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1320.	Treated Hazardous Waste Used as Dust Suppressant	FEB 28, 2019
1321.	Decharacterized RCRA Waste - Manifesting and LDR Reporting	ENCORE MAR 7, 2019
1322.	Decharacterized Hazardous Waste Listed Solely for Non-Toxic Characteristics	ENCORE MAR 14, 2019
1323.	Decharacterized Wastes, ≤90-Day Accumulation Time Limits and LDR Storage Prohibition	ENCORE MAR 21, 2019
1324.	Decharacterized Wastes and the LDR Dilution Prohibition	ENCORE MAR 28, 2019
1325.	PCB Decontamination Standard with No Decontamination Performed	ENCORE APR 4, 2019
1326.	PCB Manifest Relief a.k.a., When is a PCB Manifest Not Required?	ENCORE APR 11, 2019
1327.	PCB Manifest Relief a.k.a., When is a PCB Manifest Not Required? – The Sequel	ENCORE APR 18, 2019
1328.	PCB Concentrations and Micrograms per Centimeters Squared (µg/cm ²)	ENCORE APR 25, 2019
1329.	Operating Record vs. Operating Log	ENCORE MAY 2, 2019
1330.	Operating Records Not Referenced in the “Operating Record” Regulations	ENCORE MAY 9, 2019
1331.	Washington State Used Oil and Mixtures with Other Materials	ENCORE MAY 16, 2019
1332.	Used Oil Filter Regulation – The Feds vs. Washington State	ENCORE MAY 23, 2019
1333.	Printed Circuit Board Recycling – Shredded vs. Whole	ENCORE MAY 30, 2019

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TWO MINUTE TRAINING

TO: CH2M HILL PLATEAU REMEDIATION COMPANY

FROM: PAUL W. MARTIN, RCRA Subject Matter Expert
CHPRC Environmental Protection, Hanford, WA

SUBJECT: PRINTED CIRCUIT BOARD RECYCLING – SHREDDED VS. WHOLE

DATE: MAY 30, 2019

<u>CHPRC Projects</u>	<u>CH PRC - Env. Protection</u>	<u>MSA</u>	<u>Hanford Laboratories</u>	<u>Other Hanford Contractors</u>	<u>Other Hanford Contractors</u>
Richard Austin Tania Bates Rene Catlow Richard Clinton Larry Cole Laura Cusack John Dent Lorna Dittmer Eric Erpenbeck Stuart Hildreth Mike Jennings Stephanie Johansen Sasa Kosjerina Melvin Lakes Richard Lipinski Stuart Mortensen Dave Richards Phil Sheely Connie Simiele Jeff Westcott	Jeff Bramson Bob Bullock Frank Carleo Bill Cox Noah Cruz Jeanne Elkins Jonathan Fullmer Ted Hopkins Tad Karschnia Barry Lawrence Jim Leary Diane Leist Mitch Marrott Stewart McMahan Brian Mitcheltree Anthony Nagel Linda Petersen Fred Ruck Sean Sexton Dave Shea Ray Swenson Kat Thompson Wayne Toebe Eric Trotta Daniel Turlington Dave Watson	Brett Barnes Michael Carlson Mike Demiter Kip George Jerry Cammann Jeff Ehlis Garin Erickson Panfilo Gonzalez Jr. Dashia Huff Mark Kamberg Jon McKibben Saul Martinez Matt Mills Carly Nelson Michelle Oates Eric Pennala Jon Perry Christina Robison Christian Seavoy David Shaw John Skoglie Lana Strickling Greg Sullivan	(TBD) <u>DOE RL, ORP, WIPP</u> Mary Beth Burandt Duane Carter Al Farabee Tony McKarns	Bill Bachmann Dean Baker Scott Baker Lucinda Borneman Paul Crane Tina Crane Ron Del Mar John Dorian Mark Ellefson Darrin Faulk Tom Gilmore Rob Gregory James Hamilton Andy Hobbs Ryan Johnson Megan Lerchen Charles (Mike) Lowery Michael Madison Terri Mars Cary Martin Grant McCalmant Steve Metzger Tony Miskho Tom Moon Chuck Mulkey Kirk Peterson	Jean Quigley Dan Saueressig Merrie Schilperoort Joelle Moss Glen Triner Greg Varljen Julie Waddoups Jay Warwick Ted Wooley

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TWO MINUTE TRAINING

SUBJECT: Printed Circuit Board Recycling – Shredded vs. Whole

Q: A customer has two drums of printed circuit boards destined for recycling. One drum contains whole circuit boards and the other drum contains shredded circuit boards. What is the regulatory path for recycling these two types of circuit boards?

A: Concerning whole circuit boards, per an EPA letter dated August 26, 1992, ([RO 14155](#)), EPA stated that used circuit boards are subject to regulation as scrap metal and are therefore exempt from RCRA Subtitle C regulation when recycled. Note that in the [May 12, 1997 Federal Register](#), (page 26013, bottom of middle column starting with “(Please note that whole used circuit boards...), EPA seemed to reverse its position on managing whole circuit boards as scrap metal since liquid mercury and batteries were not within the scope of the definition of scrap metal. However, after receiving feedback from the circuit board industry EPA re-clarified its position in the [May 26, 1998 Federal Register](#) (page 28629) that whole circuit boards can be managed as scrap metal since the amounts of liquid mercury and batteries on circuit boards are minimal.

Then per [WAC173-303-120\(2\)\(a\)\(iv\)](#) [[40 CFR 261.6\(a\)\(3\)\(ii\)](#)], scrap metal is basically not regulated as a dangerous waste unless it is managed or released in a manner that is a threat to public health or the environment. Therefore, the regulatory path for whole circuit boards is via the scrap metal exclusion.

Concerning shredded circuit boards, [WAC 173-303-071](#), “Excluded categories of waste”, and section (3), paragraph (gg), [[40 CFR 261.4\(a\)\(14\)](#)] shredded circuit boards being recycled are basically exempt from dangerous waste regulations provided that the shredded circuit boards are stored in containers to prevent a release to the environment prior to recovery. The shredded circuit boards must be free of mercury switches, mercury relays, nickel-cadmium batteries, and lithium batteries. Since shredded circuit boards destined for recycling are not solid wastes, they cannot be hazardous wastes. As long as the customer complies with WAC 173-303-071(3)(gg) the shredded circuit boards can be recycled and not be subject to any other parts of [WAC 173-303](#). Therefore, the regulatory path for shredded circuit boards is via the dangerous waste exclusions.

Note that if whole or shredded circuit boards are destined for disposal, as opposed to recycle, the boards are solid waste subject to dangerous waste designations and appropriate waste management as dangerous or nondangerous waste.

SUMMARY:

- Whole circuit boards are not regulated as dangerous waste when recycled per the scrap metal exclusion at WAC 173-303-120(2)(a)(iv).
- Shredded circuit boards are not regulated as dangerous waste when recycled per the dangerous waste exclusion at WAC 173-303-071(3)(gg).
- Both regulatory paths are dependent upon the circuit boards being recycled as opposed to disposed. If disposed, the boards are subject to dangerous waste designations and applicable waste management.

Excerpts from WAC 173-303-071, WAC 173-303-120, and the May 12, 1997, and the May 26, 1998, Federal Registers are attached to the e-mail. If you have any questions, please contact me at Paul.W.Martin@rl.gov or at (509) 376-6620.

FROM: Paul W. Martin

DATE: 5/30/19

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TWO MINUTE TRAINING – ATTACHMENT

SUBJECT: Printed Circuit Board Recycling – Shredded vs. Whole

WAC 173-303-071 Excluded categories of waste.

(3) Exclusions. The following categories of waste are excluded from the requirements of chapter 173-303 WAC, except for [WAC 173-303-050](#) [Department of ecology cleanup authority], [173-303-145](#) [Spills and discharges into the environment] and [173-303-960](#) [Special powers and authorities of the department], and as otherwise specified:

(gg) Shredded circuit boards being recycled: Provided, that they are:

(i) Stored in containers sufficient to prevent a release to the environment prior to recovery; and

(ii) Free of mercury switches, mercury relays and nickel-cadmium batteries and lithium batteries.

WAC 173-303-120 Recycled, reclaimed, and recovered wastes.

(2)

(a) The following recyclable materials are solid wastes and sometimes are dangerous wastes. However, they are subject only to the requirements of (b) of this subsection, WAC 173-303-050 [Department of ecology cleanup authority], 173-303-145 [Spills and discharges into the environment] and 173-303-960 [Special powers and authorities of the department]:

(iv) Scrap metal that is not excluded under WAC 173-303-071(3)(ff);

(b) Any recyclable material listed in (a) of this subsection will be subject to the applicable requirements listed in subsection (4) of this section if the department determines, on a case-by-case basis, that:

(i) It is being accumulated, used, reused, or handled in a manner that poses a threat to public health or the environment; or

(ii) Due to the dangerous constituent(s) in it, any use or reuse would pose a threat to public health or the environment. Such recyclable material will be listed in [WAC 173-303-016](#)(6) [Inherently waste-like materials, e.g., dioxin wastes].

TWO MINUTE TRAINING – ATTACHMENT

SUBJECT: Printed Circuit Board Recycling – Shredded vs. Whole

Federal Register / Vol. 62, No. 91 / Monday, May 12, 1997 / Rules and Regulations **26013**

“Please note that whole used circuit boards which contain mercury switches, mercury relays, nickel cadmium batteries, or lithium batteries also do not meet the definition of scrap metal because mercury (being a liquid metal) and batteries are not within the scope of the definition of scrap metal.”

Federal Register / Vol. 63, No. 100 / Tuesday, May 26, 1998 / Rules and Regulations **28629**

XI. Clarification of the RCRA Exclusion of Shredded Circuit Boards

In the May 12, 1997 final rule on Land Disposal Restrictions, the Environmental Protection Agency (EPA) excluded shredded circuit boards from the definition of solid waste conditioned on containerized storage prior to recovery. To be covered by this exclusion shredded circuit boards must be free of mercury switches, mercury relays, nickel-cadmium batteries or lithium batteries. On a related issue, current Agency policy states that *whole* circuit boards may meet the definition of scrap metal and therefore be exempt from hazardous waste regulation. In a parenthetical statement in the May 12, 1997 rule, the Agency asserted that whole used circuit boards which contain mercury switches, mercury relays, nickel-cadmium batteries, or lithium batteries also do not meet the definition of scrap metal because mercury (being a liquid metal) and batteries are not within the scope of the definition of scrap metal. The preamble cited [50 FR 614, 624 \(1985\)](#). [January 4, 1985]

Members of the electronics industry expressed concern to the Agency about the preamble statement regarding the regulatory status of whole used circuit boards which contain mercury switches, mercury relays, nickel-cadmium batteries, or lithium batteries. The electronics industry indicated that its member have developed a sophisticated asset/materials recovery system to collect and transport whole used circuit boards to processing facilities. The industry explained that the boards are sent to processing facilities for evaluation (continued use, reuse or reclamation) where the switches and the types of batteries are generally removed by persons with the appropriate knowledge and tools for removing these materials. Once these materials are removed from the boards, they become a newly generated waste subject to a hazardous waste determination. If they fail a hazardous waste characteristic, they are handled as hazardous waste, otherwise they are managed as a solid waste. Information was also provided regarding the quantity of mercury on these switches and on the physical state in which they are found on the boards. The information indicates that the mercury switches and relays on circuit boards from some typical applications contain between 0.02–0.08 grams of mercury and are encased in metal which is then coated in epoxy prior to attachment to the boards.

In today’s final rule, the Agency recognizes that the preamble statement in the May 12, 1997 final rule is overly broad in that it suggested that the scrap metal exemption would not apply to whole used circuit boards containing the kind of minor battery or mercury switch components and that are being sent for continued use, reuse, or recovery. It is not the Agency’s current intent to regulate under RCRA circuit boards containing minimal quantities of mercury and batteries that are protectively packaged to minimize dispersion of metal constituents. Once these materials are removed from the boards, they become a newly generated waste subject to a hazardous waste determination. If they meet the criteria to be classified as a hazardous waste, they must be handled as hazardous waste, otherwise they must be managed as a solid waste.

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