CHAPTER 2.
UNDERSTANDING HAZARDOUS WASTES

This section will help you:

- Determine whether the wastes you identified in your *"Hazardous/Solid Waste Inventory"* worksheet are hazardous;
- Calculate the pounds of hazardous wastes generated on a monthly basis;
- Determine your generator status; and
- Understand some of the basic requirements for your generator status.

You will need your copy of the *"Hazardous/Solid Waste Inventory"* worksheet with accompanying MSDSs to proceed with the determination process.

DETERMINE WHETHER WASTES ARE HAZARDOUS, OR NON-HAZARDOUS

There are two methods of determining whether wastes are hazardous. These methods are:

1. **Knowledge of Process** – This method allows business owners to use knowledge of the wastes generated from their processes in deciding whether they have a listed waste, whether further waste analysis should be conducted, or, if lab analysis is needed, what type of analysis should be used.
2. **Waste Analysis** – This method allows the business owner to use available raw material data to determine whether the waste stream should be further analyzed in a laboratory. By conducting a waste analysis, you can determine whether the wastes have hazardous characteristics.
   a. Characteristic Hazardous Wastes – These are wastes that have certain characteristics (ignitable, reactive, corrosive and/or toxic) that distinguish them from other solid waste materials.
   b. Listed Wastes – These are wastes, specifically listed in the hazardous waste regulations. "F-listed" hazardous wastes are generally spent cleaning solvents which contain 10% or more of at least one hazardous chemical. If your cleaning products contain any of these chemicals (concentrations of 10% or more), they are automatically considered hazardous waste when disposed.

Use MSDS to Help Make Hazardous Waste Determination

You can use each product's MSDS to help determine whether your waste streams meet any of the hazardous waste criteria described below. This section will explore how to apply the information contained in a MSDS to determine whether that product meets the criteria for a Characteristic Waste or an F-Listed Waste. ***Note:*** *MSDSs are used as a screening tool to determine whether each raw material possesses hazardous characteristics. You should apply the waste analysis method to determine unequivocally whether a waste is hazardous.*

First, take your *"Hazardous/Solid Waste Inventory"* worksheet and the MSDSs you have for each of the products found in the waste. Read through the steps (below and on the following pages) to determine whether a waste is hazardous. If you determine that the waste can be considered hazardous, check that column on your inventory worksheet for the particular waste. If you determine that the waste does not meet any of the hazardous waste criteria, check the "Non-hazardous" column.

Step 1*. Determine Whether Waste Meets Criteria of Characteristic Wastes*

1a. Refer to Section IV of the MSDS, usually called "Fire and Explosion Data," to find out what the flash point is for this product. If the flash point meets the definition of ignitable, below, the waste has a hazardous characteristic.

Ignitable Wastes Common in Metal Fabrication
- parts washer solvent
- isopropyl alcohol
- solvent-based coatings

Ignitable
Any liquid waste that has a flash point below 140° F (60° C). Any non-liquid capable of spontaneous combustion under normal conditions. An ignitable compressed gas or oxidizer.

1b. Refer to Section III of the MSDS, usually called "Physical Data," to find out what the pH level is for this product. If it meets the definition of "corrosive," below, then the waste has a hazardous characteristic.

Corrosive Wastes Common in Metal Fabrication
- acids
- waste battery acid
- highly alkaline cleaners

Corrosive
An aqueous (water-based) material with a pH less than 2.0 or greater than 12.5.

1c. Refer to Section VI of the MSDS, usually called "Reactivity Data," to find out whether this product is stable under all circumstances. If it is unstable or "reacts" (see definition below) with certain other materials, the waste has a hazardous characteristic.

Reactive
Unstable materials that react violently without detonating. React violently with water or form an explosive gas, vapor or fume when mixed with water. Contain cyanide or sulfide, and generate toxic gas vapors/fumes at a pH between 2 and 12.5.

Reactive Wastes Common in Metal Fabrication
- waste bleaches and oxidizers
- surface etchants (acids)

1d. Refer to Section II of the MSDS, usually called "Hazardous Ingredients," and find out whether this product contains constituents that would cause the waste to be toxic. You can also have a laboratory conduct a Toxicity Characteristic Leaching Procedure (TCLP) test. If the waste contains hazardous ingredients in certain concentrations, it has a hazardous characteristic.

Toxic
Contains specific constituents above threshold levels. Typically determined using the TCLP test. Refer to ***Appendix B: Contacts List*** to find out who to call to locate a testing facility in your area. This test will determine the amount of toxic materials in the waste stream.

Toxic Wastes Common in Metal Fabrication
- clean-up solvents
- coatings
- corrosive cleaners

If you need help determining whether a waste meets the criteria of characteristic wastes, refer to ***Appendix B: Contacts List*** to find out who to call in your area.

Step 2. Determine Whether the Waste Meets the Criteria for F-listed Wastes

F-Listed wastes, which are specifically listed in the hazardous waste regulations, are generally spent cleaning solvents that contain 10% or more of at least one hazardous chemical. If your cleaning products contain any of these chemicals (concentrations of 10% or more) they are automatically considered hazardous waste when disposed of.

Refer to Section II of the MSDS, usually called "Hazardous Ingredients," and compare the chemicals found in your product with the list of F-listed chemicals on the following page. If you find one of the chemicals match with the list and is in a concentration of 10% or more, then this waste has a hazardous characteristic.

F-Listed Chemicals Common in Metal Fabrication

acetone	cresols and cresylic acid
benzene	n-butyl alcohol
carbon tetrachloride	2-nitropropane
carbon disulfide	ortho-dichlorobenzene
chlorinated fluorocarbons	perchloroethylene
chlorobenzene	pyridine
cyclohexanone	toluene
2-ethosyethanol	trichloroethylene
ethyl ether	1,1,1-trichloroethane
isobutanol	1,1,2-trichloroethane
methanol	1,1,2-trichloro-1,2,2-trifluoroethane
methylene chloride	trichlorofluoromethane
methyl ethyl ketone (MEK)	xylene
methyl isobutyl ketone (MIBK)	ethyl acetate
ethyl benzene	nitrobenzene

Note: *Any still bottoms generated from the distillation or recycling of these solvents must be managed as a hazardous waste.*

If you need help determining whether a waste meets the criteria of F-listed wastes, refer to ***Appendix B: Contacts List*** to find out who to call in your area.

Step 3. *Have a Laboratory Conduct a Toxicity Test on the Waste Stream*

It is important to understand that some of your waste streams may have been contaminated by several other products. For example, you may have paint that alone does not have characteristics of a hazardous waste. But if the paint comes in contact with a solvent, that paint may now have a hazardous characteristic. One fail-safe way to determine whether a waste is hazardous is to have a laboratory perform a test on the waste stream. If the test shows that toxic substances found in the waste are above certain thresholds, the waste is considered hazardous.

Caution: *Do not mix hazardous wastes with non-hazardous wastes. This practice could change your generator status, resulting in more stringent regulatory requirements.*

Refer to ***Appendix B: Contacts List*** or your local telephone directory to locate a testing laboratory in your area.

When you have determined whether wastes are hazardous, recyclable or landfillable, check off this action on the Checklist on page 2 and go on to the next action.

QUANTIFY MONTHLY GENERATION OF HAZARDOUS WASTES

Now that you have determined whether your wastes are hazardous, you can calculate how many pounds of each waste you generate in one month. This is necessary because your regulatory requirements depend on the total amount of hazardous waste generation in a one-month period. There are several ways to calculate the total monthly generation of a hazardous waste:

Method 1

Determine the density (pounds per gallon) of each waste and multiply that by the actual number of gallons of that waste you generate in one month. The density of your waste can be estimated by referring to the MSDS for the product that makes up the waste. Some MSDSs will give you the actual weight of the product per gallon. Other MSDSs will only give you a ***specific gravity*** for the product. If your MSDS uses specific gravity, multiply that number by 8.34 *(specific gravity x 8.34)* to convert to pounds per gallon. Use this weight to calculate your monthly generation.

Example: You generate 20 gallons of waste paint in one month and paint has a density of 11 lbs./gal.

20 gal. x 11 lbs./gal. = 220 lbs.

Method 2

If you have access to a scale, weigh your hazardous waste storage container. This weight is the tare weight. After one month of filling this waste container, weigh it. Subtract the tare weight from this new weight and this will give you an approximate weight in pounds for one month of generation of that particular waste.

Example: You have a waste solvent container with a tare weight of 1 lb. and at the end of the month you weigh the container at 50 lbs.

50 lbs. - 1 lb. = 49 lbs.

Note: *Whether you use Method 1 or Method 2, be sure to record your calculated weight for each hazardous waste stream on your "Hazardous/Solid Waste Inventory" worksheet and then total all of the hazardous wastes together.*

When you have quantified your monthly generation of hazardous wastes, check off this action on the Checklist and go on to the next action.

DETERMINE HAZARDOUS WASTE GENERATOR STATUS

Hazardous Waste: _____ lbs. per month

Enter the total quantity in pounds (lbs.) you calculated from your *"Hazardous/Solid Waste Inventory"* worksheet in the above space. Use this number to determine what size hazardous waste generator you are.

• **Conditionally Exempt Generator (CEG). (The State of Washington refers to this as Small Quantity Generator [SQG])** – 1) A company that generates fewer than 220 lbs. (typically 20-25 gallons) of total hazardous waste, or fewer than 2.2 pounds of acutely hazardous waste* and/or waste that is extremely hazardous due to toxicity in a single calendar month, 2) and the company never accumulates more than 2,200 pounds of hazardous waste or 2.2 pounds of acutely hazardous waste* and/or waste that is extremely hazardous due to toxicity at any time.

• **Small Quantity Generator (SQG). (The State of Washington refers to this as Medium Quantity Generator [MQG])** – 1) A company that generates more than 220 lbs., and less than 2,200 lbs. of hazardous waste per month, and less than 2.2 pounds of acutely hazardous waste in a single calendar month, 2) and the company never accumulates more than 2,200 pounds (6,000 kilograms in Oregon) of hazardous waste or 2.2 pounds of acutely hazardous waste at any time.

• **Large Quantity Generator (LQG)** – A company that generates more than 2,200 lbs. of hazardous waste or 2.2 lbs. of acutely hazardous waste in a single calendar month, or accumulates more than 2.2 lbs. of acutely hazardous waste at any one time.

Acutely hazardous waste is generally more dangerous and/or more toxic than other listed wastes. Acutely hazardous wastes are listed as P-listed wastes. (Refer to **Appendix B: Contact List to get more information on P-listed wastes).*

On-site Recovery of Solvent
Solvent recovery can be very economical. There is typically a quick payback on solvent recovery equipment because of lower disposal and purchasing costs.

As discussed below in "Identify Requirements for Being a Hazardous Waste Generator," generators that have the smallest status have the fewest requirements. If you find you are a LQG or Small Quantity Generator (MQG in Washington), you will want to reduce your monthly generation of waste so you can enjoy the less burdensome requirements of a conditionally exempt generator (SQG in Washington). This can be accomplished by reviewing and implementing the best management practices and pollution prevention opportunities in Chapter 5 of this workbook. On-site distillation of solvent is just one of these opportunities, which can eliminate or reduce hazardous waste generation. If you have questions about your generator status, refer to ***Appendix B: Contacts List*** to find out who to call in your area.

When you have determined your hazardous waste generator status, check off this action on the Checklist on page 2 and go on to the next action.

IDENTIFY REQUIREMENTS FOR BEING A HAZARDOUS WASTE GENERATOR

Generator Classification: _____

Write in your generator classification (CEG [SQG in the State of Washington], SQG [MQG in the State of Washington] or LQG) in the space above and follow the appropriate chart (on pages 17-19) to identify some of your hazardous waste requirements and recommendations. If you have questions about your requirements for being a waste generator, refer to ***Appendix B: Contacts List*** to find out who to call in your area.

When you have identified the requirements for being a hazardous waste generator, check off this action on the Checklist on page 2 and go on to Chapter 3: Understanding Air Emission Sources.

CONDITIONALLY EXEMPT GENERATOR
(CALLED "SMALL QUANTITY GENERATOR" IN WASHINGTON STATE)

Determine whether solid wastes are designated as hazardous waste	Yes	Complete Chapter 2 of this workbook
Obtain an EPA/State Generator Identification Number	No	The state recommends that CEGs (called SQGs in Washington) obtain an identification number
Manage waste in a way that does not pose a potential threat to human health/environment	Yes	Send waste to a permitted facility, legitimate recycler or to sewer agency with permission. Do not dump to drains, dumpsters or sewer without checking with the local authorities.
Manifest wastes when shipping hazardous wastes off site	No	May be required by hazardous waste hauler
Record-keeping	No	
Annual reporting	No	If you obtained an Identification Number, you are required to submit an annual report by March 1 for the previous calendar year.
Label containers/drums	Yes	h Department of Transportation labeling generally required h Health hazard labeling strongly recommended
Prepare Emergency Response Plans	No	
Train employees on proper waste handling and emergency procedures	No	
Inspect on a schedule all monitoring equipment, safety and emergency equipment, structural soundness of drums/containers	No	Routine inspections are recommended

SMALL QUANTITY GENERATOR
(CALLED "MEDIUM QUANTITY GENERATOR" IN WASHINGTON STATE)

Determine whether solid wastes are designated as hazardous waste	Yes	Complete Chapter 2 of this workbook
Obtain an EPA/State Generator Identification Number	Yes	Notify your state agency (see Appendix B for telephone number) to obtain Identification Number
Manage waste in a way that does not pose a potential threat to human health/environment	Yes	Send waste to a permitted facility, legitimate recycler or to sewer agency with permission. Do not dump to drains, dumpsters or sewer without checking with the local authorities.
Manifest wastes when shipping hazardous wastes off site	Yes	Use the Uniform Hazardous Waste Manifest Form when shipping hazardous wastes. Waste must be disposed of within 180 days of accumulation, provided amount is less than 2,200 pounds.
Record-keeping	Yes	Keep manifests and annual reports onsite for at least three years.
Annual reporting	Yes	Complete and submit a Hazardous Waste Annual Report by March 1 for the previous calendar year.
Label containers/drums	Yes	Clearly mark each container of waste with a hazardous waste label that includes the accumulation start date, the type of waste and the waste codes.
Prepare Emergency Response Plans	Yes	Post the name and telephone number of the emergency response coordinator, location of fire extinguishers, spill control materials and fire alarms, and telephone number of the fire department.
Train employees on proper waste handling and emergency procedures	Yes	Ensure that all employees are thoroughly familiar with proper waste handling and emergency procedures relevant to their responsibilities.
Inspect on a schedule all monitoring equipment, safety and emergency equipment, structural soundness of drums/containers	Yes	Complete the Weekly Facility Inspection Checklist. Make copies of the checklist, provided in Appendix C.

LARGE QUANTITY GENERATOR

Determine whether solid wastes are designated as hazardous waste	Yes	Complete Chapter 2 of this workbook
Obtain an EPA/State Generator Identification Number	Yes	Notify your state agency (see Appendix B for telephone number) to obtain Identification Number
Manage waste in a way that does not pose a potential threat to human health/environment	Yes	Send waste to a permitted facility, legitimate recycler or to sewer agency with permission. Do not dump to drains, dumpsters or sewer without checking with the local authorities.
Manifest wastes when shipping hazardous wastes off site	Yes	Use the Uniform Hazardous Waste Manifest Form when shipping hazardous wastes. Waste must be shipped off site within 90 days of accumulation.
Record-keeping	Yes	Keep manifests and annual reports onsite for at least three years.
Annual reporting	Yes	Complete and submit a Hazardous Waste Annual Report by March 1 for the previous calendar year.
Label containers/drums	Yes	Clearly mark each container of waste with a hazardous waste label that includes the accumulation start date, the type of waste and the waste codes.
Prepare Emergency Response Plans	Yes	Formal plan required.
Train employees on proper waste handling and emergency procedures	Yes	Ensure that all employees are thoroughly familiar with proper waste handling and emergency procedures relevant to their responsibilities. Keep training records.
Inspect on a schedule all monitoring equipment, safety and emergency equipment, structural soundness of drums/containers	Yes	Complete the Weekly Facility Inspection Checklist. Make copies of the checklist, provided in Appendix C.