

<u>SUBJECT</u>		<u>DATE</u>
1448.	Definitions of Inactive Portion, Active Portion and Closed Portion of a RCRA TSD/F	AUG 12, 2021
1449.	Dangerous Waste Designations and Dangerous Waste Code Determinations	AUG 19, 2021
1450.	Method Detection Limits and Hazardous Waste Determinations	ENCORE AUG 26, 2021
1451.	Method Detection Limits and Hazardous Waste Determinations II	ENCORE SEP 2, 2021
1452.	Totals Analysis vs. TCLP and Dividing by 20	ENCORE SEP 9, 2021
1453.	Decharacterized RCRA Waste - Manifesting and LDR Reporting	ENCORE SEP 16, 2021
1454.	Decharacterized Hazardous Waste Listed Solely for Non-Toxic Characteristics	ENCORE SEP 23, 2021
1455.	Decharacterized Wastes and the LDR Dilution Prohibition	ENCORE SEP 30, 2021
1456.	The "Derived from Rule", the "Mixtures Rule", and the "Contained-In Policy"	ENCORE OCT 7, 2021
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 NOV 4, 2021
1461.	Pumps Containing Liquid Hazardous Waste and Land Disposal Restrictions	ENCORE NOV 11, 2021
1462.	Pumps Containing Liquid Hazardous Wastes and RCRA Empty Containers	NOV 18, 2021
1463.	Multiple Characteristic Hazardous Waste Codes and Underlying Hazardous Constituents	ENCORE NOV 23, 2021
1464.	LDR Notifications/Certifications and Generator Permitted Treatment, Storage, or Disposal Facility	ENCORE DEC 2, 2021
1465.	Multiple Characteristic and Listed Hazardous Waste Codes and the "in lieu of" LDR Principle	ENCORE DEC 9, 2021
1466.	Universal Wastes - Recycling versus Disposal	ENCORE DEC 16, 2021
1467.	'Twas the Night Before Christmas – The Twenty-Eighth Edition	DEC 24, 2021
1468.	Spent Lead Acid Batteries vs., Universal Wastes	ENCORE DEC 30, 2021
1469.	Hazardous Debris and Radioactively Contaminated Cadmium Batteries	ENCORE JAN 6, 2022
1470.	Hazardous Debris and Radioactively Contaminated Lead-Acid Batteries	ENCORE JAN 13, 2022
1471.	Mercury Wet Cell Batteries - Debris or Not Debris	ENCORE JAN 20, 2022
1472.	Hazardous Debris and Non-Radioactive Lead Acid Batteries	ENCORE JAN 27, 2022
1473.	Hazardous Debris and LDR High/Low Mercury Subcategories	ENCORE FEB 3, 2022
1474.	Central Accumulation Areas and the ≤90-day Time Frame	ENCORE FEB 10, 2022
1475.	Central Accumulation Areas with Satellite Accumulation	FEB 17, 2022
1476.	Definition of RCRA Empty Tank	ENCORE FEB 24, 2022
1477.	RCRA Empty Acutely Hazardous Waste Containers	ENCORE MAR 3, 2022
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 MAR 17, 2022
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 APR 7, 2022
1483.	LDR Storage Prohibitions and Treated Hazardous Wastes	ENCORE APR 14, 2022
1484.	LDR Storage Prohibitions and Treated Hazardous Debris or Contaminated Soil	ENCORE APR 21, 2022
1485.	Satellite Accumulation, the Three-Day Rule, and Washington State vs. EPA	ENCORE APR 28, 2022
1486.	Satellite Accumulation Areas and the Three-Day Accumulation Time Limit	ENCORE MAY 5, 2022
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 MAY 19, 2022
1489.	High Mercury vs. Low Mercury and Point of Generation	ENCORE MAY 26, 2022
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 JUN 16, 2022
1493.	RCRA Empty Containers vs. TSCA PCB Decontaminated Containers - Scenario I	ENCORE JUN 23, 2022
1494.	RCRA Empty Containers vs. TSCA PCB Decontaminated Containers - Scenario II	ENCORE JUN 30, 2022
1495.	RCRA Empty Containers vs. TSCA PCB Decontaminated Containers - Scenario III	ENCORE JUL 7, 2022
1496.	MACROencapsulation and a Jacket of Inert Inorganic Materials	JUL 14, 2022

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## TWO MINUTE TRAINING

**TO:** CENTRAL PLATEAU CLEANUP COMPANY

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

**SUBJECT:** MACROENCAPSULATION AND A JACKET OF INERT INORGANIC MATERIALS

**DATE:** JULY 14, 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 Theresa Boles Justin Bolles James Brack Rene Catlow Peter Ceton Richard Clinton Patty Drago Paul Fernandez Ryan Fisher Andrew Getz Cory Grabeel Lawanda Grow Char Hall Stuart Hildreth Aprill Jivelekas Sasa Kosjerina William Krueger Richard Lipinski Stuart Mortensen Edward Myers Trey Reppe Melissa Sahn-dame Seth Slater Phil Sheely Kat Thompson Jeff Westcott Richard Willson Nick Wood Jon Wright	Jeff Bramson Bob Bullock Frank Carleo Bob Cathel Stacy Cutter Jeanne Elkins Jonathan Fullmer Randal Fox Sarah Horn John Hultman Julie Johanson Mitch Marrott Morgan Matson Stewart McMahand Carlie Michaelis Brian Mitcheltree Anthony Nagel Chris Plager Linda Petersen Brent Porter Sean Sexton Dave Shea Deborah Singleton Dale Snyder Britt Wilkins Jennifer Williams	Morgan Baker Brett Barnes Curt Clement Mike Demiter Kip George Jerry Cammann Kelly Elsethagen Garin Erickson Katie Hall Dashia Vander Sys Mark Kamberg Jon McKibben Saul Martinez Matt Mills Carly Nelson Eric Pennala Jon Perry Dave Richards Christian Seavoy David Shaw John Skoglie Greg Sullivan	Dean Baker Linda Conlin Bailey Hardy Garrett Knutson Eric Van Mason Melanie Myers  <u>DOE RL, ORP, WIPP</u>  Duane Carter Ingrid Colton Tony McKarns Bryan Trimberger Robin Varljen Allison Wright	Bill Bachmann Scott Baker Michael Carlson Danielle Collins Paul Crane Tina Crane Ron Del Mar John Dorian Mark Ellefson Darrin Faulk James Hamilton Leah Hare Andy Hobbs Stephanie Johansen Ryan Johnson Megan Lerchen Mike Lowery Michael Madison Terri Mars Steve Metzger Tony Miskho Tom Moon Chuck Mulkey Michelle Oates Kirk Peterson	Dan Saueressig Lana Strickling Joelle Moss Greg Varljen Julie Waddoups Jay Warwick Ted Wooley

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## TWO MINUTE TRAINING

**SUBJECT:** MACROencapsulation and a Jacket of Inert Inorganic Materials

**Q:** The definition of macroencapsulation (MACRO) at [40 CFR 268.42](#) includes “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](#).” Concerning the phrase “a jacket of inert inorganic materials”, what is the basis for this phrase and what is an example of a jacket of inert inorganic material that meets the technology-based standard of macroencapsulation, i.e., MACRO?

**A:** EPA clarified in a letter dated December 27, 1990 ([RO 13437](#)), that the technology-based land disposal restrictions (LDR) treatment standard of MACRO at 40 CFR 268.42, explicitly prohibits containerization of wastes or materials in a tank or container. Note that the container/tank prohibition is specific to MACRO under 40 CFR 268.42 and does not apply to macroencapsulation of hazardous debris under [40 CFR 268.45](#), i.e., a stainless-steel drum could be used to macroencapsulate hazardous debris.

This same EPA letter addressed a situation where the U.S. Naval Nuclear Propulsion Program wanted to land dispose of defueled submarine reactor compartments. EPA stated:

*“The information provided by the Navy indicated that the ‘Jacket of inert inorganic materials’ (i.e., the steel surrounding the lead) could ‘substantially reduce surface exposure to potential leaching media’ and that due to their size and structure these compartments would not be classified as a tank or container according to the definitions in 40 CFR 260.10. EPA purposely modified the proposed standard for D008 radioactive lead solids (MACRO) to include ‘Jackets of inorganic materials’ in order to specifically account for these submarine reactor compartments. EPA felt that it was necessary to add the language to the definition of macroencapsulation to prevent the ‘jacket of inorganic material’ from being interpreted as including materials that are merely containers or drums.”*

Therefore the basis for the phrase “a jacket of inert inorganic material” concerned land disposal of U.S. Navy defueled submarine reactor compartments. The steel hull surrounding the lead remaining in the reactor compartment, is an example of a jacket of inert inorganic material that substantially reduces surface exposure to potential leaching media. And who can argue with that?

### SUMMARY:

- The definition of MACRO at 40 CFR 268.42 includes the phrase, “with a jacket of inert inorganic materials” and a prohibition on using containers or tanks to achieve macroencapsulation.
- EPA added the prohibition to prevent containers from being defined as inert inorganic jackets.
- The U.S. Navy’s defueled submarine reactor compartments are examples of achieving the 40 CFR 268.42 MACRO treatment standard via a jacket of inert inorganic material.

The December 27, 1990, EPA letter is attached to the e-mail. If you have any questions, please contact me at [Paul W Martin@rl.gov](mailto:Paul_W_Martin@rl.gov) or at (509) 376-6620.

**FROM:** Paul W. Martin

**DATE:** 7/14/2022

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## TWO MINUTE TRAINING - ATTACHMENT

**SUBJECT:** MACROencapsulation and a Jacket of Inert Inorganic Materials

9554.1990(14)

DEC 27, 1990

TREATMENT STANDARDS FOR CERTAIN MIXED RADIOACTIVE WASTES

OFFICE OF SOLID WASTE AND EMERGENCY RESPONSE

Mr. Kevin S. Dunn, Project Manager  
Environmental Policy Center  
Law Companies Environmental Group  
1828 L Street, N.W., Suite 711  
Washington, D.C. 20036

Dear Mr. Dunn:

This letter is in response to your letter dated November 16, 1990, requesting clarification on certain issues regarding treatment standards for certain mixed radioactive wastes.

With regards to Question 1 (as referred to in your letter), "placement in a heavy stainless-steel box and welding the box closed" would not be considered to comply with the standard identified as "MACRO" in 268.42 Table 1 ([55 FR 22693, June 1, 1990](#)). This standard is quite clearly described in regulatory language in 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" (emphasis added). Paraphrasing the regulatory language, compliance with the macroencapsulation standard explicitly prohibits containerization of wastes or materials in a tank or container meeting the regulatory criteria under the 40 CFR 260.10.

This is not the same situation as here the U.S. Naval Nuclear Propulsion Program wanted to land dispose defueled submarine reactor compartments. The information provided by the Navy indicated that the "Jacket of inert inorganic materials" (i.e., the steel surrounding the lead) could "substantially reduce surface exposure to potential leaching media" and that due to their size and structure these compartments would not be classified as a tank or container according to the definitions in 40 CFR 260.10. EPA purposely modified the proposed standard for D008 radioactive lead solids to include "Jackets of inorganic materials" in order to specifically account for these submarine reactor compartments. EPA felt that it was necessary to add the language to the definition of macroencapsulation to prevent the "jacket of inorganic material" from being interpreted as including materials that are merely containers or drums.

With regards to the plastic coated, lead lined gloves in Question 2 of your letter, they would be considered to comply with the standard identified as "MACRO" provided that none of the lead is exposed (i.e., the entire surface of the lead is coated) and provided that the coating provides a substantial reduction in surface exposure to potential leaching media (i.e., the gloves should not be expected to be exposed to physical, chemical, or thermal conditions where the integrity of the surface coating could likely be breached). With regards to the lead weights in Question 2, the wastes may be considered to meet the specified method of "MACRO", as generated, provided the stainless steel surrounding the lead weights does not meet the definition of a tank or container and provided substantial reduction in surface exposure to potential leaching media can be determined.

The standard identified as "MACRO" currently applies only to D008 wastes fitting the description of "Radioactive Lead Solids" as defined in Table 3 of 268.42 (55 FR 22700, (June 1, 1990)) (e.g., those wastes containing elemental lead forms of lead or that act specifically as radioactive shielding). This standard is currently not applicable to the D006 wastes referred to in Question 3. These D006 wastes would have to comply with the concentration-based standard for D006 which is based on a TCLP analysis. Verification of compliance with this standard would require crushing or grinding of the material and compliance cannot be achieved by dilution. Thus, macroencapsulation processes would not comply with existing BDAT standards for metals.

**FROM:** Paul W. Martin

**DATE:** 7/14/2022

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## TWO MINUTE TRAINING - ATTACHMENT

**SUBJECT:** MACROencapsulation and a Jacket of Inert Inorganic Materials

Other than a treatability variance your D006 waste may be macroencapsulated if a no-migration petition is granted. As of today, EPA had only granted a two-year capacity variance for mixed wastes from the statutory deadline prohibiting the disposal of mixed wastes scheduled in the First, Second, and Third Third wastes. Previous capacity variances issued for mixed wastes scheduled in the Solvent and Dioxin Rule and the California List Wastes Rule had expired and thus, these mixed wastes are banned from land disposal units unless they meet the promulgated treatment standards.

I trust this letter addresses all your concerns and clarifies any outstanding issues you may have had on the applicability of the treatment standard identified as "MACRO". If you need further clarification, please contact Richard Kinch, Chief of the Waste Treatment Branch, at (703) 308-8434.

Sincerely,

Sylvia K. Lowrance  
Director  
Office of Solid Waste

RO 13437



**FROM:** Paul W. Martin

**DATE:** 7/14/2022

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