

Waste Determinations & Recordkeeping

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Introduction

Wisconsin businesses and institutions are required by federal and state laws to determine if the waste materials they generate are hazardous waste. Accurate waste determinations are the first step in ensuring safe management of hazardous waste as part of the “cradle-to-grave” requirements of the federal Resource Conservation and Recovery Act (RCRA). Failure to properly identify a hazardous waste may result in damage to human and environmental health, while accurate waste determinations have the potential to reduce management and disposal costs.

Hazardous Waste regulations are found in [chs. NR 660-679](#) of the Wisconsin Administrative Code.

In accordance with ch. NR 662.011, Wis. Adm. Code, *Hazardous waste determination requirements*, a person who generates a solid waste, as defined in NR 661.02, shall determine if that waste is a hazardous waste. For large and small quantity hazardous waste generators, the waste determination recordkeeping requirements are found in NR 662.040(3) and NR 662.193(1)(b), respectively. The regulations state that *a generator shall keep records of any test results, waste analyses or other determinations made in accordance with NR 662.011 for at least 3 years from the date that the waste was last sent to on-site or off-site treatment, storage or disposal.*

Based on these regulatory requirements, records of all waste determinations conducted on solid wastes must be maintained, regardless of whether the outcome of the determination is hazardous or non-hazardous. The records associated with the waste determinations must be maintained and available during compliance inspections.

Solid waste streams that do not require a waste determination include wastes that have no potential to be a hazardous waste. Examples include food waste, office-generated paper wastes, certain wastes recycled under NR 661.02, or universal wastes managed under ch. NR 673. Refer to the *Conditional Exemptions and Exclusions* section at the end of this guidance for more information.

This guidance document contains information to help generators understand the various waste types, categories and processes used to make and document an accurate waste determination.

Waste Determination Process

There are five principal steps in the waste determination process:

1. **Identify the waste streams:** Make a list of all facility waste streams and include how the waste is generated.
2. **Determine whether the waste stream is a solid waste:** Check to see if each waste meets the definition of “solid waste” as found in NR 661.02.
3. **Determine if the solid waste is excluded** from regulation under NR 661.04.
4. **Determine whether the solid waste is a hazardous waste** under NR 662.011.
5. **Document the information in steps 1-4:** Compile the information used to make the waste determination, including a statement on whether the waste is a hazardous waste. If it is hazardous waste, list the applicable waste codes (D001, F003, U183, etc.) and what the generation rate of this waste is per month. Knowing your waste generation rates will help in determining the correct generator status and applicable regulations for your facility.

Written documentation is a required step in the hazardous waste determination process. These documents must be kept as part of your recordkeeping requirements.

Small quantity generators (SQGs), large quantity generators (LQGs) and treatment, storage and disposal (TSD) facilities are required to document and retain their hazardous waste determinations. The Department of Natural Resources (DNR) and U.S. Environmental Protection Agency (EPA) strongly recommend that very small quantity generators (VSQGs) also retain these documents.

If no documentation is available during a facility inspection, both the DNR and the EPA can require a generator to perform a waste determination to support the facility findings that a waste of concern is not a hazardous waste.

What is a Solid Waste?

In general, if you can no longer use the material for its intended purpose, and the waste is being discarded, abandoned, recycled or deemed inherently waste-like, the material would be classified as a solid waste under NR 661.02.

Certain solid wastes that are recycled are excluded from the definition of a solid waste. If a material is not a solid waste, it cannot be considered a hazardous waste. Materials that are excluded from being a solid waste when recycled are listed in both NR 661.02 and NR 661.04. **It is important to document the reasoning behind any exclusions used in the waste determination process.**

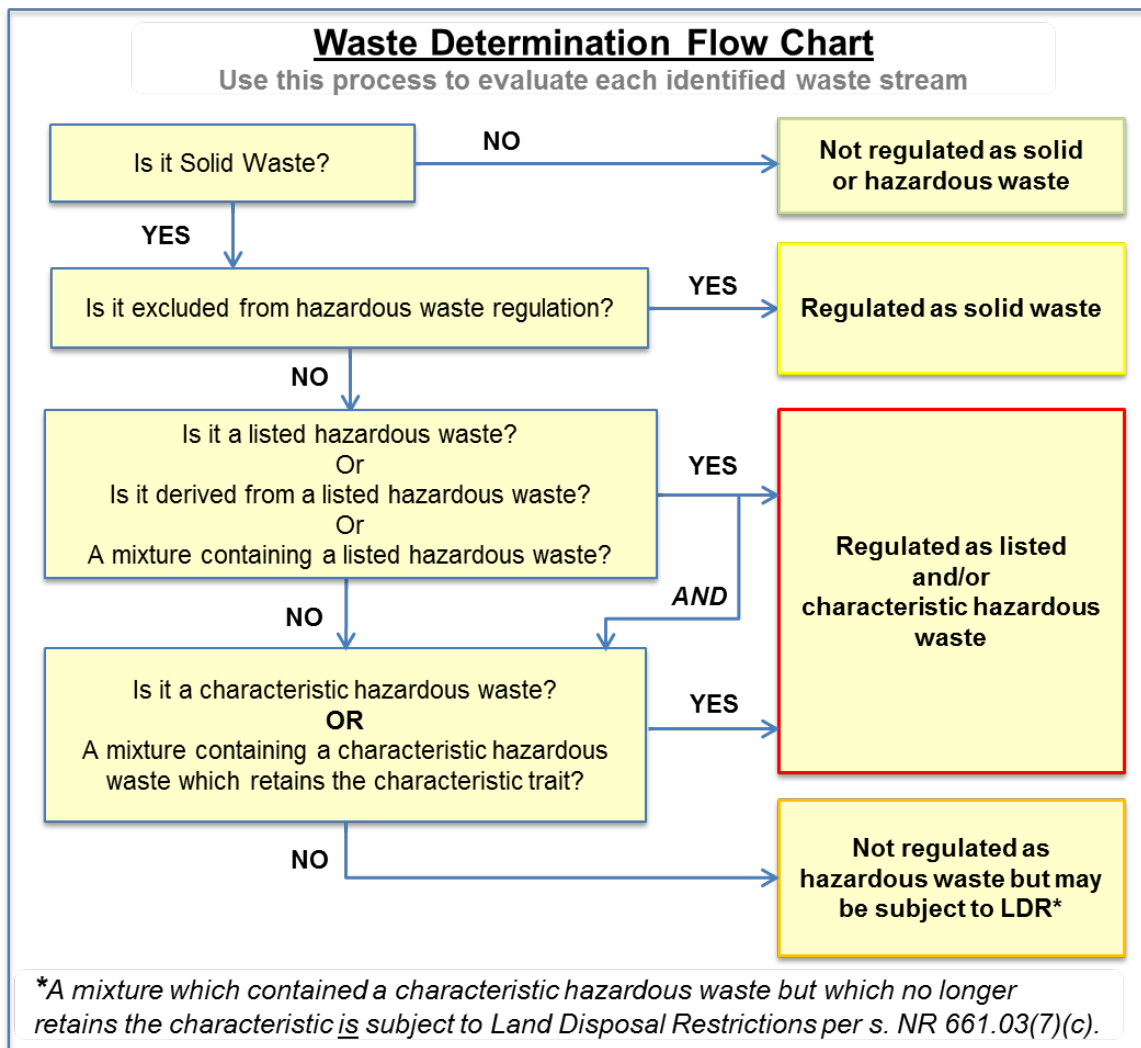
The term “solid waste” does not refer to the physical state of the waste. Solid wastes can be **solid, liquid, or containerized gas.**

What is a Hazardous Waste?

A hazardous waste is a solid waste that is not excluded under NR 661.04(2) and meets any of the following criteria:

	Wis. Adm. Code
Exhibits any of the characteristics of hazardous waste	NR 661, subch. C
Has been named as a hazardous waste and listed as such in the regulations	NR 661, subch. D
Is a mixture containing a listed hazardous waste and non-hazardous waste	NR 661.03(1)(b)4
Is derived from the treatment, storage, or disposal of listed hazardous waste.	NR 661.03(3)(b)1 & NR 661.03(4)(b)

Understanding the definitions and descriptions of hazardous waste, both characteristic and listed, will help you navigate the waste determination flow chart provided below. A hazardous waste determination for each solid waste must be made at the point of generation, before any dilution, mixing or other alteration of the waste occurs. Note that waste properties may change due to environmental exposures and other factors, which may result in a change of waste classification.



Additional Considerations

There may be other factors to consider when determining if the solid waste is a hazardous waste:

- **Dilution** of hazardous waste to remove hazardous characteristics is not allowed.
- **Treatment or mixing** of hazardous waste requires a high understanding of the hazardous waste rules and is only allowed in very limited circumstances (e.g. elementary neutralization or precipitation of metals). Prior to treating or mixing hazardous waste at a facility, the DNR strongly encourages you to contact the hazardous waste program to determine what rules apply and if a hazardous waste treatment license is required.
- **Mixtures of listed hazardous waste** with other solid wastes will result in the entire mixture becoming a listed hazardous waste.
- **Mixtures of characteristic hazardous waste** with other solid wastes will result in the entire mixture becoming a hazardous waste if the characteristic continues to be exhibited by the mixture.
- **Waste derived or generated** from treatment, storage or disposal of a listed hazardous waste, including sludge, spill residues, air emission control dust or leachate, is a listed hazardous waste.
- **Land Disposal Restrictions (LDRs)** requirements in ch. NR 668 apply to SQGs and LQGs. The LDR requirements for hazardous wastes begin at the POG and identify hazardous wastes that are restricted from land disposal. Additionally, the LDR defines the limited circumstances in which prohibited wastes may be land disposed.

Listed or Characteristic Hazardous Wastes

Hazardous wastes can be process wastes, chemicals or compounds designated as “listed wastes” and/or they can exhibit hazardous characteristics (ignitability, corrosivity, reactivity or toxicity). The waste codes outlined below are used to identify and track the wastes on shipping manifests from generation and transportation through treatment and disposal or recycling.

A hazardous waste may be listed, characteristic, or both.

Listed Wastes

F-list wastes

These waste types (F001-F039) typically include certain spent solvents, paint thinners, brake and carburetor cleaners, vapor degreasing and dry cleaning solvents, electroplating wastes, and manufacturing and process wastes. [NR 661.31]

K-list wastes

These waste types (K001-K178) typically come from specific sources such as industrial processes like wood preserving, manufacturing pesticides, organic chemicals and veterinary drugs. [NR 661.32]

P-list wastes

These wastes are identified as acute hazardous wastes (P001-P205) and include discarded commercial chemical products; off-specification species; container and spill residues including unused chemicals such as cyanides, arsenic compounds and several pesticides. These wastes are extremely dangerous to human health and the environment in very small doses or short-term exposure. [NR 661.33]

NOTE: A person generating more than 2.2 lbs. per month of acute hazardous waste is fully regulated as a large quantity generator. Additionally, a person storing more than 2.2 lbs. of acute hazardous waste at any one time is fully regulated as a large quantity generator.

U-list wastes

These wastes are identified as toxic wastes (U001- U411) and include discarded commercial chemical products, off-specification species, container residues, and spill residues including used chemicals that pose health risks due to their persistence in the environment or their potential for migrating through the environment. These wastes are dangerous to humans and the environment in small doses, but are not as toxic as “P listed” wastes. [NR 661.34]

Characteristic Wastes

Waste Code D001

Ignitability represents the ability of the waste to burn. Liquid wastes are ignitable if their flash point is less than 140 degrees F. Some non-liquids, flammable gases and certain oxidizers also have this characteristic. [NR 661.21]

Liquid wastes w/flash point <140F	Gasoline, xylene, toluene, acetone, benzene, methanol, isopropyl alcohol
Non-liquids	sulfur, oily rag containing drying oils (linseed oil, soya bean oil, tung oil), wetted titanium powder, aluminum powder, magnesium powder, alkali metals
Flammable gases	Propane, acetylene, butane, hydrogen, methane.
Oxidizers	Chlorates, permanganates, inorganic peroxides, organic peroxides, nitric acid in concentrations from 65% to 70%.

Waste Code D002

Corrosivity represents the ability of the waste to destroy or deteriorate materials, chemically burn skin, enhance movement of toxic chemicals in the environment, react dangerously with other wastes, or harm fish and other aquatic life. Aqueous wastes (>50% water) are corrosive if their pH is less than or equal to 2 or greater than or equal to 12.5 (e.g., rust remover, descaling products). Liquid wastes (e.g., ferric chloride) are corrosive if they corrode steel by more than one-quarter inch per year. [NR 661.22]

Waste Code D003

Reactivity is the waste's tendency to react violently or explode. Wastes are reactive if they are unstable either alone or in the presence of water. These wastes can form explosive mixtures with water and produce dangerous quantities of toxic gases, vapors or fumes when mixed with water or when exposed to mild acids or bases. They can detonate, react or decompose explosively (e.g., hydrogen sulfide, cyanide or sulfide-bearing wastes, lithium-sulfur batteries, nitroglycerin formulations, ethylene oxide, sodium azide, and phosphorous). [NR 661.23] **Note:** *There is currently no acceptable analytical test method for reactivity.*

Waste Code
D004 - D043

Toxicity is the ability of hazardous constituents to leach out of the waste. Wastes are toxic if they release or leach any of 39 specified heavy metals, pesticides or other organic chemicals above their regulatory level concentrations (e.g., benzene, carbon tetrachloride, chromium, Chlordane, Endrin, lead, mercury). [NR 661.24]

Waste Determination Methods

To make a waste determination, per sNR 662.011(3), the generator can use either laboratory analysis results and/or apply knowledge of the waste based on the materials and processes used to generate the waste. While representative sampling and analysis of the waste might not be considered as convenient as relying solely on applying knowledge, it provides advantages. An accurate waste determination is a critical factor in demonstrating compliance with hazardous waste regulations, reducing RCRA liability and reducing disposal costs by avoiding the over-classification of hazardous wastes.

Laboratory Analysis

A generator is required to use a DNR-certified lab to analyze waste samples for making waste determinations as per NR 662.011(3)(a)1. Before collecting the representative waste sample, select a lab and discuss the following: sample volumes, required containers, sample collection methods, and correct analytical test methods.

Visit dnr.wi.gov and search for 'accredited labs' to find a list of commercial state [certified labs](#).

For information on sampling and test methods go to NR 661, subch. C, Appendix I -Representative sampling methods; Appendix II Method 1311 Toxic Characteristic Leaching Procedure (TCLP); and Appendix III Chemical Analysis Test Methods.

Note that the certification of the lab is based on the specific test methods and analytical parameters. Be aware that labs can lose DNR certification so it is important to verify the current certification status.

If technical assistance is needed regarding test methods or lab analysis, contact the DNR hazardous waste inspector assigned to your facility or the Laboratory Certification Program at 608-267-7633 or DNRLabCert@Wisconsin.gov.

Representative Sampling

The methods and equipment used for sampling waste materials will vary based on the form and consistency of the waste. Sampling guidance for generators, along with key issues to identify when developing a waste analysis plans, can be found in the U.S. EPA's 2015 [Waste Analysis at Facilities that Generate, Treat, Store, and Dispose of Hazardous Wastes](#). This guidance document provides information on selecting waste analysis parameters, data quality objectives, sampling procedures, analytical methods and determining re-evaluation frequencies.

A representative sample of each waste stream must be collected and analyzed in order to provide sufficient data to make the waste determination. The sample collected should reflect an unbiased representation of the waste, exhibit the average properties of the waste stream (or universe, such as a waste pile or lagoon) and reflect potential process variations. As the referenced EPA guidance states:

To be representative, a sample needs to be collected and handled in a way that preserves its original physical form and chemical composition and prevents contamination. For a sample to provide meaningful data, it is important that it reflect the properties of the waste from which it was obtained, that its physical and chemical integrity be maintained, and that it be analyzed within a dedicated quality assurance program.

Approved representative sampling methods for specific waste types are located in NR 661 Appendix 1.

Acceptable Knowledge

Using knowledge when determining whether a waste material is hazardous waste or non-hazardous waste may be acceptable; however, it must be supported with documentation. Examples of supporting documentation include: Safety Data Sheets (SDSs), published information, process flow diagrams, chemical reaction diagrams, identified breakdown products, and other process reactions or chemical information. Typically, none of these documents are acceptable as stand-alone information for a waste determination as most do not state conclusively whether or not the waste is hazardous or non-hazardous. Therefore, multiple document sources may be needed to support a knowledge-based determination.

Examples of when it may be sufficient to apply knowledge include: when waste is a listed hazardous waste generated from a specific source identified in NR 661.32, Wis. Adm. Code; for discarded unused chemical products, reagents, or chemicals of known physical and chemical constituents; or for reactive waste materials with no acceptable test methods (ex. reactivity D003).

Safety Data Sheets: SDSs can provide useful information regarding ignitability (flash point), corrosivity (pH), or reactivity of the material going into the process. However, they tend to be less useful when it comes to identifying the toxic characteristics of waste generated from that process. The SDS only lists ingredients that make up greater than 1% of the total constituents (0.1% if they are carcinogens). Ingredients that are less than 1% by mass can equal up to 10,000 parts per million (ppm). This means that a material used in a process may contain a toxic constituent that is not listed on the SDS, but which contributes to the generation of a hazardous waste. Additionally, the process itself may chemically or physically change the properties of the materials such that the generated waste is hazardous.



In most cases knowledge of materials used in a process cannot properly characterize the generated waste, particularly when the waste is non-homogenous or has become cross-contaminated. Therefore, to accurately characterize the waste collect representative samples for laboratory analysis.

Waste profiles: A documented “waste profile” is typically generated by Treatment, Storage or Disposal (TSD) facilities as a means for them to standardize and categorize information regarding wastes they intend to accept. The information outlined in the waste profiles regarding waste characterization needs to be supported by either laboratory analysis or acceptable knowledge. Waste profiles are not standardized forms and may not adequately characterize the waste. The generator will likely have a better understanding of the waste materials they generate and should work with the TSD to ensure adequate characterization

Recordkeeping

Adequate written documentation (records) should include a statement regarding the waste determination for each waste stream. It should state whether the waste is hazardous waste or non-hazardous waste and include copies of all information used to support the determination. Written documentation includes, but is not limited to:

- A description of each identified waste stream and process.
- Analytical sampling results including a description of how each representative sample was collected and managed, why the specific test method was chosen, and evidence that the lab was certified for the test method used.
- Records that justify and support knowledge-based determinations such as SDSs, published information, process flow diagrams, chemical reaction diagrams, identified breakdown products, and other process reactions or chemical information.

A sample waste determination checklist is attached to this publication. This specific form is not required. Generators may create their own form or recordkeeping system to meet the needs of their individual facilities.

During a hazardous waste generator inspection, waste determination records will be requested by the inspector to verify compliance with hazardous waste regulations, and it is recommended that this information be kept organized and readily accessible.

Re-evaluation of waste determinations should occur following process or material changes, or if the waste is highly variable, to verify that the original waste determination remains valid. Additionally, the DNR recommends a re-characterization of each waste stream be conducted every one to three years. It is the responsibility of the generator to make a correct waste determination and retain the supporting documentation. [NR 662.011]

Written records are required to demonstrate compliance for all wastes, both hazardous and non-hazardous, that may reasonably be suspected of being hazardous waste.

This requirement does not apply to VSQGs but is highly recommended.

Conditional Exemptions and Exclusions

Specific conditional exemptions and exclusions from solid waste or hazardous waste can be found in the following codes and guidance documents. These conditions are typically specific to the waste type and use, and may have testing, handling, and recordkeeping requirements. Contact the Waste and Materials Management Hazardous Waste Program for assistance.

Waste Determination Checklist

Waste Name/Type: _____ Date: _____

Waste Information	
Description of process generating the waste:	
Amount generated per month (lbs)	
Does the waste meet the definition of solid waste? <i>See s. 289.01(33), Wis. Stats., and ch. NR 661.02, Wis. Adm. Code.</i>	<input type="checkbox"/> Yes <input type="checkbox"/> No, explain why:
Is this solid waste excluded from regulation? <i>See NR 661.04</i>	<input type="checkbox"/> No <input type="checkbox"/> Yes, explain why:
Is this solid waste a hazardous waste?	<input type="checkbox"/> Yes <input type="checkbox"/> No <i>Attach supporting documentation</i>
Is the waste exempt from hazardous waste regulations?	<input type="checkbox"/> No <input type="checkbox"/> Yes, explain why/ provide code citation:
Is this waste a listed hazardous waste?	<input type="checkbox"/> No <input type="checkbox"/> Yes, list waste code(s): <hr style="border: 1px solid black;"/>
Is this waste a characteristic hazardous waste?	<input type="checkbox"/> No <input type="checkbox"/> Yes, list waste code(s): <hr style="border: 1px solid black;"/>
Is the waste Universal Waste?	<input type="checkbox"/> No <input type="checkbox"/> Yes, list waste type:
Is the waste Used Oil?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Supporting Documentation	
Was laboratory analysis used to make this decision?	<input type="checkbox"/> No <input type="checkbox"/> Yes, Laboratory / DNR certification #:
	<hr style="border: 1px solid black;"/> <i>Attach a copy of the analytical results to this sheet</i>
Was objective knowledge of the material and process used to make this determination?	<input type="checkbox"/> No <input type="checkbox"/> Yes
	Name and date of supporting documents: <hr style="border: 1px solid black;"/> <i>Attach a copy of supporting documents to this sheet</i>
Safety Data Sheet(SDS):	<input type="checkbox"/> No <input type="checkbox"/> Yes, attach the SDS to this sheet
Process Flow Diagram:	<input type="checkbox"/> on reverse of this form <input type="checkbox"/> attached
Research Data:	
Other:	
Facility Information	
Name of Facility / Business	
EPA ID # / Facility ID # (FID)	
Name/Title of Person making determination:	
Signature:	Date:

