

ENVIRONMENTAL, SAFETY, AND RECYCLING OFFICE

HAZARDOUS WASTE MANAGEMENT

An Instruction Program for Handlers of Hazardous Wastes

Hazardous wastes are ingredients or byproducts from various operations (especially laboratory experiments) at the University that can pose a substantial or potential hazard to human health or the environment when improperly managed. They are specifically defined by both the United States Environmental Protection Agency and the Massachusetts Department of Environmental Protection. It is vital that Students and Faculty look at specific experiments as to identify hazardous reagents and end products which require specific handling. The intent of this document is to shine some light on the general laws associated with the identification, labeling, storage, transportation and disposal of hazardous wastes.

Waste Generation

The amount of waste generated by the University determines the level of regulation required for compliance. There are three categories of hazardous waste generators. These categories maintain separate weight thresholds for oil versus hazardous waste. In other words, a large quantity generator of oil waste can be a small quantity generator of hazardous waste.

- Large Quantity Generator >2,200 lbs per month generated
- Small Quantity Generator >220 lbs but less than 2200 lbs per month generated
- Very Small Quantity Generator <220 lbs per month generated

The University is becoming a Small Quantity Generator of hazardous waste and is a Small Quantity Generator of oily waste. This is important to understand because changes to operations, which will increase oil or hazardous waste generation amounts, need to be communicated to the Environmental, Safety and Recycling Manager (ESRM). There is additional planning and paperwork required to switch generation categories.

How to Identify a Hazardous Waste

Hazardous waste is a material which has served its original purpose or:

- is no longer needed AND is being discarded

Having met the above definition, Faculty and Students must next determine if the waste meets the definition of listed and or characteristic hazardous waste. Listed hazardous waste is waste from specific industries, non-specific sources, specific commercial chemical products or waste considered acutely toxic. Lists of hazardous chemicals, hazardous waste types and pertinent industry types can be reviewed in the Federal and State Hazardous Waste laws to help determine the appropriate listing. The Massachusetts Hazardous Waste Regulations are 310CMR30. Listed Hazardous wastes are discussed in 310CMR30.130 through 310CMR30.136. Some examples of Listed Hazardous Wastes that can be expected from University laboratories include:

- Solvents including but not limited to Acetone, Benzene, Toluene, Xylene, Methylene Chloride, Trichloroethylene, Methyl Ethyl Ketone
- Solvent mixtures
- Rags saturated with any of the above
- Oil Wastes
- PCB Wastes

Characteristic hazardous waste is waste that demonstrates a property of ignitability, corrosivity, reactivity or toxicity. A waste can be tested or assumed (based on MSDS or other pertinent information) to meet the specific definitions listed in the Federal and State Hazardous Waste laws. The Massachusetts Hazardous Waste Regulations are 310CMR30. Characteristic Hazardous wastes are discussed in 310CMR30.120 through 310CMR30.125. Below summarizes some of the general definitions more common to characteristic wastes

- Ignitable
 - is a liquid with a flashpoint <140(F).
 - is a solid and is capable, under standard temperature and pressure of causing fire through friction, absorption of moisture or spontaneous chemical changes and, when ignited, burns so vigorously and persistently that it creates a hazard.
 - is an ignitable compressed gas as defined in 49 CFR 173.115(a).
 - is an oxidizer, as defined in 49 CFR 173.127(a).
- Corrosive
 - Is a liquid with a pH<2 or pH >12.5
- Reactive
 - Is normally unstable and undergoes violent changes
 - Is going to react violently with water
 - Is a cyanide waste that will create a hazard when introduced to low pH material.
- Toxic
 - Contains more than the regulatory limit of a constituent listed in 310CMR30.125 Table 1

Some routine examples of Characteristic Hazardous Wastes that can be expected from University laboratories include:

Ignitable:

- Gasoline
- Alcohols or ketones
- Acetone, Xylene, Hexane, Cyclohexanone
- Ethers
- Most Aerosol Cans – (Paints, adhesives, etc...)

Corrosive:

- Acid Solutions (i.e. Hydrochloric, Sulfuric, Phosphoric, Nitric, etc...)
- Iodine Solutions
- Caustic Solutions (i.e. Potassium Hydroxide, Sodium Hydroxide, Bleach, Ammonium Hydroxide, etc...)
- Biuret and or Benedict's Solution

Reactive:

- Sodium Metal

Toxic:

- Lead, Mercury, Silver, Cadmium, Chromium or other heavy metal contaminated solution or solids
- Copper, Zinc, Cobalt, Manganese, Iron containing solutions.
- Chloroform
- Benzene
- Methyl Ethyl Ketone

Reviewing ingredients on the chemical label or reviewing the chemical MSDS sheet in conjunction with understanding the process generating the waste are the best ways to screen for applicability to the hazardous waste listings or characteristics. Further understanding of the laws and definitions pertinent to performing waste determinations will tell for sure. The Environmental, Safety and Recycling Manager (X1634) should be contacted for hazardous waste questions.

What is not a Hazardous Waste?

Any material that has lost its hazardous properties in use such as curing, neutralization, etc. or does not meet the definition of hazardous waste. Non-Hazardous waste should be kept separate from hazardous waste. Note that when mixed (waste made up of hazardous and non-hazardous constituents) it is considered hazardous unless by knowledge of process or testing it is proven otherwise. Below are examples of hazardous and non-hazardous waste mixtures that may need to be considered hazardous. Also below are activities to avoid if considering how to aid a material in losing its hazardous properties.

- A paint roller is used to apply oil based paint. This roller is left out to dry. Once dry it is thrown in the trash.

This is a violation of several environmental laws. Excess oil based paint should be removed from rollers and collected for reuse or proper disposal. A roller that will not release one drop of paint when squeezed and has not been treated with paint thinner or solvent may be discarded in the trash. Otherwise it should be collected for proper disposal.

- Oil based paint cans are left out to dry and then discarded.
See above. This is a violation of environmental law.
- Blanket wash containing Acetone and Methylene Chloride is poured on a rag and used to clean the printing press. The rag is saturated with the wash agent and ink when done.
This rag is hazardous waste.

How do we properly handle and store Hazardous Waste?

Properly handling and storing hazardous waste (once it has been identified) is a vital step in protecting the safety and well being of coworkers, students and the environment. Once a hazardous waste is generated, all associated handling steps will need to be laid out as to ensure compliance with law. Below are the key steps to consider:

- Select a container appropriate for the waste for to be collected. Ensure the container is in good condition, is compatible with the waste, will contain the entire volume of waste and can be closed. If reusing a container, make sure what was in it previously will not react negatively with the waste. It should also be clean and free from any residue. An example of an inappropriate container use would be using a plastic bag to collect waste paint. Questions concerning container types can be directed to the ESRM at X1634.

Note: Laboratory wastes are commonly collected in polyethylene containers outfitted with “eco funnels”. These containers are commonly located in one of the chemical fume hoods. A “Hazardous Waste” sign indicates where the containers are located within a particular lab.

- The selected container must be appropriately labeled. The label should go on the outside of the container and must contain very specific information. This information includes:
 - The words: "HAZARDOUS WASTE"
 - The constituents or ingredients of the waste.
 - The type of Hazard. (Ignitable, Corrosive, Toxic, Reactive, etc.)
 - The date the container is filled.

Note: Label templates are available for electronic distribution. Contact the ESRM for access.

- The labeled container can now accept the waste. Use appropriate engineering controls (i.e. fume hood) and or PPE to transfer or collect the waste into the container.

Note: The “eco funnels” allow for the easy pour off into a container of end product wastes generated at the lab bench. Remember...

- *Make sure the container you are adding to has enough room to accommodate the volume*
- *Close and latch the red lid on top of the funnel when you are done.*

- Once full the date section on the label needs to be filled in. The container will need to be relocated within 3 Days of this date so contact the ESRM for relocation.

How do we properly transport Hazardous Waste?

The ESRM coordinates the pick-up of hazardous waste containers from satellite areas. This is done either on a routine basis (as a result of an ESRM inspection of the area) or via notification. All satellite area containers must be relocated to Central Storage Areas within 3 days of becoming full.

Wastes from Central storage areas are packaged and shipped off-campus by a third party vendor twice per year. This is based on current waste generation rates and existing storage room availability. All third party vendor arrangements are made by the ESRM. The third party vendor prepares the appropriate paperwork to transport hazardous or oily waste, and this paperwork is signed and maintained by the ESRM. Additional questions on shipping hazardous wastes should be directed to the ESRM. Only the ESRM can sign shipping documents for hazardous or oily waste.

What if I spill my hazardous or oily waste?

- Consider the hazardous properties of the waste before attempting any action.
- Notify your Supervisor or Instructor immediately
- Either send someone to contact (or you yourself contact) Public Safety at X1411.
- If safe to do so and you are comfortable with the waste material, contain the spill or take actions to keep the spill from reaching:
 - any sink or floor drains,
 - the outside environment, or
 - other chemicals or equipment.

- Return as much of the spilled material to its waste container as possible.
- Use available sorbants or specialty sorbents stored in the accumulation areas to pick up the remainder of the spill. These sorbent materials then become a hazardous waste and must be treated as such. Containers will be available for spent spill clean-up materials in each accumulation area.

Final Thought

The hazardous components of the University's hazardous waste could be used in a deliberate attempt of assault, environmental pollution or other illegal act. Waste cabinets should remain locked except when adding material. Rooms where chemicals or wastes are stored should be kept locked unless under Faculty or Staff Supervision. Keys for the waste cabinets should be kept in the control of the person to whom they were distributed. Threats to these security precautions should be reported to the ESRM at extension 1634. Threats could include suspicious persons, behavior, actions or unlocked or unsecured chemicals or wastes. If any threat creates an immediate danger to individuals or University property, or the illegal use of a hazardous material is observed or suspected, contact Public Safety at their Emergency Extension 1411.