

# UNIVERSAL WASTE

## 1. What can be handled as Universal Waste?

All facilities, including manufacturing industries, businesses, agencies, health care providers, and other waste generators, are required to determine if they generate hazardous waste (see the [Waste Characterization](#) guidance). If Michigan facilities determine they have hazardous waste, they may choose to handle the following as universal waste:

- ✓ **Antifreeze**, meaning a mixture containing ethylene glycol or propylene glycol used as a heat transfer or dehydration fluid
- **Batteries**, including spent dry cell and lead-acid batteries.
- **Consumer electronics** which are devices run by electricity containing circuit boards commonly found in offices and homes such as computers, fax machines, telephones, televisions, and printers (note CRTs may alternatively be managed as electric lamps).
- **Electric lamps**, including fluorescent, high intensity discharge, sodium vapor, mercury vapor, neon, and incandescent lamps, and cathode ray tubes (CRTs) from computers and televisions (note CRTs may alternatively be managed as consumer electronics).
- **Devices containing elemental mercury**, including thermostats, switches, thermometers, manometers, barometers, anti-locking braking systems (ABS), gas flow regulators, hydrometers, blood pressure cuffs and various medical devices, etc.
- **Pesticides**, including certain suspended, canceled, or unused pesticides.
- **Pharmaceuticals**, including drugs for both human and veterinary use.

Universal waste has alternative management requirements identified in [R 299.9228](#) in place of the hazardous waste requirements. Michigan includes additional types of universal wastes than what is included in the federal universal waste regulations and there are a few differences between the state and federal universal waste requirements. The management requirements depend on how much universal waste is handled at a site and are discussed later in more detail. When households generate these wastes, they are not regulated in the same way (see page 2).

If generators do not handle these materials as universal waste, they need to manage them under the applicable [hazardous waste regulations](#) when they are listed hazardous waste or exhibit hazardous waste characteristics. Those requirements will depend on a company's hazardous waste generator status — large quantity, small quantity, or conditionally exempt small quantity generator. Facilities should keep in mind that if they have spill cleanup wastes, it may affect their generator status and subsequent management requirements.

### Hazardous Waste Generator Status Categories

In ONE month, the total amount of ALL nonacute hazardous waste is generated and accumulated at the following volumes:

**Large Quantity Generator (LQG):** more than 2,200 pounds [and/or more than 2.2 pounds of acutely and severely toxic hazardous waste is generated.]

**Small Quantity Generator (SQG):** 220 pounds to less than 2,200 pounds. Accumulation never exceeds 13,200 pounds.

**Conditionally Exempt Small Quantity Generator (CESQG):** less than 220 pounds. Accumulation never exceeds 2,200 pounds.

There are also storage time limits and other requirements. Contact the DEQ Environmental Assistance Center at 800-662-9278, or your local [DEQ Waste and Hazardous Materials Division district office](#), for more hazardous waste information. See the [Waste Characterization](#) guidance about what is hazardous.

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## 2. How should residents handle these wastes?

Although households are exempt from the hazardous waste regulations, residents are encouraged to recycle these wastes when possible and to always manage them properly:

- For [electronics](#) from home: take devices to [community electronics collection programs](#).
- For other household wastes including antifreeze and other automotive fluids and household hazardous waste: contact your [local recycling coordinators](#), or the local [household hazardous waste collection program](#), or sites listed on [www.earth911.org](http://www.earth911.org) to find recycling and disposal options.
- For unwanted pharmaceuticals from home: see the publication [A Remedy for Prescription Drug Disposal](#). Do not flush medications down the drain.
- For unwanted pesticides from home: take pesticides to your local [household hazardous waste collection](#) or [MDA Clean Sweep Program](#). Some clean sweep programs will also take devices containing elemental mercury.
- If no recycling or alternative collection program is currently available, check if your solid waste hauler and licensed disposal company will accept the items for disposal, and encourage your local officials to support local collection programs.
- If you have broken thermometers or other devices containing mercury including compact fluorescent bulbs or CFLs, see the [Department of Community Health Mercury website](#) or call them at 1-800-648-6942 for cleanup information.

## 3. What are the advantages for facilities managing universal waste?

- ✓ Universal waste volume is not included when determining the facility's hazardous waste generator status [R 299.9205(5)(i)]. This may allow some sites to reduce their generator status level and regulatory requirements. For example, a large quantity generator who manages part of their hazardous waste stream as universal waste may be able to become a conditionally exempt or small quantity generator.
- ✓ Universal waste can be accumulated up to one year which is a longer accumulation time than allowed for a small quantity and large quantity generator's hazardous waste [40 CFR 273.15 and 273.35].
- ✓ Less labeling is required on universal waste [40 CFR 273.14 and 273.34; and R 299.9228(4)(c)].
- ✓ A hazardous waste manifest is not necessary to ship universal waste that is not a liquid in Michigan or in other states that recognize it as universal waste [40 CFR 273.52(a)]
- ✓ A handler may use a universal waste transporter to haul the universal waste off-site that is not a liquid instead of using a permitted and registered hazardous waste transporter [40 CFR 273, Subpart D].

## 4. Where are the universal waste regulations and what agencies can answer questions?

The regulations are designed to encourage proper collection, recycling, treatment, or disposal of these wastes. Universal waste handlers, transporters, and destination facilities have specific requirements.

**The Michigan Department of Environmental Quality (DEQ) Waste and Hazardous Materials Division (WHMD)** oversees the following universal wastes regulations:

- [R 299.9228 of the Part 111 hazardous waste administrative rules](#) of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Act 451) and
- [40 CFR Part 273](#) of the federal Resource Conservation and Recovery Act (RCRA) of 1976
- Liquid universal wastes are also regulated under [Part 121](#), Liquid Industrial Waste, of Act 451 and [Act 138 of 1998](#), Hazardous Materials Transportation Act.

### Contacts:

- ✓ WHMD hazardous waste inspectors [District Office](#)
- ✓ Environmental Assistance Center at 800-662-9278 for general information and referrals

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**The Michigan State Police Traffic Safety Division and the US Department of Transportation (US DOT)** oversee the transportation regulations when universal wastes is a US DOT regulated hazardous material. For example pesticides, and packages containing one pound or more of mercury, are US DOT regulated.

- [49 CFR Parts 171 through 180](#) Federal Hazardous Materials Regulations (FHMR) and Federal Motor Carrier Safety Administration (FHMSR) which are adopted by state law. MSP hazardous materials bulletins are at [www.michigan.gov/documents/msp/Hazardous\\_Materials\\_Bulletins\\_212350\\_7.pdf](http://www.michigan.gov/documents/msp/Hazardous_Materials_Bulletins_212350_7.pdf).

Contacts:

- ✓ Michigan State Police, Traffic Safety Division at 517-336-6580 or [District Investigators](#) [www.michigan.gov/msp](http://www.michigan.gov/msp)
- ✓ US DOT helpline at 1-800-467-4922 or Michigan office at 517-377-1866 <http://hazmat.dot.gov>
- ✓ The Michigan Center for Truck Safety at 800-682-4682 or go to [www.truckingsafety.org](http://www.truckingsafety.org)

## 5. What are the universal waste handler categories?

There are two levels of universal waste handlers — small quantity handler and large quantity handler. Handlers include waste generators and facilities consolidating universal waste for shipment to a destination facility for recycling, treatment, or disposal.

Do not confuse the universal waste handler categories with the hazardous waste generator status levels of small quantity generator and large quantity generator (see summary box on page 1).

### Small quantity handler of universal waste

- ✓ Accumulates less than 5,000 kilograms (11,000 pounds) total of all universal wastes at any time [R 299.9109(i)]
- ✓ Is not required to get a site identification number [40 CFR 273.12], unless they generate liquid wastes or other regulated wastes.
- ✓ Is not required to keep a record of universal waste shipments under the universal waste regulations [40 CFR 273.19], but a waste manifest or alternative shipping records are required under Part 121 for liquid wastes (e.g. pesticides) and shipping papers are required if it is an US DOT hazardous material. Shipping records can also be used to document that universal waste accumulation time was not exceeded.

A facility may want to use the [small quantity handler inspection form](#) to conduct a self compliance audit.

### Large quantity handler of universal waste

- ✓ Accumulates 5,000 kilograms (11,000 pounds) or more of all types of universal waste at any time [R 299.9109(h)]. This designation as a large quantity handler is retained through the end of the calendar year in which this amount of universal waste is accumulated [R 299.9228(5)].
- ✓ Is required to get a site identification number from the DEQ Waste and Hazardous Materials Division before meeting or exceeding 11,000 pounds of universal waste [40 CFR 273.32]. Search the [Waste Data System \(WDS\)](#) to confirm if a company already has a site identification number or to find out what activities the company has on file. This website includes instructions on how to apply for a site identification number and update an existing notification and also includes a link to the form [EQP5150](#).

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- ✓ Is required to keep records of universal waste shipments for at least 3 years [40 CFR 273.39]. This can be in a log, invoice, manifest, bill of lading, or other shipping document. The following must be recorded:
    - Name and address where the waste came from if received from another handler or where it was shipped to;
    - Quantity of each waste type (e.g. batteries, electric lamps, pesticides, or mercury containing devices) received or shipped out; and
    - Date when shipment was received or sent out.

A facility may want to use the [large quantity handler inspection form](#) to conduct a self compliance audit.

## 6. What are the basic handler requirements for all types of universal waste?

The following requirements apply to both small and large quantity handlers for all types of universal waste. See the following sections for more requirements when handling specific types of universal waste.

- ✓ Handlers may not dispose of universal waste.
- ✓ Handlers can not treat or dilute universal waste except when responding to releases or when managing wastes as summarized in the following specific waste sections.
- ✓ Handlers must manage wastes in a way to avoid releases.
- ✓ Handlers must inform employees who handle or have responsibility for managing universal waste about proper handling and emergency procedures for those wastes at that facility [40 CFR 273.16]. The DEQ does not offer training. Training can be done by a knowledgeable in-house employee, or employees can attend training session offered elsewhere, or the facility can hire a trainer to come to the site to provide training. Check if the Material Safety Data Sheet (MSDS) has guidance on proper handling and storage along with spill response measures.

Depending on the type of universal waste and release, there may be release reporting requirements under various regulations. For example, a small spill of mercury which is less than one pound is not reportable. Releases of one pound or more of mercury are reportable. More information about mercury, including managing [mercury spills](#) is at [www.michigan.gov/deq](http://www.michigan.gov/deq) and select "Mercury" in the left column.

For more release reporting information, go to [www.michigan.gov/deqrelease](http://www.michigan.gov/deqrelease). If in doubt who to report to, contact the following authorities:

- LOCAL – 911
- STATE – 800-292-4706, or if calling from out of state, dial 517-373-7660 (PEAS-Pollution Emergency Alerting System)
- FEDERAL – 800-424-8802 (NRC-National Response Center)

Questions about indoor air quality or employee safety concerns from spills can be directed to the Department of Community Health, Toxic and Health hotline at 800-MI-TOXIC (800-648-6942).

- ✓ Send or take universal waste to another universal waste handler, destination facility, or foreign destination [40 CFR 273.18 and 38].
- ✓ Make prior arrangements if their shipment is to be received by another universal waste handler [40 CFR 273.18 and 38].
- ✓ Meet transporter requirements if hauling their own waste [40 CFR 273.18 and 38].

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## Storage and Labeling

- ✓ Handlers may accumulate universal waste up to 1 year after it was generated or received from another handler [40 CFR 273.15 and 273.35]. A longer accumulation time may be allowed if it is demonstrated that it is necessary to accumulate enough universal waste to facilitate proper recovery, treatment, or disposal. Discuss accumulation time extensions with your WHMD hazardous waste inspector in the district office.

A handler must be able to show how long the waste has been held. This can be done by any of the following:

- Labeling the container with the date universal waste was first put into it or when the container was received;
  - Labeling the individual item with the date it was considered a waste or received as a universal waste;
  - Maintaining an inventory system on site which identifies the date it became a universal waste or was received;
  - Placing the universal waste in a specific accumulation area and identifying the earliest date that any universal waste was put in that area; or
  - Using any other method that clearly demonstrates how long the universal waste has been accumulated.
- ✓ Containers must be kept closed, in good condition, and be compatible with the type of universal waste accumulated in them.
  - ✓ All universal waste must be accumulated in a manner that prevents any spills or releases.
  - ✓ Meet additional universal wastes labeling requirements as discussed in the later sections for:
    - Antifreeze
    - Batteries
    - Consumer electronics
    - Electric Lamps
    - Devices containing elemental mercury
    - Pesticides
    - Pharmaceuticals

## Shipping Off-Site

Universal waste handlers can transport their own universal waste if they meet the transporter requirements [R 299.9228(4)(b) and 9228(5)(c)] or they can hire a commercial transporter that meets the transporter requirements summarized below, or ship under applicable postal and other commercial carrier requirements if it is not a liquid and that carrier will accept the shipment.

### **For facilities hauling their own waste:**

- All universal waste handlers may haul their own universal waste to another universal waste handler or destination facility. See the [Nonhazardous Liquid Waste Generator Requirements](#) guidance if hauling the universal waste is a liquid or if company wants to haul other nonhazardous liquid wastes.
- Any facility hauling their waste needs to confirm their insurance company provides coverage. If hauling more than 55 gallons, see the [Nonhazardous Liquid Waste Generator Requirements](#) guidance for requirements to submit the insurance form MCS-90 to the DEQ.
- The facility should confirm the designated facility, or large quantity handler, where they are taking their waste has notified WHMD of that activity and are meeting requirements. To find notification information about Michigan large quantity handlers and facilities with waste activities overseen by the Waste and Hazardous Materials Division, search the Waste Data System at [www.deq.state.mi.us/wdspj](http://www.deq.state.mi.us/wdspj) or contact the Waste and Hazardous Materials Division [District Office](#).
- Must meet applicable shipping record requirements:
  - If the universal waste is not a liquid, it is not necessary to use a hazardous waste uniform manifest when shipping universal waste [40 CFR 273.52(a)].

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- Liquid universal waste must be accompanied by the Uniform Hazardous Waste Manifest under the [Part 121 liquid industrial waste regulations](#) when the handler is hauling their own waste in quantities more than 55 gallons or a permitted and registered waste transporter is being hired. Copies must be submitted to the DEQ and copies kept as required [Sec 324.12103]. Manifest information is available at [www.michigan.gov/deqwaste](http://www.michigan.gov/deqwaste) under “Announcements.”
  - Handlers hauling their own liquid universal waste in quantities of 55 gallons or less must have records accompany the waste shipment if a waste manifest is not used [Sec 324.12103(3) and (4)]. The record must identify:
    - ✓ The company name and address, and contact number where the waste was generated
    - ✓ What kind of waste
    - ✓ How much waste is being hauled, and
    - ✓ Where the waste is being transported

The handler needs to obtain a signature from the designated facility acknowledging receipt of the waste and provide a copy of the record to that facility, and the handler must keep a copy of shipment records for at least three years after the date of shipment.

- If a waste manifest is not used, shipping papers are required when the universal waste is a US DOT hazardous material. Not all universal wastes are US DOT hazardous materials. One pound or more of mercury in one package, along with many pesticides, are examples of US DOT hazardous materials. US DOT hazardous materials must be packaged, labeled, marked, placarded and shipping papers prepared according to US DOT regulations prior to shipment off-site, in addition to the universal waste requirements. Contact the Michigan State Police, Traffic Safety Division at 517-336-6580 or US DOT at 517-377-1866, and go to [hazmat.dot.gov](http://hazmat.dot.gov) for more information or see the [Michigan State Police bulletins](#) at [www.michigan.gov/msp](http://www.michigan.gov/msp).

#### **For facilities hiring a transporter:**

- **When shipping out of state:**

- The waste can be managed as universal waste at the Michigan handler site, but it would need the appropriate hazardous waste shipping label added before shipping
- A hazardous waste manifest is not necessary to ship universal waste through other states that recognize it as universal waste [40 CFR 273.52(a)], but if it is a liquid it needs to be manifested per Part 121.
- If the universal waste is being shipped to or through a state that does not recognize the waste as universal waste, a uniform hazardous waste manifest must be prepared and it will be necessary to use hazardous waste transporters. The manifest must be forwarded to the first transporter to travel in a State where the waste is not a universal waste. If the receiving state does not consider the shipment universal waste, add an explanation in block 14 of the manifest (Special Handling Instructions and Additional Information) that the waste is covered under universal waste regulations in Michigan but not in the receiving facility’s State.

If the waste is shipped out of Michigan to another state that does recognize it as a universal waste, but it must travel through states that do not recognize it as universal waste, then the transporter must deliver the manifest to, and obtain the signature of either the next transporter or the destination facility.

It is the handler’s responsibility to ensure that the manifest is forwarded to the destination facility by any non-hazardous waste transporter and signed copies are sent back to the handler.

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- **When facility is a Small Quantity Handler and is shipping in-state and hiring a transporter:**
    - Obtain site identification number if it is a liquid waste and the facility does not already have a current number for this location. Use form EQP5150.
    - If it is liquid universal waste, hire a permitted and registered liquid industrial waste or hazardous waste transporter.
    - If it is liquid universal waste, you must use the uniform hazardous waste manifest or get required receipts if the transporter is using consolidated manifest. See the [Nonhazardous Liquid Waste Generator Requirements](#) guidance. If you are shipping other universal wastes that are US DOT hazardous materials, then the shipment records also need to meet US DOT shipping paper requirements.
  - **When facility is a Large Quantity Handler and is shipping in-state and hiring a transporter**
    - Obtain site identification number. Use form EQP5150.
    - If it is liquid universal waste, hire a permitted and registered liquid industrial waste or hazardous waste transporter
    - If it is liquid universal waste, you must use the uniform hazardous waste manifest or get receipts if the transporter using consolidated manifest. See the [Nonhazardous Liquid Waste Generator Requirements](#) guidance. If you are shipping other universal wastes that are US DOT hazardous materials, then the shipment records also need to meet US DOT shipping paper requirements.
  - **If shipping out of the United States:**

There are additional requirements when exporting universal waste to other countries, including notifications, annual reporting, and recordkeeping. The state's universal waste rule adopts the [federal universal waste rules](#) for exports. See information at [www.epa.gov/compliance/international/importexport.html](http://www.epa.gov/compliance/international/importexport.html) and contact the US EPA International Compliance Assurance Division at 202-564-4108.

**If a load, or partial load, of universal waste is rejected by the site where it is sent, the originating universal waste handler must either:**

- ✓ Take back the waste when notified of the rejection, or
- ✓ Agree with the receiving handler on a destination facility where the shipment will be sent [40 CFR 273.18 and 273.38]

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## **How to find and work with recyclers**

To find recyclers for antifreeze, batteries, electronics, lamps, and devices containing mercury, go to [www.michigan.gov/deqrmmd](http://www.michigan.gov/deqrmmd) and search on the appropriate category. See the following tips about selecting recyclers and the following requirements about shipping waste off-site:

- ✓ Be aware that there is no such thing as an “EPA or DEQ certified recycler” of any kind. Unfortunately, a number of waste recyclers are using this term to signify they have notified WHMD that they are a large quantity universal waste handler or have obtained a liquid [industrial waste transporter permit and registration](#) to haul liquid universal waste.
- ✓ Get several estimates from different businesses.
- ✓ Ask what services are provided in their fee since there usually is a charge for recycling.
- ✓ Do they provide certification how equipment was handled, or that data was deleted from computers?
- ✓ Visit the recycling site to see how they handle collected equipment, if possible.
- ✓ Ask for references and contact them. Check if any complaints were received by the [Better Business Bureau](#).
- ✓ Ask the recycler about their compliance history, or contact the agencies that regulate the business to see if they have been inspected. Do not assume companies listed in the Recycled Materials Market Directory are permitted and registered transporters if they will be picking up your universal waste. To find information about Michigan large quantity handlers, transporters, and facilities with other waste activities overseen by the Waste and Hazardous Materials Division, search the Waste Data System at [www.deq.state.mi.us/wdspj](http://www.deq.state.mi.us/wdspj). You will be able to find out if the company has a site identification number, their current activities on file, and their waste compliance history. Contact the DEQ [District Office](#) that oversees the area where the business is located for more information. Depending on the activities at the recycling site, they may be subject to DEQ programs in the Waste and Hazardous Materials and Air Quality Divisions, and the Water Bureau.
- ✓ Discuss your specific handling requirements with the recycler. For example, how do they want them packaged, is there a minimum amount they accept, can you deliver the material to their site, or do you have to use a waste transporter or shipping company, etc.
- ✓ For electronics, check the EPA’s “Guidelines for Materials Management” at [www.epa.gov/passiton/guide.htm](http://www.epa.gov/passiton/guide.htm). These guidelines were developed to help partners in the [Plug-In To e-Cycling](#) project manage electronic waste in a safe manner. They include information to help contract with recyclers practicing environmentally sound management of electronic waste. The International Association of Electronics Recyclers also has standards for certifying electronic waste recyclers. See information about that program at [www.iaer.org/communications/certification.htm](http://www.iaer.org/communications/certification.htm).
- ✓ Check if the [local household hazardous waste collection program](#) will accept universal waste from businesses. Not all programs accept this waste.
- ✓ Contact the [Michigan Department of Agriculture Clean Sweep Programs](#) regarding pesticide collections. Some programs accept devices containing elemental mercury.

### **7. What are the universal waste transporter requirements?**

A universal waste transporter is a person who engages in off-site transportation of universal wastes by air, rail, highway, or water [R 299.9109(k)]. See the earlier section about shipping waste off-site. A universal waste transporter is:

- Not required to get a site identification number unless they are also a permitted and registered hazardous waste and/or a liquid industrial waste transporter.
- Not required to get a [hazardous waste transporter registration and permit](#) under Part 111 from DEQ Waste and Hazardous Materials Division for shipments of universal waste within Michigan. If transporting universal waste out of Michigan, check with the other states regarding their transporter requirements.

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If the waste is a liquid, transporters must obtain a [liquid industrial waste transporter permit and registration](#). Generators hauling only their own generated waste are not required to get a transporter permit and registration, but need to notify the WHMD that they are transporting their own liquid waste when shipping over 55 gallons at a time and need to meet liquid industrial waste generator requirements [Act 138 of 1998]. To submit the notification, follow the instructions and links to the form EQP5150 and online paying option posted at [www.deq.state.mi.us/wdsp](http://www.deq.state.mi.us/wdsp).

Direct transporter permit and registration application questions to the Uniform Transporter Program at 586-753-3850. Direct transporter operating questions to the Waste and Hazardous Materials Division [District Office](#).

- ✓ Not allowed to dispose, dilute, or treat universal waste [40 CFR 273.51].
- ✓ Required to comply with all applicable US DOT regulations, including having the shipment properly packaged, labeled, marked, placarded, and transported with the proper shipping papers [40 CFR 273.52]. Contact the US DOT at 517-377-1866 or go to [hazmat.dot.gov](http://hazmat.dot.gov) for more information or see the Michigan State Police bulletins on shipping papers and placarding at [www.msp.state.mi.us/mcd](http://www.msp.state.mi.us/mcd).
- ✓ Required to deliver the shipment to a universal waste handler, destination facility, or foreign destination [40 CFR 273.55].
- ✓ Allowed to store universal waste up to 10 days at their universal waste transfer facility. A transfer facility is any transportation related area, including loading docks, parking areas, storage areas, or similar areas, used to store shipments of universal wastes during the normal course of transportation. If a transporter exceeds this period, he or she must manage the universal waste according to the applicable handler requirements [R 299.9228(6)(b)].
- ✓ Not required to use a waste manifest, unless the waste is a liquid or is being transported in a state that does not recognize it as a universal waste. If a waste manifest is used, then the transporter must meet all the uniform hazardous manifest requirements.

**If a receiving facility gets waste delivered that is not universal waste from another handler:**

- ✓ If the receiving universal waste handler gets a shipment of hazardous waste that is not universal waste:

They must immediately notify the DEQ Waste and Hazardous Materials [District Office](#) and Waste and Hazardous Materials Division Manifest Unit. Provide the name, address and phone number of the originating shipper. The DEQ will provide instructions for managing the hazardous waste.
- ✓ If the receiving handler is not a licensed solid waste facility or liquid industrial waste designated facility and gets a shipment of waste they are not authorized to accept (e.g. a liquid industrial waste designated facility receives a solid waste or a solid waste facility receives liquid waste, or either type of facility receiving hazardous waste):

Immediately notify your DEQ Waste and Hazardous Materials [District Office](#). The DEQ will provide instructions for managing the waste.

## **8. What are the basic recycling and destination facility requirements?**

A destination facility is a company that treats, disposes of, or recycles a particular category of universal waste. These recycling and treatment activities are beyond the activities which are allowed in the rules for handlers.

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## **Operating a universal waste recycling and destination facility**

The specific requirements will depend on the type of material and the operations being performed. Activities allowed as a universal waste handler are summarized in the following waste specific section. Contact the WHMD to discuss what waste regulations your facility will need to meet.

- Obtain a Part 111 construction permit and operating license requirements from the DEQ Waste and Hazardous Materials Division when required depending on the operations [R 299.9228(7)(a)]. This includes financial capability requirements, along with regulations pertaining to treatment, storage, and disposal facilities and other hazardous waste regulations. Destination facilities and recycling process may be exempt from the permit and license requirements **if**:
  - They do not store the waste prior to recycling and meet requirements in R 299.9206(1)(c) [R 299.9228(8)].
  - They only recycle electric lamps in accordance with R 299.9206(5) [R 299.9228(9)].

The recycler and destination facility requirements are too complex to adequately address in this publication. To discuss how the Part 111 and Part 121 requirements applies to your operation, call a Waste and Hazardous Materials Division Hazardous Waste Program permit engineer at 517-373-9875. In addition, it may be necessary to obtain other DEQ [permits and operating licenses](#) and meet other regulatory requirements. See the [Michigan Manufacturers Guide to Environmental, Health and Safety Regulations](#) for more information.

- Get a site identification number from the DEQ Waste and Hazardous Materials Division [R 299.9228(7)(a) and 9228(8)]. Apply online through [MiTAPS](#) or submit the form [EQP5150](#) to meet this requirement. Call 517-335-5139 to obtain the form or download off the Internet at [www.michigan.gov/deqwaste](http://www.michigan.gov/deqwaste).
- Keep records of universal waste shipments for at least 3 years [40 CFR 273.62]. This can be in a log, invoice, manifest, bill of lading, or other shipping document. The following must be recorded:
  - Name and address where the waste came from;
  - Quantity of each waste type (e.g. batteries, electric lamps, pesticides, mercury containing devices) received or shipped out; and
  - Date when shipment was received.
- Follow the manifest system requirements as described in R 299.9608 if receiving waste for recycling that is accompanied by a manifest [R 299.9228(8)].
- Send or take universal waste to another handler, destination facility, or foreign destination and meet federal exportation and importation requirements [40 CFR 273.61(a)]. See section about handler requirements for shipping off-site for more information.
- If the receiving facility gets a shipment of hazardous waste that is not universal waste:

They must immediately notify your DEQ Waste and Hazardous Materials [District Office](#) and Manifest Unit Provide the name, address and phone number of the originating shipper. The DEQ will provide instructions for managing the hazardous waste.

If the receiving destination facility is not a licensed solid waste facility or liquid industrial waste designated facility and gets a shipment of solid or liquid waste that is not hazardous waste and not a universal waste:

Immediately notify your DEQ Waste and Hazardous Materials [District Office](#). The DEQ will provide instructions for managing the waste.

## **9. What are specific universal waste additional requirements for handlers?**

Following are the specific requirements that handlers must meet regarding labeling and management for the different universal wastes. In addition, other related regulations are discussed where applicable.

### **Antifreeze**

Antifreeze is often a nonhazardous liquid waste, but it may be hazardous waste when it contains:

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- Regulated concentrations of lead and cadmium leach from the radiator. Increased amounts of lead have been found in antifreeze removed from radiators made overseas.
  - Regulated concentrations of benzene when gasoline leaked into the antifreeze
  - Listed solvents from overspray from aerosol products like brake and carburetor cleaners
  - Other hazardous wastes that employees mixed with it

If a company assumes or specifically knows its antifreeze is hazardous and manages it as a universal waste, it must meet the following conditions:

- Label containers and tanks with words "universal waste antifreeze," "waste antifreeze," or "used antifreeze"
- Keep containers closed, except to add or remove universal waste, and use containers that are structurally sound, compatible with the antifreeze, and that lacks evidence of leakage, spillage, or damage that could cause leakage under reasonably foreseeable conditions
- Storage tanks must meet additional requirements in 40 C.F.R. part 265, subpart J, except for 40 C.F.R. §§265.197(c), 265.200, and 265.201, which includes, but not limited to:
  - Professional Engineer certifications required for new tank systems and integrity assessments of existing tank systems
  - Inspections at least once each operating day
  - Secondary containment
  - General operating requirements
- Immediately clean up any spills and properly characterize to identify appropriate disposal options
- Antifreeze being hauled off-site would be manifested as liquid industrial waste with the waste code 030L (or 030LC if consolidated manifest used). See the "[Nonhazardous Liquid Waste Generator Requirements](#)" guidance.
- See the [Antifreeze](#) guidance for additional regulations that may apply.

## **Batteries**

A *used* battery becomes a waste when it is discarded. An *unused* battery becomes a waste when the handler decides to discard it. Most batteries from hybrid vehicles are dry cell batteries. To find battery recyclers, see the Miscellaneous category in the [Recycled Materials Market Directory](#). A nation-wide rechargeable battery collection program is also offered by the Rechargeable Battery Recycling Corporation. Information is available at [www.rbrc.com](http://www.rbrc.com).

**Lead acid batteries** are banned from disposal in Michigan's landfills and incinerators. They are normally handled under an alternative rule [R 299.9804](#) instead of the universal waste rule. Under Rule 804, the company must characterize the waste batteries and meet [land disposal restrictions](#) (LDR) including having the one time notice/certification on file. The LDR does not apply to Conditionally Exempt Small Quantity Generators. When being recycled, the battery volume is not included when determining your generator status. It is not necessary to use manifests when shipping the used lead acid batteries to a recycler, nor hire a permitted and registered transporter. In addition, there is no time limit in the state regulations on how long you may store the batteries before shipping. There may be local ordinances that have time limits or other requirements. Shipments need to meet the US DOT transportation requirements unless it meets an exception in [49 CFR 173.159](#). Your recycler should be able to address your transportation requirements but if you have additional questions contact the Michigan State Police, Traffic Safety Division at 517-336-6580.

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Prior to shipping batteries, handle and store batteries in ways that prevents releases. Tips from the [Battery Council International](#) for handling lead acid batteries include:

- Never put metal objects on the battery, and remove metal jewelry like rings and chains before handling batteries.
- Wear gloves and safety glasses or goggles when working with batteries.
- Avoid getting any acid on your skin or clothing or in your eyes.
- Keep the battery up-right and carry it in a non-metal, leak-proof container.
- Do not put excessive pressure on the ends of the battery. If you do not use a battery carrier, place your hands on the opposite corners of the battery to lift and carry.

Store used lead acid batteries in a manner that prevents their contents from being released into the environment:

- Handle in a way that prevents them from cracking open, such as stacking them only one layer high on a pallet.
- Put in an area constructed with an impervious surface, such as concrete coated with epoxy, or stored in a plastic tub, etc. Some facilities have used a child's plastic swimming pool for containment.
- Have a well ventilated area.
- Protect them from freezing.
- Secure them from vandalism and away from children and pets.
- Protect them from sparks and flames. Keep batteries in 'no smoking' areas.
- Post the storage area with signs which state safety directions and indicate that hazardous batteries are present.



Example of bad battery storage

If a battery is dropped or leaking, one recommendation is to place it in a plastic pail and use baking soda or lime to neutralize any spilled acid. If you get acid spilled on your skin, immediately rinse the area with water and get medical attention. Remember to properly dispose of the used neutralizing material which may be a hazardous waste since it could contain lead or un-neutralized acid. Check with the local wastewater treatment plant to see if they will allow you to discharge any liquid acid to their system. Un-neutralized liquid residue from a spill has a D002 hazardous waste code, and any battery residue that has lead levels of 5.0 mg/l or more has a D008 waste code.

**Dry cell batteries and lead acid batteries being handled as universal waste** must be:

- Labeled or marked clearly. Label each battery or containers storing batteries with any of the following: "Universal Waste-Battery(ies)" or "Waste Battery(ies)" or "Used Battery(ies)" [40 CFR 273.14(a) and 273.34(a)].
- Placed into another container if showing signs of leaking or damage that could cause it to leak [40 CFR 273.13(a)(1) and 273.33(a)(1)].
- Kept in closed structurally sound containers that are compatible with batteries. Ask the recycling company what their specific requirements are for packaging and shipping. For example, they may want the batteries sorted by their type such as all mercury batteries stored together, nickel-cadmium batteries kept in another container, etc



- 
- A handler may do any of the following if the battery casings are in good condition and kept closed [40 CFR 273.13(a)(2) and 273.33(a)(2)].
    - Remove the electrolyte but the cells must be immediately closed after removal of the liquid
    - Sort the batteries by type
    - Mix the batteries into one container
    - Discharge batteries to remove the electric charge
    - Regenerate used batteries
    - Disassemble batteries or battery packs into individual batteries or cells
    - Remove batteries from consumer products
  - Determine if any removed electrolyte or other waste, such as battery pack material, is a hazardous waste. If it is, then the waste is regulated under Part 111 of Act 451. If the waste is not a hazardous waste, it must be managed under the applicable [liquid industrial](#) or [solid waste regulations](#) [40 CFR 273.13(a)(3)].

If you don't manage the batteries as universal waste, it will be necessary to determine if they are hazardous waste and include that amount when calculating your generator status. There are many types of dry cell batteries with different properties. The DEQ does not have a list that identifies if a battery is a hazardous waste. Examples of possible characteristics for dry cell batteries besides corrosivity and reactivity include:

- Alkaline batteries (A, AA, C, DD, etc.) may contain regulated amounts of lead (D008), mercury (D009), and cadmium (D006). Recycling is still recommended for alkaline batteries that are not hazardous waste because they may contain recoverable amounts of magnesium and zinc.
- Lithium-sulfur dioxide (Li/SO<sub>2</sub>) batteries may exhibit reactivity characteristics (D003).
- Ni Cad batteries may contain regulated amounts of cadmium (D006).

Dry cell batteries containing mercury sold in Michigan are regulated under [Part 171 of Act 451](#) and the federal [Mercury-Containing and Rechargeable Battery Management Act](#).

Although not recommended, Conditionally Exempt Small Quantity Generators may put spent dry cell batteries in the trash if the waste hauler and licensed disposal facility will accept them for disposal.

Dry cell battery shipments also need to meet the US DOT transportation requirements. See [49 CFR 173.185](#) for lithium battery information and [49 CFR 173.189](#) for batteries containing sodium. Discuss transportation requirements with the Michigan State Police, Traffic Safety Division.

### **Lead Acid Battery Collection Companies, Recyclers, and Reclaimers**

The specific requirements will depend on the lead acid battery handling activities. A company reclaiming lead acid batteries must meet the requirements of [R 299.9804](#). It does not apply to a company regenerating these batteries (e.g. adding acid to batteries). Discuss your operations and the following requirements with District Office staff:

- Obtain treatment, storage, and disposal facility permit and meet requirements, including meeting financial capability regulations under Part 111 if applicable to activities.
- Get other necessary DEQ [permits and operating licenses](#) and meet applicable regulatory requirements. For an overview of general requirements, see the [Michigan Manufacturers Guide to Environmental, Health and Safety Regulations](#).

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Facilities need to meet the EPA requirements for [land disposal restrictions \(LDR\)](#). LDRs do not apply to Conditionally Exempt Small Quantity Generators. Basically there are two components of this per 40 CFR 268.7(a)(7 and 8):

1. The lead acid battery generator has a requirement to have a one time notice/certification in their files. As a business service, companies providing lead acid battery collection or recycling may want to offer their customers the required information which includes a statement that the lead acid batteries are exempt from many of the hazardous waste regulations pursuant to R 299.9804 and 299.9206(2)(d), and that the company picked up the batteries for subsequent delivery to the recycling company (and list where the batteries are being taken). If the generator asks, the battery volume is not included when determining a company's generator status when they are being recycled or reclaimed.
2. The second LDR requirement pertains to a collection or recycling business needing to provide a one time notice to another recycling company if the batteries are being shipped to them for further processing. Check with them if they provide a preprinted LDR form to use to meet this requirement.

In both instances, the notices need to be kept at least 3 years after the last shipment.

It is not necessary to use permitted and registered hazardous waste transporters or use waste manifests when used lead acid batteries are hauled to collection sites, recyclers, or reclaimers in Michigan. Shipments must meet the US DOT transportation requirements unless it meets an exception in [49 CFR 173.159](#). There is no time limit in the state regulations on how long a collection center may store the batteries before shipping unless they are being managed as universal waste. Collection centers would need to meet the universal waste handler requirements and the one year limit. Local ordinances may have time limits or other requirements.

#### **Other Regulations Pertaining to Batteries**

**Retailers must accept their customer's used lead acid batteries.** Retailers must post a sign that tells customers recycling is the only correct way to dispose of lead acid batteries [[Part 171 of Act 451](#)]. Two [battery poster templates](#) are available online.

**Dry cell batteries** containing intentionally introduced mercury are not allowed to be sold or offered for promotional purposes in Michigan. These dry cell batteries include zinc carbon batteries, mercuric oxide button cell batteries, and alkaline manganese button cell batteries that have more than 25 milligrams of mercury. If a manufacturer participates in a voluntary collection program for nickel cadmium batteries, the manufacturer must provide retailers a written notice about the program. Retailers can voluntarily display this notice [[Part 171 of Act 451](#)]. Most used dry cell batteries must be managed as a hazardous or universal waste.

**Household hazardous waste collections accepting batteries from households** are exempt from the Part 111 of Act 451 requirements.

**Programs accepting hazardous waste, including batteries, from conditionally exempt small quantity generators** must meet the requirements in [R 299.9205](#).

**Lead acid batteries** are subject to SARA Title III requirements. Sulfuric acid is classified as an extremely hazardous substance and makes up about 1/9 of the total weight of a lead-acid battery. If you have 1000 pounds of sulfuric acid on site, you are subject to SARA Title III section 302 Emergency Planning Notification. It takes approximately 200 car batteries to amass 1000 pounds of sulfuric acid. SARA Title III information is at [www.michigan.gov/degemergencyplan](http://www.michigan.gov/degemergencyplan).

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## Consumer Electronics

Consumer electronics are devices run by electricity containing circuit boards commonly found in offices and homes such as computers, printers, fax machines, telephones, printers, televisions, etc. Cathode ray tubes (CRTs) from equipment like computers and televisions may be handled as either consumer electronics or electric lamps universal waste.

When managing as universal waste, they must be handled in a manner that prevents breakage. Any components or residues from broken electronics need to be put in containers labeled with either of the following:

- “Universal Waste Electronics”
- “Universal Waste Consumer Electronics”



Handlers may do any of the following under the universal waste regulation:

- Repair electronics for potential redirect reuse
- Remove other universal waste e.g. batteries from the electronics
- Remove modular components for direct reuse

Please see the [Electronic Equipment](#) guidance for more information if handling as hazardous waste, including information about donating the equipment. To find recyclers, go to the Miscellaneous category in the [Recycled Materials Market Directory](#). Many electronic waste ‘recyclers’ are actually universal waste handlers that resell refurbished equipment and components. However, if a recycler is processing electronic waste, please contact the Waste and Hazardous Materials Division [District Office](#) to discuss operations to determine if additional permits are needed and see the EPA’s “Guidelines for Materials Management” at <http://www.epa.gov/passiton/guide.htm> for information about managing electronic waste in a safe manner.

They recommend:

- An up-to-date, written hazardous materials identification and management plan that specifically addresses at least the following: lead, mercury, beryllium, cadmium, batteries, toner, phosphor compounds, [PCBs](#), and [brominated fire retardants](#) and other halogenated materials, with particular focus on possible generation of by-product dioxins and furans.
- Where materials are shredded or heated, appropriate measures to protect workers, the general public and the environment from hazardous dusts and emissions. Such measures include adaptations in equipment design or operational practices, air flow controls, personal protective devices for workers, pollution control equipment or a combination of these measures.

Anyone interested in organizing a community electronics collection program should see the information posted at [www.michigan.gov/degreycling](http://www.michigan.gov/degreycling), Electronics Reuse and Recycling, [Electronic Waste Management Information for Community Collection Programs](#).

## Electric Lamps

Common lamps include fluorescent, high intensity discharge, sodium vapor, mercury vapor, neon, and incandescent lamps, and cathode ray tubes (CRTs) from computers and televisions. A company may choose to handle CRTs as consumer electronics or electric lamp universal waste in Michigan. *Used lamps* become waste on the date the handler permanently removes it from its fixture. *Unused lamps* become waste on the date the handler decides to discard it [R 299.9228(2)(j)].



When managing lamps as universal waste:

- Label the individual lamps or storage containers with the words “Universal Waste Electric Lamp(s)” or “Waste Electric Lamp(s)” or “Used Electric Lamp(s)” [R 299.9228(4)(c)].
- Do **not** crush or break the lamps [R 299.9228(4)]. Operating a lamp crushing device (sometimes called drum top crusher) requires a permit from the Air Quality Division and there are additional hazardous waste requirements. Once the lamps are broken, they can not be managed as universal waste.
- Package the lamps in a structurally sound container so there will be minimal breakage during normal handling conditions. If you have breakage, re-evaluate how they are being handled and stored.

Boxes used to ship new bulbs, or another double or triple ply cardboard container, are usually suitable to package the intact waste bulbs. The picture to the right shows one company’s storage method using labeled PVC pipes mounted on the wall to provide additional protection. The cap was removed to show the bulbs.



- If lamps are broken, contain and package any release of lamp fragments or residues immediately. See information about managing [mercury spills](#) at [www.michigan.gov/deq](http://www.michigan.gov/deq) “Key Topics” “Pollutants and Toxicants” “Mercury P2.” Check which type of container the disposal company or recycler wants used. Small amounts of unintentionally broken lamps may usually be placed in closed wax fiberboard drums or other puncture proof containers.
- Determine if the broken used lamps are hazardous waste. **Broken lamps, and lamps that are characterized as hazardous that are not managed as universal waste, must be managed according to the applicable hazardous waste regulations.** See the [Electric Lamps](#) guidance for additional regulations that may apply.
- Ship the universal waste lamps to a recycler or hire a mobile recycler. Check with your recycler if they can accept broken lamps. See the Glass category in the [Recycled Materials Market Directory](#) for a list of lamp recyclers. Although not a common option in many areas of Michigan, the facility can also check if their [local household hazardous waste collection program](#) will accept universal waste lamps. Some stores are beginning to accept the return of compact fluorescent lamps (CFLs) for recycling. Collection programs that accept and commingle household lamps with lamps from universal waste handlers and Conditionally Exempt Small Quantity Generators need to manage the lamps under the universal waste requirements [R 299.9228(3)].

A four foot fluorescent lamp can average between 15 to 50 mg of mercury per lamp. If a facility only manages fluorescent lights as universal waste, it takes about 17, 000 four foot lamps to reach the Large Quantity Handler category. The actual number of bulbs will depend on the brand and length of bulbs.

*Packages of universal waste lamps containing mercury are only regulated by US DOT when transported by air. If being shipped through or to states that do not recognize them as universal waste, contact that state for requirements, call US DOT at 800-467-4922, or see US DOT information at [hazmat.dot.gov](http://hazmat.dot.gov). Questions about hazardous materials transportation in Michigan can be directed to the Michigan State Police, Traffic Safety Division at 517-336-6580.*

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## Electric Lamp Recyclers

A recycling company that does not store electric lamps before recycling must meet the requirements in [R 299.9206\(1\)\(c\)](#). A recycling company storing electric lamps before recycling must meet the requirements in [R 299.9206\(5\)](#). This includes:

- Getting a site identification number from the DEQ Waste and Hazardous Materials Division [R 299.9228(7)(a) and 9228(8)]. Apply online through [MiTAPS](#) or submit the form [EQP5150](#) to meet this requirement. Call 800-662-9278 for a copy or download off the Internet at [www.michigan.gov/deqwaste](http://www.michigan.gov/deqwaste).
- Submitting a map and a description of the recycling units at the facility to the DEQ Waste and Hazardous Materials Division. Discuss your operations and requirements with a Waste and Hazardous Materials Division Hazardous Waste Program permit engineer at 517-373-9875.
- Training employees regarding hazardous waste handling and emergency response.
- Meeting air pollution control requirements, including obtaining an [Air Quality Division](#) permit. Discuss operations with [Air Quality Division District Office](#).
- Keeping a written record on-site showing the quantity of lamps received and recycled and documentation the waste has not been stored longer than one year.
- Locating the facility at an appropriate site.
- Meeting facility design and operating standards.
- Getting any other necessary DEQ [permits and operating licenses](#) and meeting other regulatory requirements. See the [Michigan Manufacturers Guide to Environmental, Health and Safety Regulations](#).

## Devices Containing Elemental Mercury

A *used* thermostat, mercury switch, or other device containing only elemental mercury as its hazardous waste constituent becomes a waste on the date it is discarded. An *unused* device becomes a waste on the date the handler decides to discard it [R 299.9228(2)(h)]. The universal waste regulations do not apply to mercury that was removed from devices or ampules (e.g. mercury collected in a container). Facilities will need to manage that mercury under the applicable hazardous waste rules that apply to their generator status.



- Label or clearly mark each thermostat or the container storing them with the words “Universal Waste-Mercury Thermostat(s)” or “Waste Mercury Thermostat(s)” or “Used Mercury Thermostat(s)” [40 CFR 273.14(d) and 273.34(d)]. If you have other mercury containing devices, replace “thermostat” with the other device’s name.
- Contain any mercury device which shows evidence of leakage, spillage, or damage that could cause leakage [40 CFR 273.13(c)(1) and 273.33(c)(1)]. Other regulations require you to contain and cleanup all spills involving regulated substances.
- Removal of mercury-containing ampules from devices is allowed if done in a manner that prevents breakage and the following requirements are met:
  - ✓ Removal must be done over or in a containment device (e.g. tray or pan sufficient to collect and contain any mercury released from the ampule in case of breakage).
  - ✓ A mercury clean-up system must be readily available to transfer spilled or leaked mercury to another approved container.
  - ✓ The area must be well ventilated and monitored.
  - ✓ Removed ampules are packed in a closed, non-leaking container with packing material.
  - ✓ Employees must be trained in proper waste handling and emergency procedures [40 CFR 273.13(c)(2) and 273.33(c)(2) and R 299.9228(4)(d) and (5)(e)].

Tips on removing vehicle switches is at [www.deq.state.mi.us/documents/deq-ess-P2-mercury-switch-sweep-brochure.pdf](http://www.deq.state.mi.us/documents/deq-ess-P2-mercury-switch-sweep-brochure.pdf)

- Characterize mercury or clean-up residues resulting from spills or leaks, and/or other solid waste generated when removing mercury from devices, to determine if it is hazardous waste. See [Waste Characterization](#) guidance at [www.deq.state.mi.us/documents/deq-ess-p2tas-wastecharacterization.pdf](http://www.deq.state.mi.us/documents/deq-ess-p2tas-wastecharacterization.pdf) and go to [www.michigan.gov/deqmercuryp2](http://www.michigan.gov/deqmercuryp2) for more mercury spill cleanup information.
  - ✓ If the waste is hazardous, then it is managed under Part 111 of Act 451. For example, if the laboratory results from the Toxicity Characteristic Leaching Procedure (TCLP) indicate concentrations of mercury is greater than or equal to 0.2 mg/L, it would be a hazardous waste.
  - ✓ If the waste is not hazardous waste and there are no free liquids, then the device must be properly managed as solid waste under Part 115 [40 CFR 273.13(c)(3) and 273.33(c)(3)].

Waste characterization is required for any waste generated. Test results or other documentation indicating its characteristics must be kept at least 3 years after the waste was last generated [R 299.9302].

- To find mercury recyclers, go to the Metals category in the [Recycled Materials Market Directory](#) or list of companies on the [Mercury Pollution Prevention webpage](#).

## Pesticides

Recalled, suspended, and cancelled pesticides, and unused pesticides that have not been recalled but are collected and managed as part of a waste pesticide collection program may be managed as a universal waste. *Recalled, suspended, and cancelled* pesticides become a waste on the first date on which the generator agrees to participate in the voluntary or mandatory recall and the person conducting the recall decides to discard it. An *unused* pesticide becomes a waste on the date the generator decides to discard it [R 299.2228(1)(b) and (f)].



- Label or mark container, tank or transport vehicle or vessel with the label that was on or accompanied the product as sold or distributed. Also include the words “Universal Waste-Pesticide(s)” or “Waste-Pesticide(s)” [40 CFR 273.14(b) and (c); 273.34(b) and (c)].
- Overpack any original container that is not structurally sound and is not compatible with the pesticide in it, or has evidence of leakage, spillage or damage that could cause leakage, into a container in good condition [40 CFR 273.13(b) and 273.33(b)].
- Prevent releases by containing pesticides in closed containers that are structurally sound and compatible with the pesticide [R 299.9228(4) and 40 CFR 273.13(b)(1) and 273.33(b)(1)]
- Meet the applicable federal requirements of [40 CFR Part 265, Subpart J](#) if the pesticides are contained in a tank [40 CFR 273.13(b)(3) and 273.33(b)(3)].
- Contact the [Michigan Department of Agriculture \(MDA\) Clean Sweep Program](#) for pesticide collections in your area. Call 517-335-6529 if you have pesticide disposal questions. Call the MDA Pesticide and Plant Management Division at 517-373-1087 with questions about using pesticides and [pesticide applicator permits](#).

Empty pesticide containers are exempt from the hazardous waste regulations. Containers are empty when all contents have been removed through normal means, and it has one inch or less of residue, or has no more than 3% by weight remaining if 110 gallons or less in size. Triple rinse according to [R 299.9207](#) and recycle where possible. The residues removed from containers must be managed as hazardous waste or universal waste if not used. See the [MDA Generally Accepted Agricultural and Management Practices for Pesticide Utilization and Pest Control](#) for more information.



## Pharmaceuticals

There is a lot of confusion how unwanted pharmaceuticals must be managed. This is due to the different regulations that apply to the different types of pharmaceuticals (e.g. controlled substances, hazardous, nonhazardous liquids, or solid waste), the different hazardous waste generator and universal waste handler categories, and different state and federal waste regulations if being shipped out of state or in state. In addition, new pharmaceuticals are always coming on the market and pharmaceuticals may be known by different brand names which may not be included on lists of hazardous waste examples. Some Michigan facilities are choosing to characterize all of their pharmaceuticals except controlled substances as universal waste to simplify the characterization process. The receiving universal waste handler then further characterizes the waste and ships them out of state for disposal under the applicable waste regulation. If a facility does not manage them as universal waste, then the facility needs to characterize the individual pharmaceuticals. This section does not describe all the requirements when pharmaceuticals are not managed as universal waste. For additional information, see the "[Managing Pharmaceutical Waste: A 10-Step Blueprint for Health Care Facilities in the United States](#)." The DEQ [Healthcare Facility Waste](#) publication is under revision.



When determining your waste requirements, you need to know:

1. **If the pharmaceuticals are [controlled substances](#).** If you have controlled substances, you must follow the US Drug Enforcement Administration's (US DEA) more stringent handling and disposal requirements. For example, phenobarbital and paraldehyde are both controlled substances and hazardous waste but disposal is regulated by US DEA. These regulations also have requirements for handling specific chemicals because of concerns with illegal drugs. Information is available at [www.dea.gov](http://www.dea.gov) and [www.deadiversion.usdoj.gov](http://www.deadiversion.usdoj.gov). Call the DEA Detroit Office at 313-234-4377 or 313-234-4388 with questions about handling controlled substances.
2. **If the pharmaceuticals will be managed as universal waste, or are a hazardous waste or non hazardous liquid waste**

### **HAZARDOUS WASTE**

In Michigan, a facility may choose to handle some pharmaceuticals used in human and veterinary medicine either under the hazardous waste rules or as a universal waste. At the time of this revision, Florida is the only other state that regulates pharmaceuticals as universal waste. Michigan does not define hazardous waste the same way as the US EPA.

- Michigan did not adopt the federal nitroglycerine exemption
- Michigan has additional U listed wastes that include pharmaceuticals
- Michigan has included pharmaceuticals as a universal waste

Some pharmaceuticals may be hazardous waste if it is on a list in the administrative rules or because it exhibits a hazardous characteristic for corrosivity, reactivity, ignitability, or toxicity. Examples of hazardous waste pharmaceuticals are identified on the following pages. It would also be necessary to determine if spill residue is hazardous or not (spill waste cannot be handled as universal waste). Some waste can have both listed and characteristic hazardous waste codes that would apply if it isn't managed as universal waste. It may be necessary to know the formulation of the pharmaceutical to determine how it is regulated and which waste code applies. For example:

- Lindane U129 (a listed waste when it is the sole active ingredient in an unused product)
- Lindane D013 if the Toxicity Characteristic Leaching Procedure concentration is equal to or greater than 0.4 mg/L (characteristic for toxicity)

If the facility does not handle hazardous waste pharmaceuticals under the universal waste rules, they will need to follow the applicable hazardous waste regulations for their generator status including:

- |                              |  |
|------------------------------|--|
| Notification                 | Transportation and disposal options      |
| Labeling                     | Annual user fees if SQG/LQG              |
| Training, emergency planning | Hazardous waste manifest processing fees |

## **NONHAZARDOUS LIQUID WASTE**

Pharmaceuticals that are not a hazardous waste and fail the paint filter test (a test used to determine if free liquids are present) would be regulated as liquid industrial waste in Michigan. See the "[Nonhazardous Liquid Waste Generator Requirements](#)" guidance. Examples are listed below.

- Used formalin (not contaminated with other hazardous waste). The fixed specimens are not regulated as medical waste and can be double bagged and landfilled if those authorities accept.
- Embalming fluids
- IV fluids - Dextrose & Sodium chloride

Check if the wastewater treatment plant will allow these wastes to be discharged to the sewer system.

3. **If the pharmaceuticals are in a liquid or solid formula.** This affects shipping record and handling requirements.
4. **If the pharmaceuticals are regulated as a radioactive material** (not common)
5. **The universal waste handler status for the facility** (which would include the amount of all universal wastes generated at the facility and not just the amount of pharmaceuticals)
6. **If the shipment is going out of state or to a Michigan treatment and disposal facility**
7. **If the shipment is going out of the USA**
8. **If the pharmaceuticals are mixed with medical waste.** Pharmaceuticals themselves are not defined as a [medical waste](#) in Michigan. Do **not** put unwanted pharmaceuticals in medical waste containers and in sharps containers for disposal.

### **Summary of how to manage pharmaceutical vials**

Vials may be handled under different regulations. "Empty" is described in the following section.

- Broken and/or contaminated with blood or body fluids = medical waste and also regulated under MIOSHA PART 554 Bloodborne infectious diseases
- Unbroken and contains listed or characteristic pharmaceuticals = hazardous or universal waste
- Empty, unbroken, and had contained P listed wastes but not triple rinsed = hazardous or universal waste
- Unbroken and empty vials = solid waste

## **MORE INFORMATION ABOUT HAZARDOUS WASTE PHARMACEUTICALS**

There are pharmaceuticals that are now on the market that did not exist when the wastes were listed in the hazardous waste regulations resulting in some pharmaceuticals that are not technically a "regulated hazardous waste", e.g. trace chemo drugs. Although not regulated as hazardous waste, the Healthcare Environmental Resource Center recommends they be handled as such for safety reasons.

Hazardous waste codes that begin with a letter are included in both the state and the federal hazardous waste regulations and waste codes that end with a letter are Michigan specific hazardous wastes. For some wastes you need to know the concentration to know which waste code applies. For example:

- Warfarin >0.3% P001
- Warfarin <0.3% U248

**The following would be examples of "P" listed hazardous wastes** when these pharmaceuticals are unused and the following substances are the sole active ingredient in the formula, and when they are not handled as universal waste:

- |  |                                 |
|--|---------------------------------|
| ▪ Arsenic trioxide P012 (Chemotherapy agent brand name Trisenox) | ▪ Physostigmine P204            |
| ▪ Epinephrine P042 <sup>1</sup>                                  | ▪ Physostigmine Salicylate P188 |
| ▪ Nicotine P075  | ▪ Sodium Azide P105             |
| ▪ Nitroglycerin P081 <sup>2</sup>                                | ▪ Strychnine P108               |
| ▪ Phentermine (CIV) P046   | ▪ Warfarin >0.3% P001           |

<sup>1</sup> Michigan did adopt the US EPA determination that epinephrine salts are not P042 waste. See the US EPA memo at [http://www.epa.gov/region1/healthcare/pdfs/EpiMemo\\_Final.pdf](http://www.epa.gov/region1/healthcare/pdfs/EpiMemo_Final.pdf).

<sup>2</sup> Michigan did not adopt the federal exemption for nitroglycerin formulations but amended the empty container rule to address the small amounts of nitroglycerine residue that remain in used vials – this rule revision may affect the generator status for some facilities that was previously handling the vials as hazardous waste.

**The new rule for empty pharmaceutical containers** applies if:

- the pharmaceutical was an acute hazardous waste only because of a characteristic. To determine if this applies to your P listed pharmaceutical, look at the table 205a in the rules to see if has a hazard code
- the remaining formulation in the container or liner does not exhibit that characteristic
- as much as possible is removed from container under normal practices and
  - 1” or less remains or
  - not more than 3% by weight of the container capacity remains

EPA Hazardous Waste Number	Chemical Abstract Services Number	Substance	Hazard Code
P081	55-63-0	Nitroglycerine	(R)
P084	4549-40-0	N-Nitrosomethylvinylamine	
P085	152-16-9	Octamethylpyrophosphor-amide	
P087	20016-49-0	Quarternary amide	



Vials that do not meet the empty pharmaceutical container rule and had contained drugs on the “P” hazardous waste list in [R 299.9224](#) must be managed as either an universal waste or hazardous waste unless the vial had been triple rinsed according to [R 299.9207](#). Triple rinsing is not usually done in healthcare settings. Empty containers are defined as having:

- All contents have been removed that can be removed through normal means and no more than 3% by weight remains and
- Residues removed from container must be managed as hazardous waste or universal waste.

If P listed wastes are not managed as universal waste, keep in mind that when 2.2 pounds or more is generated in a calendar month or is accumulated, the facility would be a large quantity generator of hazardous waste.

**The following would be examples of “U” listed hazardous wastes** when these pharmaceuticals are unused and the following substances are the sole active ingredient in the formula, and when they are not handled as universal waste:

Chemical	Waste Code	Common Brand Name <sup>1</sup>
Chloral hydrate (CIV) <sup>2</sup>	U034	
<i>Chlorambucil</i>	U035	Leukeran
Chloroform	U044	
<i>Cyclophosphamide</i>	U058	CTX Cytotoxan Neosar Procytox
<i>Daunomycin</i>	U059	Cerubidine Daunorubicin DaunoXome Liposomal Daunorubicin Rubidomycin
Dichlorodifluoromethane	U075	
<i>Diethylstilbestrol</i>	U089	
Formaldehyde	U122	
Hexachlorophene	U132	
Lindane	U129	
<i>Melphalan</i>	U150	Alkeran L-PAM
Mercury	U151	

Chemical	Waste Code	Common Brand Name <sup>1</sup>
<i>Mitomycin C</i>	U010	Mitomycin Mutamycin
Paraldehyde (CIV) <sup>2</sup>	U182	
Phenacetin	U187	
Phenol	U188	
Reserpine	U200	
Resorcinol	U201	
Sacchrin	U202	
Selenium sulfide	U205	
<i>Streptozotocin</i>	U206	Streptozocin Zanosar
Trichloromonofluoromethane	U121	
<i>Uracil mustard</i>	U237	
Warfarin <0.3% (Coumadin)	U248	

\* Drugs in italics are older chemotherapy agents. Not all chemotherapy agents are currently listed as hazardous waste since they came on the market after EPA developed the listings. The Healthcare Environmental Resource Center recommends all chemo drugs be handled in the same manner as hazardous waste since they are extremely toxic.

<sup>1</sup> List does not include all brand names (obtained from [www.hercenter.org/hazmat/pharma.cfm](http://www.hercenter.org/hazmat/pharma.cfm))

<sup>2</sup> These pharmaceuticals are also US DEA controlled substances

Additional Michigan U listed pharmaceuticals include:

- |  |                                       |
|--|---------------------------------------|
| ■ 001U dactinomycin (Cosmegen)                               | ■ 113U phenazopyridine HCl (Pyridium) |
| ■ 070U hydroquinone  | ■ 115U phenobarbital                  |
| ■ 077U lithium and compounds (aspartate, carbonate, citrate) | ■ 116U phenytoin                      |
| ■ 104U nitrogen mustard (Mustargen, mechlorethamine)         | ■ 117U phenytoin sodium               |
|  | ■ 127U propylthiouracil               |

**The following are common examples of characteristic hazardous wastes relating to medical use.** The non pharmaceutical wastes are highlighted if universal waste is an option.

### **Ignitable**

- Aqueous solutions with a flashpoint less than 140 F except those containing less than 24% ethanol. Note that Michigan is more stringent than US EPA and ethanol is the only alcohol exempted under the state's hazardous waste regulations.
- Non-aqueous formulations with flashpoint less than 140° F
  - e.g. Some wart removal medications are ignitable
  - e.g. Mixtures of more than 24 percent alcohol content: undiluted injectable Taxol and VP-16 are 49 percent and 30 percent alcohol respectively in their concentrated forms. If the facility has Brevibloc, you will need to check the MSDS since the alcohol concentrations vary between its different formulations.
  - e.g. Rubbing alcohol
  - e.g. Disinfectant hand washing chemicals
  - e.g. Laboratory solvents
- Compressed gases with flammable propellants. These regulated materials are now described in 40 CFR 261.21(a)(3) instead of the previous reference to the US DOT regulations.
- Strong oxidizers
  - e.g. Potassium permanganate
  - e.g. Silver nitrate
  - e.g. Over the counter (OTC) ear wax removers containing carbomide peroxide

### **Toxic**

These chemicals and heavy metals found in drug formulations or in other medical facility operations would be hazardous waste when they meet or exceed the Toxicity Characteristic Leaching Procedure (TCLP) concentrations identified in R 299.9217. The following common examples have items highlighted that can be managed as universal waste.

<sup>1</sup> The US Food and Drug Administration (FDA) provides a list of mercury-containing pharmaceutical

Material	CAS	Waste number	TCLP mg/L	Examples of potential use (there can be other chemicals and uses not listed here)
Arsenic	7440-38-2	D004	5.0	Used for <b>heartworm treatment</b> , arsenic tribromide in medicines or analytical chemistry or arsenic trioxide in cattle and sheep dip)
Barium	7440-39-3	D005	100	<b>Barium sulfate medium</b> used in radiography or <b>Barium permanganate</b> may be used as strong disinfectant or treating wounds
Cadmium	7440-43-9	D006	1.0	<b>Dry cell batteries</b>
Chloroform	67-66-3	D022	6.0	Now banned from drug use; previously used as <b>anesthetic</b> and in laboratories
Chromium	7440-47-3	D007	5.0	May be found in injectable <b>medications</b>
M-cresol	108-39-4	D024	200	<b>Disinfectant, fumigant</b>
Lead	7439-92-1	D008	5.0	X-ray aprons, gloves, walls
Lindane	58-89-9	D013	0.4	Previously used for <b>lice and scabies treatment</b>
Mercury <sup>1</sup>	7439-97-6	D009	0.2	<b>Mercurochrome; mercury used as a preservative like thimerosal in flu and other vaccines; thermometers, medical devices, switches, fluorescent light bulbs, dental amalgam</b>
Selenium	7782-49-2	D010	1.0	May be found in <b>injectable medications, vitamins</b>
Silver	7440-22-4	D011	5.0	May be found in <b>burn creams</b>

products at <http://www.fda.gov/cder/fdama/mercury300.htm>.

NOTE: When determining your healthcare facility's hazardous waste generator status, do not forget to include the amount of hazardous wastes that was generated in other areas of the facility such as solvents from laboratories and additional hazardous waste from other departments.

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**Corrosive** (Not commonly found in many pharmaceuticals)

- pH of less than or equal to 2 (highly acidic) or pH greater than or equal to 12.5 (highly basic)
  - e.g. Wart remover solutions containing trichloroacetic acid
  - e.g. Acetic and phosphoric acids in eye medications
  - e.g. Primarily compounding chemicals
    - Glacial Acetic Acid
    - Sodium Hydroxide
    - Carboic acid (liquid phenols)

**Reactive** (Not common in pharmaceuticals)

e.g. nitroglycerine (when packaged into individual doses, nitroglycerin is not explosive, see the empty container rule explanation under the U listed wastes)

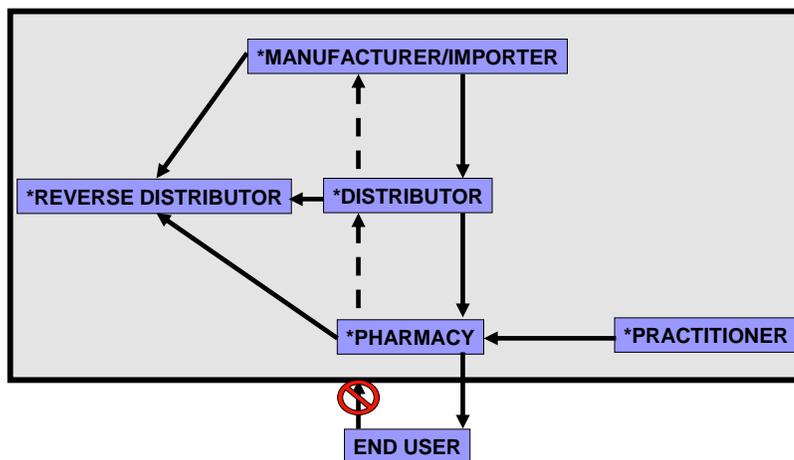
**UNIVERSAL WASTE PHARMACEUTICAL ON-SITE STORAGE AND HANDLING:**

- Do not put unwanted drugs in medical waste red bags or sharps containers.
- Keep incompatible pharmaceuticals segregated and adequate distance apart to prevent them from reacting with each other.
- Keep original labels on closed containers. If original label is not readable or available, add a label identifying contents, or you may label them "Universal Waste Pharmaceuticals." The rule does not have specific terms that must be put on the label.
- A universal waste handler may disassemble the packaging and sort the pharmaceuticals and store in closed containers. Check with the destination facility before doing this. If the original label is not readable, add a label as to the sorted contents.
- If the unwanted drugs are liquids, they are also subject to the [Part 121 liquid industrial waste regulations](#) and see the previous mentioned nonhazardous liquid waste generator guidance.
- Employees handling universal waste need to be trained on how to respond to spills. Training should include how to:
  - Overpack leaking containers
  - Immediately cleanup releases
  - Characterize and properly handle debris
  - Report releases. The reporting requirements would depend on what was spilled, how much, and where the spill occurred.

**PHARMACEUTICAL WASTE DISPOSAL:**

- Disposal by flushing down the drain is no longer a recommended practice by DEQ although the US DEA and some health providers still have policies using that disposal method. If you use this disposal method, be aware that wastewater treatment plants use different technologies and not all pharmaceuticals react the same way during treatment, so what could be allowed in one community may not be acceptable in another one. Check with the local wastewater treatment plant authority for approval before pouring pharmaceuticals down the drain.
- Do not mix pharmaceuticals with medical waste
- Do not put pharmaceuticals into septic systems since they may affect septic system performance
- Do not burn the drugs or any other business waste

## DEA Controlled Substances Closed System



\*DEA Registrant

- All pharmaceuticals that are a controlled substance must be handled according to the US DEA requirements. Facilities may request approval from US DEA to destroy controlled substances on-site or ship them to a US DEA approved disposal facility. The DEQ does not have a list of companies that can accept controlled substances.

- Some unused or expired pharmaceuticals may be taken back by the drug manufacturer or handled by [reverse drug distributors](#) for credit. Contact the manufacturer for their return policy or the Healthcare

Distribution Management Association (HDMA) at 703-787-0000 for information about reverse distributors. Drug representatives are not allowed to accept drug samples back for disposal. Reverse distributors can not be used as a means to dispose of obvious wastes like used IV bags containing medications, partially used containers, etc. as a way to avoid the regulations.

To determine who is considered the hazardous waste generator or the universal waste handler when using a reverse distributor:

- If the material is being sent back to the reverse distributor and they make the determination at their site if the pharmaceutical is a hazardous waste or not, the pharmaceuticals would not be shipped as a waste from the hospital to the reverse distributor. After the determination, the reverse distributor would be considered the waste generator.
  - If the hospital or reverse distributor or consultant makes the determination if something is a waste at the healthcare facility, then that facility is the hazardous waste generator or universal waste handler and it would have to manage the waste accordingly.
- A site that is a Conditionally Exempt Small Quantity Generator has the option of putting pharmaceuticals (that are not a controlled substance) in solid form (e.g. pills, dry mixes) in the trash if the landfill and waste hauler will accept it. However, this is not a recommended disposal option. If it is chosen, the pharmaceuticals should be made unusable by dissolving them in a small amount of liquid, and are only put in the dumpster on the day of pickup and place a lock on the trash container to help deter scavenging.
- If employees ask about how to handle unwanted drugs from their homes, refer them to the guidance "[Remedy for Prescription Drug Disposal](#)" at [www.deq.state.mi.us/documents/deq-ess-cau-rxbrochure.pdf](http://www.deq.state.mi.us/documents/deq-ess-cau-rxbrochure.pdf).
- Have the pharmaceuticals transported off-site to another universal waste handler or destination facility. Liquid pharmaceuticals have the waste code 014L (or 014LC if a consolidated manifest is used). Until other states adopt pharmaceuticals as universal waste, shipments out of Michigan would need to be handled according to that state's regulations. Contact the company receiving the waste for their specific handling requirements (e.g. packaging, delivery practices, etc.). See the transportation section for more information.

This document was revised in September 2008 by the Environmental Science and Services and Waste and Hazardous Materials Divisions. Reliance on information from this document is not usable as a defense in any enforcement action or litigation. Refer to the regulations or discuss your requirements with your consultant or the regulating agency staff.

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