Mr. Steve Zappe, WIPP Project Leader  
Hazardous Waste Permits Program  
Hazardous and Radioactive Materials Bureau  
New Mexico Environment Department  
2905 E. Rodeo Park Drive, Bldg. 1  
Santa Fe, NM  87505

Subject: Transmittal of Approved Waste Stream Profile Form for Rocky Flats  
Environmental Technology Site, Waste Stream Profile Form Number  
RF102.31 – TRU-Mixed (TRM) Metal with Lead Shielding

Dear Mr. Zappe:

The Department of Energy, Carlsbad Field Office (CBFO) has approved the Rocky Flats Environmental Technology Site (RFETS), Waste Stream Profile Form RF102.31. Enclosed is a copy of the approved form as required by Section B-4(b)(1) of the WIPP Hazardous Waste Facility Permit No. NM4890139088-TSDF.

If you have any questions on this matter, please contact me at (505) 234-7357 or (505) 706-0066.

Sincerely,

[Signature]

Kerry W. Watson  
CBFO Assistant Manager  
Office of National TRU Program

Enclosure

cc: w/o enclosure  
J. Kieling, NMED  
C. Walker, TechLaw  
J. Bennett, WTS  
P. Roush, WTS  
L. Greene, WRES  
S. Calvert, CTAC  
CBFO M&RC
Congratulations!

If you can read this information, you have correctly installed your HP LaserJet IIISi.

The information below describes your printer driver and port settings.

Printer name:    HP LaserJet IIISi
Printer model:   HP LaserJet IIISi
Driver name:    HPPCL5MS.DRV
Driver version: 4.00
Color support:  No
Port name:      doe17
Data format:    EMF

Files used by this driver:
 c:\windows\system\HPPCL5MS.DRV  (4.10.1998, GPC 3.08)
 c:\windows\system\UNIDRV.DLL   (4.10.1998)
 c:\windows\system\UNIDRV.HLP
 c:\windows\system\ICONLIB.DLL  (4.10.1998)
 c:\windows\system\FINSTALL.DLL (4.0.2.01)
 c:\windows\system\FINSTALL.HLP

This is the end of the printer test page.
Waste Stream Profile Number: RF102.31
Generator site name: RFETS
Generator site EPA ID: CO7890010526
Technical contact: Eric D'Amico
Phone number: (303) 966-5362
Date of audit report approval by NMED: March 9, 2000 as amended February 7, 2001; June 5, 2001; April 8, 2002; August 20, 2002 and August 29, 2002
Title, version number, and date of documents used for WAP certification: Rocky Flats Environmental Technology Site TRU Waste Characterization Program Quality Assurance Project Plan, 95-QAP/P-0050, Revision 6, March 2002.
Did your facility generate this waste? ☑ Yes ☐ No If no, provide the name and EPA ID of the original generator:

Waste Stream Information

WIPP ID: RF-MR0320, RF-MR0321, RF-MT0320, RF-MT0321
Summary Category Group: S5000
Waste Matrix Code Group: Lead/Cadmium Metal Waste
Waste Stream Name: TRM Metal Debris with Lead Shielding (D008)
Description from the WTWBR: This waste form consists of metallic lead in the form of sheets, bricks, or tape.
Defense TRU Waste: ☑ Yes ☐ No
Check one: ☑ CH ☐ RH
Number of SWBs: 54
Number of Drums: 149
Number of Canisters: N/A

Batch Data Report numbers supporting this waste stream characterization: See Table 7.
List applicable EPA Hazardous Waste Codes(2): D008
Applicable TRUCON Content Codes: RF 117A, RF 117B, RF 117C, RF 117D, RF 117E, RF 117F, RF 117H, RF 117I, RF 117N, RF 117T

Acceptable Knowledge Information

Required Program Information
- Map of site: Reference List, No. 4
- Facility mission description: Reference List, No. 4
- Description of operations that generate waste: Reference List, Nos. 1, 2, 3, 4, 7
- Waste identification/categorization schemes: Reference List, Nos. 9, 10
- Types and quantities of waste generated: Reference List, Nos. 1, 2, 3, 4, 7
- Correlation of waste streams generated from the same building and process, as appropriate: Reference List, Nos. 1, 2, 3, 7
- Waste certification procedures: Reference List, No. 6

Required Waste Stream Information
- Area(s) and building(s) from which the waste stream was generated: Reference List, Nos. 1, 2, 3, 7
- Waste stream volume and time period of generation: Reference List, Nos. 5, 7
- Waste generating process description for each building: Reference List, Nos. 1, 2, 3, 7
- Process flow diagrams: Reference List, Nos. 1, 2, 3
- Material inputs or other information identifying chemical/radionuclide content and physical waste form: Reference List, Nos. 1, 2, 4, 7

Which Defense Activity generated the waste: (Check one) Reference List, No. 4
☑ Weapons activities including defense inertial confinement fusion
☐ Naval Reactors development
☐ Verification and control technology
☐ Defense nuclear waste and material by products management
☐ Defense nuclear materials production
☐ Defense nuclear waste and materials security and safeguards and security investigations
WIPP WASTE STREAM PROFILE FORM

Supplemental Documentation:
- Process design documents: Note 3
- Standard operating procedures: Note 3
- Safety Analysis Reports: Note 3
- Waste packaging logs: Note 3
- Test plans/research project reports: Note 3
- Site data bases: Note 3
- Information from site personnel: Note 3
- Standard industry documents: Note 3
- Previous analytical data: Note 3
- Material safety data sheets: Note 3
- Sampling and analysis data from comparable/surrogate Waste: Note 3
- Laboratory notebooks: Note 3

Sampling and Analysis Information
(For the following, when applicable, enter procedure title(s), number(s) and date(s))
- Radiography: Reference List Nos. 14, 15, 19
- Visual Examination: 12, 13, 17, 18
- Headspace Gas Analysis
  VOCs: Reference List, No. 8, 16
  Flammable: Reference List, No. 8, 16
- Other gases (specify): N/A

- Homogeneous Solids/Soils/Gravel Sample Analysis (Tables 1, 3, 4, and 5 are not applicable and not included)
  Total metals: N/A
  PCBs: N/A
  VOCs: N/A
  Nonhalogenated VOCs: N/A
  Semi-VOCs: N/A
  Other (specify): N/A

Waste Stream Profile Form Certification:
I hereby certify that I have reviewed the information in this Waste Stream Profile Form, and it is complete and accurate to the best of my knowledge. I understand that this information will be made available to regulatory agencies and that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Signature of Site Project Manager
G. A. O'Leary, Manager TRU Programs
Printed Name and Title
Date
2/13/03

Signature of Site QA Officer
C. L. Ferrara, TWCP Site QA Officer
Printed Name and Title
Date
2/13/03

NOTE
(1) Use back of sheet or continuation sheets, if required.
(2) EPA Hazardous Waste Codes were determined using acceptable knowledge and confirmed using headspace gas sampling and analysis (see attached Characterization Information Summary documenting this determination).
(3) See the References section in the Acceptable Knowledge Summary (attached) for additional backup documentation associated with this waste stream.
REFERENCE LIST

13. TRU/TRM Waste Visual Verification (V²) and Data Review, PRO-1031-WIPP-1112, Revision 1, June 2002.
Form A
Reconciliation with Data Quality Objectives

I certify by signature (below) that sufficient data have been collected to determine the following Program-required waste parameters:

**WSPF # RF102.31**

<table>
<thead>
<tr>
<th>Item</th>
<th>Check Box</th>
<th>Reconciliation Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>✓</td>
<td>Waste Matrix Code as reported in WEMS.</td>
</tr>
<tr>
<td>2</td>
<td>✓</td>
<td>Waste Material Parameter Weights for individual containers as reported in WEMS.</td>
</tr>
<tr>
<td>3</td>
<td>✓</td>
<td>The waste matrix code identified is consistent with the type of sampling and analysis used to characterize the waste.</td>
</tr>
<tr>
<td>4</td>
<td>✓</td>
<td>Container mass and activities of each radionuclide of concern as reported in WEMS.</td>
</tr>
<tr>
<td>5</td>
<td>✓</td>
<td>Each waste container of waste contains TRU radioactive waste.</td>
</tr>
<tr>
<td>6</td>
<td>✓</td>
<td>Mean concentrations, UCL&lt;sub&gt;50&lt;/sub&gt; for the mean concentrations, standard deviations, and the number of samples collected for each VOC in the headspace gas of waste containers in the waste stream/waste stream lot.</td>
</tr>
<tr>
<td>7</td>
<td>N/A</td>
<td>Mean concentrations, UCL&lt;sub&gt;50&lt;/sub&gt; for the mean concentrations, standard deviations, and number of samples collected for VOCs in the waste stream/waste stream lot. Summary Categories S3000 and S4000.</td>
</tr>
<tr>
<td>8</td>
<td>N/A</td>
<td>Mean concentrations, UCL&lt;sub&gt;50&lt;/sub&gt; for the mean concentrations, standard deviations, number of samples collected for SVOCs in the waste stream/waste stream lot. Summary Categories S3000 and S4000.</td>
</tr>
<tr>
<td>9</td>
<td>N/A</td>
<td>Mean concentrations, UCL&lt;sub&gt;50&lt;/sub&gt; for the mean concentrations, standard deviations, and number of samples collected for metals in the waste stream/waste stream lot. Summary Categories S3000 and S4000.</td>
</tr>
<tr>
<td>10</td>
<td>N/A</td>
<td>Sufficient number of samples was taken to meet statistical sampling requirements.</td>
</tr>
<tr>
<td>11</td>
<td>✓</td>
<td>Only validated data were used in the above calculations, as documented through the site data review and validation forms and process.</td>
</tr>
<tr>
<td>12</td>
<td>✓</td>
<td>Waste containers were selected randomly for sampling, as documented in site procedures.</td>
</tr>
<tr>
<td>13</td>
<td>✓</td>
<td>The potential flammability of TRU waste headspace gases.</td>
</tr>
<tr>
<td>14</td>
<td>✓</td>
<td>Sufficient number of waste containers was visually examined to determine with a reasonable level of certainty that the UCL&lt;sub&gt;50&lt;/sub&gt; for the misclassification rate is less than 14 percent.</td>
</tr>
<tr>
<td>15</td>
<td>✓</td>
<td>Whether the waste stream exhibits a toxicity characteristic (TC) under 40 CFR Part 261, Subpart C.</td>
</tr>
<tr>
<td>16</td>
<td>✓</td>
<td>All TICs were appropriately identified and reported in accordance with the requirements of the WIPP WAP prior to submittal of a waste stream profile form for a waste stream or waste stream lot.</td>
</tr>
<tr>
<td>17</td>
<td>✓</td>
<td>The overall completeness, comparability, and representativeness QAOs were met for each of the analytical and testing procedures as specified in the WIPP WAP Sections B3-2 through B3-9 prior to submittal of a waste stream profile form for a waste stream or waste stream lot.</td>
</tr>
<tr>
<td>18</td>
<td>✓</td>
<td>The RTLS (i.e.,PRQLs) for all analyses were met prior to submittal of a waste stream profile form for a waste stream or waste stream lot.</td>
</tr>
<tr>
<td>19</td>
<td>✓</td>
<td>Appropriate packaging configuration and DAC were met and documented in the headspace gas sampling documentation and the drum age was met prior to sampling.</td>
</tr>
<tr>
<td>20</td>
<td>✓</td>
<td>Whether the waste stream can be classified as hazardous or non-hazardous at the 90-percent confidence limit.</td>
</tr>
</tbody>
</table>

* Check (✓) indicates that data or acceptable knowledge are sufficient to determine the waste parameters and that the waste parameters have been reported in the listed document or database. N/A indicates parameter does not apply to waste stream. NO indicates data are insufficient.

Signature of Site Project Manager: [Signature]
Printed Name: G. A. O'Leary
Date: 2/13/03
## WSPF # RF102.31

**Sampling and Analysis Method (check one):**

- ☑ 100% Sampling
- □ Reduced Sampling

### Table 2: Headspace Gas Summary Data

<table>
<thead>
<tr>
<th>ANALYTE(^a)</th>
<th># Samples(^b)</th>
<th>Transform Applied(^c)</th>
<th>Normality Test (Pass/Fail)(^d)</th>
<th>Mean(^d) (ppmV)</th>
<th>UCL(_{90})(^d) (ppmV)</th>
<th>RTL(^e) (ppmV)</th>
<th>EPA Code(^e)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,1-Dichloroethane</td>
<td>0</td>
<td></td>
<td>(Pass/Fail)</td>
<td>0.554</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>1,2-Dichloroethane</td>
<td>0</td>
<td></td>
<td>(Pass/Fail)</td>
<td>0.726</td>
<td>10</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>1,1-Dichloroethylene</td>
<td>0</td>
<td></td>
<td>(Pass/Fail)</td>
<td>0.699</td>
<td>10</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>cis-1,2-Dichloroethylene</td>
<td>0</td>
<td></td>
<td>(Pass/Fail)</td>
<td>0.653</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>trans-1,2-Dichloroethylene</td>
<td>0</td>
<td></td>
<td>(Pass/Fail)</td>
<td>0.757</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>1,1,2,2-Tetrachloroethane</td>
<td>0</td>
<td></td>
<td>(Pass/Fail)</td>
<td>0.696</td>
<td>10</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>1,1,1-Trichloroethane</td>
<td>0</td>
<td></td>
<td>(Pass/Fail)</td>
<td>0.705</td>
<td>10</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>1,1,2-Trichloro-1,2,2- Trifluoroethane</td>
<td>0</td>
<td>Log</td>
<td>Fail(^h)</td>
<td>0.716</td>
<td>10</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>1,2,4-Trimethylbenzene</td>
<td>0</td>
<td>Log</td>
<td>Fail(^h)</td>
<td>0.823</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>1,3,5-Trimethylbenzene</td>
<td>0</td>
<td>Log</td>
<td>Fail(^h)</td>
<td>0.835</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Acetone</td>
<td>22</td>
<td>Log</td>
<td>Fail(^h)</td>
<td>24.685 31.0312</td>
<td>10</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Benzene</td>
<td>0</td>
<td>Log</td>
<td>Fail(^h)</td>
<td>0.706</td>
<td>10</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Bromoform</td>
<td>0</td>
<td>Log</td>
<td>Fail(^h)</td>
<td>0.896</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Butane</td>
<td>0</td>
<td>Log</td>
<td>Fail(^h)</td>
<td>6.014</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Carbon disulfide</td>
<td>0</td>
<td>Log</td>
<td>Fail(^h)</td>
<td>0.635</td>
<td>10</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Carbon tetrachloride</td>
<td>0</td>
<td>Log</td>
<td>Fail(^h)</td>
<td>0.885</td>
<td>10</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Chlorobenzene</td>
<td>0</td>
<td>Log</td>
<td>Fail(^h)</td>
<td>0.615</td>
<td>10</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Chloroform</td>
<td>0</td>
<td>Log</td>
<td>Fail(^h)</td>
<td>0.7031 0.7411</td>
<td>10</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Cyclohexane</td>
<td>0</td>
<td>Log</td>
<td>Fail(^h)</td>
<td>0.586</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Ethyl benzene</td>
<td>23</td>
<td>Log</td>
<td>Fail(^h)</td>
<td>3.5983 4.8230</td>
<td>10</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Ethyl ether</td>
<td>0</td>
<td>Log</td>
<td>Fail(^h)</td>
<td>0.702</td>
<td>10</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Methanol</td>
<td>26</td>
<td>Log</td>
<td>Pass</td>
<td>24.7254 29.1750</td>
<td>10</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Methyl ethyl ketone</td>
<td>0</td>
<td>Log</td>
<td>Fail(^h)</td>
<td>6.411</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Methyl isobutyl ketone</td>
<td>17</td>
<td>Log</td>
<td>Fail(^h)</td>
<td>17.2249 21.1798</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Methylene chloride</td>
<td>2</td>
<td>Sq Rt</td>
<td>Fail(^h)</td>
<td>0.6038 0.6496</td>
<td>10</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>o-Xylene</td>
<td>26</td>
<td>Log</td>
<td>Fail(^h)</td>
<td>5.6847 8.1198</td>
<td>10</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>m,p-Xylene</td>
<td>29</td>
<td>Log</td>
<td>Pass</td>
<td>14.2994 20.9445</td>
<td>10</td>
<td>Note i</td>
<td>100</td>
</tr>
<tr>
<td>Tetrachloroethylene</td>
<td>0</td>
<td>Log</td>
<td>Fail(^h)</td>
<td>0.791</td>
<td>10</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Toluene</td>
<td>30</td>
<td>Log</td>
<td>Fail(^h)</td>
<td>4.6619 6.2210</td>
<td>72.02(^g)</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Trichloroethylene</td>
<td>0</td>
<td>Log</td>
<td>Fail(^h)</td>
<td>0.695</td>
<td>10</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

**NOTES:**

- \(^a\) A total of 40 samples were collected and analyzed. Analysis was performed for all analytes identified. Samples were not composited.
- \(^b\) Identifies the number of samples in which the associated analyte was detected.
- \(^c\) Identifies the type of data transformation used, if applicable, to achieve (or better achieve) a normal probability distribution of the data.
NOTES (continued)

d. Statistics calculated based on using \( \frac{1}{2} \) the MDL for less-than-detectable observations with data transformation as identified (Reference 11). With no detectable concentrations, listed mean reflects average of one-half of reported MDL values for analyte and calculation of standard deviation and UCL\(_{90}\) values is not meaningful. With fewer than five detectable concentrations, calculated values for UCL\(_{90}\) are subject to potentially large relative error.

e. RTLs for headspace gas analysis results correspond to the analyte PRQL for analytes that are hazardous waste constituents. "NA" means the analyte is not a hazardous waste constituent and so has no associated regulatory threshold.

f. No entry indicates no associated EPA Code assigned to the waste stream based on headspace analysis.

g. Limit used for evaluation EPA Hazardous Waste Code for toluene (Reference No. 4).

h. Data set (with or without transformation) did not pass the test for normality. The data set that most approximated a normal distribution was used for computation of statistics.

i. EPA code F003 was not initially assigned to this waste stream by AK. Because xylene is an F003-listed solvent listed solely for the characteristic of ignitability, and metal debris with lead shielding is not an ignitable waste (i.e., is not assigned D001), EPA code F003 is not assigned to this waste stream (Reference No. 7).
Data Summary Report—Table 2: Headspace Gas Summary Data (continued)

WSPF # RF102.31

<table>
<thead>
<tr>
<th>TENTATIVELY IDENTIFIED COMPOUND (TIC) CHEMICAL ABSTRACTS SERVICE (CAS) NUMBER</th>
<th>Maximum Observed Estimated Concentrations (ppmv)</th>
<th># Samples Containing TIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>No TICs were detected in the headspace gas samples for the waste stream lot.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Did the data verify the acceptable knowledge? ☑ Yes ☐ No

Data as reported in Data Summary Report – Table 2 confirm acceptable knowledge in that no additional EPA codes, other than those assigned by acceptable knowledge, are applicable.

If not, describe the basis for assigning the EPA Hazardous Waste Codes:
WSPF # RF102.31

The absence of prohibited items is documented through acceptable knowledge. Radiography or visual examination is performed on each container in this waste stream to verify the absence of the following prohibited items:

- Liquids
- Non-radiouclide pyrophoric materials
- Waste incompatible with backfill, seal and panel closure materials, container and packaging materials, shipping container materials, or other wastes
- Explosives or compressed gases
- PCBs in concentrations greater than or equal to 50 ppm
- Waste exhibiting the characteristics of ignitability, corrosivity or reactivity
- Non-mixed hazardous wastes
## Data Summary Report—Table 7: Correlation of Container Identification to Batch Data Reports

### WSPF # RF102.31

<table>
<thead>
<tr>
<th>Package No.</th>
<th>Radioassay Data Package</th>
<th>Headspace Sample Batch No.</th>
<th>Headspace VOC Data Package</th>
<th>RTR Data Package*</th>
</tr>
</thead>
<tbody>
<tr>
<td>S00313</td>
<td>440SH1-DP-021802</td>
<td>02W0102</td>
<td>HGAS-DP-00206</td>
<td>6R-043</td>
</tr>
<tr>
<td>S00321</td>
<td>440SH1-DP-082801</td>
<td>02W0127</td>
<td>HGAS-DP-00208</td>
<td>6T-2104</td>
</tr>
<tr>
<td>S00322</td>
<td>440SH1-DP-060501</td>
<td>02W0154</td>
<td>HGAS-DP-00227</td>
<td>6T-2075</td>
</tr>
<tr>
<td>S00323</td>
<td>440SH1-DP-020802</td>
<td>02W0127</td>
<td>HGAS-DP-00208</td>
<td>6T-2102</td>
</tr>
<tr>
<td>S00327</td>
<td>440SH1-DP-041701</td>
<td>02W0154</td>
<td>HGAS-DP-00227</td>
<td>6T-2075</td>
</tr>
<tr>
<td>S00329</td>
<td>440SH1-DP-082801</td>
<td>02W0126</td>
<td>HGAS-DP-00233</td>
<td>6T-2105</td>
</tr>
<tr>
<td>S00333</td>
<td>440SH1-DP-082801</td>
<td>02W0119</td>
<td>HGAS-DP-00220</td>
<td>6T-2106</td>
</tr>
<tr>
<td>S00339</td>
<td>440SH1-DP-082401</td>
<td>02W0206</td>
<td>HGAS-DP-00314</td>
<td>5R-0002</td>
</tr>
<tr>
<td>S00340</td>
<td>440SH1-DP-082801</td>
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<td>02W0134</td>
<td>HGAS-DP-00242</td>
<td>5T-0150</td>
</tr>
</tbody>
</table>

**NOTES:**

* Radiography was performed on all of the containers identified here. All of the containers were candidates for visual examination to confirm radiography; however, none were selected.
Acceptable Knowledge Summary

WSPF # RF102.31

RMRS-WIPP-98-100, Acceptable Knowledge TRU/TRM Waste Stream Summaries, Section 7.9, TRM Metal Debris with Lead Shielding (D008) (attached).
ACCEPTABLE KNOWLEDGE INFORMATION

ACCEPTABLE KNOWLEDGE TRU/TRM
WASTE STREAM SUMMARIES

RMRS-WIPP-98-100

Section 7.9
TRM Metal Debris with Lead Shielding (D008)
Profile No. RF102.31
Revision 0

Reviewed for Classification/UCNI
By: Unclassified Not UCNI
Reference Exemption Number CEX-032-00
Date: September 11, 2000

Approval signatures in Site Document Control history file
7.9 TRM Metal Debris with Lead Shielding (D008)

Acceptable Knowledge Waste Stream Summary

Waste Stream Name: TRM Metal Debris with Lead Shielding (D008)

Generation Buildings: Buildings 371, 440, 559, 707, 771, 776, 777, and 779 (3,8,15)


Generation Dates (Projected): February 2003 – September 2004 (15,16)


Process Knowledge Demonstrates Flammable VOCs in Headspace < 500 ppm: Yes (see Sec. 7.9.6)

7.9.1 WIPP Transuranic Waste Baseline Inventory Report Information (2)

WIPP Identification Numbers: RF-MR0320, RF-MR0321, RF-MT0320, RF-MT0321

Summary Category Group: X7000 Waste Matrix Code Group: Lead/Cadmium Metal Waste

Waste Matrix Code: X7211 Waste Stream Name: Lead/TRM

Description from the WTWBIR: This waste form consists of metallic lead in the form of sheets, bricks, or tape.

NOTE: The Summary Category Group and Waste Matrix Code included in the TWBIR for IDCs 320 and 321 have been revised based on the acceptable knowledge for this waste stream (refer to Section 7.9.2). This waste stream also includes IDC 488, Glovebox Parts with Lead, which is not included in the TWBIR.

7.9.2 Waste Stream Description

This waste is generated by similar activities, and is similar in material, physical form and hazardous constituents and therefore is considered a single waste stream. TRM
metal debris with lead shielding assigned EPA hazardous waste number D008 consists of Heavy Non-Special Source (SS) Metal (IDC 320), Lead (IDC 321), and Glovebox Parts with Lead (IDC 488). Table 7.9-1 presents the waste matrix code and waste material parameters for metal debris with lead shielding.

Table 7.9-1, Metal Debris with Lead Shielding (D008) Waste Description

<table>
<thead>
<tr>
<th>IDC</th>
<th>Description</th>
<th>Waste Matrix Code</th>
<th>Waste Material Parameters</th>
<th>Weight %</th>
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</thead>
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<tr>
<td>320</td>
<td>Heavy Non-SS Metal</td>
<td>S5112, Metal Debris with Lead</td>
<td>Iron-Based Metals/Alloys</td>
<td>Note 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Other Metals/Alloys</td>
<td></td>
</tr>
<tr>
<td>321</td>
<td>Lead</td>
<td>S5112, Metal Debris with Lead</td>
<td>Other Metals/Alloys</td>
<td>Note 1</td>
</tr>
<tr>
<td>488</td>
<td>Glovebox Parts with Lead</td>
<td>S5112, Metal Debris with Lead</td>
<td>Iron-Based Metals/Alloys</td>
<td>Note 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Other Metals/Alloys</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Rubber</td>
<td></td>
</tr>
</tbody>
</table>

Notes:
1. Waste material parameter weights are determined during visual verification at the time of packaging or by RTR, as appropriate.

**IDC 320, Heavy Non-SS Metal:** This waste consists primarily of metals made from tantalum, tungsten, platinum, and lead. In 1987, lead was segregated from other heavy metals as IDC 321. Examples of non-lead items in this waste include crucibles, funnels, pull rods, stirrers, pans, and process fixtures. Lead items that may be included are the same as those listed under IDC 321.(6,7,8,10)

**IDC 321, Lead:** This IDC was created in 1987 to better account for the generation and material control of lead waste. Waste items consist primarily of lead shielding in the form of sheeting, bricks, and tape. Other items may include empty lead-lined drums; empty glass, metal, or plastic containers wrapped with lead tape; lead components from radiographic film processing; lead-acid batteries (drained); glove port covers; and lead-containing solder. Hydrogenous materials (e.g., plastic) will comprise less than 1%, by weight, of each waste container. (5,7,9,10,11,12,13,14)

**IDC 488, Glovebox Parts with Lead:** This waste consists primarily of lead metal sheet attached to stainless-steel glovebox structures. Small parts and pieces of scrap are collected in drums while gloveboxes are size-reduced as necessary and packaged in boxes. (5,10,12,13,14)

### 7.9.3 Areas of Operation

TRM metal debris with lead shielding assigned EPA hazardous waste number D008 is generated by the following defense operations in Buildings 371, 440, 707, 771, 776, 777, and 779.(4,5,6,7,8,9,10,11,12,13,14)

- Plutonium Production
- Plutonium Recovery
7.9.4 Generation Processes

Historical production, recovery, laboratory, and R&D operations used lead shielding to reduce exposure of workers to elevated levels of penetrating radiation (primarily gamma radiation). The lead or lead-covered components became waste due to replacement, modification, or decommissioning activities. Prior to the creation of IDC 321, other heavy metals were collected in the same waste containers with the lead shielding. Other heavy metals included primarily tantalum, tungsten, and platinum tools and equipment from production foundry, pyrochemical recovery, and similar R&D operations. Process flow diagrams for historical production, recovery, laboratory, and R&D operations are provided in the archived WSRIC Books.\(^{(5,6)}\)

More recently, metal debris with lead shielding is being generated during D&D operations in Buildings 371, 707, 771, 776, 777, and 779. D&D activities include the physical isolation and removal of contaminated gloveboxes, equipment, machinery, furnishings, and support systems. This includes removal and size reduction of glovebox internals, process piping and supports, tanks and ancillary equipment, and other fixed equipment such as ducting, wires, conduits, electrical panels and cabinets. Gloveboxes and equipment are size reduced as necessary and packaged for shipment to WIPP.\(^{(7,10,11,12,13)}\)

Lead waste from historical operations and more recent activities is repackaged in Buildings 371, 440, and 707 to meet residue safe-storage criteria and WIPP WAC and WAP requirements. Process flow diagrams for repackaging operations are provided in the Buildings 371, 440STOR, and 707 WSRIC Books.\(^{(7,8,10)}\)

7.9.5 RCRA Characterization

This waste stream is characterized as a mixed waste. The specific BWR Baseline Book Subpopulations and WSRIC Process Numbers associated with metal debris with lead shielding assigned EPA hazardous waste number D008 are listed in the WEMS AK Waste Stream Summary for Profile Number RF102.31.\(^{(3)}\)

During D&D operations, hazardous materials (with the exception of lead) are removed from glovebox systems and managed as a separate waste stream. Nonhazardous spray fixatives (e.g., 3M Fire Dam Spray) are used to fix radioactive contamination in place for size reduction operations. RCRA permitted systems that undergo clean closure by decontamination followed by clean rinsate analysis or clean debris surface standard closure may be included in this waste stream; however, RCRA permitted systems that
do not meet the clean closure standards are managed as a separate hazardous waste stream. Therefore, only EPA hazardous waste number D008 is assigned to this waste stream and no other EPA hazardous waste numbers apply.\(^{(5,7,10,11,12,13)}\)

Heavy metal items, such as lead sheeting attached to a glovebox that was wiped down with solvents, or tantalum funnels from foundry operations that came in contact with solvents, are not considered listed hazardous wastes. At the time the solvent contamination occurred, the metal items and solvents were not waste, but were being utilized for their intended purpose. These metal items also would not have become contaminated with solvent because they do not retain volatile solvents in the same manner as paper or cloth wipes. Therefore, the metal debris with lead shielding is considered not to be an F-listed hazardous waste under the mixture rule as provided in 40 CFR 261.3.\(^{(5)}\)

This waste stream may also include empty containers. As provided in 40 CFR 261.7, any hazardous waste remaining in an empty container is not subject to regulation under Part 261. A container that has held non-acute hazardous waste is empty if all wastes have been removed that can be removed using the practices commonly employed to remove materials from that type of container, e.g., pouring, pumping, aspirating, and no more than one inch of residue remains on the bottom of the container, or no more than 3 percent (in a container less than 110 gallons) or 0.3 percent (in a container greater than 110 gallons) by weight of the total capacity of the container remains.

Visual examination of waste contents at the time of packaging and/or RTR is used to verify that the waste stream does not contain free liquid, explosives, non-radionuclide pyrophoric materials, compressed gasses, or reactive waste. Therefore, this waste stream does not exhibit the characteristics of ignitability (D001), corrosivity (D002), or reactivity (D003).

Beryllium parts were used in the manufacture/assembly of weapons components, and residual beryllium contamination of plutonium parts may have occurred. Metal including lead shielding associated with these operations may have been contaminated with beryllium and therefore, trace quantities of beryllium may be present in the waste stream. Any beryllium present is as a contaminant of the process and not as unused commercial chemical product, and therefore is not a P015-listed waste.\(^{(5,7,10,12)}\)

Heavy metal including lead shielding (IDC 320) generated at RFETS was sent to the INEEL for storage but is considered a different waste stream because of the EPA hazardous waste numbers assigned. The INEEL waste streams (Local ID Number ID-RFO-320T) were generated and shipped to INEEL prior to the full implementation of RCRA and therefore, EPA hazardous waste numbers were assigned to each IDC as a whole.\(^{(2)}\)

Headspace gas sampling and analysis of containers assigned to this waste stream by AK detected 9 VOCs. Statistics were calculated based on using one-half the method
detection limit (MDL) for less-than-detectable observations with data transformation applied where appropriate. Using this method, the calculated 90% upper confidence limit (UCL$_{90}$) for the mean concentration of m,p-Xylenes (F003) exceeded the regulatory threshold limit (RTL). EPA hazardous waste number F003 was not initially assigned to this waste stream by AK. Because xylene is an F003-listed solvent listed solely for the characteristic of ignitability, and metal debris with lead shielding is not an ignitable waste (i.e., is not assigned D001), EPA hazardous waste number F003 is not assigned to this waste stream. (17)

7.9.6 Transportation

The payload containers in this waste stream must also comply with the TRUPACT-II Authorized Methods for Payload Control (TRAMPAC) requirements. Flammable volatile organic compounds (VOCs) were not anticipated in this waste stream based on the descriptions in the BWR Baseline Book and WSRIC Building Books. Several flammable solvents were detected in the headspace gas analysis, including acetone, ethyl benzene, methanol, methyl isobutyl ketone, toluene, and xylene; however, the sum total of these solvents is well below the flammable VOC limit of 500 ppm. (17)

7.9.7 Radionuclides

Table 7.9-2 summarizes the radionuclides potentially present in TRM metal debris with lead shielding assigned EPA hazardous waste number D008. (4)

**Table 7.9-2, Metal Debris with Lead Shielding (D008) Radionuclides**

<table>
<thead>
<tr>
<th>IDC</th>
<th>Description</th>
<th>Radionuclides</th>
<th>Rationale</th>
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<tr>
<td>0320</td>
<td>Heavy Non-SS Metal</td>
<td>WG Pu, Am-241, Am-243, Np-237, DU, EU</td>
<td>IDC generated in nearly every TRU building; radionuclides dependent on generation process.</td>
</tr>
<tr>
<td>0321</td>
<td>Lead</td>
<td>WG Pu, Am-241, Am-243, Np-237, DU, EU</td>
<td>IDC generated in nearly every TRU building; radionuclides dependent on generation process.</td>
</tr>
<tr>
<td>0488</td>
<td>Glovebox Parts with Lead</td>
<td>WG Pu, Am-241, Am-243, Np-237, DU, EU</td>
<td>IDC generated by decommissioning operations.</td>
</tr>
</tbody>
</table>

Key: 
- WG Pu: weapons-grade plutonium
- Am-241: americium-241
- Am-243: americium-243
- Np-237: neptunium-237
- DU: depleted uranium
- EU: enriched uranium

Notes:
1. Am-243 was not initially predicted to be present by AK; however, it has been identified by NDA and is therefore added as a potential radionuclide in this waste stream.
7.9.8 References