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## Hazardous Waste Characterization & Generator Status

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### Do I Need to Know All of This

Hazardous waste regulations. . .

- Apply to all businesses, including municipalities, hospitals, and service industries, not just manufacturing industries
- Are written broadly to address hazards posed by all waste streams

### Why Cover These Topics

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### Why Cover These Topics

Hazardous waste regulations require each business, by site, to . . .

- Evaluate the character and composition of their wastes
- Determine the total weight of all hazardous waste generated monthly on a continuous basis
- Based on the amount and types of hazardous waste generated each month, the business is required to determine the legal disposal options
- Less hazardous waste = less regulation and more disposal options under the law
- There is no 1 best answer for how to dispose of waste for all businesses and all locations
- Each business location must evaluate and select their own preferred disposal options based on their facility circumstances

### Why Cover These Topics

Site specific disposal needs will vary based on . . .

- Type of hazardous wastes generated
- Amount of hazardous wastes generated
- Regulatory disposal options
- Proximity of disposal facilities
- Cost of disposal
- On-site “real-estate” for sorting, storing, treating
- On-site disposal options (sanitary sewer or Public Operated Treatment Works [POTW])
- Waste hazards
- Employee culture (trainability)

### What Regulations Require Waste Characterization

- **Act 451, Michigan Natural Resource and Environmental Protection Act**
  - [Part 111](#), Hazardous Waste
  - [Part 121](#), Liquid Industrial Waste
  - [Part 115](#), Solid Waste
  - [Part 169](#), Scrap Tires

- **Act 368, Michigan Public Health Code**
  - [Part 138](#), Medical Waste Regulatory Act
  - [Part 2](#) Ionizing Radiation Rules
- **Federal Toxic Substance Control Act**

### 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 and characterizing ALL waste streams

### Waste Survey, Do Not Overlook Waste Streams

- Look inside and outside, including drains
- Look at on-site sewer maintenance or catch basins
- Look at office and maintenance, electronics, batteries, electric lamps, and thermostats
- Look at aerosol cans and can puncturing
- Look at construction and demolition waste
- Look at wastes from fleet maintenance, antifreeze, degreasing, corrosive baths, and used oil
- Look at rags and textiles
- Look at laboratory and art wastes
- Look at painting and solvent wastes
- Look at cleaning activities, including power washing and carpet cleaning



**To properly comply with the regulations, businesses must determine if their wastes are hazardous or non-hazardous.**

### Who Does the Waste Characterization?

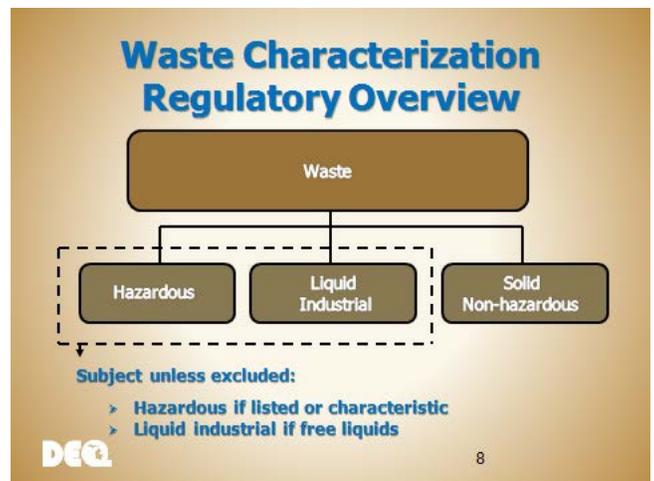
- Do the waste characterization yourself
- Hire a consultant
- Use the disposal company services
- Use a combination of the above

### How Do You Characterize?

- Using knowledge, test data or both
- Knowledge can include MSDS data, facility process data, technical information, manufacturer information or hazardous waste listing information

### What is a Hazardous Waste? (MAC R 299.9302<sup>1</sup>)

- **Characteristic Hazardous Waste** - Waste stream found to be ignitable, corrosive, reactive, and/or toxic due to the characteristics or composition of the waste via testing
- **Listed Hazardous Waste** - Common waste stream known to be hazardous without testing
- **Hazardous Waste Mixture Rule (MAC R 299.9203)** - Mixture of a **listed** hazardous waste with other non-hazardous wastes is a listed hazardous waste
- **Hazardous Waste Derived From Rule (MAC R 299.9203)** - Residues derived from treating a **listed** hazardous waste is listed hazardous waste



<sup>1</sup> MAC is the "Michigan Administrative Code" reference for the rule, so MAC R 299.9302 is Rule 302 of the Part 111 Rules.



**Knowledge or test data can be used to characterize and records must be maintained for 3 years from the date the waste was last shipped off-site or treated and/or disposed on-site.**

### **Waste Stream 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 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.

#### **Step 1 – Review Listed Hazardous Waste Codes (MAC R 299.9213 and R 299.9214)**

- **F Codes** (Table 203a) – Common wastes from a non-specific sources (e.g. spent chlorinated solvents, wastewater metal treatment sludges)
- **K Codes** (Table 204a) – Wastes from specific industries - includes some Michigan only codes (e.g. petroleum refining and wood treatment wastes). Note too that 11/5/13 rule change eliminated 001K and 002K hazardous waste codes.
- **P and U Codes** (Table 205a-c): Commercial chemical products, off-specification products, container and spill residues - includes some Michigan only U codes (e.g. formaldehyde, parathion, benzene, DDT, xylene). Note too that 11/5/13 rule change eliminated some P & U codes as well.
- All P codes and all listed hazardous waste codes with an “H” hazard code are acutely hazardous, triggering large quantity generator status at 2.2 pounds

#### **Step 2 – Review if Characteristic Hazardous Waste (MAC R 299.9212)**

- Ignitable - D001
- Corrosive - D002
- Reactive - D003
- Toxic - D004 – D043 (Table 201a)
- Severely Toxic – 001S - 007S (Table 202)

#### **Characteristic Hazardous Waste, Common Tests**

- **Flash Point** – Used for testing Ignitability, < 140 F (D001), *Examples: paints, solvents*
- **pH** – Used for testing corrosivity,  $\leq 2$  or  $\geq 12.5$  (D002), *Examples: acids, bases*
- **Reactivity** – Test as required for DOT classification for materials that are unstable at normal conditions, reacts violently with water, explodes, and/or emits toxic gas (D003), *Examples: lithium hydride and 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

### **Step 3 - Review Common Exemptions and Exclusions (MAC R 299.9202 through R 299.9207 and MAC R 299.9228 of Part 111 - not all inclusive)**

- Wastewater discharges approved by the sanitary sewer authority are exempted at the point of discharge to the sanitary sewer
- Batteries, pesticides, mercury devices, electric lamps, pharmaceuticals, consumer electronics and antifreeze may enjoy a partial “universal waste” exemption
- Wastes used or reused in a process that are not reclaimed – Beware of sham recycling
- Laboratory samples are exempt until discarded
- Used oils that are recycled
- Petroleum contaminated media from an underground storage tank that fail TCLP for D018 – D043 only and are being remediated through a DEQ approval
- Off specification fuel (gasoline, kerosene, etc) being recycled for use as fuel or burned as fuel (not incinerated)
- Materials remaining in manufacturing unit until removed or unit is removed from service
- Laundered rags that are reused. Note new federal rule on disposable rags is not yet adopted by Michigan.
- Hazardous waste from which precious metals are recycled are partially excluded
- Dredge spoils from permitted projects by the US Army Corps of Engineers or the DEQ
- Some recycled materials, but not all (See 40 CFR Part 261.2 table 1 that identifies some reclaimed materials are not solid waste: commercial chemical products, sludges and by-products)
- Scrap metal (pieces of metal) that are recycled
- Waste generated by households, including single and multiple residents, hotels and motels, bunkhouses, ranger stations, crew quarters, campgrounds, picnic grounds, and day-use recreational areas
- Residues in containers are excluded if empty
- Conditionally Exempt Small Quantity Generator wastes enjoy partial exemption

#### **Empty Containers (MAC R 299.9207)**

For **non-acute hazardous waste** after all waste has been removed using common practices and:

- No more than 1 inch or not more than 3.0% the weight of the capacity of the container for containers less ≤ to 119 gallons in size
- No more than 1 inch or not more than 0.3% the weight of the capacity of the container for containers more than 119 gallons in size

For **acute hazardous or severely toxic hazardous 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

For **compressed gas**:

- Container pressure is equal to atmospheric pressure
- Container is not clogged
- No audible liquids in container when shaken

#### **Exemptions and Exclusions (MAC R 299.9202(5))**

- Any claim that a material is not a waste or is exempt from hazardous waste regulation must be demonstrated by the generator
- Where exemption is questionable, seek concurrence with hazardous waste regulatory staff

## Exemptions and Exclusions

- No exclusions for one-time or periodic events that change generators status
- Establish procedures to limit or prevent one-time or periodic changes in generator status/classification
- Be prepared to meet higher regulatory requirements for events changing generator status/classification

## Step 4 – Review if Other Regulations (MAC R 299.9205 and MCL 324.12101(l))<sup>2</sup>

### What is a Liquid Industrial Waste?

- Determined using the Paint Filter Test, Method 9095 in [EPA SW-846](#)
- Includes liquid waste that is not a listed or characteristic hazardous waste (used oil, antifreeze, wastewaters)
- Rule of thumb – if there are any free liquids in the waste or if the waste is thinner than butter at or below 100 F, it should be managed as a liquid industrial waste

### Common Liquid Industrial Waste Examples (for waste codes see [Uniform Manifest Instructions](#))

- Includes liquid CESQG hazardous wastes conditionally excluded from hazardous waste manifest and disposal at a licensed hazardous waste disposal facility
- Most antifreeze
- Some wastewater including most mobile power washing wastewater, carpet cleaning wastewater, food processing wastewaters
- Most sludge 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 facilities, etc.)
- Storm sewer cleanout waste
- Grease trap waste
- Most used oils being recycled
- Off-specification fuels being recycled

## Step 5 – Create and Maintain Waste Characterization Record (MAC R 299.9307)

Records for each waste stream may include:

- Waste type/description
- Source of waste
- Test results
- Waste analyses records
- Material Safety Data Sheet (MSDS)
- Sample procedure
- Representative sample information

## Step 6 – Re-characterize (MAC R 299.9302(3))

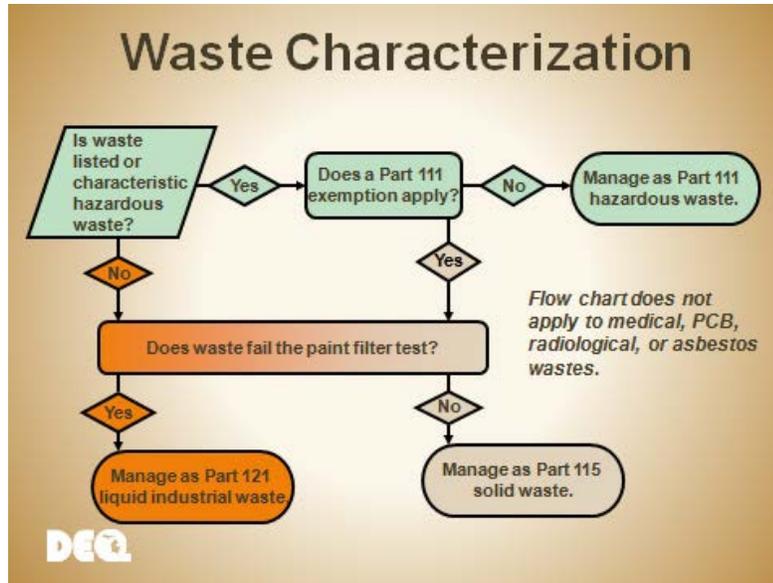
Re-characterize whenever there is a process or material change



**Pre-screening new materials with purchasing staff may help reduce variability in the amount of hazardous waste generated monthly and prevent the purchase of materials that will result in the generation of a hazardous waste.**

<sup>2</sup> MCL is the “Michigan compiled Law” reference for the statute, so MCL 324.12101 is Section 12101 of part 121.

## Waste Characterization Flow Chart



## Determining Hazardous Waste Generator Status



Once you know what wastes are hazardous or non-hazardous, including what is exempted or excluded, you must determine where you fall within the regulations by determining your generator status.

### Determining Hazardous Waste Generator Status – Conditionally Exempt Small Quantity (CESQG)



Generator

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

### Determining Hazardous Waste Generator Status – Small Quantity Generator (SQG)



- Monthly hazardous waste generation 220 lbs – 2,200 lbs (~1/2 to 5 drums)
- Total hazardous waste accumulation always < 13,200 pounds (<~30 drums)

### Determining Hazardous Waste Generator Status – Large Quantity Generator (LQG)

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

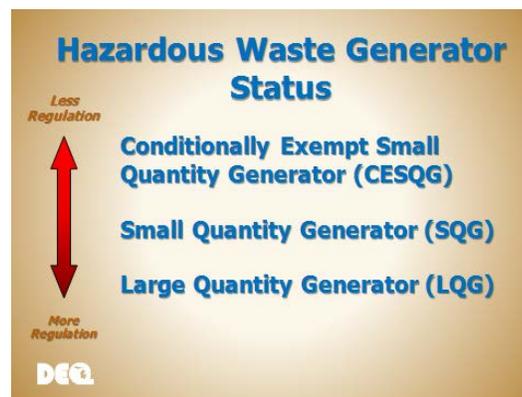
### Calculating Amount of Hazardous Waste Generated

- Add up ALL the hazardous waste generated at the site in a calendar month
- Calculate amounts per site
- One site is under one identification number and is contiguous property
- Calculate the amount in pounds or kilograms
- Calculate the amount generated, not the amount shipped
- Include hazardous waste treated and/or disposed on-site unless it is hard piped to the sanitary sewer
- Do not include hazardous waste managed as a universal waste

- Do not include waste specifically excluded from Part 111 (scrap metal being recycled, fuel being recycled, or sanitary sewer approved direct discharges)
- Do not include liquid industrial waste
- Do not include used oil

### Determining Generator Status

- Review total/maximum amount of hazardous waste 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
- Generator limits are found in MAC R 299.9306



## ADDITIONAL RESOURCES

### Simple “How To” Calculate Hazardous Waste Generated In a Month

- Perform generator calculations on the first day of each month.
- Add-up the weight of all full hazardous waste containers placed into storage during the previous month (use accumulation date).
- Add to the weight of all the waste in satellite containers that are currently accumulating hazardous waste near the point of generation.
- Subtract from this amount the weight of the prior month’s satellite containers.
- That should give the monthly generation rate if there were no shipments directly from the equipment or a satellite accumulation area during the prior month.
- Maintaining a running log of waste containers put into service and their contents at the beginning of each month is an easy way to document generation rates.

### Strategies to Minimize Generator Status



**A waste inventorying system that tracks the amount of hazardous waste generated on a monthly basis is necessary to continuously evaluate your hazardous waste generator status and determine your waste disposal options.**

- Hazardous wastes managed using the universal waste standards are not included in the monthly hazardous waste volume for determining generator status and can be used to reduce your generator status – USE THEM!!!
- Use all possible exemptions and alternate materials that are less toxic to minimize your hazardous waste volumes, minimize your regulatory burden, and ultimately, minimize your compliance and disposal costs
- Do not accumulate volumes of hazardous waste that will cause you to be subject to additional regulations

### Techniques For Minimizing the Volume of Hazardous Waste Generated Monthly

- Do not mix listed hazardous waste with other waste to minimize the volume of hazardous waste generated, number of regulations that apply, and disposal costs
- Use a materials as long as possible before removing them from equipment
- Confirm all equipment generating hazardous wastes are used/needed
- Bleed-off a portion of the process materials and add an equivalent volume of virgin material for continued operation instead of removing the entire volume of a material
- Reuse materials a second time in a second process/operation without reclaiming
- Routinely review product inventories and purge of expired materials
- Use less hazardous or non-hazardous materials where possible (e.g. powder versus solvent coatings or aqueous versus solvent cleanser)
- Engineer your process to allow for hard piping through approved discharge to the sanitary sewer

### Need Help?

- Review the DEQ Guidebook at [www.michigan.gov/ehsguide](http://www.michigan.gov/ehsguide)
- Go to [www.michigan.gov/deqwaste](http://www.michigan.gov/deqwaste) and select “Hazardous and Liquid Industrial Waste,” then “Hazardous and Liquid Industrial Waste Management”
- Contact [DEQ district](#) waste inspection staff
- Contact the DEQ Environmental Assistance Center at 800-662-9278 (800-NO2-WASTE)
- Contact hazardous waste vendors
- Contact waste consultants