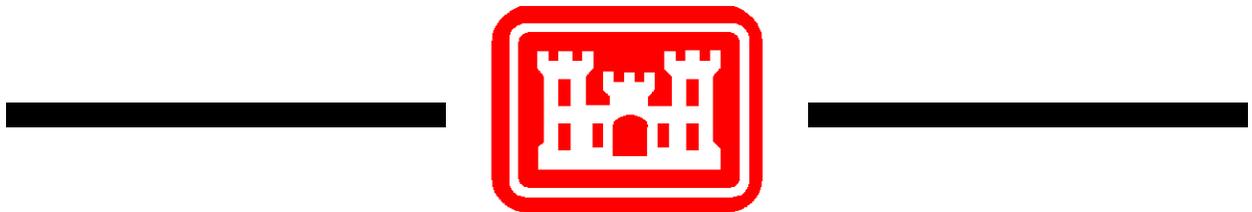


PUBLIC WORKS TECHNICAL BULLETIN 200-1-76
23 MARCH 2010

**UNIVERSAL WASTE MANAGEMENT
AND DISPOSAL**



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FACILITIES ENGINEERING
Utilities

UNIVERSAL WASTE MANAGEMENT AND DISPOSAL

1. Purpose.

a. The purpose of this Public Works Technical Bulletin (PWTB) is to provide a review of the universal waste rule and to provide basic information that can be used by installation personnel at Continental United States (CONUS) locations responsible to make decisions on how best to manage and dispose of universal waste.

b. All PWTBs are available electronically (in Adobe® Acrobat® portable document format [PDF]) through the World Wide Web (WWW) at the U.S. Army Engineering and Support Center's Technical Information - Facility Design ("TechInfo") web page, which is accessible through Universal Resource Locator (URL):

http://www.wbdg.org/ccb/browse_cat.php?o=31&c=215

2. Applicability. This PWTB applies to all U.S. Army facilities engineering activities.

3. References.

a. Army Regulation (AR) 200-1, Environmental Protection and Enhancement, effective 27 December 2007.

b. 40 Code of the Federal Regulations (CFR) 260, Hazardous Waste Management System: General.

c. 40 CFR 261, Identification and Listing of Hazardous Waste.

d. 40 CFR 262, Standards Applicable to Generators of Hazardous Waste.

e. 40 CFR 263, Standards Applicable to Transporters of Hazardous Waste.

f. 40 CFR 264, Standards for Owners and Operators of Treatment, Storage, and Disposal Facilities.

g. 40 CFR 265, Interim Status Standards for Owners and Operators of Treatment Storage and Disposal Facilities.

h. 40 CFR 266, Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities.

i. 40 CFR 268, Land Disposal Restrictions.

j. 40 CFR 273, Standards for Universal Waste Management.

4. Discussion.

a. AR 200-1, para 10-1c states that the Army's major program goal is to "continually reduce the volume of Hazardous Waste (HW) generated by Army installations, and maintain compliance with pertinent HW regulations." The volume of hazardous waste generated can be reduced by handling waste lamps, waste batteries, waste pesticides, and waste mercury-containing equipment as universal wastes when appropriate.

b. 40 CFR Parts 260, 261, 262, 264, 265, 268 (hereafter cited as 260-280) regulate the classification, storage, handling, and documentation regulations for hazardous waste and acute hazardous waste.

c. 40 CFR 273 contains regulations for the management of universal waste, which consists of waste streams identified by the U.S. Environmental Protection Agency (USEPA) as being able to be safely managed without being classified as hazardous waste. The use of the universal waste regulations is an option, not a requirement. Currently there are four categories of universal waste: batteries, pesticides, mercury-containing equipment, and lamps.

d. Appendix A to this PWTB discusses why it is preferable to dispose of fluorescent light bulbs and other lamps, mercury-

PWTB 200-1-76
23 March 2010

containing equipment, thermostats, waste pesticides, and batteries as universal waste instead of hazardous waste.

e. Appendix B to this PWTB outlines available management options for managing and disposing of items such as fluorescent light bulbs and other lamps, mercury-containing equipment, thermostats, waste pesticides, and batteries using the universal waste rule.

f. Appendix C to this PWTB details the regulatory definitions associated with the universal waste rule.

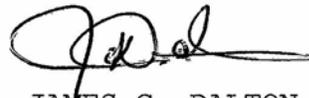
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PWTB 200-1-76
23 March 2010

Appendix A Why Universal Waste?

1. 40 CFR 273 outlines the requirements for handling, management, and transportation of universal waste. Hazardous waste generators have the option of handling waste streams identified as universal waste according to alternative standards. While being less restrictive than hazardous waste regulations, the universal waste standards still encourage environmentally sound collection and proper management of those hazardous wastes, which are declared to be universal waste. The goal of 40 CFR 273 was to create a mechanism by which hazardous waste generators could reduce the total amounts of hazardous waste generated and still prevent items that are otherwise hazardous waste from being disposed of in landfills or treated in a manner that created additional hazardous by-products.

2. Identifying segments of the hazardous waste stream as being universal waste also enables the preparer of the hazardous waste manifest (EPA Form 8700-22 [Rev. 3-05]) to truthfully affirm the following statement from field 15 of the hazardous waste manifest "I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) of (b) (if I am a small quantity generator) is true."

3. Unfortunately, disposal of waste as universal waste rather than hazardous waste is often not a financially cheaper approach. Sometimes a local recycler or other entity will take the universal waste without cost. If this is the case, maintain documentation on the amounts of universal waste sent to the local entity. The data in Table A1 (provided by Fort Rucker) can be used to compare the costs to handle universal wastes with the costs to handle hazardous waste using 2008 disposal costs.

Table A1. Costs To Handle Universal and
Hazardous Waste.

| Item | Handled as Universal Waste* | Handled as Hazardous Waste |
|------------------------------------|-----------------------------|--|
| Lithium Batteries | \$1.75/lb | \$0.22/lb |
| Ni-Cad Batteries (wet or dry cell) | \$0.96/lb | \$0.22/lb |
| Alkaline Batteries | \$0.96/lb | \$0.17/lb if shipped as non-RCRA solid |
| Fluorescent Lamps | \$1.21/lb | \$0.22/lb |
| *Source: Fort Rucker, AL | | |

23 March 2010

4. Even though the financial costs to dispose of universal waste are higher than the cost to dispose of hazardous waste, the long term environmental and human health costs associated with the disposal of hazardous waste outweigh the financial costs of universal waste recycling and disposal. One example of this universal waste environmental and human health benefit is fluorescent lamps. According to the EPA website (www.epa.gov), over 670 million mercury-containing bulbs (including Green Tip bulbs) are discarded each year as municipal solid waste that is ultimately landfilled or incinerated. These disposal methods can lead to a release of elemental mercury into the air, soil, and/or water through breakage and leakage and ultimately contaminate the food chain. Alternatively, instead of taking up space in a landfill and potentially causing contamination, virtually all components of a fluorescent bulb can be recycled. The metal end caps, glass tubing, mercury and phosphor powder can all be separated and re-used. Recyclers can sell the metallic portions as scrap metal. The recycled glass can be remanufactured into other glass products. The mercury can be recycled into new fluorescent light bulbs and other mercury-containing devices.

Appendix B

Management Options Using the Universal Waste Rule

1. 40 CFR 273 outlines the requirements for handling, management, and transportation of universal waste. Hazardous waste generators have the option of handing waste streams identified as universal waste according to alternative standards. While less restrictive than hazardous waste regulations, the universal waste standards still encourage environmentally sound collection and proper management of these hazardous wastes that are declared to be universal waste. Figure B1 shows a flow chart of the decision process to classify universal waste handlers.

2. Applicability. The universal waste regulations apply to handlers and transporters of universal wastes. Handlers include universal waste generators and collection facilities. The regulations distinguish between "large quantity handlers of universal waste" (those who accumulate more than 5,000 kg of total universal waste at one time) and "small quantity handlers of universal waste" (those who accumulate 5,000 kg or less of universal waste at one time). This distinction does not consider the "amount of time stored" as does the distinction between small and large quantity generators of hazardous waste. The delineation for universal wastes is based solely on amount accumulated. Figure B1 shows a flow chart to classify universal waste handlers.

3. When Does an Item Become "Universal Waste"? Items that may be handled as universal waste become a waste as follows:

a. A used battery becomes a waste on the date that it is discarded (e.g., when sent for reclamation). An unused battery becomes a waste on the date the handler decides to discard it.

b. Used mercury-containing equipment becomes a waste on the date it is discarded. Unused mercury-containing equipment becomes a waste on the date the handler decides to discard it.

c. A used thermostat becomes a waste on the date it is discarded (e.g., sent for reclamation). An unused thermostat becomes a waste on the date the handler decides to discard it.

d. A used lamp becomes a waste on the date it is discarded. An unused lamp becomes a waste on the date the handler decides to discard it.

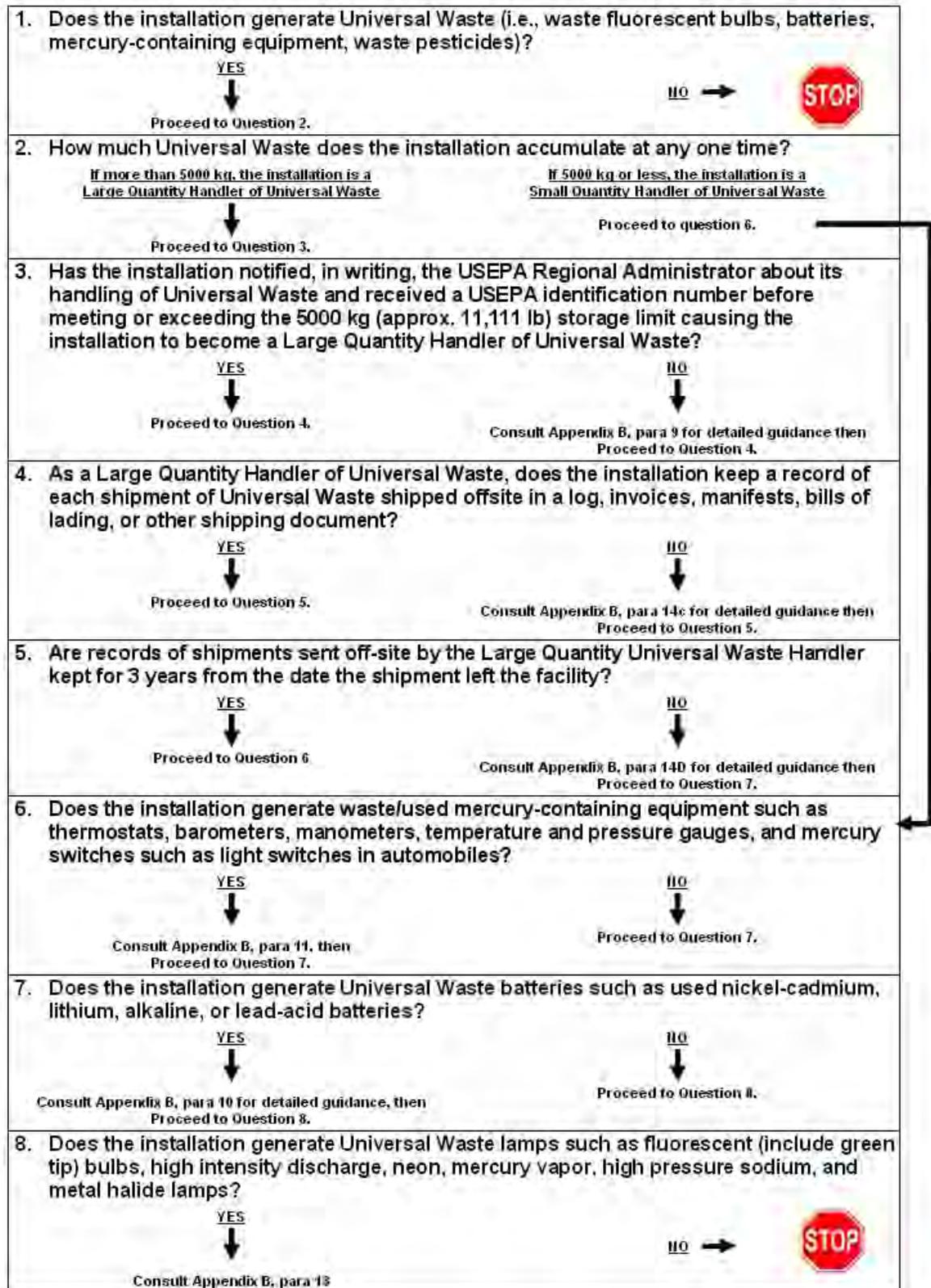


Figure B1. Flow chart to classify universal waste handlers.

e. A recalled pesticide becomes a waste on the first date on which both of the following conditions apply:

i. the generator of the recalled pesticide agrees to participate in the recall; and

ii. the person conducting the recall decides to discard the pesticides (e.g., burn the pesticides for energy recovery).

f. Stocks of unused pesticide products that are collected and managed as part of a waste pesticide collection program become a waste on the day the generator decides to discard it. **NOTE that the following pesticides are not waste:**

i. Recalled pesticides providing the person conducting the recall has either:

A. Not made a decision to discard (e.g., burn for energy recovery) the pesticide, or

B. Made a decision to use a management option that, under 40 CFR 261.2, does not cause the pesticide to be a solid waste (i.e., the selected option is use (other than use constituting disposal), or reuse, or reclamation).

ii. Unused pesticide products that are collected and managed as a part of a waste pesticide collection program if the generator of the unused pesticide product has not decided to discard (e.g., burn for energy recovery) them.

4. Classification of Universal Waste Handlers. A Universal Waste Handler is either a generator of universal waste, or the owner or operator of a facility, including all contiguous property, that receives universal waste from other universal waste handlers, accumulates universal waste, and sends universal waste to another universal waste handler, to a destination facility, or to a foreign destination.

a. A Universal Waste Handler is not a person who treats, disposes of, or recycles universal waste, except in limited circumstances. A Universal Waste Handler is also not one engaged in offsite transportation of a universal waste by air, rail, highway, or water, including a universal waste transfer facility.

a. Unlike the classifications for hazardous waste, there are only two classifications if Universal Waste Handlers:

23 March 2010

i. A Small Quantity Handler of Universal Waste does not accumulate 5,000 kg or more of universal waste (batteries, pesticides, mercury-containing equipment, or lamps, calculated collectively) at any time (40 CFR 273.9)

ii. A Large Quantity Handler of Universal Waste accumulates 5,000 kg or more total of universal waste (batteries, pesticides, mercury-containing equipment, or lamps, calculated collectively) at any time. This designation as a large quantity handler of universal waste is retained through the end of the calendar year in which the 5,000 kg limit is met or exceeded (40 CFR 273.9) The difference in requirements between the two classifications is additional notification and recordkeeping requirements for Large Quantity Universal Waste Handlers.

5. General Management of Universal Waste. Except when responding to a release or performing universal waste type specific management activities, the facility will not dilute or treat universal waste. When the following wastes are commingled with universal wastes, the commingled wastes must be managed under 40 CFR 273 as universal waste:

a. Household wastes that are exempt under 40 CFR 261.4(b)(1) and are also the same type as the universal wastes defined at 40 CFR 273.6

b. Conditionally exempt small quantity generator (CESQG) wastes that are exempt under 40 CFR 261.5 and are also the same types as the universal waste defined in 40 CFR 273.6.)

c. The following waste may, at the option of the generator, be managed under the universal waste requirements:

i. Household wastes that are exempt under 40 CFR 261.4(b)(1) and are also the same type as the universal wastes defined at 273.6

ii. Conditionally exempt small quantity generator wastes that are exempt under 40 CFR 261.5 and are also the same types as the universal waste defined in 40 CFR 273.6.)

6. Accumulation Limitations for Universal Waste. Unlike hazardous waste, there are no quantity limitations for how much universal waste is accumulated onsite, but there is a time limitation of 1 year from the date that the universal waste is generated, or received from another handler, that Universal Waste may be stored. The universal waste handler must be able to prove the time of accumulation through one of the following methods:

a. Placing the universal waste in a container and marking or labeling the container with the earliest date that any universal waste in the container became a waste or was received

b. Marking or labeling each individual item of universal waste with the date it became waste or was received

c. Maintaining an inventory system onsite that identifies the date each universal waste became a waste or was received

d. Maintaining an inventory system onsite that identifies the earliest date that any universal waste in a group of universal waste items or a group of containers of universal waste became a waste or was received

e. Placing the universal waste in a specific accumulation area and identifying the earliest date that any universal waste in the area became a waste or was received

f. Any other method that clearly demonstrates the length of time that the universal waste has been accumulated from the date that it becomes a waste or was received. (NOTE: The 1-year limit may be exceeded if the sole purpose is to accumulate such quantities as necessary to facilitate proper recovery, treatment, or disposal. However, the handler must be able to prove that this is the case.)

7. Release of Universal Waste. All releases of universal waste and other universal waste residues must be immediately contained. The facility must determine if the material resulting from the release is a hazardous waste or not, and handle it accordingly.

8. Universal Waste Training. Regardless of handler classification, employees must be trained in the proper handling and emergency response procedures appropriate to the types of universal waste handled at the facility. This is not necessarily formal classroom training.

9. Notification. Large Quantity Handlers of universal waste must notify, in writing, the USEPA Regional Administrator about their handling of universal waste and receive an USEPA identification number before meeting or exceeding the 5000 kg (approx. 11,111 lb) storage limit. Small quantity handlers of universal waste are not required to perform notification. In the following circumstances, the large quantity handler is not required to notify the USEPA:

23 March 2010

a. If the handler has already notified the USEPA of hazardous waste management activity and has received a USEPA identification number;

b. If recalled pesticides are being managed and notification has already been sent in under 40 CFR 165. Notification will include:

i. The universal waste handlers name and mailing address

ii. The name and business phone of the POC at the facility

iii. The address or physical location of the universal waste management activities

iv. A list of all types of universal waste managed by the handler (e.g., batteries, pesticides, mercury-containing equipment, and lamps)

v. A statement indicating that the handler is accumulating more than 5000 kg (approx. 11,111 lb) of universal waste at one time and the types of universal waste that are accumulated above this quantity.

10. Management of Universal Waste Batteries. Universal waste batteries (each battery), or a container in which the batteries are contained, must be labeled or marked clearly with any one of the following phrases:

- Universal Waste - Battery(ies)
- Waste Battery(ies)
- Used Battery(ies).

a. Universal waste batteries must be managed in a way that prevents releases of any universal waste or component of a universal waste to the environment. Universal waste batteries that show evidence of leakage, spillage, or damage that could cause leakage under reasonably foreseeable condition must be contained in a container. Containers for universal waste batteries with leak potential must be closed, structurally sound, compatible with the contents of the battery, and lack evidence of leakage, spillage, or damage that could cause leakage under reasonably foreseeable conditions.

b. When a universal waste handler is conducting any of the following activities, the casing of each individual battery cell must not be breached and remains intact and closed:

- sorting batteries by type
- mixing battery types in one container

23 March 2010

- discharging batteries so as to remove the electric charge
- regenerating used batteries
- disassembling batteries or battery packs into individual batteries or cells
- removing batteries from consumer products
- removing electrolyte from batteries. (NOTE: Cells may be opened to remove electrolyte but must be immediately closed after removal.)

c. If the universal waste handler removes electrolyte from batteries or generates other solid waste (e.g., battery pack materials, discarded consumer products) as a result of battery management activities, the universal waste handler must determine if any of the wastes exhibit the characteristics of a hazardous waste. If the waste does exhibit the characteristics of a hazardous waste, it must be treated and handled as a hazardous waste. If the electrolyte or other solid waste is not a hazardous waste, it is managed in accordance with any other applicable state and Federal laws and regulations.

11. Management of Universal Waste Mercury-Containing Equipment.

Common mercury-containing equipment includes: thermostats, barometers, manometers, temperature and pressure gauges, and mercury switches such as light switches in automobiles. Universal waste mercury-containing equipment (i.e., each device), or a container in which the equipment is contained, must be labeled or marked clearly with any of the following phrases:

- Universal Waste-Mercury Containing Equipment
- Waste Mercury-Containing Equipment
- Used Mercury-Containing Equipment.

a. NOTE: A universal waste mercury-containing thermostat or container containing only universal waste mercury-containing thermostats may be labeled or marked clearly with any of the following phrases:

- Universal Waste-Mercury Thermostat(s)
- Waste Mercury Thermostat(s)
- Used Mercury Thermostat(s).

b. Universal waste mercury-containing equipment must be managed in a way that prevents releases of any universal waste or component of a universal waste to the environment and protects the worker. Universal waste mercury-containing equipment with non-contained elemental mercury or equipment that shows evidence of leakage, spillage, or damage that could cause leakage under

23 March 2010

reasonably foreseeable conditions must be placed in a container. The container must be kept closed, structurally sound, compatible with the contents of the device, lack evidence of leakage, spillage, or damage that could cause leakage under reasonably foreseeable conditions, and be reasonably designed to prevent the escape of mercury into the environment by volatilization or any other means.

c. Mercury-containing ampules may be removed from universal waste mercury-containing equipment provided the handler:

- removes and manages the ampules in a manner designed to prevent breakage of the ampules
- removes the ampules only over or in a containment device (e.g., tray or pan sufficient to collect and contain any mercury released from an ampule in case of breakage)
- ensures that a mercury clean-up system is readily available to immediately transfer any mercury resulting from spills or leaks from broken ampules from that containment device to a container that meets the requirements of 40 CFR 262.34
- immediately transfers any mercury resulting from spills or leaks from broken ampules from the containment device to a container that meets the requirements of 40 CFR 262.34
- ensures that the area in which ampules are removed is well ventilated and monitored to ensure compliance with applicable OSHA exposure levels for mercury
- ensures that employees removing ampules are thoroughly familiar with proper waste mercury handling and emergency procedures, including transfer of mercury from containment devices to appropriate containers
- stores removed ampules in closed, non-leaking containers that are in good condition
- packs removed ampules in the container with packing materials adequate to prevent breakage during storage, handling, and transportation.

d. When a handler of universal waste mercury-containing equipment that does not contain an ampule removes from the equipment the open original housing holding the mercury, the handler shall:

- immediately seal the original housing holding the mercury with an air-tight seal to prevent the release of any mercury to the environment
- follow all requirements for removing ampules and managing removed ampules under paragraph 40 CFR 273.13(c)(2) (see checklist item number HW.290.4.US).

e. Universal waste handlers who remove mercury-containing ampules from mercury-containing equipment or seals mercury from mercury-containing equipment in its original housing must determine whether the following exhibit a characteristic of hazardous waste identified in 40 CFR 261, subpart C:

- mercury or clean-up residues resulting from spills or leaks
- other solid waste generated as a result of the removal of mercury-containing ampules or housings (e.g., the remaining mercury-containing device).

f. If the mercury, residues, and/or other solid waste exhibit a characteristic of hazardous waste, it must be managed as hazardous waste, not universal waste. In this situation, the universal waste handler is considered the generator of the mercury, residues, and/or other hazardous waste.

g. If the mercury, residues, and/or other solid waste is not hazardous waste, the universal handler may manage the waste in any way that is in compliance with applicable Federal, state or local solid waste regulations.

12. Management of Universal Waste Pesticides Containers or multiple container package units, tanks, transport vehicles, or vessels in which recalled universal waste pesticides are contained are marked clearly with the label that was on or accompanied the product as sold or distributed and the words UNIVERSAL WASTE PESTICIDE(S) or WASTE PESTICIDE(s).

a. Containers, tanks, or transport vehicles or vessels in which unused pesticide products are contained shall be labeled or marked clearly with: the words UNIVERSAL WASTE - PESTICIDE(S) or WASTE PESTICIDE(S) and:

- the label that was on the product when purchased, if still legible
- if this is not feasible, the appropriate DOT label
- if it is not feasible to use the original or DOT label, an alternate label prescribed or designated by the waste pesticide collection program administered or recognized by a state.

b. Universal waste pesticides must be managed in a way that prevents releases of any universal waste or component of a universal waste to the environment and protects the worker.

c. Universal waste pesticides must be contained in one or more of the following:

- A container that remains closed, structurally sound, compatible with the pesticide, and that lacks evidence of leakage, spillage, or damage that could cause leakage under reasonably foreseeable conditions. (This is considered an appropriate container.)
- An inappropriate container that is overpacked in an appropriate container.
- A tank that meets the requirements of 40 CFR 265, Subpart J, except for 40 CFR 265.197(c) (tank closure plans), 40 CFR 265.200 (waste analysis and trial tests), and 40 CFR 265.201 (requirements for SQGs).
- A transport vehicle or vessel that is closed, structurally sound, compatible with the pesticide, and that lacks evidence of leakage, spillage, or damage that could cause leakage under reasonably foreseeable conditions.

13. Management of Universal Waste Lamps. According to the USEPA, the amount of mercury in a CFL or other fluorescent light bulb typically ranges between 3.5 milligrams to 15 milligrams. The amount of mercury varies depending on the type of fluorescent light bulb, the company that makes the light bulb, and when the fluorescent light bulb was made. Even fluorescent lamps referred to as "green-tipped" lamps contain a small amount of mercury. According to the USEPA, the amount of mercury in a low-mercury bulb can range from 3.5 to 4 milligrams compared to a standard fluorescent bulb, which ranges from 8 to 14 milligrams of mercury. The USEPA encourages the recycling of all mercury-containing lamps, regardless of the mercury content. Under Federal regulations, the Toxicity Characteristic Leaching Procedure (TCLP) determines if a lamp is a hazardous waste. Lamps that pass the TCLP for mercury are not hazardous and therefore, are not subject to Federal regulation. If the facility does not test its low-mercury lamps and prove them non-hazardous, they must assume they are hazardous waste and handle them accordingly. Some states require that all mercury-containing lamps be recycled or managed as a hazardous waste, regardless of the mercury content.

a. Each lamp or a container or package in which lamps are contained is labeled or marked clearly with one of the following phrases:

- Universal waste - lamp(s)
- Waste lamp(s)
- Used lamp(s).

b. Universal waste lamps must be in containers or packages that are structurally sound, adequate to prevent breakage, and compatible with the contents of the lamps. Containers and packages must remain closed and without evidence of leakage, spillage, or damage that could cause leakage under reasonably foreseeable conditions. Containers must be kept closed, structurally sound, compatible with the contents of the lamps, and lack evidence of leakage, spillage, or damage that could cause leakage, or releases of mercury or other hazardous constituents to the environment under reasonably foreseeable conditions.

c. Virtually all components of a fluorescent lamp can be recycled. The metal end caps, glass tubing, mercury, and phosphor powder can all be separated and reused. The metallic portions may be sold as scrap metal. The recycled glass can be remanufactured into other glass products. The mercury can be recycled into new fluorescent lamps and other mercury-containing devices.

d. A broken universal waste lamp, or a universal waste lamp that shows evidence of breakage, leakage, or damage that could cause a release of mercury or other hazardous constituent must be immediately cleaned up and placed in a container. The USEPA recommends the following approach to cleanup of a broken universal waste lamp.

Step 1: Before actual clean-up:

- a. Air out the room by opening a window and shutting off any forced air HVAC system.
- b. Ensure that people and animals leave the room and no one walks through the broken lamp.

Step 2: Put on rubber, nitrile, or latex gloves.

Step 3: Clean hard surfaces such as wood or vinyl-covered floors, countertops:

- a. Scoop up glass pieces and powder using stiff paper or cardboard and place them in a glass jar with metal lid (such as a canning jar) or in a sealed plastic bag.
- b. Use sticky tape, such as duct tape, to pick up any remaining small glass fragments and powder.
- c. Wipe the area clean with damp paper towels or disposable wet wipes. Place towels in the glass jar or plastic bag.
- d. DO NOT use a vacuum or broom to clean up the broken bulb on hard surfaces.

Step 4: Clean carpeting or rugs:

- a. Pick up glass fragments and place them in a glass jar with metal lid (such as a canning jar) or in a sealed plastic bag.

23 March 2010

- b. Use sticky tape, such as duct tape, to pick up any remaining small glass fragments and powder.
- c. If vacuuming is needed after all visible materials are removed, vacuum the area where the bulb was broken.
- d. Remove the vacuum bag (or empty and wipe the canister), and put the bag or vacuum debris in a sealed plastic bag.

Step 5: Clean clothing and other soft materials

- a. If clothing or other soft materials come in direct contact with broken glass or mercury-containing powder from inside the bulb that may stick to the fabric, the clothing or bedding should be thrown away. Do not wash such clothing or soft materials because mercury fragments in the clothing may contaminate the machine and/or pollute sewage.
- b. It is acceptable to wash clothing or other materials that have been exposed to the mercury vapor from a broken CFL, such as the clothing being worn when cleaning up a broken CFL, as long as that clothing has not come into direct contact with the materials from the broken bulb.
- c. If shoes come into direct contact with broken glass or mercury-containing powder from the bulb, wipe them off with damp paper towels or disposable wet wipes. Place the towels or wipes in a glass jar or plastic bag for disposal.

Step 6: Dispose of clean-up materials:

- a. Immediately place all clean-up materials outdoors in a trash container or protected area for the next normal trash pickup.
- b. Wash hands after disposing of the jars or plastic bags containing clean-up materials.
- c. Check with the local or state government about disposal requirements in the specific area. Some states do not allow such trash disposal. Instead, they require that broken and unbroken mercury-containing bulbs be taken to a local recycling center.

Step 6: Regarding future cleaning of carpeting or rug:

- a. The next several times the area is vacuumed, shut off the central forced-air heating/air conditioning system and open a window before vacuuming.
- b. Keep the central heating/air conditioning system shut off and the window open for at least 15 min after vacuuming is completed.

23 March 2010

14. Disposal of Universal Waste Universal waste may not be sent or taken to any place other than another universal waste handler, a universal waste destination facility, or a foreign destination. Before sending the universal waste offsite, the originating universal waste handler must ensure that the receiving universal waste handler or universal waste destination agrees to receive the universal waste.

a. If the facility is offering universal waste for off-site transportation, the universal waste must be packaged, labeled, marked, and placarded as required for hazardous materials shipment if the universal waste is also classed as a hazardous material by the Department of Transportation (DOT). DOT shipping papers must also be prepared. There is no Federal regulatory requirement to use a manifest for disposal of universal waste, but it is a simple way to track the amounts of universal waste generated and its final disposition.

b. A Small Quantity Handler of Universal Waste is not required by Federal regulation to maintain copies of shipping papers. As a good management practice though, Small Quantity Handlers of Universal Waste should maintain such documentation.

c. Large Quantity Universal Waste Handlers must keep a record of each shipment of universal waste shipped offsite in a log, invoices, manifests, bills of lading, or other shipping document. The record for each offsite shipment must include:

- name and address of the handler, destination facility, or foreign destination to whom the universal waste was sent,
- the quantity of each type of universal waste shipped, and
- the date the shipment left the facility.

d. For shipments sent off-site by the Large Quantity Universal Waste Handler, records must be kept for 3 years from the date the shipment left the facility.

15. Shipping Universal Waste to Another Universal Waste Handler. If a receiving universal waste handler rejects a waste shipment, the originating universal waste handler must either:

- receive the waste back when notified the shipment was rejected, or
- agree with the receiving universal waste handler on a universal waste destination facility to which the shipment will be sent.

23 March 2010

16. Receiving Universal Waste From Another Universal Waste Handler. If the receiving universal waste handler rejects a shipment or a portion of the shipment, the receiving universal waste handler must notify the originating handler to discuss reshipment of the load, and either:

- send the shipment back to the originating universal waste handler, or
- if agreed by both originating and receiving universal waste handlers, send the shipment to a destination facility.

a. If the universal waste handler receives a shipment containing hazardous waste that is not universal waste, the universal waste handler must immediately notify the regional USEPA office of the illegal shipment and provide the name, address, and phone number of the originating shipper.

b. When receiving universal waste from other universal waste handlers, Large Quantity Universal Waste Handlers must keep a record of each shipment of universal waste received in a log, invoices, manifests, bills of lading, or other shipping document. The record for each received shipment must include:

- name and address of the handler, destination facility, or foreign destination to whom the universal waste was sent,
- the quantity of each type of universal waste shipped, and
- the date the shipment left the facility.

c. For shipments received at the facility, Large Quantity Universal Waste Handlers must keep the records for 3 years from the date of receipt of the shipment

17. Import of Universal Waste. If the universal waste handler receives universal waste from a foreign country, the universal waste must be handled according to all applicable requirements of 40 CFR 273.

18. Decreasing the Generation of Universal Waste Without Increasing Hazardous Waste Generation.

a. To reduce the generation of universal waste, installations need to look at alternative technologies and practices.

b. At this time, the only mercury-free, energy-efficient alternative to mercury-containing light bulbs are products that use light-emitting diodes (LEDs). LEDs are currently used in applications ranging from traffic signals and exit signs, but are

23 March 2010

not suitable for all lighting purposes. LEDs do not radiate light 360 degrees as CFLs and other fluorescent lamps do.

c. For universal waste batteries, currently the best option is to use rechargeable batteries. Over its useful life, each rechargeable battery may substitute for hundreds of single-use batteries.

d. Universal waste pesticides are by definition waste pesticides, so the managing how much of a pesticide is procured or using alternative pest control methods such as native landscaping, using mechanical trapping devices, and natural predators (e.g., insects that eat other insects) can minimize the amount of waste pesticides generated.

e. The simplest approach to decreasing the amount of mercury-containing equipment procured at an installation is to institute a mercury-free purchasing policy. Mercury-free alternatives for equipment typically found in medical environments (one of the largest sources of mercury-containing equipment) can be found through www.sustainablehospitals.org.

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23 March 2010

Appendix C
Definitions Relating to Universal Waste

Ampule.

An airtight vial made of glass, plastic, metal, or any combination of these materials (40 CFR 273.9).

Battery.

A device consisting of one or more electrically connected electrochemical cells that are designed to receive, store, and deliver electric energy. An electrochemical cell is a system consisting of an anode, cathode, and an electrolyte, plus such connections (electrical and mechanical) as may be needed to allow the cell to deliver or receive electrical energy. The term "battery" also includes intact, unbroken batteries from which the electrolyte has been removed (40 CFR 260.10 and 273.9)

In relation to the concept of universal wastes, this term includes all batteries except (40 CFR 273.2(b)):

1. spent lead acid batteries that are managed under 40 CFR 266, Subpart G (reclamation of spent lead acid batteries that are recyclable),
2. batteries as defined above that are not yet wastes under 40 CFR 261, including those that do not meet the criteria for waste generation (see definition of Waste Battery), and
3. batteries as defined above that are not hazardous waste. A battery is a hazardous waste if it exhibits one or more of the characteristics identified in 40 CFR 261, Subpart C.

Destination Facility.

A facility that treats, disposes of, or recycles a particular category of universal waste. A facility at which a particular category of universal waste is only accumulated, is not a destination facility for purposes of managing that category of universal waste. (The management activities of handlers for universal waste batteries and universal waste thermostats are exempt from the definition of a destination facility.) (40 CFR 262.10 and 273.9).

Lamp.

The bulb or tube portion of an electric lighting device. A lamp is specifically designed to produce radiant energy, most often in the ultraviolet, visible, and infrared regions of the electromagnetic spectrum. Examples of common

universal waste electric lamps include, but are not limited to, fluorescent, high intensity discharge, neon, mercury vapor, high pressure sodium, and metal halide lamps (40 CFR 260.10, 273.9).

The following are exempted from the definition of lamp in relation to universal waste (40 CFR 273.5(b)):

1. Lamps that are not yet wastes under 40 CFR 261 (see the definition of Waste Lamp)
2. Lamps that are not hazardous waste. A lamp is a hazardous waste if it exhibits one or more of the characteristics identified in 40 CFR 261.

Large Quantity Handler of Universal Waste.

A universal waste handler (as defined in this section) who accumulates 5,000 kg or more total of universal waste (batteries, pesticides, mercury-containing equipment, or lamps, calculated collectively) at any time. This designation as a large quantity handler of universal waste is retained through the end of the calendar year in which the 5,000 kg limit is met or exceeded (40 CFR 273.9).

Mercury-Containing Equipment.

A device or part of a device (including thermostats, but excluding batteries and lamps) that contains elemental mercury integral to its function (40 CFR 260.10 and 273.9).

The requirements of 40 CFR 273 do not apply to persons managing the following mercury-containing equipment (40 CFR 273.4(b)):

1. Mercury-containing equipment that is not yet a waste under 40 CFR 261.
2. Mercury-containing equipment that is not a hazardous waste. Mercury-containing equipment is a hazardous waste if it exhibits one or more of the characteristics identified in 40 CFR 261, subpart C, or is listed in 40 CFR 261, subpart D.
3. Equipment and devices from which the mercury-containing components have been removed.

Pesticides.

Any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest, or intended for use as a plant regulator, defoliant, or desiccant, other than any article that either (40 CFR 262.10 and 273.9):

1. Is a new animal drug under FFDCA Section 201(w)

2. Is an animal drug that has been determined by regulation of the Secretary of Human Health and Human Services not to be a new animal drug
3. Is an animal feed under FFDCA section 201(x) that bears or contains any substances described by paragraph 1 or 2 of this definition.

Pesticides that are regulated as universal wastes include pesticides that are either (40 CFR 273.3(a)):

1. Recalled pesticides that are stocks of a suspended and canceled pesticide that are a part of a voluntary or mandatory recall under FIFRA Section 19(b), including, but not limited to, those owned by the registrant responsible for conducting the recall
2. Recalled pesticides that are stocks of suspended or canceled pesticides, or a pesticide that is not in compliance with FIFRA, that are part of a voluntary recall by the registrant
3. Stocks of other unused pesticide products that are collected and managed as a part of a waste pesticide collection.

Pesticides that are not universal wastes include (40 CFR 273.3(b)):

1. The following pesticides when disposed of on a farmers own farm in a manner consistent with the label, and the container is triple rinsed:
 - a. Suspended or recalled pesticides that are a part of a voluntary or mandatory recall under FIFRA Section 19(b), including, but not limited to, those owned by the registrant responsible for conducting the recall
 - b. Stocks of suspended or canceled pesticide products that are not in compliance with FIFRA and are part of a voluntary recall by the registrant
 - c. Stocks of other unused pesticide products
2. Pesticides not meeting the definition of a universal waste
3. Pesticides that are not wastes under 40 CFR 261, including those who do not meet the criteria for waste generation or those that are not wastes (see the definition of Waste Pesticide)
4. Pesticides that are not a hazardous waste.

Small Quantity Handler of Universal Waste.

A universal waste handler (as defined in this section) who accumulates less than 5,000 kg or more of universal waste (batteries, pesticides, mercury-containing equipment, or lamps, calculated collectively) at any time (40 CFR 273.9).

23 March 2010

Thermostat.

A temperature control device that contains metallic mercury in an ampule attached to a bimetal sensing element, and mercury-containing ampules that have been removed from these temperature control devices in compliance with the requirements of 40 CFR 273.12(c)(2) or 273.33(c)(2) (40 CFR 262.10 and 273.9).

The following are exempted from the definition of thermostat in relation to universal waste (40 CFR 273.4(b)):

1. Thermostats that are not yet wastes under 40 CFR 261 (see the definition of Waste Thermostat)
2. Thermostats that are not hazardous waste.

Universal Waste.

Any of the following hazardous wastes that are managed under the universal waste requirements of 40 CFR 273 (40 CFR 260.10 and 273.9):

1. Batteries as described in 40 CFR 273.2 (see definition of Battery)
2. Pesticides as described in 40 CFR 273.3 (see definition of Pesticides)
3. Mercury-containing equipment as described in 40 CFR 273.4 (see definition of Mercury-Containing Equipment)
4. Lamps as described in 40 CFR 273.5 (see definition of Lamp).

Universal Waste Handler.

This term means either (40 CFR 262.10 and 273.9):

1. A generator of universal waste
2. The owner or operator of a facility, including all contiguous property, that receives universal waste from other universal waste handlers, accumulates universal waste, and sends universal waste to another universal waste handler, to a destination facility, or to a foreign destination.

This term does not mean:

1. A person who treats (except under the provisions of 40 CFR 273.13(a) or (c), or 273.33(a) or (c), disposes of, or recycles universal waste
2. A person engaged in offsite transportation of a universal waste by air, rail, highway, or water, including a universal waste transfer facility (Revised October 1999; Reviewed March 2000).

Universal Waste Transfer Facility.

Any transportation-related facility including loading

docks, parking areas, storage areas, and other similar areas where shipments of universal waste are held during the normal course of transportation for 10 days or less (40 CFR 273.9).

Universal Waste Transporter.

A person engaged in the offsite transportation of universal waste by air, rail, highway, or water (40 CFR 260.10 and 273.9).

Waste Battery.

A used battery becomes a waste on the date that it is discarded (e.g., when sent for reclamation). An unused battery becomes a waste on the date the handler decides to discard it. See also the definition of Battery (40 CFR 273.2(c)).

Waste Lamp.

A used lamp becomes a waste on the date it is discarded. An unused lamp becomes a waste on the date the handler decides to discard it (40 CFR 273.5(c)).

Waste Mercury-Containing Equipment.

Used mercury-containing equipment becomes a waste on the date it is discarded. Unused mercury-containing equipment becomes a waste on the date the handler decides to discard it (40 CFR 273.4(c)).

Waste Pesticides.

This term applies as follows (40 CFR 273.3(c)):

1. A recalled pesticides becomes a waste on the first date on which both of the following conditions apply:
 - a. The generator of the recalled pesticide agrees to participate in the recall; and
 - b. The person conducting the recall decides to discard (e.g., burn the pesticides for energy recovery) the pesticides.
2. Stocks of unused pesticide products that are collected and managed as part of a waste pesticide collection program becomes a waste on the day the generator decides to discard it.

The following pesticides are not waste (40 CFR 273.3(d)):

1. Recalled pesticides providing the person conducting the recall either:
 - a. Has not made a decision to discard (e.g., burn for energy recovery) the pesticide

23 March 2010

- b. Has made a decision to use a management option that, under 40 CFR 261.2, does not cause the pesticide to be a solid waste (i.e., the selected option is use (other than use constituting disposal), or reuse, or reclamation)
2. Unused pesticide products that are collected and managed as a part of a waste pesticide collection program if the generator of the unused pesticide product has not decided to discard (e.g., burn for energy recovery) them (Reviewed March 2000).

Waste Thermostats.

A used thermostat becomes a waste on the date it is discarded (e.g., sent for reclamation). An unused thermostat becomes a waste on the date the handler decides to discard it (40 CFR 273.4(c)).

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