



CHAPTER 13

Hazardous Waste

POLICY

This section establishes minimum requirements for the disposal of hazardous wastes to ensure compliance with federal, state, and local regulations concerning hazardous waste storage and disposal, and protection of Department employees and the general public from exposure to hazardous wastes. All Flight Department facilities and personnel shall comply with these requirements. (Operators should include in this manual a means to ensure all new or revised local, state, and federal laws are complied with.)

PROCEDURE

GENERAL. Hazardous wastes are generally considered industrial wastes that can endanger human health or the environment. Each government agency that is concerned with hazardous materials management (Occupational Safety and Health Administration OSHA), Department of Transportation [DOT], Environmental Protection Agency [EPA]) has its own definition of hazardous materials.

OSHA considers any chemical that poses a physical or health hazard to an employee to be a hazardous chemical. Employees can familiarize themselves with the hazards of the chemicals they use through Material Safety Data Sheets (MSDS) and container labels. Refer to Chapter 12 Hazard Communication for further information.

DOT considers any substance or material which is capable of posing an unreasonable risk to health, safety, and property when transported in commerce to be a hazardous material. A material that is a hazardous chemical under OSHA regulations may not be considered a hazardous material by DOT.

EPA considers any material that is a waste and either exhibits a hazardous characteristic or is specifically listed by the EPA to be a hazardous waste. All hazardous wastes must be managed as hazardous materials when they are being transported.

RESPONSIBILITIES. It is the responsibility of the generator of a waste to determine if it is hazardous. For a waste to be considered hazardous, it must not be excluded; it must be included on a list of hazardous wastes, or it must exhibit a hazardous characteristic. EPA determines which wastes should be considered hazardous and assigns a four digit alpha-numeric number to each listed waste referred to as the EPA Waste Number. However, before EPA can designate a waste as hazardous, the waste must contain at least one of the six characteristics described below. Each characteristic has a one-letter Hazard Code in parenthesis beside it:

Ignitability (I):	Liquids with a flashpoint less than 140°F; solids which can readily ignite and burn vigorously; ignitable compressed gases; oxidizers.
Corrosivity (C):	Aqueous solutions with a pH of less than or equal to 2 or greater than or equal to 12.5; liquids that can corrode steel at specified rates.
Reactivity (R):	Wastes that can produce toxic fumes under certain conditions; wastes that are explosive or capable of detonation.
Toxicity Characteristic (E):	Wastes that contain above a regulated level of specified toxic constituents. The levels of these constituents in a waste can be determined using a standard analytical test called the Toxicity Characteristic Leaching Procedure (TCLP).
Toxic (T):	Wastes that are capable of posing a substantial present or potential threat to human health or the environment if improperly managed.
Acutely Hazardous (H):	Wastes that may be fatal or capable of causing irreversible or incapacitating illness to humans in low doses.

HAZARDOUS WASTES

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LISTED WASTES. Some hazardous wastes can be found on four lists developed by the EPA having waste codes that begin with the letters F, P, U, or K. These wastes are listed by chemical name, by the process that produces the waste, and by the general use of the waste material. A copy of these lists is included in Appendix A of this Section. Further information can be found at www.epa.gov under 'waste types'.

Non-specific source wastes (F-listed wastes) are wastes that are hazardous regardless of the specific industry or source producing them. The most common example is spent degreasing solvents, such as methylene chloride or trichloroethylene. These solvents are hazardous wastes regardless of the type of industry that produces them.

Specific source wastes (K-listed wastes) are wastes from certain industries and common industrial processes that are by nature hazardous.

Commercial chemical products (U- and P-listed wastes) consist of:

- Commercial chemical products.
- Off-specification commercial chemical products or manufacturing intermediates.
- Residues/spill clean-up of commercial chemical products, intermediates, or off-spec products.
- Formulations containing U- or P-listed material as the only active ingredient.

P-listed wastes are listed because they are acutely hazardous (H); most U-listed wastes are toxic (T).

CHARACTERISTIC WASTES. If the waste does not appear on the F, K, U, or P lists, it may still be considered hazardous because it exhibits certain hazardous characteristics. There are four characteristics that can cause a waste to be hazardous. These can be "reasonably detected" based upon the generator's knowledge of the waste, or by standardized and available analytical tests. The four characteristics are as follows:

Ignitability:	Wastes that are ignitable have the waste code D001. These include: liquids with a flashpoint less than 140°F; solids which can readily ignite and burn vigorously; ignitable compressed gases; and oxidizers.
Corrosivity:	Corrosive wastes have the waste code D002. These include: aqueous solution with a pH less than 2 or greater than 12.5 and liquids that can corrode steel at specified rates.
Reactivity:	Reactive wastes are assigned the waste code D003. These include: water reactive materials; wastes that can produce toxic fumes under certain conditions; and wastes that are explosive or capable of detonation.
Toxicity:	There are 39 identified constituents that cause a waste to be toxic: D004-D011 (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver); D012-D017 (pesticides); and D018-D043 (organics). Toxicity is determined by conducting the toxicity characteristic leaching procedure (TCLP) on these identified constituents. See Appendix I for a listing and regulatory levels.

WASTE MIXTURES. When a non-hazardous waste is mixed with a hazardous waste, the mixture is almost always considered a hazardous waste. This is to prevent generators from diluting hazardous wastes to avoid having to meet the stringent requirements for hazardous waste management. In other words, if an F-, K-, U-, or P-listed waste is mixed with a non-hazardous waste, the entire mixture becomes a listed waste regardless of the concentration of the hazardous waste in the mixture. Mixtures of non-hazardous wastes and characteristic wastes (D001-D043) are hazardous wastes if the mixture still meets the hazardous characteristics either by exhibiting the hazardous property or by containing a hazardous constituent above the regulated level.

GENERATOR REQUIREMENTS

The idea of cradle-to-grave liability puts the greatest responsibility for proper hazardous waste management upon generators. A generator is an individual facility whose act or process creates a waste that is determined to be hazardous. Depending upon the amount of hazardous waste a site produces, the facility may need to apply for and receive from EPA an individual identification number which is unique to that particular site. A generator may obtain this ID number by filing Form 8700-12 with the EPA Regional Office (form and instructions can be found at <http://www.epa.gov/epaoswer/hazwaste/data/form8700/forms.htm>). This 12-digit number must be included on all

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reports and manifests submitted by that facility. Also, generators may not offer their hazardous wastes for transportation, storage, or disposal unless all of the respective facilities have an ID number, if applicable.

GENERATOR CLASSES. EPA defines hazardous waste generators according to the amount of hazardous waste they generate during a calendar month. Facilities that generate more hazardous wastes have stricter management requirements than those that do not generate as much.

Sites that generate less than 100 kg (220 lbs.) of hazardous waste or less than 1 kg (2.2 lbs.) of acutely hazardous waste per calendar month are classified as Conditionally Exempt Small Quantity Generators (CESQGs). CESQGs are exempt from most hazardous waste generator standards outlined in 40 CFR Part 262. They are not required to have EPA ID numbers for their site, nor are they restricted to using treatment, storage, or disposal facilities (TSDFs) that have EPA ID numbers. However, CESQGs must ensure the delivery to an off-site permitted hazardous, municipal, or industrial waste facility of any hazardous waste not treated on-site.

Facilities that generate greater than 100 kg (220 lbs.) but less than 1000 kg (2200 lbs.) of hazardous waste or \leq 1 kg (2.2 lbs.) of acutely hazardous waste within one calendar month are classified as Small Quantity Generators (SQGs). Facilities that generate greater than 1000 kg (2200 lbs.) of hazardous waste or greater than 1 kg (2.2 lbs.) of acutely hazardous waste within one calendar month are classified as Large Quantity Generators (LQGs). SQGs and LQGs are regulated by the standards established in 40 CFR Part 262.

Facilities that generate hazardous wastes in excess of the above amounts are classified as Large Quantity Generators (LQGs). Aviation Services facilities do not generate waste in sufficient quantity to be considered LQGs.

EPA ID NUMBER. Depending upon the amount of hazardous wastes generated, a facility may need to apply for and receive an identification number from the state or federal EPA. The identification number is a unique, 12-digit number that must be used on all reports and manifests submitted by the facility.

An identification number must be obtained before a generator can offer hazardous waste for transport off-site. In addition, a generator cannot offer hazardous waste to a transporter or a TSDF that does not also have an EPA identification number.

ON-SITE ACCUMULATION. Small Quantity Generators (SQGs) may accumulate hazardous wastes on-site for up to 180 days without having to apply for interim status provided that:

- The quantity of waste accumulated on-site never exceeds 6000 kg (13,200 lbs).
- The containers are in compliance with the Container Management guidelines outlined in the following section.
- The generator ensures that all employees are thoroughly familiar with the proper waste handling and emergency procedures.
- There is an emergency coordinator at the site or on-call 24-hours a day who will respond to emergencies in the prescribed manner.
- All of the necessary emergency information is posted next to the telephone.

A Small Quantity Generator, who must transport this waste greater than 200 miles for off-site treatment or disposal, may accumulate hazardous waste on-site for up to 270 days without having to apply for interim status.

A Small Quantity Generator who accumulates hazardous wastes for more than 180 days (or more than 270 days if the waste must be transported more than 200 miles) or who accumulates > 6000 kg of hazardous waste on-site is considered to be an operator of a hazardous waste storage facility and is subject to the regulations regarding hazardous waste storage facilities, unless the 180-day or 270-day period is extended due to unforeseen, temporary, and uncontrollable circumstances.

CESQGs can accumulate up to 1000 kg (2200 lbs.) of hazardous waste, up to 1 kg (2.2 lbs.) of acutely hazardous wastes, or 100 kg (220 lbs.) of residue or spill clean-up from acutely hazardous wastes on-site for any length of time provided that those maximums are not exceeded. However, once a CESQG exceeds those limits they become subject to all the requirements of an SQG.

SATELLITE ACCUMULATION AREAS

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Wastes that are accumulated in designated hazardous waste storage areas are subject to the accumulation time and quantity limits of the generating facility. For a small quantity generator, wastes can be accumulated for 180 days or until the quantity limit is reached.

There may be some areas of a facility where wastes are generated in small quantities, and the time limits for accumulation are not practical. A laboratory producing only a few gallons of hazardous waste each month may not have enough wastes accumulated after 90 or 180 days to justify the energy and expense of shipping the wastes off-site.

For this reason, a generating facility can designate certain areas as satellite accumulation areas. It is the policy of the Flight Department that up to 55 gallons of hazardous waste, or one quart of acutely hazardous waste, can be stored up to one year in these satellite accumulation areas.

The following requirements must be met when accumulating wastes in a satellite accumulation area:

- Satellite accumulation areas must be at or near the process producing the waste. The area must also be under the control of the process operator.
- The first three requirements for container management outlined in the following section must be met at all times.
- When over 55 gallons of hazardous waste or one quart of acutely hazardous waste accumulates in a satellite area, the container must be marked and dated. The container must be transferred to the designated hazardous waste storage area and comply with all of the requirements for container management within three days.

Example: An employee in a maintenance area begins collecting used solvents in a 55 gallon drum. As soon as he meets the 55 gallon limit for this waste (fills the drum), he marks the date on the drum and moves it to a storage area within three days.

CONTAINER MANAGEMENT GUIDELINES

Time and quantity limits for hazardous waste accumulation are designed to minimize the risks that these wastes may present to employees, facility integrity, and the environment. To further reduce these risks, the following requirements apply to waste container use and storage during the accumulation period:

- All waste containers must be in good condition. If leaking or damaged, they must be immediately transferred or otherwise managed.
- Wastes must be compatible with the containers. A container must be cleaned before it can be used to store a waste that is incompatible with the waste previously held in the container.
- Containers must remain closed unless adding or removing waste.
- Wastes should be placed in suitable, DOT-approved containers.
- Containers of incompatible wastes must be separated by dikes, berms, or similar devices.
- Containers holding ignitable or reactive wastes shall be located at least 15 meters (50 feet) from the property line.
- Containers shall not be opened, handled, or stored in a way that might cause them to rupture or leak.
- Each container must be labeled or clearly marked with the words "Hazardous Waste" and other words that identify the contents, if known.
- All containers must be clearly marked with the date that the allowable accumulation limit is achieved (i.e. when a 55-gallon drum is full).
- Dates and labels on each container shall be clearly visible for inspection.

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- Areas where containers are stored must be inspected at least on a weekly basis for leaks, deterioration, etc. The area must be inspected even if empty. A logbook showing the date and time of inspection, name of inspector, and contents shall be maintained.

PRE-TRANSPORTATION REQUIREMENTS

Before transporting hazardous wastes off-site, generators must package, label and mark hazardous wastes in accordance with DOT regulations. In addition, each container containing up to 110 gallons must be labeled with the following information:

"HAZARDOUS WASTE"
Federal Law Prohibits Improper Disposal.
If found, contact the nearest police or public
safety authority or the USEPA.

Generator's Name & Address

Manifest Document Number

Before transporting hazardous wastes off-site, generators must offer the initial transporter the appropriate placards in accordance with DOT regulations.

MANIFESTS. A major component in the management and disposition of hazardous wastes is the transportation of these materials from the point of generation to a specified TSDF. The EPA, in conjunction with the DOT, established regulations that govern the movement of hazardous waste. A tracking system was established to accurately document all movement of waste by approved transporters from a generator to a TSDF. This method of documentation is called manifesting.

A hazardous waste manifest is a multi-copy shipping document that must accompany all hazardous waste shipments. The manifest is designed to track shipments of hazardous waste from their point of generation to their final disposal (cradle-to-grave). The manifest also serves as the prime source of information about a given material in the event of a spill.

The hazardous waste generator, the transporter, and the designated disposal facility must each sign this document and maintain a copy. The designated disposal facility operator also must send a copy back to the generator so the generator is aware that the shipment actually arrived. The generating facility must keep its signed copy on-file for at least three years.

Accuracy is a key aspect in manifesting. It is essential that all items on the manifest be completed correct. Incomplete or illegible manifests are violations of the law and could result in civil or criminal liabilities. Although individual states may print their own manifest forms to be used by the generators and TSDFs in their state, these forms must follow the same general layout as the Uniform Hazardous Waste Manifest, as specified in the appendix of 40 CFR Part 262.

Both the DOT and the EPA may require certain information on a manifest. The shaded areas indicate information that may be required by the federal or state EPA (e.g., EPA ID number, EPA waste number). The unshaded areas indicate DOT-required information (e.g., Proper Shipping Name, number of containers).

All shipments of hazardous wastes shall be accompanied by a properly completed Uniform Hazardous Waste Manifest. The disposal of all hazardous wastes shall be coordinated by the Safety Manager. The [*Position Title*] is responsible for ensuring the proper preparation, review, and signing of the manifest.

PREPARATION OF HAZARDOUS WASTE MANIFESTS. Hazardous waste manifests are usually filled out by the contractor or vendor; however, this does not relieve the Flight Department of the liabilities if the information that is recorded on the documents is inaccurate. This is the primary reason for requiring personnel involved in signing this document to attend Resource Conservation and Recovery Act (RCRA) and DOT training. They may not be involved in the preparation but they have to understand what they are signing and should be able to detect errors.

Other items to be verified include:

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- Container marking and labeling.
- Proper shipping names (note: these should match the label).
- Number of containers and amounts.
- Emergency response phone numbers.

Never sign a manifest unless you have checked for these items and have verified them to be correct. Questions may be directed to the Safety Manager.

Once the manifest and other related shipping documents are signed, make sure the vendor gives you your copies. Facilities should keep copies of this information. When the original manifest complete with TSD signatures is returned to the generator, this original shall be attached to the generator original already in the facility file.

Note: It is critical the facility be aware of the generation dates and the subsequent 45 day window in which a TSDF must return the completely signed manifest. If a facility has not received the completely signed manifest within 45 days, the [*Position Title*] shall immediately contact the Safety Manager to begin the required notification procedures.

RECORDKEEPING

The Safety Manager must keep copies of all manifests for a period of at least three years. All land disposal restriction forms and related documentation must be retained for at least five years. Any test results, waste analyses, or other supporting data used to determine if a waste is hazardous must be retained for at least three years. Inspection logs for hazardous waste storage areas and emergency equipment must be retained for three years. The three-year retention periods referred to in this section are automatically extended during the course of any unresolved enforcement action regarding the regulated activity or as requested by the State or Regional EPA Director.

NOTIFICATIONS

EXCEPTION REPORTING. A Small Quantity Generator who does not receive a copy of a manifest with the handwritten signature of the authorized representative of the designated facility within 60-days of the date the waste was accepted by the initial transporter, must submit a legible copy of the manifest, with some indication that the generator has not received confirmation of delivery, to the Designated State Director.

RELEASE REPORTING. Any generator responsible for the release of a hazardous waste from a facility which poses an immediate threat to public health is required by law to notify the National Response Center. They shall also notify the chief administrative officer of the local government of the jurisdiction in which the release occurs as well as certain emergency agencies.

ADDITIONAL REPORTING. The designated State Agency or EPA Regional Director has the discretion to require generators to file additional reports concerning the quantities and disposition of hazardous wastes as they deem necessary.

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APPENDIX I – HAZARDOUS CONTAMINANTS LIST

Maximum Concentration of Contaminants for the Toxicity Characteristic (TCLP)

EPA HW Number	Contaminant	CAS Number	Regulatory Level (mg/l)
D004	Arsenic	7440-38-2	5.0
D005	Barium	7440-39-3	100.0
D018	Benzene	71-43-2	0.5
D006	Cadmium	7440-43-9	1.0
D019	Carbon Tetrachloride	56-23-5	0.5
D020	Chlordane	57-74-9	0.03
D021	Chlorobenzene	108-90-7	100.0
D022	Chloroform	67-66-3	6.0
D007	Chromium	7440-47-3	5.0
D023	o-Cresol	95-48-7	200.0
D024	m-Cresol	108-39-4	200.0
D025	p-Cresol	106-44-5	200.0
D026	Cresol		200.0
D016	2,4-D	94-75-7	10.0
D027	1,4-Dichlorobenzene	106-46-7	7.5
D028	1,2-Dichloroethane	107-06-2	0.5
D029	1,1-Dichloroethylene	75-35-4	0.7
D030	2,4-Dinitrotoluene	121-14-2	0.13
D012	Endrin	72-20-8	0.02
D031	Heptachlor (and its hydroxide)	76-44-8	0.008
D032	Hexachlorobenzene	118-74-1	0.13
D033	Hexachlorobutadiene	87-68-3	0.5
D034	Hexachloroethane	67-72-1	3.0
D008	Lead	7439-92-1	5.0
D013	Lindane	58-89-9	0.4
D009	Mercury	7439-97-6	0.2
D014	Methoxychlor	72-43-5	10.0
D035	Methyl ethyl ketone	78-93-3	200.0
D036	Nitrobenzene	98-95-3	2.0
D037	Pentachlorophenol	87-86-5	100.0
D038	Pyridine	110-86-1	5.0
D010	Selenium	778-49-2	1.0
D011	Silver	7440-22-4	5.0
D039	Tetrachlorethylene	127-18-4	0.7
D015	Toxaphene	8001-35-2	0.5
D040	Trichlorethylene	79-01-6	0.5
D041	2,4,5-Trichlorophenol	95-95-4	400.0
D042	2,4,6-Trichlorophenol	88-06-2	2.0
D017	2,4,5-TX (Silvex)	93-72-1	1.0
D043	Vinyl chloride	75-01-4	0.2