

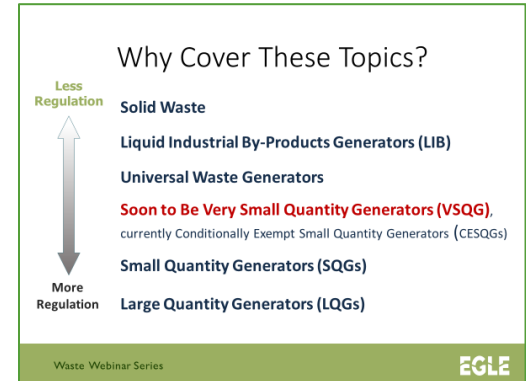


Waste Characterization and Generator Status

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Presentation Goals

- Identify how you determine what type of waste you generate.
- Identify regulations requiring characterization.
- Identify waste survey and waste characterization steps.
- Identify who does the waste characterization, when and how
- Identify common waste characterization test and how to determine hazardous waste generator category or status.



Covid-19 Emergency

- In determining whether your business is considered critical infrastructure for the purposes of the Stay Home Stay Safe order, please:
 - Review [Executive Order 2020-21](#) and related [Frequently Asked Questions](#) at Michigan.gov/Coronavirus
 - Refer to the federal Cybersecurity and Infrastructure Security Agency (CISA) [guidance](#), which EO 2020-21 uses for identification of critical infrastructure workers
 - Visit [Guidance for Business](#)
- The executive order must be construed broadly to prohibit in-person work that is not necessary to sustain or protect life.
- Conducting minimum basic operations may include activities required to comply with EGLE permits and environmental laws/standards
- EGLE continues to monitor questions related to EO 2020-21 sent to EGLE-Reporting@mi.gov
- EGLE established a process for handling enforcement discretion due to COVID-19
- To access this information on that process, go to Michigan.gov/EGLE, and it is found spotlighted on the top of the page
- All requests for enforcement discretion should follow the procedures provided and be submitted to EGLE-EnforcementDiscretion@mi.gov
- Procedure requires that the following information be submitted to EGLE:
 - The specific regulatory requirement in question, including identification of any permit, order, or agreement that applies to the entity's obligations
 - A concise statement describing the circumstances preventing compliance and how the compliance issue is impacted by the COVID-19 response - regulatory flexibility is only for COVID-19 prompted non-compliance
 - The steps taken to avoid the compliance issue, including whether you contacted EGLE for assistance and why the compliance issue was not reasonably avoidable
 - The anticipated duration of the compliance issue and whether it may create an acute risk or imminent threat to human health or the environment, if this is the case, please call 800-292-4706
 - A description of measures planned to protect public health and environment during period the requirement(s) cannot be met
 - A central point of contact for the site be provided, including an email address and phone number.

What is a Waste?

- A waste is any discarded material.
- A waste can be a solid, liquid, semisolid, or gaseous material.
- A waste is any material that cannot be used for its original intended purpose, including materials that are:
 - Burned as fuel;
 - Accumulated and recycled or reclaimed; or
 - Discarded, abandoned or disposed.

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 *at each site to...*
 - Evaluate the character & composition of their wastes.
 - Determine the total weight of all hazardous waste generated each month.
- **This is necessary to determine the legal disposal options for the waste!!!**
- 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.

Waste Characterization Regulations

- ~~Public Act 451, Michigan Natural Resources & Environmental Protection Act:~~
 - Part 111, Hazardous Waste Management [Statute](#) and [Rules](#)
 - Part 121, Liquid Industrial By-Products [Statute](#)
 - Part 115, Solid Waste Management [Statute](#) and [Rules](#)
 - Part 169, Scrap Tires Statute
- Public 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 - Automatically subject to waste regulations 90 days after equipment is taken out of service.
- Catch basins
- Office activities, electronics, batteries, lamps, thermostats, etc.
- Aerosol cans, ignitable & could have TCLP issues
 - See [aerosol can puncturing/recycling guide](#)
 - **New rules** to propose making aerosol cans a universe waste type streamlining handling requirements.
- Remodeling/demolition debris, expired products, gym flooring, [abrasive blasting](#)

- Fleet maintenance, like antifreeze and mercury switches, parts washer, used oil
- Laboratory waste, art class waste
- Solvent contaminated rags and textiles

Waste Characterization - Who Does It?

- Do the waste characterization yourself.
- Hire a [consultant](#).
- Use [disposal company](#) services.
- Use a combination of the above.

Waste Characterization - How Do You Do It?

- Knowledge:
 - SDS
 - Facility process information
 - Technical information
 - Manufacturer information
 - Hazardous waste listings
- Testing

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 – Waste Determinations

- Waste determination must be made:
 - At the point of waste generation, before any dilution, mixing, or other alteration of the waste, and
 - At any time the waste has or may have changed as a result of exposure to the environment or other factors that may change the properties of the waste making the classification change.

Waste Characterization Basics

- Listed Hazardous Waste (F, K, P & U wastes)
 - A common waste stream known to be hazardous without testing.
- Characteristic Hazardous Waste (D wastes)
 - A waste stream found to be ignitable, corrosive, reactive, and/or toxic by 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

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

Waste Characterization Step 1: Listed Hazardous Waste - What are Listed Hazardous Wastes? (Rules 213 and 302)

- Generators use knowledge to determine if a listing applies by looking at the:
 - origin of the waste
 - waste composition
 - process producing the waste
- 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 (2017 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).
- P Codes are all acutely hazardous.
- Also, acutely hazardous when “H” appears in “Hazard Code” column.

Waste Characterization Step 2: Characteristic Hazardous Waste - What are Characteristic Hazardous Wastes? (Rules 212 and 302)

- When making a characteristic determination, generator may use knowledge or testing like:
 - Information about chemical feedstocks and other inputs to the process.
 - Knowledge of products, by-products, and intermediates produced by the process.
 - Chemical or physical characteristics of wastes.
- When making a characteristic determination, generator may use knowledge or testing like:
 - Information about chemical feedstocks and other inputs to the process.
 - Knowledge of products, by-products, and intermediates produced by the process.
 - Chemical or physical characteristics of wastes.
 - Information on the chemical and physical properties of the chemicals used, produced by the process, or contained in the waste.
 - Testing that illustrates the properties of the waste.
- 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. Includes U.S. DOT oxidizers and ignitable compressed gasses that meet the criteria in 40 CFR 261.21(a)(3), not the criteria referenced in the U.S. DOT regulations.
- 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) and determining a waste is **toxic**.
 - Examples: Paints or sludges containing metals or MEK, contaminated soil, groundwater or debris.
 - Compare TCLP sample extract concentration limit to the concentration identified via waste sampling and analysis.
 - If sample extract meets or exceeds the limit in Table 201a, the waste is a characteristic toxic hazardous waste.

Characteristic Hazardous Waste
Common Tests

R 299 9217 Table 201a.
Rule 217. Table 201a reads as follows:

EPA Hazardous Waste Number	Chemical Abstract Service Number	Material	Extract Concentration milligrams per liter
D004	440-382	Arsenic	5.0
D004	7440-999	Barium	100.0
D018	71-43-2	Benzene	0.5
D018	71-43-2	Toluene	0.5
D019	56-23-5	Carbon tetrachloride	0.5
D020	97-49-8	Chloroform	0.03
D021	108-90-7	Chlorobenzene	100.0
D022	87-86-3	Chromium	5.0
D027	7440-47-3	Chromium	5.0
D023	95-48-7	m-Cresol	200.0*
D024	105-39-4	p-Cresol	200.0*
D025	108-44-5	p-Cresol	200.0*
D028	—	Cresol	200.0*
D016	84-75-7	2,4-D (2,4-Dichlorophenoxyacetic Acid)	10.0
D027	108-46-7	1,4-Dichlorobenzene	7.5
D029	107-26-2	1,2-Dichloroethane	0.5
D029	75-35-4	1,1-Dichloroethane	0.7
D030	121-45-2	1,4-Dioxinbenzene	0.12
D012	72-20-8	Endrin (1,2,3,4,10,10-hexachloro-1,7-Epoxy-1,4,4a,8,8,7a,8a-octahydro-1,4-endo, endo-5,6-epithiobicyclo[2.2.1]heptane)	0.02
D031	76-44-6	Heptachlor (and its Epoxide)	0.008

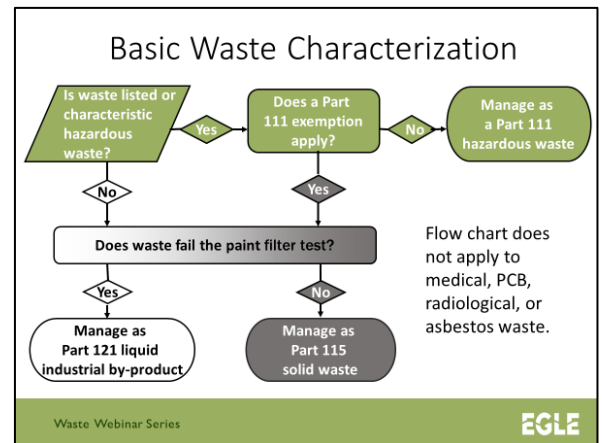
TCLP Sample Extract Concentration Limit

If sample extract meets or exceeds limits, waste is a characteristic toxic hazardous waste

- Total Halogens - Used for testing **used oils** for chlorine, fluorine, bromine, etc., to determine if a “presumed” hazardous waste.
 - Examples: Used to process used oil into lubricants and to process used oil into specification/off- specification fuels.
- If a waste contains > 1.0 part per million of the dioxin and furans in Table 202, the material is a severely toxic 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 the municipal wastewater treatment plant that are **authorized** by that sewer authority are exempted at the point of discharge to the sewer.
- Batteries, pesticides, mercury devices, electric lamps, pharmaceuticals, consumer electronics, antifreeze, and soon to be aerosol cans 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 EGLE concurrence on exemption, and retain supporting documents.
- Laboratory samples are exempt until being discarded.
- Most used oil being recycled.
- Petroleum contaminated media from leaking UST systems that fail the TCLP for D018 – D043 only & are being remediated under EGLE 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).
- **NEW 2017!!!** Excluded wipes contaminated with solvents that are laundered and reused or disposed properly.
 - Took effect January 2014 federally and April 2017 in Michigan.
 - To be excluded, must be managed in closed, labeled containers and cannot contain free liquids when sent for laundering and reuse or disposal.
 - Requires records and cannot accumulate wipes for longer than 180 days.
 - If disposable wipes are sent to an intermediary, like a hazardous waste treatment storage or



disposal facility, prior to destination facility that meets the rules (a permitted municipal solid waste incinerator or landfill or a licensed hazardous waste incinerator, landfill or boiler), the generator would need to maintain records regarding both the intermediate facility and the ultimate disposal facility.

- See [Solvent Contaminated Wipes Guide](#).
- Hazardous wastes from which precious metals are recovered enjoy a **partial exemption**.
- Dredge spoils from projects permitted by the U.S. Army Corps of Engineers or EGLE.
- Hazardous Secondary Materials –**NEW 2017!!!**
 - Exempt if meet the legitimacy criteria established in Rule 232 and recycled:
 - Under generator control (Rule 204(1)(aa)).
 - At a verified recycling facility (Rule 204(1)(bb)).
 - Transferred to another person for the purpose of remanufacturing (Rule 204(1)(cc)).
 - See [Hazardous Secondary Materials Guide](#).
- Household waste, including single & multiple residences, hotels & motels, bunkhouses, ranger stations, crew quarters, campgrounds, picnic grounds, & day-use recreational areas.
 - Must be generated at a residence and not from a business.
- 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 ≤ 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: Do Other Waste Regulations Apply

- Part 121 of Act 451 for liquid industrial by-products
- Part 115 of Act 451 for solid waste
- Public health code requirements for medical or radioactive waste
- Clean Air Act requirements for asbestos
- Toxic Substance Control Act for polychlorinated biphenyl (PCBs)

What is Liquid Industrial By-Product?

- Liquid industrial by-product is defined in and governed by Part 121 of Public Act 451.
- Determine 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 by-product.
- Liquid industrial by-products include liquid wastes from locations other than “industrial” sites, like

municipal, and commercial facilities.

- Examples of facilities that generate liquid industrial by-products includes:
 - Health care facilities (hospital, pharmacy)
 - Office locations
 - Nail salons
 - Car washes
- Liquid industrial by-products include:
 - Liquid hazardous wastes from a conditionally exempt small quantity generators (a.k.a. very small quantity generators).
 - Wastewaters, including most mobile power washing wastewater, carpet cleaning wastewater, food processing wastewater, and abrasive blasting wastewaters that are **NOT** a hazardous waste.
 - Most sludges from trench drains or blind sumps (unless there's been a release making it a hazardous waste).
 - Some storm sewer cleanout – See [Receiving Facilities Reporting Requirements Guide](#).
 - Most [antifreeze](#).
 - Landfill leachate.
 - Brine.
 - Grease trap waste.
 - Most used oil being recycled.
 - Liquids remaining in manufactured articles, until it's removed or item is discarded (automobiles, light ballast).
 - Liquid vegetable or animal fat transported directly to biofuel manufacturer
 - Most off-specification fuels being recycled.
 - Liquids subject to medical waste regulation.
 - Sanitary clean-out liquids subject to a wastewater permits.
 - Biosolids subject to a residuals management plan.
 - Septage.
 - Empty containers.

Empty Containers (Part 121, Section 12102a)

- After all liquid industrial by-product has been removed using common practices and the amount of waste residue remaining in the container does not exceed:
 - no more than 1 inch or 3.0% by weight of the total capacity of the container for containers ≤ to 110 gallons or
 - no more than 1 inch or 0.3% by weight of the total capacity of the container for containers > than 110 gallons.

Waste Characterization Step 5: Waste Characterization Record (Rule 307 and Part 121, Section 12103)

- Records for each waste stream may include:
 - Date/person performing evaluation
 - Waste type/description and codes
 - Source of waste
 - Test results
 - Waste analysis records
 - Safety Data Sheets
 - Sample procedure
 - Representative sample information

- See [Waste Characterization Questions and Steps](#)
- See [Optional Waste Characterization Form](#)

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

- Do it all over again!
- Recharacterize if process or materials change or if accumulation may have resulted in a change!

Generator Improvement Rule Adoption

- In November 2016 EPA published the federal General Improvement Rules recodify the federal rules, providing regulatory clarification related to waste characterization, and regulatory relief to generators
- EGLE is in the final process of adopting those rules.
- **EGLE has final new rule rules that are not yet effective.**
- The new rules must reside with the Joint Committee on Administrative Rulemaking for fifteen session days after which they can be filed with the Office of Great Seal and will take effect seven days later.

Hazardous Waste Generator Status – Conditionally Exempt Small Quantity

Generator (CESQG) aka **Very Small Quantity Generator (VSQG) (new Rule 304)**

- Monthly nonacute hazardous waste generation < 220 lbs. or ~ 1/2 drum, acute ≤ 2.2 lbs. and clean-up waste with acute constituents ≤ 220 lbs.
- Total hazardous waste accumulation must always be < 2200 pounds nonacute (~ 5 drums).
- Wastes are properly disposed under other regulations.
- Records of waste characterization, generator status, and lawful disposal are maintained for at least 3 years.
- Waste accumulated on site never exceeds 13,200 lbs. (30 drums) or 6,000 kilograms nonacute.
- Waste accumulated on site never exceeds 2.2 lbs. acute or severely toxic.
- Waste accumulated on site never exceeds 220 lbs. of contaminated soil, water or other debris from clean-up of acute or severely toxic

Hazardous Waste Generator Status - **Small Quantity Generator (SQG) (new Rule 306)**

- Monthly hazardous waste generation > 220 lbs. and < 2,200 pounds nonacute or ~ 1/2 to 5 drums.
- Total hazardous waste accumulation must always be $\leq 13,200$ pounds (30 drums).
- Waste accumulated on site never exceeds 2.2 lbs. acute or severely toxic.
- Waste accumulated on site never exceeds 220 lbs. of contaminated soil, water or other debris from clean-up of acute or severely toxic

Hazardous Waste Generator Status – Large Quantity Generator (LQG)

(new Rule 307)



- Generates ≥ 2200 pounds of nonacute hazardous waste per month or
- Generates and/or accumulates > 2.2 pounds of acute or severely toxic waste or > 220 lbs. of contaminated soil, water or other debris from clean-up of acute or severely toxic spill.



Generator Category Calculation (New Rule 303)

- 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 permitted and hard piped to POTW.
- Do not include hazardous waste managed as a universal waste like:
 - Lamps
 - Batteries
 - Pesticides

- Mercury containing devices
- Consumer electronics
- Pharmaceuticals
- Antifreeze
- **Aerosol cans once proposed rules are final and become effective**
- Do not include *liquid industrial by-product and/or used oil* like:
 - Most **used oil**
 - Most **antifreeze**
 - Non-hazardous wash waters like most **mobile power washing wastewaters**
 - Non-hazardous **catch basin wastewaters**
 - **Sanitary sewer clean-out waste**
 - Fats, oils, and grease
- Do not include *materials specifically excluded from being a “waste” under Part 111* including:
 - Scrap metal being recycled
 - Off spec fuel being re-refined into fuel
 - Wastewater treatment plant approved direct discharges
 - Excluded solvent wipes
 - Hazardous secondary materials
- Review total/maximum amount of hazardous waste generated and accumulated at any one time during the month.
- If nonacute, acute and/or severely toxic hazardous waste is generated evaluate each separately and compare to the limits for the different generator categories.
- Compare amount of hazardous waste generated and total accumulated during the month to the CESQG/VSQG, SQG, and LQG definitions/limits found in Part 111, Rule 303 summarized above to determine generator status that determines the management and disposal standards that must be met for handling the site’s waste streams.
- See a summary of the generator categories and amount which can be generated monthly and accumulated at any time in the [Michigan Guide to Environmental Health and Safety Regulations, Chapter 2](#), Table 2.5 (Page 2-49), the [new draft Hazardous Waste Generator Category and Accumulation Requirements Summary guide](#), the new [draft Very Small Quantity Generator Guide](#), and the updated [Contingency Plan guide](#).
- Watch the recorded waste webinars in the “Hazardous Waste and Liquid Industrial By-products Regulations Webinar Series” at [Michigan.gov/EGLEWaste](https://www.michigan.gov/EGLEWaste) under the “Announcements” tab.