



Safety Manual
Section 13
Hazardous Waste Disposal

13. HAZARDOUS WASTE DISPOSAL

The following sections provide hazardous waste safety guidelines and procedures. This chapter covers the following topics:

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Safety Manual

Section 13

Hazardous Waste Disposal

13.1 Hazardous Waste and Texas State University – San Marcos

Hazardous waste disposal is governed by the EPA and the Texas Commission on Environmental Quality (TCEQ) through State and Federal regulations. The purpose of environmentally sound disposal methods is to prevent harm to the water, land, and air.

Texas State University - San Marcos complies with hazardous waste disposal regulations by means of the Hazardous Waste Management Program Texas State University - San Marcos UPPS 04.05.06 Disposal of Hazardous Waste. The Risk Management & Safety Office (RMSO) administers this program.

■ Permits and Requirements

Texas State University - San Marcos is a "Large Quantity Generator" of hazardous waste. The University's EPA and TCEQ Generator Registration I.D.s apply to all university activities. The RMSO will assist any department or System Part in determining its hazardous waste disposal needs.

■ Penalties of Noncompliance

Noncompliance with any hazardous waste regulation may result in substantial fines and penalties for the University. The University may be cited or fined for numerous types of violations ranging from improperly labeling a waste container to intentionally disposing of hazardous waste incorrectly.

■ Role of RMSO

The RMSO administers the Hazardous Waste Management Program at Texas State University - San Marcos. Compliance with this program is very demanding — it requires full cooperation by all campus entities. The main focus of this program is chemical waste management (Hazardous and Class 1 Industrial). The program does not include procedures for the management of radioactive, infectious, biological, or municipal solid waste.

The RMSO collects, transports, and stores hazardous waste (less than 90 days) until it is shipped for final disposal. The Office also maintains permanent records (manifests) of all disposed waste. Contact the RMSO for more information on hazardous waste disposal.

13.2 Definitions

■ **Container Accumulation Area(s) (CAAs)**

Designated by the RMSO to be used for the storage of hazardous wastes (less than 90 days) prior to shipment to permitted waste disposal waste storage area.

■ **Disposal**

The proper disposition of hazardous and Class 1 Industrial waste at a permitted treatment, storage or disposal (TSD) facility in compliance with all applicable TCEQ and EPA regulations.

■ **Generator**

Any person, by site, who produces hazardous waste or industrial solid waste; any person who possesses hazardous waste or industrial solid waste to be shipped to any other person; or any person whose act first causes solid waste to become subject to regulation. Generators accumulate waste in Satellite Accumulation Areas.

■ **Hazardous Waste**

Any solid waste material listed or identified in Title 40 Code of Federal Regulations, Part 261, Subpart D or exhibiting the characteristics of ignitability, corrosivity, reactivity, or E.P. toxicity also defined in 40CFR Part 261 Subpart C. Tables containing the listing and characteristics of hazardous wastes are shown in these subparts and in the University's Waste Analysis Plan, Attachment C.

■ **Mixed Waste**

A radioactive waste that is also a hazardous waste.

■ **Satellite Accumulation Area(s)**

A storage location at or near the point of generation where hazardous waste initially accumulates. The SAA are limited to storage of less than 55 gallons.

■ **Solid Waste**

Any garbage, refuse, sludge from a waste treatment plant, water treatment plant, or air pollution control facility or other discarded material. Solid waste can be solid, liquid, semi-solid, or contained gaseous material resulting from industrial, municipal, commercial, mining and agricultural operations, and from community and institutional activities.

13.3 Types of Hazardous Waste

An item is considered waste when the owner determines that the material is no longer useful and needs to be discarded. A detailed description of the wastes generated at the University is in the Waste Analysis Plan.

An item is considered to be hazardous waste if it meets one or more of the following characteristics:

- Mixture contains a listed hazardous waste and a non-hazardous waste.
- Material meets the definition of one of the following:
 - Ignitability (flashpoint < 60° C or supports combustion)
 - Reactivity (e.g., water reactives, cyanides, explosives, unstable chemicals)
 - Corrosivity (ph < 2 or > 12.5)
 - EP toxicity (e.g., pesticides, heavy metals, organic compounds, see Waste Analysis Plan, Attachment C.)
- Material is listed in 40CFR 261, Subpart D, (see Waste Analysis Plan, Attachment C.)
- Material is not excluded from regulations.

Individual departments are responsible for properly identifying the hazardous waste they generate and for following University disposal procedures. Departments should contact the RMSO for assistance if necessary to characterize hazardous waste through process knowledge or chemical analysis.

13.4 Containers, Tags, and Collection

Proper containment, tagging, collection and disposal are essential to the success of the Hazardous Waste Program. The following sections discuss these areas.

A. Filling Containers

Hazardous waste collection containers must be in good condition, must not leak, and must be compatible with their hazardous contents (e.g., do not use metal containers for corrosive waste or plastic containers for organic solvents). All containers must have suitable screw caps or other secure means of closure. RMSO provides 5-gallon poly-ethylene carboys that meet most of these compatibility requirements. When large waste containers (greater than 5 gallons total volume) are warranted, contact the RMSO for assistance.

If you are reusing a container to accumulate waste, destroy the original product label. EPA regulations require that waste containers be labeled with the identity of the contents, and the words "Hazardous Waste". RMSO provides hazardous waste I.D. tags that meet these requirements. The RMSO will add the accumulation start date when the waste is picked up from the department and transported to the CAA(s).

IMPORTANT!

Never overfill hazardous waste containers. Expansion and excess weight can lead to spills, explosion, and extensive environmental exposure.

Do not fill past the shoulder of the container. The shoulder of the container is the place where the container slopes in towards the neck.

Fill closed head cans (5 gallons or less) to leave approximately two inches of space between the liquid level and the top of the container.

Fill closed head drums (larger than 5 gallons) to leave approximately four inches of space.

Hazardous waste containers for solids are generally rated by their weight capacity and volume capacity. Take care not to exceed the weight capacity of a solid container. Weight is generally not a problem for jars and open head cans (5 gallons or less), but it can be a problem for open head drums (larger than 5 gallons). Depending on weight requirements, you may fill containers for solids within two inches of the closure.

IMPORTANT!

Keep all waste collection containers closed except when adding or removing material.

B. Completing Tags

When a container first receives waste it is necessary to attach a waste tag.

Follow these guidelines for completing hazardous waste tags:

- Use full chemical names or common names. Chemical formulas or abbreviations are not acceptable.
- List all chemical components in the waste container, including water. Long lists may be continued on a second tag.
- Indicate the percent concentration of the chemicals, especially potentially explosive materials such as picric acid and nitro compounds.
- Attach the tag to the container.

C. Collection and Disposal

The RMSO collects waste from generators on a weekly basis. Specific details concerning waste pickup procedures are in procedure RMS-01.03, "Hazardous and Non-hazardous Waste Pickup."

Containers with improper caps, leaks, outside contamination, or improper labeling will not be picked up until these problems have been corrected.

Improper disposal methods for hazardous chemical waste include the following:

- Disposal down the drain.
- Intentional evaporation in a fume hood.
- Disposal in the regular trash.
- Dilution and disposal down the drain.

D. Disposing of Empty Containers

EPA and TCEQ (40CFR 264.170, and [TAC 335.41\(f\)](#), [TAC 335.508\(2\)](#)) regulations stipulate that empty containers must meet the following requirements:

- Containers must not contain free liquid or solid residue.
- Containers must be triple rinsed (place the rinsate in an approved waste container).
- Product labels must be defaced or removed.
- Container lids or caps must be removed.
- Aerosol cans must be at atmospheric pressure.

IMPORTANT!

Containers that do meet these requirements will be picked up for disposal by RMSO.

13.5 Minimization and Substitution

The cost of commercial waste disposal continues to rise and the amount of waste generated continues to increase. Texas State University - San Marcos cannot control disposal costs, but it can reduce the amount of waste generated. The following sections discuss how to minimize waste sources and waste products. Additional information can be found in the University's Source Reduction/Waste Minimization Plan.

A. Waste Source Reduction Techniques

Use the following techniques to reduce waste sources:

- Purchasing and Inventory Control
- Use computerized tracking systems to manage purchasing and control inventory.
- Maintain current inventory records to prevent overstocking and to monitor the shelf life of remaining chemicals.
- Develop a campus-wide chemical exchange network to promote chemical sharing and avoid redundant purchases.
- Negotiate with suppliers to gain volume discounts, flexible delivery schedules, and delivery of fewer small-sized containers without cost penalties.
- Purchase quantities for immediate use only. Do not order quantities to obtain a special unit cost savings.
- Obtain compressed gases from vendors who accept return of empty or partially full cylinders.

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- Include waste generation as criteria in equipment selection.
 - Rotate chemical stocks to use chemicals before their shelf-life expires.
- B. Chemical Usage
- Use lab procedures that assure the integrity of chemical quality.
 - Reduce spills and waste by pre-weighing chemicals for undergraduate use.
 - Require proper labeling of all secondary containers. Replace all deteriorating labels on primary and secondary containers.
 - Substitute less hazardous chemicals whenever possible (e.g., biodegradable scintillation cocktails instead of xylene or toluene-based cocktails).
 - Minimize the use of heavy metals (e.g., silver, chromium, mercury, barium, cadmium, and lead).
 - Substitute alcohol or electronic thermal monitors for mercury thermometers.
 - Use "No-Chromix", detergents, or enzymatic cleaners to clean laboratory glassware.
 - Minimize solvent waste by recycling or substitution.
- C. Waste Minimization Techniques
- Follow these techniques to reduce hazardous waste:
- Establish a Faculty Task Force to review waste streams and recommend waste minimization procedures.
 - Do not mix different types of waste.
 - Do not put non-hazardous waste, such as a mixture of water, sodium bicarbonate, and acetic acid, into a waste container of hazardous waste.
 - Do not combine inorganic heavy metal waste with organic solvents waste.
 - Segregate halogenated waste solvents from non-halogenated waste solvents.
 - Segregate waste streams by storing them in separate waste containers. Store waste containers separate from reagent containers being used to avoid accidental contamination.
 - Decontaminate empty containers to make them non-hazardous.
 - Neutralize dilute acids and bases to make them non-hazardous and suitable for drain disposal (i.e. as long as no heavy metals are in solution).
 - When possible, redesign experimental protocols so that harmful byproducts are detoxified or reduced.
 - Recycle chemicals via purification.
 - Make lab employees accountable for waste when labs are decommissioned.

13.6 Segregation

Segregated waste is safer and easier to dispose of than nonsegregated waste. Mixed waste, for example, must be handled as both radioactive waste and hazardous waste.

Each employee who generates waste is personally responsible for the following:

- Ensuring that hazardous wastes are accumulated in safe, transportable containers.
- Ensuring that hazardous wastes are stored properly to prevent possible exposure.

In addition to the guidelines for waste minimization and substitution, follow these guidelines for waste segregation:

- Segregate waste into the following groups:
 - Halogenated solvents
 - Non-halogenated solvents
 - Acids
 - Bases
 - Heavy metals
 - Poisons
 - Reactives
- Do not mix non-hazardous waste, such as water, with hazardous waste.
- Do not combine inorganic heavy metal waste with organic solvent waste in hazardous waste containers.
- Double-bag dry materials contaminated with chemicals (paper, rags, towels, gloves, or kim wipes, etc.) in heavy-duty plastic bags. Do not use biohazard bags. Dispose of these items in the same manner as hazardous waste.
- Encapsulate sharps (e.g., needles, razor blades, etc.) then place them in trash dumpsters.

13.7 Special Concerns

Employees who generate hazardous waste must maintain and control their hazardous waste accumulation areas. Special concerns for hazardous waste include the following:

- Unneeded chemicals that are to be discarded must be handled and managed as hazardous waste.
- Unknown chemical waste will be picked up by the RMSO however the University will incur additional charges for the chemical analysis to determine the proper disposal method. If possible identify unknowns at the point of generation.
- Gas cylinders (including lecture bottles) are extremely difficult to discard. They should be returned to the manufacturer or distributor whenever possible. Cylinders that cannot be returned should be tagged as hazardous waste as soon as possible.
- Photographic chemicals containing silver may not be placed in the sanitary sewer. They must be disposed of as hazardous waste.

13.8 Contingency Plan and Emergency Response Procedures

Details concerning the University's spill response procedures can be found in the RCRA Contingency Plan and Emergency Response Procedures.

13.9 RCRA Hazardous Waste Training

- Generator in the departments receive specific hazardous waste training in accordance with 40 CFR265.16.
- The initial training is shown in Hazardous Waste Management Program.
- Training is provided by RMSO and training records are maintained by RMSO.
- Refresher training is provided by RMSO annually.
- Training includes generator requirements (waste containers, labels, secondary containment, spill kits), CAA requirements, waste pickup procedures, and spill response procedures.