Waste Determinations

May 2, 2023

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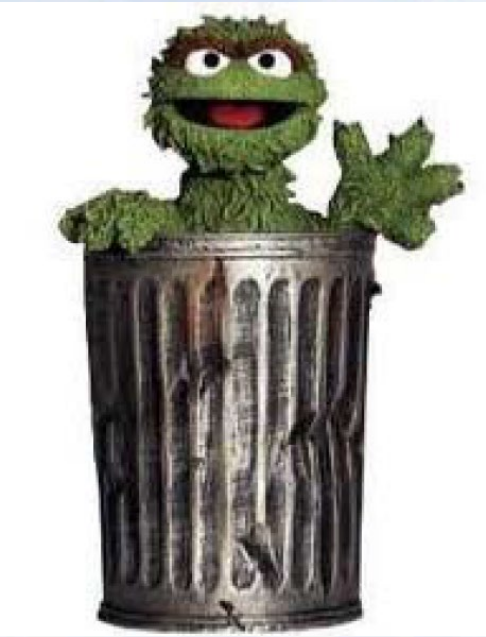
Are You Knowledgeable About Your Waste Streams?



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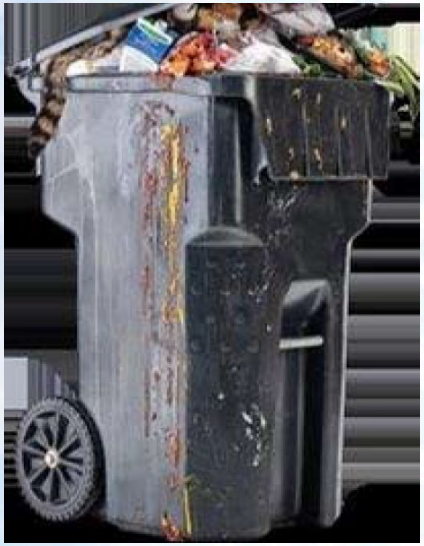
Do you generate waste?



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Do you generate waste?

Pictures from EPA or state enforcement actions, these conditions resulted in fines.

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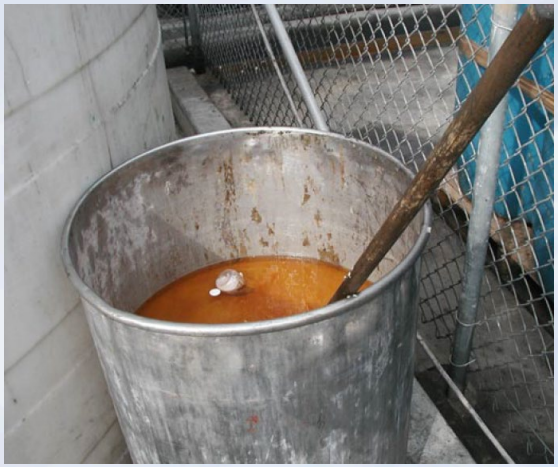
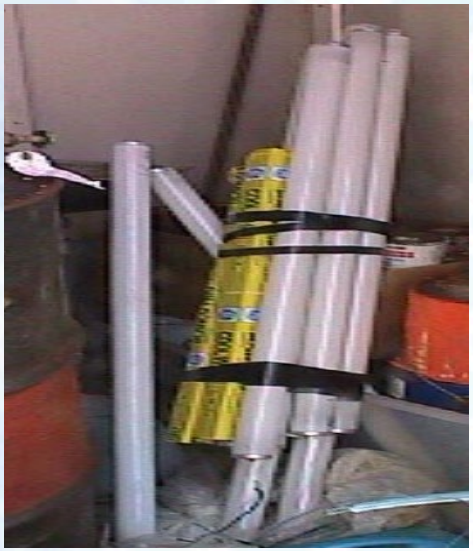
Do you generate waste?





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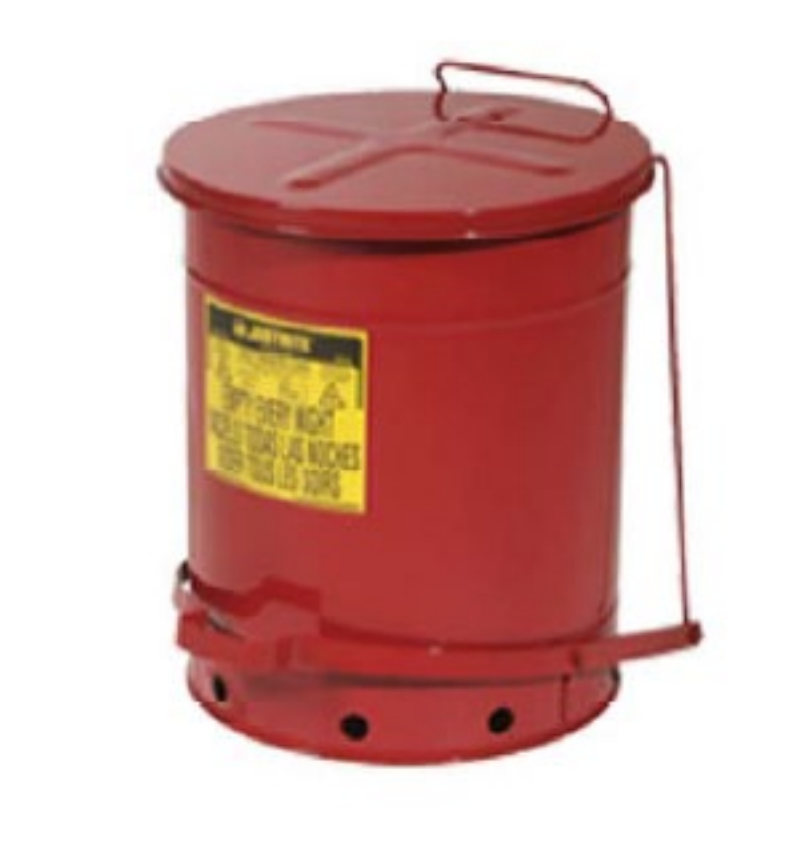

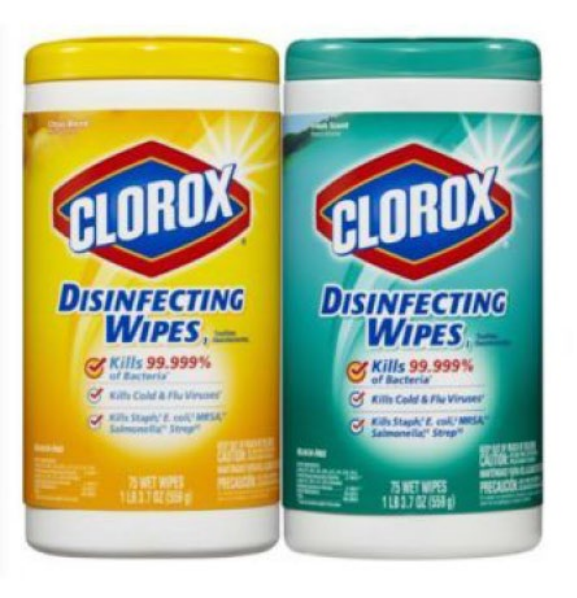

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Waste Determination

- Highly cited
- Lacking documented waste determinations is the Number 1 cited item
- Who uses Profiles?
  - EPA and most states do not recognize waste profiles as documented waste determinations
- The following are the steps to perform waste determinations

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Waste Determination Process

40 CFR 262.11

- This wording is from EPA's new rule
  - This rule has been adopted by most state
- Waste determinations completed in a five-step process:
  1. The hazardous waste determination for each solid waste must be made at the point of waste generation.
  2. Determine if the waste is excluded from regulation under 40 CFR 261.4.
  3. If the waste is not excluded, determine if the waste meets any of the listing descriptions under in subpart D of 40 CFR part 261.
  4. Determine whether the waste exhibits one or more hazardous characteristics as identified in subpart C of 40 CFR part 261 by either:
     - Applying knowledge of the hazard characteristic of the waste in light of the materials or the processes used to generate the waste.
     - When available knowledge is inadequate, testing the waste according to the methods set forth in subpart C of 40 CFR part 261, or according to an equivalent method approved by the Administrator under 40 CFR 260.21
  5. If the waste is determined to be hazardous, the generator must refer to parts 261, 264, 265, 266, 267, 268, and 273 for possible exclusions or restrictions pertaining to management of the specific waste.

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Waste Determination Process

Initial Step

- "Initial step" – determine whether the waste meets the definition of a "solid waste"
  - If the waste is not considered a solid waste, it cannot be considered a hazardous waste

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Exclusions – Solid Waste

"Initial Step" – 40 CFR 261.4(a)

- There are 27 exclusions for materials which are not solid waste, below are listed a few of the exclusions
  - **Domestic sewage**
  - Irrigation return flow
  - Special nuclear or by-product material defined by Atomic Energy Act
  - In-situ mining techniques
  - Pulping liquors
  - Spent sulfuric acid used to product virgin sulfuric acid
  - **Excluded scrap metal being recycled**
  - Shredded circuit boards being recycled
  - Used cathode ray tubes (CRTs)
  - **Solvent-contaminated wipes sent for cleaning and reuse**

Please note that several of these exclusions have additional requirements that are not listed above in order to meet the solid waste exclusion

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Point of Generation

Step 1 – 40 CFR 262.11(a)

- Waste determinations must be made at the point of waste generation
  - Prior to any dilution, mixing, or other alteration of the waste
  - Prior to any changes that have occurred as a result of exposure to the environment or other factors that may change the properties of the waste
- Example #1: Parts Washer
- Example #2: IPA Wipe
- Example #3: Spent Lamps

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Exclusions – Hazardous Waste

Step 2 – 40 CFR 262.11(b), 261.4(b)

- There are 18 exclusions of solids wastes which are not hazardous wastes, below are listed a few of the exclusions
  - **Household waste**
  - Fly ash waste, bottom ash waste, slag waste, and flue gas emission control waste form combustion of coal or other fossil fuels
  - Drilling fluids associated with the exploration of crude oil or natural gas
  - Solid waste from the extraction, beneficiation, and processing of ores and minerals
  - **Non-terne plated used oil filters**
  - **Solvent-contaminated wipes sent for disposal, except for wipes contaminated with trichloroethylene**

Please note that several of these exclusions have additional requirements that are not listed above in order to meet the solid waste which are not hazardous waste exclusion

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Listed Wastes
Step 3

- 40 CFR 261 Subpart D
- **Four Lists: F-List, K-List, P-List, U-List**
- Includes hazard code explaining why EPA defined waste as hazardous
- Most facilities have no idea about Listed Wastes
  - Contact your environmental person for help

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Listed Wastes
Step 3

§261.31 Hazardous wastes from non-specific sources.

(a) The following solid wastes are listed hazardous wastes from non-specific sources unless they are excluded under §§260.20 and 260.22 and listed in appendix IX.

Industry and EPA hazardous waste No.	Hazardous waste	Hazard code
Generic:		
F001	The following spent halogenated solvents used in degreasing: Tetrachloroethylene, trichloroethylene, methylene chloride, 1,1,1-trichloroethane, carbon tetrachloride, and chlorinated fluorocarbons; all spent solvent mixtures/blends used in degreasing containing, before use, a total of ten percent or more (by volume) of one or more of the above halogenated solvents or those solvents listed in F002, F004, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures	(T)
F002	The following spent halogenated solvents: Tetrachloroethylene, methylene chloride, trichloroethylene, 1,1,1-trichloroethane, chlorobenzene, 1,1,2-trichloro-1,2,2-trifluoroethane, ortho-dichlorobenzene, trichlorofluoromethane, and 1,1,2-trichloroethane; all spent solvent mixtures/blends containing, before use, a total of ten percent or more (by volume) of one or more of the above halogenated solvents or those listed in F001, F004, or F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures	(T)
F003	The following spent non-halogenated solvents: Xylene, acetone, ethyl acetate, ethyl benzene, ethyl ether, methyl isobutyl ketone, n-butyl alcohol, cyclohexanone, and methanol; all spent solvent mixtures/blends containing, before use, only the above spent non-halogenated solvents; and all spent solvent mixtures/blends containing, before use, one or more of the above non-halogenated solvents, and, a total of ten percent or more (by volume) of one or more of those solvents listed in F001, F002, F004, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures	(I)*
F004	The following spent non-halogenated solvents: Cresols and cresylic acid, and nitrobenzene; all spent solvent mixtures/blends containing, before use, a total of ten percent or more (by volume) of one or more of the above non-halogenated solvents or those solvents listed in F001, F002, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures	(T)
F005	The following spent non-halogenated solvents: Toluene, methyl ethyl ketone, carbon disulfide, isobutanol, pyridine, benzene, 2-ethoxyethanol, and 2-nitropropane; all spent solvent mixtures/blends containing, before use, a total of ten percent or more (by volume) of one or more of the above non-halogenated solvents or those solvents listed in F001, F002, or F004; and still bottoms from the recovery of these spent solvents and spent solvent mixtures	(I,T)

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Hazardous Characteristics

Step 4

- Ignitability: Flashpoint < 140ºF [D001]
- Corrosivity: pH=<2.0 or =>12.5 [D002]
- Reactivity: Unstable [D003]
- Toxicity: TCLP (Toxicity Characteristic Leaching Procedure) [D004 – D043]

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Flash Point

- Q. What on-site would have a flash point of less than 140 ºF?
  - Parts washer (not all but many do have flash points less than 140ºF)
  - Laboratory solvents, e.g. acetone
- If you don't know, review the SDS for that product
  - Most inspectors will ask for SDSs

Corrosive

- Acids with a pH equal to or less than 2.0
- Bases with a pH equal to or greater than 12.5
- Wastes that may be subjected
  - Chemicals used in the lab
  - Water treatment chemicals

Reactive

- Peroxides
  - Temperature or shock sensitive

Toxic Limits (partial list)

EPA HW No.[1]	Contaminant	CAS No.[2]	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	[4]200.0
D024	m-Cresol	108-39-4	[4]200.0
D025	p-Cresol	106-44-5	[4]200.0
D026	Cresol		[4]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	[3]0.13
D012	Endrin	72-20-8	0.02

[1] Hazardous waste number.

[2] Chemical abstracts service number.

[3] Quantitation limit is greater than the calculated regulatory level. The quantitation limit therefore becomes the regulatory level.

[4] If o-, m-, and p-Cresol concentrations cannot be differentiated, the total cresol (D026) concentration is used. The regulatory level of total cresol is 200 mg/l.

Additional Exclusions
Step 5

- Universal Waste – 40 CFR 273
- Used Oil – 40 CFR 279
- Lead Acid Battery Exchange Program – 40 CFR 266

- More on these later!

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Final Step - Document the Waste Determination [40 CFR 262.11(f)]

- Must maintain records for at least 3 years from the date that the waste was last sent to on-site or off-site treatment, storage, or disposal
- Records must include:
  - Supporting documentation, such as SDSs, analytical testing, etc.
  - Written determination (e.g., “waste stream A is considered a hazardous waste based on TCLP sampling and the current SDS information”)
- Records directly required for SQGs and LQGs
  - Indirectly required for VSQGs/CESQGs

Example of a Waste Summary List

Example of Waste Inventory

Appendix Table A-1. Waste Inventory Summary

No.	Waste Description or Process	Approximate Generation Amount	Waste Determination 40 CFR 262.11						Comments
			Initial Step	Step 1	Step 2	Step 3	Step 4	Step 5	
			Solid Waste (Y/N)	At Point of Generation (Y/N)	Excluded per 40 CFR 261.4 (Y/N)	Listed 40 CFR 261 Subpart D (Y/N)	Characteristic 40 CFR 261 Subpart C (Y/N)	If Hazardous, Other Exclusions or Restrictions (Y/N)	
1	Waste Lamp(s)	20-25/ month	Yes	Yes	No	No	Yes – D009 (mercury)	Yes – Exempt 40 CFR 261.9	Universal Waste (40 CFR 273)
2	Broken Lamp(s)	As occurs	Yes	Yes	No	No	Yes – D009 (mercury)	No	Haz Waste (D009)
3	Waste Battery(ies) – Ni-Cad	1 lbs/ month	Yes	Yes	No	No	Yes – D006 (cadmium)	Yes – Exempt 40 CFR 261.9	Universal Waste (40 CFR 273)
4	Waste Battery(ies) – Lithium	1 lbs/ month	Yes	Yes	No	No	Yes – D003 (reactive)	Yes – Exempt 40 CFR 261.9	Universal Waste (40 CFR 273)
5	Waste Battery(ies) – Lead-Acid	1 lbs/ month	Yes	Yes	No	No	Yes – D008 (lead)	Yes – Exempt 40 CFR 261.9	Universal Waste (40 CFR 273)
6	Waste Battery(ies) – Alkaline	5 lbs/ month	Yes	Yes	No	No	No	N/A	Non-Haz Solid Waste
7	Exchanged Lead-Acid Batteries	1 unit exchanged/ month	Yes	Yes	No	No	Yes – D008 (lead)	Yes – Exempt 40 CFR 261.6(a)(2)(iv)	Exchange Program (40 CFR 266)
8	Mercury-containing Waste	As occurs	Yes	Yes	No	No	Yes – D009 (mercury)	Yes – Exempt 40 CFR 261.9	Universal Waste (40 CFR 273)
9	Empty Aerosol Cans	~6/week	Yes	Yes	Yes – Excluded 40 CFR 261.4(a)(13)	N/A	N/A	N/A	Recycled as Scrap Metal
10	Aerosol Can Residue	<1 lb/ month	Yes	Yes	No	TBD	TBD	No	Typically Haz Waste (D001, D035, etc.)
11	Aerosol Can Puncturing Device Filter	As occurs	Yes	Yes	No	TBD	TBD	No	Typically Haz Waste (D001, D035, etc.)
12	Broken and/or Scrap Metal Parts	500 lbs/ month	Yes	Yes	Yes – Excluded 40 CFR 261.4(a)(13)	N/A	N/A	N/A	Recycled as Scrap Metal

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Supporting Documentation:

Process knowledge (SDS, technical data sheets, etc.)

Analytical data (TCLP, compositional data, etc.)

5.1.11. Waste Laminator Adhesive

Refer to Section 1.4 for details. See Appendix C for a copy of the waste adhesive test results demonstrating that the waste adhesive is not a hazardous waste.

5.1.12. Sanitary Waste (POTW)

The generator is connected to the municipal sewer system. At this time, only sanitary waste from the on-site restrooms is discharged to the sanitary sewer system. There are no floor drains in the manufacturing area. There is no process wastewater discharged to the sanitary sewer system.

5.1.13. Forklift Lead Acid Batteries

The generator uses a contractor to maintain their forklift fleet. However, there are times the batteries must be replaced. Lead acid batteries replaced by the contractor or by the generator are sent back to the battery supply company and exchanged for a new battery. Therefore, the lead acid batteries from forklifts are not disposed of as hazardous waste and are not handled as universal waste. They are handled under the battery exchange program, thus exempt from the hazardous waste rule; refer to 40 CFR 266, part G.

5.1.14. Spent Batteries

The generator uses alkaline, rechargeable, Ni-Cad, and lithium batteries in several types of equipment; examples of each are listed below:

- Alkaline Batteries – employee flashlights, small electronic equipment
- Rechargeable Batteries – employee flashlights, small electronic equipment, exit signs.
- Ni-Cad – backup computer &/or telephone systems
- Lithium Batteries - exit signs, cordless power tools, cell phones, and multiple uses.

Management requests that employees follow these simple steps after a battery replacement:

1. Do not throw spent batteries into the trash, especially Lithium batteries.
   a) There is a fire hazard risk if the battery, even a spent battery, makes contact with liquids &/or metals in the trash or trash compactor. A battery that is shorted will heat up and possibly ignite.
2. Place spent batteries in the maintenance area. Maintenance determines the type of battery disposal option (e.g., universal waste, battery exchange, etc.).
3. If the batteries are handled as universal waste, the ends or the terminals of each battery are taped over or each individual battery is placed in a plastic bag.
4. Maintenance will determine the method of disposal or exchange.

Management does not allow employees to bring batteries from their home into the facility for disposal.

5.1.15. Empty 55-gallon Steel Drums

The facility has reduced the generation of 55-gallon steel drums by purchasing inks in 5-gallon cans and mixing as needed. Totes are used for base colored inks. However, some inks are supplied in 55-gallon drums. Employees must tip the drums over into another drum of the similar ink or solvent to collect any unused material. This is a cost savings practice because there may be as much as an inch or more remaining in the drum prior to tipping the drum. When the drums are emptied, a supervisor verifies the steel drum is empty prior to staging the empty drum in the empty drum storage area. The drum storage area is located along the northeast corner of the property.

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Summary

- Walk through your facility and make a list of all the waste streams, and recyclables.
- Perform a waste determination on each waste stream
  - Determine if the waste stream is hazardous waste or not
  - Most waste determines can be based on process knowledge, e.g., Safety Data Sheets
  - If the waste stream has been contaminated, perform analytical

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