use. Biohazardous sharps containers must be closable, puncture resistant, leakproof on the sides and bottom, and labeled as described in Section 6.2.2.

Departments are responsible for purchasing and placing sharps containers. They must be located as near to their area of use as possible and always kept upright. Dispose of containers when they are around ¾ full in the nearest bio bin or contact EHS for pick up if no bin is available.

The following sharps must **ALWAYS***** be disposed of in a biohazardous sharps container, **EVEN IF THEY ARE NEW/UNUSED:**

- Hypodermic, intravenous, and other medical needles (e.g. lancets)
- Hypodermic or intravenous syringes
- Scalpel blades

***Unless they are used with chemicals, see Section 6.3.2.

The following biohazardous sharps must be disposed of in a biohazardous sharps container:

- Pasteur pipettes
- Slides and cover slips
- Broken glass
- Broken rigid plastic (e.g. petri dishes)
- Capillary tubes
- Blood vials
- Razor blades

The following biohazardous items are not considered sharps but should be handled with extra caution as they may poke through collection bags. They can be placed into a biohazardous sharps container or alternative puncture resistant container before being placed into a bio bin:

- Serological pipettes
- Pipette tips
- Test tubes
- Swabs
- Any other items that could puncture a bag

6.3.2 Chemically Contaminated Sharps

An item is considered chemically contaminated if it contains more than a trace amount of chemical residue.

The following chemically contaminated sharps must always be disposed of in a NON-biohazardous sharps container (not red, not labeled biohazardous):

- Needles
- Syringes
- Scalpel blades
- Pasteur pipettes
- Slides and cover slips
- Broken glass
- Capillary tubes
- Razor blades

6.3.3 Non-Hazardous Broken Glass and Sharp/Pointy Objects

The following items that are free of contamination but may puncture a bag and injure custodial workers must be disposed of in a broken glass box or other sturdy box, labeled "broken glass," "nonhazardous lab glass," or whatever is appropriate, taped securely closed, and disposed of in the regular trash:

- Broken/chipped glass
- Fragile glass items
- Broken rigid plastic
- Pipettes and tips
- Slides and cover slips
- Test tubes
- Capillary tubes
- Razor blades

Lab users may place full, taped broken glass boxes into trash dumpsters themselves or request pick up by Facility Operations via work order. Leave boxes inside the lab for pick up.

6.4 Lab Debris/Solid Waste

Lab debris includes gloves, towels, plastic, rags, weigh boats, etc. which do not contain more than a trace amount of chemical residue. These items may be safely disposed of in the regular trash. If these

items are chemically contaminated, they must be collected in an acceptable waste container as described in Section 4.0.

6.5 Radioactive Waste

Radioactive waste, including any radioactive sharps, must be treated similarly to chemical waste, but kept completely separate. Please contact the Radiation Safety Officer (Dr. John Dean, Biological Sciences) and EHS for more information if you anticipate generating radioactive waste.

6.6 Compressed Gas Cylinders

Every effort should be made to return compressed gas cylinders to the manufacturer or supplier. If you are unable to return a gas to a vendor for any reason, contact EHS for assistance. See the Compressed Gas Safety Manual for more information.

APPENDIX A: PROGRAM HISTORY

Date	Revision Number	Brief Description of Changes	Review Completed by
June 2016	1	Formatting, minor content changes	K. Abma
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