

<u>SUBJECT</u>		<u>DATE</u>
1448.	Definitions of Inactive Portion, Active Portion and Closed Portion of a RCRA TSDF	AUG 12, 2021
1449.	Dangerous Waste Designations and Dangerous Waste Code Determinations	AUG 19, 2021
1450.	Method Detection Limits and Hazardous Waste Determinations	ENCORE
1451.	Method Detection Limits and Hazardous Waste Determinations II	ENCORE
1452.	Totals Analysis vs. TCLP and Dividing by 20	ENCORE
1453.	Decharacterized RCRA Waste - Manifesting and LDR Reporting	ENCORE
1454.	Decharacterized Hazardous Waste Listed Solely for Non-Toxic Characteristics	ENCORE
1455.	Decharacterized Wastes and the LDR Dilution Prohibition	ENCORE
1456.	The "Derived from Rule", the "Mixtures Rule", and the "Contained-In Policy"	ENCORE
1457.	Hazardous Debris and Options to Exclude as a Dangerous Waste	OCT 14, 2021
1458.	Regulatory Status of Characteristic Baghouse Dust Destined for Reclamation	OCT 21, 2021
1459.	RCRA Point of Generation and Baghouse Dust Collection Systems	OCT 28, 2021
1460.	Pumps Containing Liquid Hazardous Wastes and Liquids in Landfill Prohibition	ENCORE
1461.	Pumps Containing Liquid Hazardous Waste and Land Disposal Restrictions	ENCORE
1462.	Pumps Containing Liquid Hazardous Wastes and RCRA Empty Containers	NOV 18, 2021
1463.	Multiple Characteristic Hazardous Waste Codes and Underlying Hazardous Constituents	ENCORE
1464.	LDR Notifications/Certifications and Generator Permitted Treatment, Storage, or Disposal Facility	ENCORE
1465.	Multiple Characteristic and Listed Hazardous Waste Codes and the "in lieu of" LDR Principle	ENCORE
1466.	Universal Wastes - Recycling versus Disposal	ENCORE
1467.	'Twas the Night Before Christmas – The Twenty-Eighth Edition	DEC 24, 2021
1468.	Spent Lead Acid Batteries vs., Universal Wastes	ENCORE
1469.	Hazardous Debris and Radioactively Contaminated Cadmium Batteries	ENCORE
1470.	Hazardous Debris and Radioactively Contaminated Lead-Acid Batteries	ENCORE
1471.	Mercury Wet Cell Batteries - Debris or Not Debris	ENCORE
1472.	Hazardous Debris and Non-Radioactive Lead Acid Batteries	ENCORE
1473.	Hazardous Debris and LDR High/Low Mercury Subcategories	ENCORE
1474.	Central Accumulation Areas and the ≤90-day Time Frame	ENCORE
1475.	Central Accumulation Areas with Satellite Accumulation	FEB 17, 2022
1476.	Definition of RCRA Empty Tank	ENCORE
1477.	RCRA Empty Acutely Hazardous Waste Containers	ENCORE
1478.	The RCRA Definition of Acute Hazardous Waste	MAR 10, 2022
1479.	Regulatory Status of Liquids and Solids Separated from D001 High TOC Wastes	ENCORE
1480.	Generator Accumulation at a Permitted Storage Facility	MAR 24, 2022
1481.	Generator Accumulation and Maximum Inventory of Dangerous Waste Onsite at a RCRA TSD	MAR 31, 2022
1482.	LDR Storage Prohibitions and the One-Year Rule	ENCORE
1483.	LDR Storage Prohibitions and Treated Hazardous Wastes	ENCORE
1484.	LDR Storage Prohibitions and Treated Hazardous Debris or Contaminated Soil	ENCORE
1485.	Satellite Accumulation, the Three-Day Rule, and Washington State vs. EPA	ENCORE
1486.	Satellite Accumulation Areas and the Three-Day Accumulation Time Limit	ENCORE
1487.	Satellite Accumulation Areas and the Three-Day vs., the 72-Hour Accumulation Time Limit	MAY 12, 2022
1488.	RCRA and New Point of Generation	ENCORE
1489.	High Mercury vs. Low Mercury and Point of Generation	ENCORE
1490.	Nonwastewater vs., Wastewater – The LDR Definitions	JUN 2, 2022
1491.	LDR Treatability Groups and Applicability of LDR Treatment Standards	JUN 9, 2022
1492.	Land Disposal Restricted vs. Land Disposal Prohibited	ENCORE
1493.	RCRA Empty Containers vs. TSCA PCB Decontaminated Containers - Scenario I	ENCORE
1494.	RCRA Empty Containers vs. TSCA PCB Decontaminated Containers - Scenario II	ENCORE
1495.	RCRA Empty Containers vs. TSCA PCB Decontaminated Containers - Scenario III	ENCORE
1496.	MACROencapsulation and a Jacket of Inert Inorganic Materials	JUL 14, 2022
1497.	MACROencapsulation vs. macroencapsulation	ENCORE

Approved for Public Release;  
Further Dissemination Unlimited

**DISCLAIMER** - "Two Minute Training" ("2MT") is a peer-to-peer communication, presented to share the benefit of the author's work experience with other professionals, who can independently evaluate his analysis. 2MT does not necessarily reflect the opinions, conclusions or policies of the author's past or current employers or the US Department of Energy. The author's employers do not take any responsibility for the accuracy of its conclusions. 2MT is not intended to be used as authoritative guidance or direction by any person or entity. Anyone transmitting or reproducing it is prohibited from modifying its content, this disclaimer, or other text, or republishing it independent of its original source.

## TWO MINUTE TRAINING

**TO:** CENTRAL PLATEAU CLEANUP COMPANY

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

**SUBJECT:** *MACROENCAPSULATION VS. MACROENCAPSULATION*

**DATE:** JULY 21, 2022

<u>CPCCo Projects</u>	<u>CPCCo Functionals</u>	<u>HMIS</u>	<u>Hanford Laboratories</u>	<u>Other Hanford Contractors</u>	<u>Other Hanford Contractors</u>
Tania Bates	Jeff Bramson	Morgan Baker	Dean Baker	Bill Bachmann	Dan Saueressig
Theresa Boles	Bob Bullock	Brett Barnes	Linda Conlin	Scott Baker	Lana Strickling
Justin Bolles	Frank Carleo	Curt Clement	Bailey Hardy	Michael Carlson	Joelle Moss
James Brack	Bob Cathel	Mike Demiter	Garrett Knutson	Danielle Collins	Greg Varljen
Rene Catlow	Stacy Cutter	Kip George	Eric Van Mason	Paul Crane	Julie Waddoups
Peter Ceton	Jeanne Elkins	Jerry Cammann	Melanie Myers	Tina Crane	Jay Warwick
Richard Clinton	Jonathan Fullmer	Kelly Elsethagen	<u>DOE RL, ORP, WIPP</u>	Ron Del Mar	Ted Wooley
Patty Drago	Randal Fox	Garin Erickson		John Dorian	
Paul Fernandez	Sarah Horn	Katie Hall	Duane Carter	Mark Ellefson	
Ryan Fisher	John Hultman	Dashia Vander Sys	Ingrid Colton	Darrin Faulk	
Andrew Getz	Julie Johanson	Mark Kamberg	Tony McKarns	James Hamilton	
Cory Grabeel	Mitch Marrott	Jon McKibben	Bryan Trimberger	Leah Hare	
Lawanda Grow	Morgan Matson	Saul Martinez	Robin Varljen	Andy Hobbs	
Char Hall	Stewart McMahand	Matt Mills	Allison Wright	Stephanie Johansen	
Stuart Hildreth	Carlie Michaelis	Carly Nelson		Ryan Johnson	
Aprill Jivelekas	Brian Mitcheltree	Eric Pennala		Mike Lowery	
Sasa Kosjerina	Anthony Nagel	Jon Perry		Michael Madison	
William Krueger	Chris Plager	Dave Richards		Terri Mars	
Richard Lipinski	Linda Petersen	Christian Seavoy		Steve Metzger	
Stuart Mortensen	Brent Porter	David Shaw		Tony Miskho	
Edward Myers	Sean Sexton	John Skoglie		Tom Moon	
Trey Reppe	Dave Shea	Greg Sullivan		Chuck Mulkey	
Melissa Sahn-dame	Deborah Singleton			Michelle Oates	
Seth Slater	Dale Snyder			Kirk Peterson	
Phil Sheely	Britt Wilkins				
Kat Thompson	Jennifer Williams				
Jeff Westcott					
Richard Willson					
Nick Wood					
Jon Wright					

Approved for Public Release;  
Further Dissemination Unlimited

**DISCLAIMER** - "Two Minute Training" ("2MT") is a peer-to-peer communication, presented to share the benefit of the author's work experience with other professionals, who can independently evaluate his analysis. 2MT does not necessarily reflect the opinions, conclusions or policies of the author's past or current employers or the US Department of Energy. The author's employers do not take any responsibility for the accuracy of its conclusions. 2MT is not intended to be used as authoritative guidance or direction by any person or entity. Anyone transmitting or reproducing it is prohibited from modifying its content, this disclaimer, or other text, or republishing it independent of its original source.

## TWO MINUTE TRAINING

**SUBJECT:** MACROencapsulation vs. macroencapsulation

**Q:** Last week's Two Minute Training (2MT), referenced MACROencapsulation and macroencapsulation. Please expand on this land disposal restrictions (LDR) treatment standard concept. Example:

A customer has a container of radioactive lead solids (RLS) and another container of hazardous debris. Both wastestreams exhibit the characteristic of lead, D008. For the RLS, the LDR treatment standards at [40 CFR 268.40](#), state that the RLS waste must be treated via "MACRO" - the EPA five-letter specified technology code for macroencapsulation as defined at [40 CFR 268.42](#). For the hazardous debris, the LDR treatment standards at [40 CFR 268.45](#), state that the hazardous debris can be treated via "macroencapsulation". The customer understands that hazardous debris could be macroencapsulated via placement in a welded-shut, stainless steel container. Could the customer macroencapsulate the RLS in the same way as debris, i.e., place the RLS in a welded-shut, stainless steel drum and meet MACRO standards?

**A:** Per 40 CFR 268.42, the definition of "MACRO" is:

"Macroencapsulation with surface coating materials such as polymeric organics (e.g., resins and plastics) or with a jacket of inert inorganic materials to substantially reduce surface exposure to potential leaching media. Macroencapsulation specifically does not include any material that would be classified as a tank or container according to [40 CFR 260.10](#)." (See definition of container and tank attached).

Per 40 CFR 268.45, the definition of "macroencapsulation" is:

"Application of surface coating materials such as polymeric organics (e.g., resins and plastics) or use of a jacket of inert inorganic materials to substantially reduce surface exposure to potential leaching media."

The difference between the definition of MACRO at 268.42 and the definition of macroencapsulation at 268.45 is that the MACRO definition specifically excludes the use of tanks or containers in meeting the LDR treatment standard of macroencapsulation.

Per an EPA letter dated September 19, 1995, ([13762](#)) the prohibition against using tanks and containers was intentionally not included in the definition of macroencapsulation for treating hazardous debris. This provided more flexibility in the treatment of hazardous debris, i.e., tanks and containers could be used for macroencapsulation if the tanks or containers are non-corroding, e.g., stainless steel.

Therefore, the customer could use a welded-shut, stainless steel drum for the macroencapsulation of hazardous debris. However, the customer could not use a welded-shut, stainless steel drum for the MACRO of RLS, since containers are specifically prohibited from the MACROencapsulation definition. The RLS must be macroencapsulated with a surface coating or a jacket of inert inorganic material per 40 CFR 268.42.

### SUMMARY:

- Radioactive lead solids must be treated via macroencapsulation (MACRO) as defined at 268.42.
- Hazardous debris can be treated via macroencapsulation as defined at 268.45.
- The difference in the two definitions is that the 40 CFR 268.42 MACRO prohibits the use of tanks or containers.

Excerpts from 40 CFR 260 and 268 and the September 19, 1995, EPA letter are attached to the e-mail. If you have any questions, contact me at [Paul W Martin@rl.gov](mailto:Paul_W_Martin@rl.gov) or at (509) 376-6620.

**FROM:** Paul W. Martin

**DATE:** 7/21/2022

**FILE:** 2MT\2022\072122.rtf

**PG:** 1

**DISCLAIMER** - "Two Minute Training" ("2MT") is a peer-to-peer communication, presented to share the benefit of the author's work experience with other professionals, who can independently evaluate his analysis. 2MT does not necessarily reflect the opinions, conclusions or policies of the author's past or current employers or the US Department of Energy. The author's employers do not take any responsibility for the accuracy of its conclusions. 2MT is not intended to be used as authoritative guidance or direction by any person or entity. Anyone transmitting or reproducing it is prohibited from modifying its content, this disclaimer, or other text, or republishing it independent of its original source.

## TWO MINUTE TRAINING - ATTACHMENT

**SUBJECT: MACRO**encapsulation vs. macroencapsulation

**40 CFR 268.40**                      **Applicability of treatment standards.**

WASTE CODE	TREATMENT STANDARDS FOR HAZARDOUS WASTE NOTE: NA means not applicable			
	WASTE DESCRIPTION AND TREATMENT/ REGULATORY SUBCATEGORY	REGULATED HAZARDOUS CONSTITUENTS		NONWASTEWATER
		Common Name	CAS No.	Concentration in mg/kg unless noted as "mg/l TCLP"; or Technology Code
D008	Radioactive Lead Solids Subcategory (Note: these lead solids include, but are not limited to all forms of lead shielding and other elemental forms of lead. These lead solids do not include treatment residuals such as hydroxide sludges, other wastewater treatment residuals, or incinerator ashes that can undergo conventional pozzolanic stabilization, nor do they include organo-lead materials that can be incinerated and stabilized as ash. This subcategory consists of nonwastewaters only.)	Lead	7439-92-1	<b>MACRO</b>

**40 CFR 268.42**                      **Treatment standards expressed as specified technologies.**

Table 1.                      Technology Codes and Description of Technology-Based Standards

Technology code	Description of technology-based standards
<b>MACRO:</b>	<b>Macroencapsulation</b> with surface coating materials such as polymeric organics (e.g., resins and plastics) or with a jacket of inert inorganic materials to substantially reduce surface exposure to potential leaching media. Macroencapsulation specifically does not include any material that would be classified as a tank or container according to 40 CFR 260.10.

**40 CFR 268.45**                      **Treatment standards for hazardous debris.**

Table 1.                      Alternative Treatment Standards For Hazardous Debris

Technology description	Performance and/or design and operating standard	Contaminant restrictions
C. Immobilization Technologies 1. <b>Macroencapsulation:</b> Application of surface coating materials such as polymeric organics (e.g., resins and plastics) or use of a jacket of inert inorganic materials to substantially reduce surface exposure to potential leaching media.	Encapsulating material must completely encapsulate debris and be resistant to degradation by the debris and its contaminants and materials into which it may come into contact after placement (leachate, other waste, microbes).	None.

**40 CFR 260.10**                      **Definitions.**

*Container* means any portable device in which a material is stored, transported, treated, disposed of, or otherwise handled.

*Tank* means a stationary device, designed to contain an accumulation of hazardous waste which is constructed primarily of non-earthen materials (e.g., wood, concrete, steel, plastic) which provide structural support.

**FROM:** Paul W. Martin

**DATE:** 7/21/2022

**FILE:** 2MT\2022\072122.rtf

**PG:** 2

**DISCLAIMER** - "Two Minute Training" ("2MT") is a peer-to-peer communication, presented to share the benefit of the author's work experience with other professionals, who can independently evaluate his analysis. 2MT does not necessarily reflect the opinions, conclusions or policies of the author's past or current employers or the US Department of Energy. The author's employers do not take any responsibility for the accuracy of its conclusions. 2MT is not intended to be used as authoritative guidance or direction by any person or entity. Anyone transmitting or reproducing it is prohibited from modifying its content, this disclaimer, or other text, or republishing it independent of its original source.

## TWO MINUTE TRAINING -ATTACHMENT

**SUBJECT:** MACROencapsulation vs. macroencapsulation

FAXBACK 13762

PPC 9554.1995(02)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

September 19, 1995

Mr. Kevin J. Igli  
Vice President, Environment, Health & Safety  
Chemical Waste Management, Inc.  
3001 Butterfield Road  
Oak Brook, Illinois 60521 .

Dear Mr. Igli:

Thank you for your letter of June 15, 1995, regarding macroencapsulation of hazardous debris. You referred to an interpretive guidance memorandum sent by EPA's Office of Solid waste to EPA Region VIII on February 16, 1994, regarding the macroencapsulation of mixed hazardous/radioactive debris waste, and requested clarification on the memorandum's applicability. Specifically, you requested EPA's determination on whether CWM's macroencapsulation process addresses the requirements of 40 CFR 268.45, Table 1.

As your letter pointed out, EPA has specified two definitions of macroencapsulation: a specified technology for D008 radioactive lead solids, and one for hazardous debris. In 40 CFR 268.42, Table 3, EPA specified for D008 radioactive lead solids a required method of treatment, macroencapsulation. **Macroencapsulation is defined in 268.42, Table 1 as:**

Macroencapsulation with surface coating materials such as polymeric organics (e.g., resins and plastics) or with a jacket of inert inorganic materials to substantially reduce surface exposure to potential leaching media. Macroencapsulation specifically does not include any material that would be classified as a tank or container according to 40 CFR 260.10.

**EPA defined macroencapsulation for hazardous debris at 268.45 as:**

Application of surface coating materials such as polymeric organics (e.g., resins and plastics) or of a jacket of inert inorganic materials to substantially reduce surface exposure to potential leaching media.

Obviously, the only difference between the definitions is that the prohibition against using tanks and containers was not included in the definition of macroencapsulation for treating hazardous debris. Thus, the Agency provided more flexibility in treatment for hazardous debris by not specifically prohibiting the use of tanks and containers.

Your letter describes CWM's macroencapsulation process. A jacket of inert inorganic material is placed around the hazardous debris as the encapsulating agent in a high-density polyethylene vault. The lid of the vault is secured, and the unit is disposed in a subtitle C (hazardous waste) landfill.

It is EPA's determination that your treatment process meets the definition of macroencapsulation for hazardous debris, subject to an evaluation that the tank or container is structurally sound and resistant to degradation, in order to substantially reduce exposure to potential leaching media. As you allude to in your letter, merely placing hazardous debris in a tank or container, except under special circumstances where the container is made of noncorroding materials (e.g.,

**FROM:** Paul W. Martin

**DATE:** 7/21/2022

**FILE:** 2MT\2022\072122.rtf

**PG:** 3

**DISCLAIMER** - "Two Minute Training" ("2MT") is a peer-to-peer communication, presented to share the benefit of the author's work experience with other professionals, who can independently evaluate his analysis. 2MT does not necessarily reflect the opinions, conclusions or policies of the author's past or current employers or the US Department of Energy. The author's employers do not take any responsibility for the accuracy of its conclusions. 2MT is not intended to be used as authoritative guidance or direction by any person or entity. Anyone transmitting or reproducing it is prohibited from modifying its content, this disclaimer, or other text, or republishing it independent of its original source.

## TWO MINUTE TRAINING - ATTACHMENT

**SUBJECT:** MACROencapsulation vs. macroencapsulation

stainless steel), would not fulfill the macroencapsulation treatment standard. State or EPA Regional authorities can best evaluate if the design criteria and operation procedures are sufficient.

EPA does not view this as a reversal of its previous position in its memorandum of February 18, 1994. Rather, it is clarifying that for the treatment of hazardous debris, the definition of macroencapsulation in 268.45 should be used, and for the treatment of D008 radioactive lead solids, the definition in 268.42 should be used.

Hopefully, this response addresses your concerns. If you have further questions, do not hesitate to give me a call on (703) 308-8434.

Sincerely,

Richard Kinch  
Chief  
Waste Treatment Branch

cc: Fredrick Moore, Oregon DEQ  
Bruce Long, Region X, Oregon Operations Office

RO 13762