



Waste Characterization & Generator Status

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Today's Goals

- Identify Regulations Requiring Characterization
- Identify Waste Survey and Waste Characterization Steps
- Identify How to Calculate Hazardous Waste Generator Status

Do I Need to Know All of This?

- Hazardous waste regulations...
 - apply to all businesses, including municipalities, hospitals, & service industries, not just manufacturing industries
 - are written broadly to address hazards posed by all waste streams

Why Cover These Topics?

- Hazardous waste regulations require each business to...
 - Evaluate the character & composition of their wastes
 - Determine the total weight of all hazardous waste generated each month
 - Determine their legal disposal options
- Less hazardous waste = less regulation & more disposal options under the law
- There is no one best answer for how to dispose of waste for all businesses & locations

Regulations Requiring Waste Characterization

- Act 451, Michigan Natural Resources & Environmental Protection Act:
 - Part 111, Hazardous [Statute](#) and [Rules](#)
 - Part 121, Liquid Industrial By-Products [Statute](#)
 - Part 115, Solid Waste [Statute](#) and [Rules](#)
 - Part 169, Scrap Tires Statute
- Act 368, Michigan Public Health Code:
 - Part 138, Medical Waste Regulatory Act Statute and Rules
 - Part 2, Ionizing Radiation Rules Statute and Rules
- Federal Toxic Substance Control Act (TSCA)

Waste Characterization - Where Do I Start?

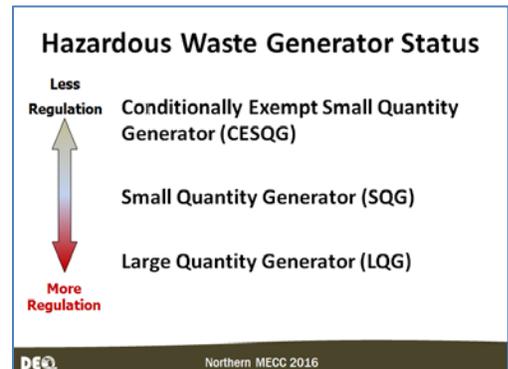
- Perform a waste survey to identify what wastes are generated at your facility
- Tour your entire facility and inventory all waste streams
- Don't overlook identifying & characterizing ALL waste streams

Waste Characterization - Waste Survey

- Drains, discontinued lines
- Catch basins
- Office activities, electronics, batteries, electric lamps, thermostats
- [Aerosol can puncturing](#), ignitable & could have TCLP issues
- Demolition debris, gym flooring, [abrasive blasting](#)
- Antifreeze and mercury switches, parts washer, used Oil
- Laboratory waste, art class waste

Waste Characterization - Rags & Textiles

- New federal rule in 2013, became effective January 2014
- Not adopted by Michigan
- Excludes wipes that are contaminated with solvents listed as hazardous wastes under RCRA that are cleaned or disposed of properly.



- To be excluded, solvent-contaminated wipes must be managed in closed, labeled containers and cannot contain free liquids when sent for cleaning or disposal.
- Requires records and cannot accumulate wipes for longer than 180 days
- State reviewing adoption through rulemaking presently

Waste Characterization - Who does it?

- Do the waste characterization yourself
- Hire a consultant
- Use the disposal company services
- Use a combination of the above

Waste Characterization - How do you do it?

- Knowledge
- MSDS
- Facility Process Information
- Technical Information
- Manufacturer Information
- Hazardous Waste Listings

Waste Characterization – “Green” Dry Cleaning Solvents

- Cautionary Example: Analyses of wastes from dry cleaning processes using the newer "green" solvents are testing positive for chromium

Waste Characterization Basics

- Characteristic Hazardous Waste (D wastes)
 - A waste stream found to be ignitable, corrosive, reactive, and/or toxic by testing
- Listed Hazardous Waste (F, K, P & U wastes)
 - A common waste stream known to be hazardous without testing
- Hazardous Waste Mixture Rule
 - Mixture of a listed hazardous waste with other non-hazardous wastes is a listed hazardous waste.
- Hazardous Waste Derived From Rule
 - Residues derived from treating a listed hazardous waste is listed hazardous waste

Waste Characterization - Basic Steps

1. Is waste listed? Review lists of waste types & codes in rules
2. Is waste characteristic? Analytic test or by knowledge (MSDS, knowledge of process, etc.)
3. Does an exclusion or exemption apply?
4. Do other regulations apply? (Liquid industrial by-product or solid waste, etc.)
5. Create & maintain records of characterization for at least 3 years from the date waste was last shipped offsite
6. Re-characterize if there is a change in process or materials

Waste Characterization Step 1: Listed Hazardous Waste - What are Listed Hazardous Wastes?

- F Codes (Table 203a) – Wastes from non-specific sources (e.g. spent chlorinated solvents, metal treatment wastewaters & sludges)
- K Codes (Table 204a) – Wastes from specific industries (Rule change – Michigan Hazardous Wastes 001K and 002K rescinded)
- P & U Codes (Table 205a-c) – Commercial chemical products, off-specification products, container and spill residues including some Michigan only U Codes (e.g., formaldehyde, parathion, benzene, DDT, xylene) (Rule change – Some Michigan hazardous wastes rescinded)
- P Codes are all acutely hazardous
- Acutely hazardous when “H” appears in Hazard Code Column

Waste Characterization Step 2: Characteristic Hazardous Waste - What are Characteristic Hazardous Wastes?

- Characteristic Hazardous Waste & Codes:
 - Ignitable - D001
 - Corrosive - D002
 - Reactive - D003
 - Toxic - D004 – D043 (Table 201a)

- Severely Toxic – 001S - 007S (Table 202, includes dioxins & furans)

Characteristic Hazardous Waste Common Tests

- Flash point – Used for testing Ignitability < 140 F (D001) Examples: paints, solvents
- pH – Used for testing corrosivity ≤ 2 or ≥ 12.5 (D002) Examples: acids, bases
- Reactivity – Test as required for DOT classification for materials that are unstable at normal conditions, reacts violently with water, explode, and/or emit toxic gas (D003) Examples: lithium hydride & trichlorosilane
- TCLP (Toxicity Characteristic Leaching Procedure) - Used for testing leaching potential for Table 201a hazardous constituents (D004-D043) Examples: Paints or sludges containing metals or MEK, contaminated media
- Total Halogens - Used for testing used oils for chlorine, fluorine, bromine, etc. to determine if a “presumed” hazardous waste

Waste Characterization Step 3: Common Exemptions and Exclusions (Rules 202, 203, 204, 206, 207 and 228 of Part 111 -not all inclusive)

- Wastewater discharges to POTW's that are approved by that sewer authority are exempted at the point of discharge to the sewer
- Batteries, pesticides, mercury devices, electric lamps, pharmaceuticals, consumer electronics & antifreeze handled as Universal Waste enjoy a partial exemption
- Wastes used or reused in a process to make a product are excluded provided there is no reclamation, but beware of sham recycling, get DEQ concurrence on exemption, and retain supporting documents
- Laboratory samples are exempt until being discarded
- Used oils that are recycled
- Petroleum contaminated media from leaking UST systems that fail the TCLP for D018 – D043 only & are being remediated under DEQ approval pursuant to Part 213
- Off-specification fuel (gasoline, kerosene, diesel, etc.) being recycled for use as fuel or burned as fuel
- Materials remaining in manufacturing units that would otherwise be hazardous wastes - if taken out of service the material becomes a hazardous waste (degreasers, paint pots)
- Laundered rags that are reused that would otherwise be a hazardous waste
- Hazardous wastes from which precious metals are recovered (partial exemption)
- Dredge spoils from projects permitted by the U.S. Army Corps of Engineers or DEQ
- Recycled materials (not all see 40 CFR, Part 261.2, Table 1)
 - Some reclaimed materials are not considered solid wastes under RCRA, although they may exhibit a hazardous waste characteristic (e.g., commercial chemical products, sludges and by-products)
 - Commercial chemical products being speculatively accumulated are not solid wastes under RCRA
- Household waste, including single & multiple residences, hotels & motels, bunkhouses, ranger stations, crew quarters, campgrounds, picnic grounds, & day-use recreational areas
- Empty container residues

Waste Characterization - Empty Containers (Rule 207)

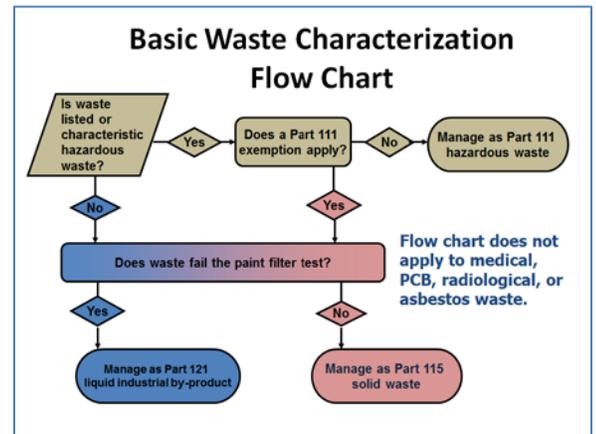
- After all non-acute hazardous waste or liquid industrial by-product has been removed using common practices:
 - No more than 1 inch or not more than 3.0% by weight of the total capacity of the container for containers less \leq to 119 gallons
 - No more than 1 inch or not more than 0.3% by weight of the total capacity of the container for containers > than 119 gallons
- Acute Hazardous or Severely Toxic Waste:
 - Triple rinse with appropriate solvent or cleaned by proven equivalent method
 - Remove inner liner that prevented contact with container
 - If listed due to characteristic, empty if no longer exhibits the characteristic
 - Rinse water/removed residue would be hazardous waste based on knowledge
- Compressed Gas:
 - Container pressure is equal to atmospheric pressure
 - Container is not clogged
 - No audible liquids in container when shaken

Waste Characterization Step 4: What is a Liquid Industrial By-Product (Part 121 of Act 451)

- Determine by using the Paint Filter Test, Method 9095 in EPA SW-846
- If there are any free liquids in the by-product or if the by-product is thinner than butter at or < 100 F, it should be managed as a liquid industrial waste
- Liquid hazardous wastes from a CESQG
- Some wastewater including most mobile power washing wastewater, carpet cleaning wastewater, food processing wastewaters.
- Most sludges from trench drains or blind sumps (unless there's been a release making it a hazardous waste)
- Includes liquid wastes from other locations besides "industrial" sites (e.g. municipal, health care, etc.)
- Most antifreeze
- Storm sewer cleanout waste
- Grease trap waste
- Most used oils being recycled
- Off-specification fuels being recycled

Waste Characterization Step 5: Waste Characterization Record (Rule 307)

- Records for each waste stream may include:
 - Waste type/description
 - Source of waste
 - Test results
 - Waste analysis records
 - MSDS
 - Sample procedure
 - Representative sample information



Waste Characterization Step 6: Re-characterize if process or materials change

- Do it all over again!

Hazardous Waste Generator Status

- Monthly hazardous waste generation < 220 lbs. or ~ 1/2 drum
- Total hazardous waste accumulation must always be less than 2200 pounds (5 drums)
- Wastes are properly disposed under other regulations
- Records of waste characterization and generator status are maintained for 3 years

Small Quantity Generator (SQG)

- Monthly hazardous waste generation 220 lbs. – 2,200 lbs. or ~ ½ to 5 drums
- Total hazardous waste accumulation must always be less than 13,200 pounds (30 drums)

Large Quantity Generator (LQG)

- Generates 2200 pounds of non-acute hazardous waste per month or
- Generates and accumulates 2.2 pounds of acute or severely toxic waste

Calculating Amount of Hazardous Waste Generated (Rule 205(5))

- Calculate the amount generated, not the amount shipped
- Calculate the amount in pounds or kilograms
- Include hazardous waste treated and/or disposed on-site unless it is hard piped to POTW
- Do not include hazardous waste managed as a universal waste
- Do not include liquid industrial by-product and/or used oil
- Do not include waste specifically excluded from Part 111 Examples: scrap metal being recycled, fuel being recycled, or POTW approved direct discharges
- Review total/maximum amount of hazardous waste generated and accumulated at any 1 time during the month
- Compare amount of hazardous waste generated and total accumulated during the month to the CESQG, SQG, and LQG definitions/limits found in Part 111, Rule 306