Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221
June 25, 2001

ENTERED

Mr. Steve Zappe
Hazardous Waste Permits Program
Hazardous Waste Bureau
New Mexico Environment Department
2909 E. Rodeo Dr. Bldg E
Santa Fe, New Mexico 87505

Subject: Transmittal of Approved Waste Stream Profile Form for RFETS (RF009.01)

Dear Mr. Zappe:

The Department of Energy, Carlsbad Field Office has approved the RFETS Waste Stream Profile Form (WSPF) for Waste Stream RF009.01. Enclosed is a copy of the approved WSPF as required by Section B-4(b)(1) of the WIPP Hazardous Waste Facility Permit No. NM4890139088-TSDF.

Please contact me at 505-234-7357 or 505-361-0265 should you have any questions regarding this matter.

Sincerely,

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

Enclosure

cc w/o enclosure:
S. Hunt, CBFO
H. Johnson, CBFO
J. Kieling, NMED
C. Walker, TechLaw
J. Cotton, WTS
B. Kehrman, WTS
C. Riggs, CTAC

010614

CBFO:NTP:JDV:GS:01-1056:UFC 5822.00

WASTE STREAM PROFILE FORM

Waste Stream Profile Number: RF009.01

Generator site name: RFETS
Technical contact: Eric D'Amico
Generator site EPA ID: CO7890010526
Phone number: (303) 966-5362

Date of audit report approval by NMED: March 9, 2000 as amended February 7, 2001 and June 5, 2001

Title, version number, and date of documents used for WAC certification: Rocky Flats Environmental Technology Site TRU Waste Characterization Program Quality Assurance Project Plan, 95-QAPjP-0050, Revision 5, April 2001. Transuranic (TRU) Waste Management Manual, Revision 4, 1-MAN-008-WM-001, December 2000. WIPP Waste Acceptance Criteria, Revision 7, DOE/WIPP-069, November 1999.

Did your facility generate this waste? ☑ Yes ☐ No If no, provide the name and EPA ID of the original generator:

Waste Stream Information[1]

WIPP ID: RF-TR0404 (RF-W103), RF-TR0405 (RF-W103), RF-TR0406 (RF-W103), RF-TR0407 (RF-W103), RF-TR0408 (RF-W103), RF-MR-0409 (RF-W058), RF-MT0409 (RF-W058), RF-TR0409 (RF-W103), RF-TR0410 (RF-W103), RF-MR-0411 (RF-W058), RF-MT0411 (RF-W058), RF-TR0411 (RF-W103), RF-MT0412 (RF-W058), RF-TR0412 (RF-W103), RF-MR-0413 (RF-W058), RF-TR0413 (RF-W103), RF-MR-0414 (RF-W058), RF-MT0414 (RF-W058), RF-TR0414 (RF-W103), RF-TR0415 (RF-W103), RF-TR0417 (RF-W103), RF-TR0418 (RF-W103), RF-TR0427 (RF-W103), RF-TR0429 (RF-W103), RF-TR0433 (RF-W103), RF-MR-0434 (RF-W058), RF-TR0434 (RF-W103), RF-TR0473 (RF-W103), RF-TR0654 (RF-W103), RF-MR-0365 (RF-W058),

Summary Category Group: S3000 Waste Matrix Code Group: Salt Waste (S3141)

Waste Stream Name: Misc. Pu Recovery By Product/TRU and Misc. Pu Recovery By Product/TRM[3]

Description from the WTWBIR: This waste is generated during plutonium recovery operations such as direct oxide reduction, molten salt extraction, electrorefining and salt scrub. Its composition includes chunks and powdered mixed salts, a probable presence of magnesium, sodium, and potassium metals.[3]

Defense TRU Waste: ☑ Yes ☐ No

Check one: ☑ CH ☐ RH Number of SWBs N/A Number of Drums 6,224 Number of Canisters N/A

Batch Data Report numbers supporting this waste stream characterization: See Table 7.

List applicable EPA Hazardous Waste Codes[2]: None

Applicable TRUCON Content Codes: RF 124E, RF 124F, RF 124FF, RF 124G, RF 124GF, RF 124H, RF 124HF, RF 130A, RF 130BA, RF 130D, RF 130DF, RF 130E, RF 130F, RF 130G, RF 130GF, RF 130J, RF130K, RF 130P RF 130PF, RF 130PA, RF 130PAF

Acceptable Knowledge Information[1]

Required Program Information

- Map of site: Reference List, No. 3
- Facility mission description: Reference List, No. 3
- Description of operations that generate waste: Reference List, Nos. 1, 2, 3, 6
- Waste identification/categorization schemes: Reference List, Nos. 16, 17
- Types and quantities of waste generated: Reference List, Nos. 1, 2, 3, 6
- Correlation of waste streams generated from the same building and process, as appropriate: Reference List, Nos. 1, 2, 6
- Waste certification procedures: Reference List, No. 5

Required Waste Stream Information

- Area(s) and building(s) from which the waste stream was generated: Reference List, Nos. 1, 2, 6
- Waste stream volume and time period of generation: Reference List, Nos. 4, 6
- Waste generating process description for each building: Reference List, Nos. 1, 2, 6
- Process flow diagrams: Reference List, Nos. 1, 2
- Material inputs or other information identifying chemical/radionuclide content and physical waste form: Reference List, Nos. 1, 2, 3, 6
- Which Defense Activity generated the waste: (Check one) Reference List, No. 3

☑ Weapons activities including defense inertial confinement fusion
☐ Naval Reactors development
☐ Verification and control technology
☐ Defense research and development
☐ Defense nuclear waste and material by products management
☐ Defense nuclear materials production
☐ Defense nuclear waste and materials security and safeguards and security investigations

Supplemental Documentation: See the References section in the Acceptable Knowledge Summary (attached) for additional backup documentation associated with this waste stream.

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

Sampling and Analysis Information[1]
[*For the following, when applicable, enter procedure title(s), number(s) and date(s)*]

☑ Radiography: Reference List, Nos. 7, 8
☑ Visual Examination: Reference List, Nos. 9, 21
☑ Headspace Gas Analysis
VOCs: Reference List, No. 10
Flammable: Reference List, No. 10
Other gases (specify): N/A
☑ Homogeneous Solids/Soils/Gravel Sample Analysis
Total metals: Reference List, Nos. 13, 14, 15
PCBs: N/A
VOCs: Reference List, No. 11
Nonhalogenated VOCs: Reference List, No. 11
Semi-VOCs: Reference List, No. 12
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 | 6/12/01, Date

NOTE (1) Use back of sheet or continuation sheets, if required.
(2) If radiography, visual examination, headspace gas analysis, and/or homogeneous solids/soils/gravel sample analysis were used to determine EPA Hazardous Waste Codes, attach Characterization Information Summary documenting this determination.
(3) The waste stream name and description in the WTWBIR are incorrect. The correct waste stream name is TRU Pyrochemical Salts. The previously characterized mixed residue IDCs composing this waste stream were subsequently recharacterized as nonhazardous (refer to attached Acceptable Knowledge Summary). The waste stream is not a mixed waste and is not a reactive or a pyrophoric waste.

REFERENCE LIST

1. Backlog Waste Reassessment Baseline Book, Waste Form 34, Pyrochemical Salts, June 2001.
2. Waste Stream and Residue Identification and Characterization (WSRIC), Revision 6, and archived versions.
3. RFETS TRU Waste Acceptable Knowledge Supplemental Information, RF/RMRS-97-018, Revision 8, December 2000.
4. Waste and Environmental Management System (WEMS) database.
5. Transuranic Waste Certification, 1-PRO-X05-WC-4018, Revision 2, December 2000.
6. Acceptable Knowledge TRU/TRM Waste Stream Summaries, RMRS-WIPP-98-100, Revision 11, May 2001.
7. Real-Time Radiography Testing of Transuranic and Low-Level Waste, 4-W30-NDT-00664, Revision 4, February 2001.
8. Real-Time Radiography Testing of Transuranic and Low-Level Waste in Building 569, 4-I19-NDT-00569, Revision 5, February 2001.
9. Visual Examination for Confirmation of RTR, 4-H80-776-ASRF-007, Revision 4, March 2001.
10. GC/MS Determination of Volatile Organics Waste Characterization, L-4111-U, December 2000.
11. GC/MS Determination of Volatile Organic Compounds (Solids, Liquids, and TCLP Extracts), L-4165- J, October 2000.
12. GC/MS Determination of Total SVOCs for WIPP, L-4215-C, May 2000.
13. Waste Analysis by Atomic Absorption Spectroscopy, L-4151-J, September 2000.
14. Mercury Analysis in Waste (Cold-Vapor Technique), L-4152- J, September 2000.
15. Trace Metals by ICP Spectrometry (Solids, Liquids, and TCLP Extracts), L-4153-H, September 2000.
16. Waste Characterization, Generation, and Packaging, 1-PRO-079-WGI-001, Revision 3, December 2000.
17. Waste Characterization Program Manual, 1-MAN-036-EWQA-Section 1.6.1, Revision 2, September 2000.
18. Interoffice Memorandum from Thomas R. Gatliffe to Eric L. D'Amico, Headspace Gas Analysis Data Evaluation Report For Waste Stream Profile RF009.01 (TRU Pyrochemical Salts (Repackaged)) Lot 1, TRG-042-01, April 2001.
19. Interoffice Memorandum from Thomas R. Gatliffe to Eric L. D'Amico, Statistical Solid Analysis Data Evaluation Report For Waste Stream RF009.01 [TRU Pyrochemical Salts (Repackaged)] For The Residue Salt Project, TRG-061-01, June 2001.
20. RCRA Characterization Of TRU Waste To Be Disposed Of At WIPP, PRO-945-WIPP-009, Revision 4, September 2000.
21. Repack Sampling, Building 371, PRO-860-RS-0156, Revision 1, January 2001.
22. Interoffice Memorandum from Thomas R. Gatliffe to Eric L. D'Amico, Statistical Solid Analysis Data Control Chart Evaluation Report for IDC 411R, Repackaged Pyrochemical Salts, Lot RF009.01-002 (Lot 2 of Waste Stream Profile RF009.01) – TRG-064-00, September 2000.

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 # RF009.01

Item	Check Box[a]	Reconciliation Parameter
1	✓	Waste Matrix Code as reported in WEMS.
2	✓	Waste Material Parameter Weights for individual containers as reported in WEMS.
3	✓	The waste matrix code identified is consistent with the type of sampling and analysis used to characterize the waste.
4	✓	Container mass and activities of each radionuclide of concern as reported in WEMS.
5	✓	Each waste container of waste contains TRU radioactive waste.
6	✓	Mean concentrations, UCL_{90} 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.
7	✓	Mean concentrations, UCL_{90} 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.
8	✓	Mean concentrations, UCL_{90} for the mean concentrations, standard deviations, number of samples collected for SVOCs in the waste stream/waste stream lot. Summary Categories S3000 and S4000.
9	✓	Mean concentrations, UCL_{90} 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.
10	✓	Sufficient number of samples was taken to meet statistical sampling requirements.
11	✓	Only validated data were used in the above calculations, as documented through the site data review and validation forms and process.
12	✓	Waste containers were selected randomly for sampling, as documented in site procedures.
13	✓	The potential flammability of TRU waste headspace gases.
14	✓	Sufficient number of waste containers was visually examined to determine with a reasonable level of certainty that the UCL_{90} for the miscertification rate is less than 14 percent.
15	✓	Whether the waste stream exhibits a toxicity characteristic (TC) under 40 CFR Part 261, Subpart C.
16	✓	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.
17	✓	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.
18	✓	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.
19	✓	Whether the waste stream can be classified as hazardous or non-hazardous at the 90-percent confidence limit.

[a] 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

G. A. O'Leary
Printed Name

6/12/01
Date

Data Summary Report—Table 1: Solid Sampling Summary

WSPF # RF009.01

Determination of Number of Retrievably Stored Waste Containers to Sample (S3000,S4000)

Preliminary Estimates of Mean, Variance, and Coefficient of Variation:

Attach a table(s) that correlates container identification numbers to data packages if different from containers used for characterization.

Description of Source Data: Preliminary samples were collected and analyzed in compliance with all requirements (specified in the WIPP Waste Analysis Plan Section B2-2a) for being counted as part of the total number of calculated required samples. Sufficient preliminary samples were collected to demonstrate sampling sufficiency – i.e., collection of additional samples other than the preliminary samples was not required. See Reference List, No 19.

Samples Randomly Selected from Waste Stream (yes/no)? Yes.

Treatment of less-than-detectable measurements: This pertains only to data for analytes in which at least one detectable measurement was obtained. Raw data were evaluated using one half the method detection limit (MDL) for less-than-detectable observations. See Reference List, No. 19

Analytes that are listed spent solvents and therefore not included in the calculation to determine the number of containers to sample: None

Largest Calculated Sample Size selection and associated analyte: Pertains only to toxicity characteristic or listed waste analytes. Largest value is 0.92 for Cadmium.

Minimum number of containers to sample: 10 (based on preliminary sample size for evaluating the waste stream).

Attach preliminary estimates: See Reference List, No. 19. Preliminary estimates are identical to final results because sufficient preliminary samples were collected and analyzed in compliance with all requirements for being used as required samples.

Retrievably Stored Waste Sampling Results

Analytes that are listed spent solvents and therefore not included in the UCL_{90} estimate calculation to determine the toxicity characteristic: None

Largest Calculated Sample Size and associated analyte: Pertains only to toxicity characteristic or listed waste analytes. Largest value is 0.92 for Cadmium.

Comparison of largest calculated sample size with largest calculated sample size selected from preliminary estimate: 0.92 vs. 0.92 (for Cadmium)

Treatment of less-than-detectable measurements: This pertains only to data for analytes in which at least one detectable measurement was obtained. Raw data were evaluated using one half the method detection limit (MDL) for less-than-detectable observations. See Reference List, No. 19.

Transformations applied to data and justification: Data were originally evaluated both with and without transformations applied to data (see Reference List, No. 19). For this WSPF, UCL_{90} comparison to RTL values was performed on raw, untransformed data.

Drums overpacked for shipment/WWIS tracking (Yes/No)? No.
If yes, overpack container identification number:

Sampled drums included in waste stream lot reported here (Yes/No)? Yes.
If no, WSPF # including sampled drums:

Data Summary Report—Table 1: Solid Sampling Summary (continued)

Newly Generated Waste Sampling Results
Batch or continuous process? N/A[a]
Samples randomly selected from Waste Stream? (yes/no) N/A[a]
Sample locations (part of process): N/A[a]
Treatment of less-than-detectable measurements: N/A[a]
Transformations applied to data and justification: N/A[a]

NOTES:

[a] Control charting for this waste stream was determined not to be applicable and sampling and analysis was conducted using the retrievably stored characterization strategy (Reference List, No. 22).

Data Summary Report—Table 2: Headspace Gas Summary Data

WSPF # RF009.01

Sampling and Analysis Method (check one):

☐ 100% Sampling ☑ Reduced Sampling

2A

ANALYTE	# Samples[b]	Maximum (ppmv)	Mean[e] (ppmv)	SD[e] (ppmv)	UCL_{90}[e] (ppmv)	RTL[c] (ppmv)	EPA Code[a]
1,1-Dichloroethane						NA	
1,2-Dichloroethane						10	
1,1-Dichloroethylene						10	
cis-1,2-Dichloroethylene						NA	
1,1,2,2-Tetrachloroethane						10	
1,1,1-Trichloroethane						10	
1,1,2-Trichloro-1,2,2-Trifluoroethane						10	
Acetone						100	
Benzene	1	0.8	0.33	0.13	0.38	10	
Bromoform						NA	
Butanol						100	
Carbon disulfide						10	
Carbon tetrachloride						10	
Chlorobenzene						10	
Chloroform						10	
Ethyl benzene						10	
Ethyl ether						100	
Methanol						100	
Methyl ethyl ketone						100	
Methyl isobutyl ketone						100	
Methylene chloride	1	0.61	0.32	0.08	0.35	10	
o-Xylene						10	
m,p-Xylene						10	
Tetrachloroethylene						10	
Toluene	10	3.8	0.90	1.10	1.29	72.02[d]	
Trichloroethylene						10	

Data Summary Report—Table 2: Headspace Gas Summary Data (continued)

WSPF # RF009.01

2B

TENTATIVELY IDENTIFIED COMPOUND	Maximum Observed Estimated Concentrations (ppmv)[b]	# Samples Containing TIC[b]
No TICs included in the 40 CFR 261 Appendix VIII list were detected in at least 25 percent of the headspace gas VOC samples for the waste stream lot.		

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

Data as reported in Data Summary Report – Table 2 confirm acceptable knowledge that the waste stream is not a hazardous waste.

If not, describe the basis for assigning the EPA Hazardous Waste Codes:

NOTES:

[a] No entry indicates no associated EPA Code assigned to the waste stream.
[b] Analysis was performed for all analytes identified. No entry indicates no detectable measurements available for statistics. Samples were not composited
[c] 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.
[d] Limit used for evaluating EPA Hazardous Waste Code for toluene (Reference No. 3).
[e] Statistics calculated based on using ½ MDL for less-than-detectable observations without data transformation.

Data Summary Report—Table 3: Metals Summary Data

WSPF # RF009.01

Sampling and Analysis Method/Units (check one):

☐ Totals (units are in mg/kg) ☑ TCLP (units are in mg/l)

ANALYTE	# Samples[c]	Mean[d] (mg/L)	SD[d] (mg/L)	UCL_{90}[d] (mg/L)	RTL[b] (mg/L)	EPA Code[a]
Antimony					NA	
Arsenic					5	
Barium	9	0.9890	0.8267	1.351	100	
Beryllium[e]	1	0.0255	0.0394	0.043	NA	
Cadmium	2	0.3735	0.9316	0.781	1	
Chromium	1	0.2070	0.2334	0.309	5	
Lead	2	0.2325	0.2463	0.340	5	
Mercury					0.2	
Nickel	9	0.7640	0.5894	1.022	NA	
Selenium					1	
Silver					5	
Thallium					NA	
Vanadium	1	0.1800	0.2214	0.277	NA	
Zinc	9	7.4525	20.947	16.61	NA	

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

Data as reported in Data Summary Report – Table 3 confirm acceptable knowledge that the waste stream is not a hazardous waste.

If not, describe the basis for assigning the EPA Hazardous Waste Codes.

NOTES:

[a] No entry indicates no associated EPA Code assigned to the waste stream.

[b] "NA" means the analyte is not a hazardous waste constituent and so has no applicable regulatory threshold.

[c] Analysis was performed for all analytes identified. No entry indicates no detectable measurements available for statistics.

[d] Statistics calculated based on raw data using ½ the MDL values for all less-than-detectable observations without data transformation.

[e] The EPA hazardous waste number P015, beryllium powder, is not applicable to this waste stream. The applicable regulations controlling the identification of U and P listed hazardous wastes are given in 40 CFR 261.33, Discarded Commercial Chemical Products, Off-Specification Species, Container Residues, and Spill Residues Thereof. Within this regulation, it states that "The phrase 'commercial chemical product or manufacturing chemical intermediate having the generic name listed in …' refers to a chemical which is manufactured or formulated for commercial or manufacturing use which consists of the commercially pure grade of the chemical, any technical grades of the chemical that are produced or marketed, and all formulations in which the chemical is the sole active ingredient. It does not refer to a material, such as a manufacturing process waste, that contains any of the substances listed in paragraph (e) or (f). Where a manufacturing process waste is deemed to be a hazardous waste because it contains a substance listed in paragraph (e) or (f), such waste will be listed in either Sec. 261.31 or Sec. 261.32 or will be identified as a hazardous waste by the characteristics set forth in subpart C of this part."

Pyrochemical salt is a manufacturing process waste that is neither a characteristic hazardous waste nor listed in either Section 261.31 or 261.32. Therefore, the pyrochemical salt waste is not rendered a P015 listed waste by the presence of trace quantities of beryllium.

Beryllium parts were used in the manufacture/assembly of the weapons components at RFETS and residual beryllium contamination of plutonium parts may have occurred. Plutonium parts (from weapons components returned from the field) were purified using molten salt extraction and electro-refining. The beryllium detected here is attributed to extraction of residual beryllium on plutonium parts during the purification process.

Data Summary Report—Table 4: Total VOC Summary Data

WSPF # RF009.01

4A

ANALYTE	# Samples[b]	Mean[d] (mg/kg)	SD[d] (mg/kg)	UCL_{90}[d] (mg/kg)	RTL[c] (mg/kg)	EPA Code[a]
1,1-Dichloroethylene					14	
1,2-Dichloroethane					10	
1,2-Dichlorobenzene					10	
1,4-Dichlorobenzene					150	
1,1,1-Trichloroethane					10	
1,1,2-Trichloro-1,2,2-Trifluoroethane					10	
1,1,2-Trichloroethane					10	
1,1,2,2-Tetrachloroethane					NA	
Acetone	1	5.500	1.5811	6.19	100	
Benzene					10	
Bromoform					NA	
Butanol					100	
Carbon disulfide					10	
Carbon tetrachloride					10	
Chloroform					120	
Chlorobenzene					2000	
Chloromethane[e]	9	4.220	2.9551	5.51	NA	
Ethyl benzene					10	
Ethyl ether					100	
Isobutanol					100	
Methanol	2	6.300	2.8304	7.54	100	
o-Xylene					10	
m,p-Xylene					10	
Methyl ethyl ketone	2	6.300	2.7508	7.50	100	
Pyridine					100	
Tetrachloroethylene					10	
Toluene	1	0.570	0.2214	0.67	10	
Trichloroethylene					10	
Trichlorofluoromethane					10	
Vinyl chloride					4	

Data Summary Report—Table 4: Total VOC Summary Data (continued)

WSPF # RF009.01

4B

TENTATIVELY IDENTIFIED COMPOUND	Maximum Observed Estimated Concentrations (mg/kg)[b]	# Samples Containing TIC[b]
No TICs included in the 40 CFR 261 Appendix VIII list were detected in at least 25 percent of the VOC solid samples for the waste stream lot.[e]		

Did the data verify acceptable knowledge? ☑ Yes ☐ No

Data as reported in Data Summary Report – Table 4 confirm acceptable knowledge that the waste stream is not a hazardous waste.

If no, describe the basis for assigning EPA Hazardous Waste Codes.

NOTES:

[a] No entry indicates no associated EPA Code assigned to the waste stream.
[b] Analysis was performed for all analytes identified. No entry indicates no detectable measurements available for statistics.
[c] RTLs correspond to the analyte PRQL for analytes that are F-listed hazardous waste constituents or to the applicable total RTL value as calculated from the TC RTL. "NA" means the analyte is not an applicable hazardous waste constituent and so has no associated regulatory threshold.
[d] Statistics calculated based on raw data using ½ the MDL values for all less-than-detectable observations without data transformation.
[e] Chloromethane is a compound included in 40 CFR 261 Appendix VIII that was detected as a TIC in at least 25 percent of the VOC solid samples for solid sample lot 2 for this waste stream. Consequently, it was added to the Target Analyte List for this waste stream prior to collection and analysis of the samples being used here to prepare this WSPF.

Data Summary Report—Table 5: Total SVOC Summary Data

WSPF # RF009.01

5A

ANALYTE	# Samples[b]	Mean (mg/kg)	SD (mg/kg)	UCL_{90} (mg/kg)	RTL[c] (mg/kg)	EPA Codes[a]
1,2-Dichlorobenzene					10	
1,4-Dichlorobenzene					150	
2,4-Dinitrophenol					NA	
2,4-Dinitrotoluene					2.6	
Aroclor 1016					NA	
Aroclor 1221					NA	
Aroclor 1232					NA	
Aroclor 1242					NA	
Aroclor 1248					NA	
Aroclor 1254					NA	
Aroclor 1260					NA	
Cresols					40	
Hexachlorobenzene					2.6	
Hexachloroethane					60	
Nitrobenzene					40	
Pentachlorophenol					2000	
Pyridine					100	

Data Summary Report—Table 5: Total SVOC Summary Data (continued)

WSPF # RF009.01
5B

TENTATIVELY IDENTIFIED COMPOUND	Maximum Observed Estimated Concentrations (mg/kg)[b]	# Samples Containing TIC[b]
No TICs included in the 40 CFR 261 Appendix VIII list were detected in at least 25 percent of the SVOC solid samples for the waste stream lot.		

Did the data verify acceptable knowledge? ☑ Yes ☐ No

Data as reported in Data Summary Report – Table 5 confirm acceptable knowledge that the waste stream is not a hazardous waste.

If no, describe the basis for assigning EPA Hazardous Waste Codes.

NOTES:

[a] No entry indicates no associated EPA Code assigned to the waste stream.
[b] Analysis was performed for all analytes identified. No entry indicates no detectable measurements available for statistics.
[c] RTLs correspond to the analyte PRQL for analytes that are F-listed hazardous waste constitutents or to the applicable total RTL value as calculated from the TC RTL. "NA" means the analyte is not an applicable hazardous waste constituent and so has no associated regulatory threshold.

Data Summary Report—Table 6: Exclusion of Prohibited Items

WSPF # RF009.01

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-radionuclide 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

Data Summary Report—Table 7: Correlation of Container Identification to Batch Data Reports

WSPF # RF009.01

Package No.	Inner Can No.	Radioassay Data Package	Solid Sample Batch No[a]	Metals Data Package[a]	VOC Data Package[a]	SVOC Data Package[a]	Headspace Sample Batch No.[b]	Headspace VOC Data Package[b]	RTR Data Package[c]	VE or VV Data Package[d]
D95659	Z21146	371TG2-DP-050801	RS-SB-1008	MTLS-DP-00017	SVOA-DP-00030	VOCS-DP-00023				SR-DP-168
D98288	Z09717	CALG-DP-00392					01W0137	HVOC-DP-00467	5T-0193	VE-2001-006
D99004	Z09523	CALG-DP-00448					01W0137	HVOC-DP-00467	5T-0194	VE-2001-006
DA0406	Z10940	CALG-DP-00525					01W0137	HVOC-DP-00467	5T-0193	
DA1951	Z11372	CALG-DP-00602					01W0137	HVOC-DP-00467	5T-0193	VE-2001-006
DA2646	Z11406 Z11796	CALG-DP-00624 CALG-DP-00626					01W0137	HVOC-DP-00467	5T-0193	VE-2001-006
DA2998	Z11401	CALG-DP-00599					01W0137	HVOC-DP-00467	5T-0194	VE-2001-006
DA3180	Z12413	371TGS-DP-92999B					01W0137	HVOC-DP-00467	5T-0194	
DA4349	Z12427	371TG1-DP-100799					01W0137	HVOC-DP-00467	5T-0193	VE-2001-006
DA5188	Z12625	CALG-DP-00761					01W0137	HVOC-DP-00467	5T-0193	
DA5685	Z12958	CALG-DP-00781					01W0137	HVOC-DP-00467	5T-0193	
DA6450	Z14274	CALG-DP-00876					01W0139	HVOC-DP-00468	5T-0193	
DA7712	Z15242	CALG-DP-01016					01W0137	HVOC-DP-00474	5T-0194	VE-2001-006
DA8151	Z14213	CALG-DP-00950					01W0137	HVOC-DP-00467	5T-0194	VE-2001-006
DA8910	Z14805	CALG-DP-00987					01W0137	HVOC-DP-00467	5T-0194	
DA9095	Z15082	CALG-DP-01000					01W0137	HVOC-DP-00467	5T-0193	VE-2001-006
DB8292	Z21141	371TG3-DP-050901	RS-SB-1009	MTLS-DP-00017	SVOA-DP-00030	VOCS-DP-00023				SR-DP-168
DB8295	Z21138	371TG2-DP-050901	RS-SB-1009	MTLS-DP-00017	SVOA-DP-00030	VOCS-DP-00023				SR-DP-168
DB8304	Z21139	371TG3-DP-050901	RS-SB-1009	MTLS-DP-00017	SVOA-DP-00030	VOCS-DP-00023				SR-DP-168
DB8306	Z21136	371TG3-DP-050901	RS-SB-1009	MTLS-DP-00017	SVOA-DP-00030	VOCS-DP-00023				SR-DP-168
DB8652	Z21153	371TG2-DP-050401	RS-SB-1008	MTLS-DP-00017	SVOA-DP-00030	VOCS-DP-00023				SR-DP-168
DB9975	Z21145	371TG2-DP-050901	RS-SB-1008	MTLS-DP-00017	SVOA-DP-00030	VOCS-DP-00023				SR-DP-168
DB9977	Z21143	371TG2-DP-051001	RS-SB-1009	MTLS-DP-00017	SVOA-DP-00030	VOCS-DP-00023				SR-DP-168
DB9980	Z21147	371TG2-DP-050901	RS-SB-1008	MTLS-DP-00017	SVOA-DP-00030	VOCS-DP-00023				SR-DP-168
DB9987	Z21144	371TG2-DP-050901	RS-SB-1008	MTLS-DP-00017	SVOA-DP-00030	VOCS-DP-00023				SR-DP-168

NOTES:

[a] No entry indicates container was not selected or used for solid sampling.

[b] No entry indicates container was not selected for reduced headspace gas sampling.

[c] No entry indicates container was visually examined during repackaging after solid sampling.

[d] No entry indicates container was not selected for visual examination to confirm RTR or visually verified during repackaging after solid sampling.

Acceptable Knowledge Summary

WSPF # RF009.01

RMRS-WIPP-98-100, Acceptable Knowledge TRU/TRM Waste Stream Summaries, Section 6.9, TRU Pyrochemical Salts (attached).

6.9 TRU Pyrochemical Salts

Profile No. RF009.01

Acceptable Knowledge Waste Stream Summary

Waste Stream Name: TRU Pyrochemical Salts

Generation Buildings: Buildings 371 and 707[6,7,11]

Waste Stream Volume (Current): 6,224 55-gallon drums[6,9]

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Generation Dates (Current): March 1999 - May 2001[6,9]

Waste Stream Volume (Projected): 0 [9,10]

Generation Dates (Projected): 0 [9,10]

TRUCON Content Codes [1]: RF 124E, RF 124F, RF 124FF, RF 124G, RF 124GF, RF 124H, RF 124 HF, RF 130A, RF 130B, RF 130BA, RF 130D, RF 130DF, RF 130E, RF 130F, RF 130G, RF 130GF, RF 130J, RF 130K, RF 130P, RF 130PF, RF 130PA, RF 130PAF

6.9.1 Transuranic Waste Baseline Inventory Report Information [2]

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WIPP Identification Numbers: RF-TR-0404, RF-TR0405, RF-TR0406, RF-TR0407, RF-TR0408, RF-MR-0409, RF-MT-0409, RF-TR0409, RF-TR0410, RF-MR-0411, RF-MT-0411, RF-TR-0411, RF-MT-0412, RF-TR-0412, RF-MR-0413, RF-TR-0413, RF-MR-0414, RF-MT-0414, RF-TR0414, RF-TR0415, RF-TR0417, RF-TR0418, RF-TR0427, RF-TR0429, RF-TR0433, RF-MR-0434, RF-TR0434, RF-TR0473, RF-TR0654, RF-MR-0365

NOTE: The mixed residue IDCs have been recharacterized as nonhazardous. [5]

Summary Category Group: S3000 Waste Matrix Code Group: Salt Waste

Waste Matrix Code: S3141

Waste Stream Name: Misc. Pu Recovery By Product/TRU and Misc. Pu Recovery By Product/TRM

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Description from the TWBIR: This waste is generated during plutonium recovery operations such as direct oxide reduction, molten salt extraction, electrorefining and salt scrub. Its composition includes chunks and powdered mixed salts, a probable presence of magnesium, sodium, and potassium metals.

NOTE: The waste stream name and description in the TWBIR are incorrect. The correct waste stream name is TRU Pyrochemical Salts. The waste stream is not a reactive or a pyrophoric waste based on the presence of these metals. [5]

6.9.2 Waste Stream Description

Pyrochemical salt IDCs that are feed material to the repackaging process were historically generated by similar molten salt plutonium recovery processes and are similar in material, physical form, and hazardous constituents, and therefore are considered a single waste stream. Table 6-28 presents the waste matrix codes and waste material parameters for pyrochemical salts.[3]

Table 6-28, Pyrochemical Salt Waste Description

IDC	IDC Description	Waste Matrix Code	Waste Material Parameters	Weight % (Average)
411R	Electrorefining Salt (Repackaged)	S3141, Chloride Salts	Other Inorganic Materials	100%
429R	Scrub Alloy Spent Salt (Repackaged)	S3141, Chloride Salts	Other Inorganic Materials	100%
433R	Scrub Alloy Spent Dicesium Salt (Repackaged)	S3141, Chloride Salts	Other Inorganic Materials	100%
436	Miscellaneous Salt Waste	S3141, Chloride Salts	Other Inorganic Materials	100%
436R	Miscellaneous Salt Waste (Repackaged)	S3141, Chloride Salts	Other Inorganic Materials	100%
454R	Direct Oxide Reduction Salt (Repackaged)	S3141, Chloride Salts	Other Inorganic Materials	100%

IDC 411R, Electrorefining Salt (Repackaged): Repackaged spent salt from the ER processes. Salts which become IDC 411R for disposal include electrorefining salt, first use (IDC 363), electrorefining salt, second use (IDC 364), electrorefining salt – final disposition (IDC 411), impure salt from cell clean-out (IDC 413), reburned salt from cell cleanout (IDC 426), stabilized electrorefining salt (IDC 411X), and electrorefining salt packaged for LANL (IDC 473). This output may also contain some broken or irregularly shaped pieces of magnesium oxide ceramic crucible coated with pyrochemical salt.[7,11]

IDC 429R, Scrub Alloy Spent Salt (Repackaged): Repackaged spent salt from the MSE scrub alloy process including materials from failed production runs. Salts which become IDC 429R for disposal include MSE, unknown percent unpulverized (IDC 405), MSE, unknown percent pulverized (IDC 406), MSE, 8 percent unpulverized (IDC 407), MSE, 8 percent pulverized (IDC 408), MSE, 30 percent unpulverized (IDC 409), MSE, 30 percent pulverized (IDC 410), plutonium chloride mixed salt (IDC 415), MSE salt packaged for LANL (IDC 418), stabilized scrub alloy spent salt (IDC 429X), and scrub alloy spent salt (IDC 429). This output may also contain some broken or irregularly shaped pieces of magnesium oxide ceramic crucible coated with pyrochemical salt.[7,11]

IDC 433R, Scrub Alloy Spent Dicesium Salt (Repackaged): Repackaged spent salt from the dicesium hexachloroplutonate (DCHP) process. Salts which become IDC 433R for disposal include DCHP salt (IDC 417) and stabilized scrub alloy spent dicesium salt (IDC 433X).[7,11]

IDC 436, Miscellaneous Salt Waste: Miscellaneous salt waste consists of repackaged salt residue project material including any salt that may be repackaged as IDC 411R, 429R, 433R, or 454R that contains up to 10 percent by weight moisture.[7,11]

IDC 436R, Miscellaneous Salt Waste (Repackaged): This output consists of repackaged Salt Residue Project material including any salt historically generated by pyrochemistry operations that contains less than 6 percent by weight moisture. This output may also contain some broken or irregularly shaped pieces of magnesium oxide ceramic crucible coated with pyrochemical salt.[7,11]

IDC 454R,Direct Oxide Reduction Salt (Repackaged): This waste consists of repackaged pyrochemical salt in which the dominant components are calcium chloride from the Direct Oxide Reduction (DOR) process. Salts which become IDC 454R for disposal include salt from bad DOR run (IDC 365), MSE salt, Ca, Zn, K (IDC 404), Gibson salt (IDC 412), DOR salt-unoxidized calcium (IDC 414), stabilized DOR salt – oxidized calcium salt (IDC 454X), and DOR Salt – Oxidized Calcium (IDC 454). This output may also contain some broken or irregularly shaped pieces of magnesium oxide ceramic crucible coated with pyrochemical salt.[7,11]

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6.9.3 Areas of Operation

Repackaged pyrochemical salts are generated in Buildings 371 and 707.[7,11]

6.9.4 Generation Processes

Pyrochemical salts are primarily by products from a variety of pyrochemical plutonium metal purification and production processes conducted at RFETS. The following defense operations generated pyrochemical salts:[3,5,8]

- Dicesium Hexachloroplutonate Preparation
- Molten Salt Extraction
- Electrorefining
- Direct Oxide Reduction
- Salt Scrub
- Pyroredox

See archived WSRIC processes 371-1, 776-1, and 779-2 through 779-8 for process flow diagrams showing historical generation of pyrochemical salts.

In Buildings 371 and 707, pyrochemical salts are repackaged to meet residue interim safe storage criteria (ISSC) of plutonium, and WAC for the WIPP. Drums containing material to be repackaged are opened in the contamination control cell. The drums will be opened and items removed and staged until they are entered into the glovebox system via an airlock or bag-in port. The items are repacked in batches to meet the 10-weight percent plutonium concentration limit. Repacked batches will be bagged out of the glovebox system, placed in a vented metal material container and assayed. Following assay, containers will be packed into pipe overpack components (POCs) and shipped to storage pending headspace gas sampling and transfer to WIPP.

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Pyrochemical salt IDCs that are feed material to the repackaging process were historically generated by similar molten salt plutonium recovery processes and are similar in material, physical form, and hazardous constituents, and therefore are grouped together as a single waste stream. Failed runs resulted in higher actinide content in the residue material but did not change the salt matrix composition. Any chunks of metal, buttons, or billets were removed from the containers of salt during the repackaging process. These metal pieces are candidates for treatment through other processes and disposal as a different waste stream. See WSRIC 371-23 Figure 23.1 and 707-43 Figure 43.1 for process flow diagrams showing the generation of repackaged pyrochemical salts.[7,11]

Since all residue salts were molten at the time of the original process operation, which included a stirring operation, the temperatures involved (over 700 °C) would drive off any organic compounds of concern for headspace gas analysis. There were no VOCs introduced as part of the initial reagents, processing, or subsequent handling. Therefore, the repackaged salt waste stream is a candidate for reduced headspace gas sampling as waste from a high-temperature thermal process.[12]

DCF-CHG-03

6.9.5 RCRA Characterization

This waste stream is not characterized as a mixed waste. Table 6-29 presents the chemical constituent codes (CCCs) and EPA Hazardous Waste Numbers associated with the WSRIC Waste Streams assigned to pyrochemical salt waste containers.[7,11]

Table 6-29, Pyrochemical Salt Waste RCRA Characterization

IDC	WSRIC Waste Stream	RCRA CCCs	Non-RCRA CCCs	EPA Hazardous Waste Numbers
		Electrorefining Salt - Repackaged		
411R	371 - 23 - 2	00	00	None
411R	707 - 43 - 14	00	00	None
		Scrub Alloy Spent Salt - Repackaged		
429R	371 - 23 - 4	00	00	None
429R	707 - 43 - 15	00	00	None
		Scrub Alloy Spent Dicesium Salt - Repackaged		
433R	371 - 23 - 6	00	00	None
433R	707 - 43 - 13	00	00	None
		Miscellaneous Salt Waste		
436	371 - 23 - 24	00	00	None
436	707 - 43 - 18	00	00	None
		Miscellaneous Salt Waste - Repackaged		
436R	371 - 23 - 25	00	00	None
436R	707 - 43 - 20	00	00	None
		Direct Oxide Reduction Salt – Repackaged		
454R	371 - 23 - 26	00	00	None
454R	707 - 43 - 19	00	00	None

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Pyrochemical salts were identified as having a potential for exhibiting characteristics that required processing prior to disposal (i.e., metals existing in pyrophoric or reactive form entrained in the salt matrix). Sampling and characterization of salt residues was initiated to obtain data to validate if these potential hazards existed. In the interim, a salt stabilization process was developed and operated to eliminate any potential problems by ensuring that any pyrophoric or reactive metals were oxidized and any absorbed water was driven off. Through the results of the sampling and analysis program, "high-risk" (i.e., having the potential to contain pyrophoric or reactive metals) residue salts were stabilized by means of pyro-oxidation (dispositioned under Profile No. RF005.01 & RF005.02) or shown to be "low-risk" (i.e., not having the potential to contain pyrophoric or reactive metals) and repackaged without pyro-oxidation. Furthermore, the repackaged salts did not exhibit pyrophoric or reactive behavior as verified during repackaging operations. Based on this information, this waste stream does not contain non-radionuclide pyrophoric materials, and contains less than one percent by weight radionuclide pyrophoric materials. [5]

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Pyrochemical salts were previously characterized as reactive (D003) based on the potential presence of water reactive metals entrained in the salt matrix.[2,5] Water reactivity testing of the salts was conducted to quantify hydrogen gas generation rates. Violent or explosive reactions were not observed during sampling, and toxic gases were not generated when mixed with water. Consequently, the waste stream was re-characterized to remove the characteristic of reactivity EPA Hazardous Waste Number. [5]

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Furthermore, special handling of this waste has not been required at any stage in the waste management process, and there has never been a need to aggressively manage this waste stream, such as covering it with oil or kerosene, to shield it from contact with air or moisture. [5]

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IDCs 404 and 412 were previously characterized as corrosive (D002) based on the hygroscopic nature of these salts.[2,5] It has been determined that this waste stream does not exhibit the characteristic of corrosivity because examination of these salts did not identify any free liquid.[5]

DCF-CHG-02

Beryllium parts were used in the manufacture/assembly of weapons components, and residual beryllium contamination of plutonium parts may have occurred. Plutonium was recovered and purified from weapons components returned from the field using molten salt extraction and electrorefining, and therefore, trace quantities of beryllium is present in the salts. Beryllium contamination may also have occurred for some drums during the visual examination process to confirm radiography, not the original generation of this waste. In both of these instances, the beryllium is not unused commercial chemical product, and therefore is not a P015-listed waste.[5,13]

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IDC 411 was previously characterized as hazardous based on a single drum that was thought to contain cans of both salt and incinerator ash (incinerator ash is a hazardous waste).[2,5] The drum was opened and the can containing the incinerator ash was visually inspected. The contents of the can were confirmed to be IDC 411 salt, not incinerator ash. Consequently, the EPA Hazardous Waste Numbers associated with the incinerator ash were removed. [5] Visual examination of waste contents at the time of packaging and/or RTR is used to verify that the waste stream consists of only those IDCs listed Section 6.9.2.

Confirmatory solid samples that were analyzed for TCLP metals and total VOC/SVOC constituents substantiate the non-mixed acceptable knowledge characterization. The UCL_{90} values for all hazardous waste constituents analyzed were less than the corresponding regulatory threshold limit (RTL) values. The UCL_{90} values were calculated using the un-transformed, raw data in which one-half the method detection limit (MDL) was utilized for all less-than detectable observations.[14]

Chloromethane, pentachloroethane, and 1,1,1,2-tetrachloroethane, which are U-listed compounds, were detected as tentatively identified compounds (TICs) in an earlier solid sampling lot.[14] Chloromethane was detected as a VOC TIC, while pentachloroethane and 1,1,1,2-tetrachloroethane as SVOC TICs. Only chloromethane was required to be added to the target analyte list.[15] Analysis of subsequent sampling lots detected chloromethane but below the PRQL.[14] An evaluation was completed that determined these compounds were not used in the processes that generated this waste stream and are not present as unused commercial chemical products. Therefore, the presence of any these TICs does not render the waste stream a hazardous waste.[16]

Headspace gas sampling and analysis did not detect any VOCs above the PRQL, which confirms the nonhazardous acceptable knowledge characterization.[17]

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Similar waste streams were generated at RFETS and sent to the INEEL for storage. These waste streams (identified as TWBIR ID Nos. IN-W311.1013 and IN-W311.604) are assigned F001 and D028 (1,2-dichloroethane).[2] These EPA Hazardous Waste Numbers are not assigned to this waste stream because the pyrochemical salt processes did not use 1,2-dichloroethane or listed solvents. [5,7,11] Confirmatory analyses of solid samples and headspace gas samples supports the nonhazardous characterization.[14,17]

6.9.6 Radionuclides

Table 6-30 summarizes the radionuclides potentially present in pyrochemical salt wastes.[3]

Table 6-30, Pyrochemical Salt Waste Radionuclides

IDC	Radionuclides
411R	WG Pu, Am-241, Np-237
429R	WG Pu, Am-241
433R	WG Pu
436	WG Pu, Am-241, Np-237
436R	WG Pu, Am-241, Np-237
454R	WG Pu, Am-241

Key: WG Pu weapons-grade plutonium
Am-241 americium-241
Np-237 neptunium-237

6.9.7 References

1. DOE 1999. TRUPACT-II Content Codes (TRUCON), Revision 12. DOE/WIPP 89-004.

2. DOE 1995. Transuranic Waste Baseline Inventory Report, Revision 2. DOE/CAO-95-1121.

3. RFETS 2000. RFETS TRU Waste Acceptable Knowledge Supplemental Information. RF/RMRS-97-018, Revision 8.

4. RFETS 1998. Solid Radioactive Waste Packaging, 4-D99-WO-1100, Revision 1.

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5. RFETS 2001. Backlog Waste Reassessment Baseline Book, Waste Form 34, Pyrochemical Salts.

6. Waste and Environmental Management System (WEMS) database.

7. RFETS 2000. Waste Stream and Residue Identification and Characterization, Building 707, Version 6.0.

8. RFETS 2000. Backlog Waste Reassessment Book, Waste Form 28, Product.

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9. WASTREN 2001. Interoffice Memorandum from Jeff Harrison to Waste Records Center. JLH-011-2001. May 23.

10. WASTREN 2000. Interoffice Memorandum from Jeff Harrison to Vivian Sendelweck. JLH-016-2000. August 11.

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11. RFETS 2001. Waste Stream and Residue Identification and Characterization, Building 371, Version 6.0.

12. Kaiser-Hill 2001. Interoffice Memorandum from V. S. Sendelweck to Jerry O'Leary, et al. Pyrochemical Salts High-Temperature Thermal Process Documentation (Revision 1), VSS-002-01. January 24.

13. WASTREN 2001. Interoffice Memorandum from Michael J. Papp to Eric D'Amico. Beryllium Contamination Associated with Containers D98288, D99004, DA1951, DA2646, DA2998, DA4349, DA7712, DA8151, and DA9095 - MJP-156-2001. March 28.

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14. Tenera 2001. Interoffice Memorandum from Thomas R. Gatliffe to Eric L. D'Amico, Statistical Solid Analysis Data Evaluation Report For Waste Stream RF009.01 [TRU Pyrochemical Salts (Repackaged)] For The Residue Salt Project, TRG-061-01, June 8.

15. WIPP Waste Characterization Hotline Activity Archived Questions Report, Hotline ID Number 119.

16. WASTREN 2000. Interoffice Memorandum from Jeff Harrison to Eric D'Amico, Tentatively Identified Compounds in Repackaged Salt Waste, JLH-020-2000, September 21.

17. Tenera 2001. Interoffice Memorandum from Thomas R. Gatliffe to Eric L. D'Amico, Headspace Gas Analysis Data Evaluation Report For Waste Stream Profile RF009.01 (TRU Pyrochemical Salts (Repackaged)) Lot 1, TRG-042-01, April 19