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

ENTERED

October 6, 2004

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

Subject: Transmittal of Approved RFETS WSPF Number RF139.01, TRM Wastewater Treatment Sludge

Dear Mr. Zappe:

The Department of Energy, Carlsbad Field Office (CBFO) has approved the Rocky Flats Environmental Technology Site (RFETS) Waste Stream Profile Form (WSPF) RF139.01, TRM Wastewater Treatment Sludge.

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,

Kerry W. Watson, Director
Office of Characterization and Transportation

Enclosure

cc: w/o enclosure
R. McCallister, CBFO *ED
J. Kieling, NMED
C. Walker, TechLaw
M. Strum, WTS *ED
R. Chavez, WRES *ED
L. Greene, WRES
S. Calvert, CTAC *ED
WIPP Operating Record
CBFO M&RC

*ED denotes Electronic Distribution

CBFO:NTP:KWW:VW:04-2016:UFC:5822

041008

WIPP WASTE STREAM PROFILE FORM

Waste Stream Profile Number: RF139.01
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 6, 2001; May 24, 2001; June 5, 2001; April 5, 2002; April 8, 2002; August 20, 2002; August 29, 2002; December 20, 2002; April 8, 2003; September 19, 2003; December 30, 2003, July 14, 2004 and September 14, 2004
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-QAPjP-0050, Version 10, August 2004. Transuranic (TRU) Waste Management Manual, Version 7, 1-MAN-008-WM-001, February 2004. Contact-Handled Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant, Revision 1.0. March 2004.
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-MT0001[2]
Summary Category Group: S3000[2] Waste Matrix Code Group: Solidified Inorganics
Waste Stream Name: TRM Wastewater Treatment Sludge (D004, D005, D009, D010, F001, F002, F005, F006, F007, F009)[2]
Description from the WTWBIR: This waste stream is a solid cemented sludge.[2]
Defense TRU Waste: ☑ Yes ☐ No
Check one: ☑ CH ☐ RH Number of SWBs N/A Number of Drums 57 Number of Canisters N/A
Batch Data Report numbers supporting this waste stream characterization: See Table 7.
List applicable EPA Hazardous Waste Codes[3]: D004, D005, D009, D010, F001, F002, F005, F006, F007, F009
Applicable TRUCON Content Codes: RF 111A/211A, RF 111B/211B, RF 111D/211D, RF 111DF/211DF, RF 111E/211E, RF 111H/211H, RF 111J/211J, RF 111K/211K, RF 111P/211P, RF 111PF/211PF

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. 13, 14
- 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:

- Process design documents: Note 4
- Standard operating procedures: Note 4
- Safety Analysis Reports: Note 4
- Waste packaging logs: Note 4
- Test plans/research project reports: Note 4
- Site data bases: Note 4
- Information from site personnel: Note 4
- Standard industry documents: Note 4
- Previous analytical data: Note 4
- Material safety data sheets: Note 4
- Sampling and analysis data from comparable/surrogate Waste: Note 4
- Laboratory notebooks: Note 4

Sampling and Analysis Information[1]

[For the following, when applicable, enter procedure title(s), number(s) and date(s)]

☑ Radiography: Reference List, Nos. 19, 20, 21
☑ Visual Examination: Reference List, Nos. 22, 23, 24
☑ Headspace Gas Analysis
VOCs: Reference List, No. 7, 17, 18
Flammable: Reference List, No. 7, 17, 18
Other gases (specify): N/A
☑ Homogeneous Solids/Soils/Gravel Sample Analysis
Total metals: Reference List, Nos. 11, 12
PCBs: N/A
VOCs: Reference List, No. 8
Nonhalogenated VOCs: Reference List, No. 10
Semi-VOCs: Reference List, No. 9
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	9/20/04 Date
Signature of Site QA Officer	C. L. Ferrera, TWCP Site QAO Printed Name and Title	9/16/04 Date

NOTE (1) Use back of sheet or continuation sheets, if required.

(2) The WTWBIR Waste Stream Name for RF-MT0001 is Aqueous Sludge/TRM. The Waste Stream Name has been changed to TRM Wastewater Treatment Sludge (D004, D005, D009, D010, F001, F002, F005, F006, F007, F009). The Waste Stream Description requires clarification in that any liquid present will be as residual liquid in a quantity that is less than one volume percent of the payload container that is reasonably achievable after pouring, pumping and/or aspirating. The Hazardous Waste Numbers in the WTWBIR are incorrect, and the waste stream is assigned Hazardous Waste Numbers D004, D005, D009, D010, F001, F002, F005, F006, F007, and F009. The Waste Stream Name, Description, Summary Category Group, Waste Matrix Code, and Environmental Protection Agency (EPA) Hazardous Waste Numbers are based on the acceptable knowledge (see attached Acceptable Knowledge Summary).

(3) EPA Hazardous Waste Codes were determined using acceptable knowledge and confirmed using solids and headspace gas sampling and analysis (see attached Characterization Information Summary documenting this determination).

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

REFERENCE LIST

1. Backlog Waste Reassessment Baseline Book, Waste Form 55, Building 774 Aqueous Sludge, May 2004.
2. Waste Stream and Residue Identification and Characterization (WSRIC), Version 7, April 2004, and archived versions.
3. RFETS TRU Waste Acceptable Knowledge Supplemental Information, RF/RMRS-97-018, Revision 13, April 2004.
4. Waste and Environmental Management System (WEMS) database.
5. Transuranic (TRU) Waste Certification, PRO-X05-WC-4018, Version 7, March 2004.
6. Acceptable Knowledge TRU/TRM Waste Stream Summaries, RMRS-WIPP-98-100, Section 7.31, Revision 0, September 2004.
7. GC/MS Determination of Volatile Organics Waste Characterization, L-4111-X, January 2002.
8. Volatile Organic Compounds by Gas Chromatography Mass Spectrometry, ACMM-9260, Revision 9, July 2003.
9. Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry, ACMM-9270, Revision 5, April 2003.
10. Determination of Nonhalogenated Volatile Organics by Gas Chromatography, ACMM-9441, Revision 8, April 2003.
11. Determination of Mercury by CVAA for TRU Waste Characterization, ACMM-2810, Revision 2, April 2003.
12. Determination of Metals by ICP-AES for TRU Waste Characterization, ACMM-2901, Revision 2, April 2003.
13. Waste Characterization, Generation, and Packaging, 1-PRO-079-WGI-001, Revision 4, May 2002.
14. Waste Characterization Program Manual, 1-MAN-036-EWQA-Section 1.6.1, Revision 3, May 2002.
15. Interoffice Memorandum from Thomas R. Gatliffe to Eric L. D'Amico, Headspace Gas Analysis Data Evaluation Report For Waste Stream Profile RF139.01 (TRM Wastewater Treatment Sludge), Lot 1, TRG-257-04, July 2004.
16. Interoffice Memorandum from Thomas R. Gatliffe to Eric L. D'Amico, Statistical Solid Analysis Data Evaluation Report For Transuranic Mixed (TRM) Wastewater Treatment Sludge (D004, D005, D009, D010, F001, F002, F005-F007, F009) Sampling Lot 2 (Waste Stream Profile RF139.01), TRG-231-04, July 2004.
17. Headspace Gas Sampling And Analysis Using An Automated Manifold, L-4231-F, March 2002
18. Headspace Gas Sampling and Analysis Using An On-Line Integrated System, PRO-1676-HGAS-S&A, Version 2, January 2004.
19. Real-Time Radiography Testing of Transuranic and Low-Level Waste, 4-W30-NDT-00664, Version 10, March 2004.
20. Real-Time Radiography Testing of Transuranic and Low-Level Waste in Building 569, 4-I19-NDT-00569, Revision 5, January 2002.
21. Mobile Real-Time Radiography Testing of Transuranic and Low-Level Waste, PRO-1520-Mobile-RTR, Version 3, March 2004.
22. Glovebox and C-Cell Waste Operations, PRO-1358-440-VERP, Version 6, March 2004.
23. RTR Visual Examination Confirmation, Building 371, PRO-1608-VECRTR-371, Revision 0, October 2002.
24. Visual Examination for Confirmation of RTR, 4-H80-776-ASRF-007, Revision 5, June 2001.
25. TWCP Core-Drilling Operation, HFEF-OI-6910, Revision 2c, April 2003.
26. TWCP Solid Sample Preparation, HFEF-OI-6921, Revision 3d, September 2003.
27. Interoffice Memorandum from V. S. Sendelweck to E. L. D'Amico, Tentatively Identified Compounds in RF139.01 TRM Wastewater Treatment Sludge (D004, D005, D009, D010, F001, F002, F005, F006, F007, F009) Solid Sampling Lot 2, VSS-033-2004, August 2004.

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 # RF139.01

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	✓	Appropriate packaging configuration and DAC were met and documented in the headspace gas sampling documentation and the drum age was met prior to sampling.
20	✓	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 | 9-20-04, Date

Data Summary Report—Table 1: Solid Sampling Summary

WSPF # RF139.01

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 16.

  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. Data were evaluated using one half the method detection limit (MDL) for less-than-detectable observations. See Reference List, No. 16.

  Analytes that are toxicity characteristic contaminants associated with F-codes and therefore not included in the UCL_{90} estimate calculation to determine the toxicity characteristic and the largest calculated sample size: Benzene, Carbon Tetrachloride, Chlorobenzene, Methyl Ethyl Ketone, Pyridine, Tetrachloroethylene, Trichloroethylene, Cadmium, Chromium, Lead and Silver.

  Largest Calculated Sample Size selection and associated analyte: Pertains only to toxicity characteristic or listed waste analytes and only to those analytes where the associated EPA hazardous waste number is not assigned (i.e., it only applies to those cases where a site intends to establish that the constituent is below the regulatory threshold and the associated EPA hazardous waste number does not apply). Largest value is 1.37 for beryllium.

  Minimum number of containers to sample: 5 (based on WIPP Waste Analysis Plan Section B2-2a requirement that preliminary estimates be based on samples from a minimum of 5 waste containers).

- Attach preliminary estimates: See Reference List, No. 16. 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.

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

Retrievably Stored Waste Sampling Results

Analytes that are toxicity characteristic contaminants associated with F-codes and therefore not included in the UCL_{90} estimate calculation to determine the toxicity characteristic and the largest calculated sample size: Benzene, Carbon Tetrachloride, Chlorobenzene, Methyl Ethyl Ketone, Pyridine, Tetrachloroethylene, Trichloroethylene, Cadmium, Chromium, Lead and Silver.

Largest Calculated Sample Size and associated analyte: Pertains only to toxicity characteristic or listed waste analytes and only to those analytes where the associated EPA hazardous waste number is not assigned (i.e., it only applies to those cases where a site intends to establish that the constituent is below the regulatory threshold and the associated EPA hazardous waste number does not apply). Largest value is 1.37 for beryllium.

Comparison of largest calculated sample size with largest calculated sample size selected from preliminary estimate: 1.37 vs. 1.37 (for beryllium).

Treatment of less-than-detectable measurements: This pertains only to data for analytes in which at least one detectable measurement was obtained. Data were evaluated using one half the method detection limit (MDL) for less-than-detectable observations. See Reference List, No. 16.

Transformations applied to data and justification: Logarithmic or Square Root transformations were applied to the data as necessary to achieve (or better achieve) a normal probability distribution of the data for UCL_{90} comparison to RTL values.

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: _____

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]

Samples were collected by solid core drilling (Reference Nos. 25 and 26).

NOTES:

[a] This waste stream is comprised of retrievably stored waste that was sampled by coring; therefore, Newly Generated Waste Sampling is not applicable.

Data Summary Report—Table 2: Headspace Gas Summary Data

WSPF # RF139.01

Sampling and Analysis Method (check one):

☑ 100% Sampling ☐ Reduced Sampling

2A

ANALYTE[a]	# Samples[b]	Transform Applied[c]	Normality Test (Pass/Fail)[d]	Maximum (ppmv)	Mean[g]	SD[d]	UCL_{90}[d]	Transformed RTL[e]	Un-Transformed RTL[e] (ppmV)	EPA Code[f]
1,1-Dichloroethane	0			2.9	1.207				10	
1,2-Dichloroethane	0			3.6	1.228				10	
1,1-Dichloroethylene	1	None	Fail[g]	3.2	1.218	0.372	1.320	N/A	10	
cis-1,2-Dichloroethylene	0			3.2	1.27				10	
trans-1,2-Dichloroethylene	0			2.8	1.114				10	
1,1,2,2-Tetrachloroethane	0			3.4	1.215				10	
1,1,1-Trichloroethane	6	Log	Fail[g]	140	0.917	1.208	1.25	2.303	10	
1,1,2-Trichloro-1,2,2-Trifluoroethane	1	Sq. Rt.	Fail[g]	2.8	1.044	0.219	1.104	3.162	10	
1,2,4-Trimethylbenzene	1	Log	Fail[g]	3.5	0.149	0.518	0.292	2.303	NA	
1,3,5-Trimethylbenzene	0			3.5	1.105				NA	
Acetone	4	Log	Fail[g]	1400	2.976	1.201	3.307	4.605	100	
Benzene	1	Sq. Rt.	Fail[g]	2.8	1.059	0.19	1.111	3.162	10	
Bromoform	0			2.4	1.033				10	
Butanol	0			33	12.657				100	
Carbon disulfide	0			3.6	1.352				10	
Carbon tetrachloride	2	Log	Fail[g]	640	0.613	1.564	1.043	2.303	10	
Chlorobenzene	0			2.8	0.975				10	
Chloroform	2	Log	Fail[g]	9.3	0.223	0.628	0.396	2.303	10	
Cyclohexane	0			3.4	1.268				NA	
Ethyl benzene	0			2.7	1.007				10	
Ethyl ether	0			3.5	1.298				10	
Methanol	0			30	12.235				100	
Methyl ethyl ketone	0			34	13.535				100	
Methyl isobutyl ketone	0			33	11.402				100	
Methylene chloride	1	Log	Fail[g]	7.9	0.198	0.554	0.351	2.303	10	
o-Xylene	0			2.6	1.037				10	
m,p-Xylene	0			5.5	2.044				10	
Tetrachloroethylene	2	Log	Fail[g]	13	0.293	0.73	0.494	2.303	10	
Toluene	5	Log	Fail[g]	410	0.82	1.574	1.254	4.2769	72.02[h]	
Trichloroethylene	5	Log	Fail[g]	120	0.64	1.462	1.042	2.303	10	

NOTES:

[a] A total of 23 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.

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

NOTES (continued):

[d] Statistics calculated based on using ½ the MDL for less-than-detectable observations with data transformation as identified (Reference 15). When transformation was applied, the Mean and UCL_{90} values presented are the transformed values (Reference 15). 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 WIPP WAP target analytes. "NA" means the analyte is not a WIPP WAP target analyte, but instead a flammable VOC that is analyzed for compliance with the TRUPACT-II Authorized Methods for Payload Control (TRAMPAC).

[f] No entry indicates that the respective UCL_{90} value did not exceed the associated RTL.

[g] 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.

[h] Limit used for evaluation of EPA Hazardous Waste Code for toluene (Reference No. 3).

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

WSPF # RF139.01

2B

TENTATIVELY IDENTIFIED COMPOUND (TIC)	Maximum Observed Estimated Concentrations (ppmV)	# Samples Containing TIC
Nonane (CAS No. 111-84-2)	60	1
Decane (CAS No. 124-18-5)	150	1
3,6-Dimethyloctane (CAS No. 15869-94-0)	49	1
4-Methylnonane (CAS No. 17301-94-9)	56	1
2,6-Dimethylnonane (CAS No. 17302-28-2)	47	1
2,6-Dimethyloctane (CAS No. 2051-30-1)	49	1
4-Methyldecane (CAS No. 2847-72-5)	47	1
2,6-Dimethyl-2-octene (CAS No. 4057-42-5)	32	1
3,3-Dimethyloctane (CAS No. 4110-44-5)	47	1
3-Methylnonane (CAS No. 5911-04-6)	49	1

No TIC listed in 40 CFR 261, Appendix VIII was detected in greater than or equal to 25 percent of the waste containers sampled.

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

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

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

Data Summary Report—Table 3: Metals Summary Data

WSPF # RF139.01

Sampling and Analysis Method/Units (check one):

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

ANALYTE[a]	# Samples[b]	Transform Applied[c]	Normality Test (Pass/Fail)[d]	Min. Sample Size[d]	Mean[d]	Std. Dev.[d]	UCL_{90}[d]	Transformed RTL[e]	Un-Transformed RTL[e] (mg/kg)	EPA Code[f]
Antimony	6	Log	Pass	0.202	0.775	1.166	1.477	4.605	100	
Arsenic	6	Log	Pass	0.270	1.423	1.121	2.098	4.605	100	
Barium	6	Log	Pass	0.064	3.904	0.632	4.285	7.601	2000	
Beryllium[g]	6	Log	Pass	1.370	2.276	1.847	3.389	4.605	100	
Cadmium	6	Log	Fail[h]	5.120	1.789	1.85	2.904	2.996	20	
Chromium	6	Log	Pass	0.749	5.493	0.521	5.807	4.605	100	D007
Lead	6	Log	Pass	4.182	4.047	0.773	4.513	4.605	100	
Mercury	4	Log	Pass	3.213	-0.623	2.44	0.847	1.386	4	
Nickel	6	Sq. Rt.	Pass	0.856	13.4	2.131	14.684	10	100	None
Selenium	1	None	Fail[h]	0.000	0.333	0.146	0.421	NA	20	
Silver	5	Log	Pass	2.112	1.494	3.063	3.340	4.605	100	
Thallium	3	None	Fail[h]	0.000	0.742	0.472	1.026	NA	100	
Vanadium	6	Sq. Rt.	Pass	0.367	4.647	2.197	5.971	10	100	
Zinc	6	None	Pass	0.479	293.333	90.701	347.983	NA	100	None

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

Data as reported in Data Summary Report – Table 3 confirms acceptable knowledge in that no additional toxicity characteristic metal EPA codes, other than those already assigned by AK, are applicable. EPA codes D004, D005, D009 and D010 are being conservatively retained as assigned hazardous waste codes for the waste stream. In accordance with 40 CFR 268.9(a), characteristic EPA Hazardous Waste Codes do not need to be identified for a listed waste, where the treatment standards for the listed waste addresses the characteristic. Because the treatment standard for F006, F007, and F009 addresses the treatment standards for chromium, D007 is not assigned to this waste stream. Consequently, no new EPA Hazardous Waste Codes are required to be added to the EPA Hazardous Waste Codes assigned by AK for this waste stream.

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

NOTES:

[a] A total of 6 samples were collected and analyzed. Analysis was performed for all analytes identified.
[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.
[d] Statistics calculated based on using ½ the MDL values for all less-than-detectable observations with data transformation as identified (Reference 16). When transformation was applied, the Mean and UCL_{90} values presented are the transformed values (Reference 16). No entry indicates no detectable measurements available for statistics.
[e] RTLs correspond to the analyte PRQL for analytes that are not characteristic hazardous waste constituents.
[f] No entry indicates that the applicable UCL_{90} value did not exceed the associated RTL.

Data Summary Report—Table 3: Metals Summary Data (continued)

NOTES (continued):

[g] 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." Beryllium parts were used in the manufacture/assembly of weapons components, and residual beryllium contamination of plutonium parts may have occurred. As a result beryllium is present in the solidified inorganic waste. The beryllium is present as a contaminant of the process and not as unused commercial chemical product, and therefore is not a P015-listed waste.

[h] Data transformation did not pass the test for normality. The data transformation that most approximated a normal distribution was used for computation of statistics.

Data Summary Report—Table 4: Total VOC Summary Data

WSPF # RF139.01

4A

ANALYTE[a]	# Samples[b]	Transform Applied[c]	Normality Test (Pass/Fail)[d]	Min. Sample Size[d]	Mean[d]	Std. Dev.[d]	UCL_{90}[d]	Transformed RTL[e]	Un-Transformed RTL[e] (mg/kg)	EPA Code[f]
1,1-Dichloroethylene	0				0.09				14	
trans-1,2-Dichloroethylene	0				0.14				10	
1,2-Dichloroethane	0				0.14				10	
1,1,1-Trichloroethane	0				0.14				10	
1,1,2-Trichloro-1,2,2-Trifluoroethane	0				0.14				10	
1,1,2-Trichloroethane	0				0.09				10	
1,1,2,2-Tetrachloroethane	0				0.18				10	
Acetone	1	Log	Pass	0.054	-0.13	0.747	0.32	4.605	100	
Benzene	0				0.09				10	
Bromoform	0				0.14				10	
1-Butanol	1	Log	Pass	0.045	-0.146	0.684	0.266	4.605	100	
Carbon disulfide	0				0.09				10	
Carbon tetrachloride	0				0.19				10	
Chloroform	0				0.14				120	
Chlorobenzene	0				0.09				10	
Ethyl benzene	0				0.09				10	
Ethyl ether	0				1.03				100	
Isobutanol	0				0.77				100	
Methanol	1	Log	Pass	0.109	0.126	1.003	0.731	4.605	100	
o-Xylene	0				0.09				10	
m,p-Xylene	1	Log	Pass	0.041	-1.902	0.577	-1.554	2.303	10	
Methyl ethyl ketone	0				1.03				100	
Methylene chloride	0				0.09				10	
Pyridine	0				1.05				100	
Tetrachloroethylene	1	Log	Fail[g]	0.014	-2.207	0.363	-1.988	2.303	10	
Toluene	2	Log	Fail[g]	0.065	-1.89	0.724	-1.454	2.303	10	
Trichloroethylene	1	Log	Fail[g]	0.083	-1.365	0.717	-0.933	2.303	10	
Trichlorofluoromethane	0				0.09				10	
Vinyl chloride	0				0.09				4	

NOTES:

[a] A total of 6 samples were collected and analyzed. Analysis was performed for all analytes identified.
[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.
[d] Statistics calculated based on using ½ the MDL values for all less-than-detectable observations with data transformation as identified (Reference 16). No entry indicates no detectable measurements available for statistics.
[e] 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. RTLs correspond to the analyte PRQL for analytes that are not F-listed or characteristic hazardous waste constituent.

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

NOTES (continued):

[f] No entry indicates that the applicable UCL_{90} value did not exceed the associated RTL.
[g] Data transformation did not pass the test for normality. The data transformation that most approximated a normal distribution was used for computation of statistics.

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

WSPF # RF139.01

4B

TENTATIVELY IDENTIFIED COMPOUND (TIC) CHEMICAL ABSTRACTS SERVICE (CAS) Number	Maximum Observed Estimated Concentrations (mg/kg)	# Samples Containing TIC
No TICs identified in the solid VOC samples for the waste stream lot.		

Did the data verify acceptable knowledge? ☑ Yes ☐ No

Data as reported in Data Summary Report – Table 4 confirm acceptable knowledge in that no toxicity characteristic organic or F-listed solvent EPA codes, other than those already assigned by acceptable knowledge, are applicable.

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

Data Summary Report—Table 5: Total SVOC Summary Data

WSPF # RF139.01

5A

ANALYTE[a]	# Samples[b]	Transform Applied[c]	Normality Test (Pass/Fail)[d]	Min. Sample Size[a]	Mean[d]	Std. Dev.[d]	UCL_{90}[d]	Transformed RTL[e]	Un-Transformed RTL[e] (mg/kg)	EPA Codes[f]
1,2-Dichlorobenzene	0				0.15				40	
1,4-Dichlorobenzene	0				0.15				150	
2,4-Dinitrophenol	0				0.15				40	
2,4-Dinitrotoluene	0				0.13				2.6	
2-Methylphenol	0				0.15				40	
3-&4-Methylphenol	0				0.25				40	
Hexachlorobenzene	0				0.13				2.6	
Hexachloroethane	0				0.15				60	
Nitrobenzene	0				0.15				40	
Pentachlorophenol	0				0.1				2,000	

NOTES:

[a] A total of 6 samples were collected and analyzed. Analysis was performed for all analytes identified.
[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.
[d] Statistics calculated based on using ½ the MDL values for all less-than-detectable observations with data transformation as identified (Reference 16). No entry indicates no detectable measurements available for statistics.
[e] 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. RTLs correspond to the analyte PRQL for analytes that are not F-listed hazardous waste constituents or characteristic hazardous waste constituents.
[f] No entry indicates that the applicable UCL_{90} value did not exceed the associated RTL.

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

WSPF # RF139.01

5B

TENTATIVELY IDENTIFIED COMPOUND (TIC) CHEMICAL ABSTRACTS SERVICE (CAS) Number	Maximum Observed Estimated Concentrations (mg/kg)	# Samples Containing TIC
1,2-Benzenedicarboxylic acid, bis(2-ethylhexyl) ester (CAS No. 117-81-7)[a]	9.8	5
Fluoranthene (CAS 206-44-0)	2.4	1

Did the data verify acceptable knowledge? ☑ Yes ☐ No

Data as reported in Data Summary Report – Table 5 confirm acceptable knowledge in that no toxicity characteristic organic or F-listed solvent EPA codes, other than those already assigned by acceptable knowledge, are applicable..

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

NOTES:

[a] TIC is a constituent in an F-listed waste whose presence is attributable to waste packaging materials and so was not added to the target analyte list for the waste stream. TIC was determined not to be a listed hazardous waste based on comparison of the TIC identification to acceptable knowledge (see Reference No.27).

Data Summary Report—Table 6: Exclusion of Prohibited Items

WSPF # RF139.01

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:

- Liquid waste (waste shall contain as little residual liquid as is reasonably achievable by pouring, pumping and/or aspirating, and internal containers shall contain less than 1-inch or 2.5-centimeters of liquid in the bottom of the container. Total residual liquid in any payload container (e.g., 55-gallon drum or standard waste box) may not exceed 1 percent volume of that container.)
- 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
- Waste exhibiting the characteristics of ignitability, corrosivity or reactivity
- Non-mixed hazardous waste

Newly generated waste is characterized by visual verification (VV) at the time of waste packaging using the visual examination (VE) technique unless the use of radiography in lieu of, or in combination with, visual verification is justified by any of the following criteria:

- Visual verification was conducted during packaging, but was unacceptable,
- Visual verification requires extensive handling of high gram content waste that results in high radioactive exposure for the VV personnel,
- Situations where waste packaging is conducted at numerous locations generating small quantities of transuranic waste requiring a large number of VV personnel; and/or
- Where waste was originally packaged as low-level waste, but subsequently determined to be transuranic.

Each container of waste is certified and shipped only after radiography and/or VE either:

- Did not identify any prohibited items in the waste container, or
- All prohibited items found in a waste container by radiography or VE are identified and corrected (i.e., eliminated or removed) through the site non-conformance reporting system.

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

WSPF # RF139.01

Package No.	Org. Package No.	Radioassay Data Package	Solid Sample Batch No.[a]	Metals Data Package	VOC Data Package[a]	SVOC Data Package[a]	Headspace Sample Batch No.	Headspace VOC Data Package	RTR Data Package[b]
D60575		440IP1-DP-060904					04W0301	HGAS-DP-01016	6T1702
D64909		440IP1-DP-042303					04W0336	HGAS-DP-01051	6T-2190
D71019		440IP1-DP-052604					04W0275	HGAS-DP-00991	6T-2173
D71494		440IP1-DP-052004					04W0284	HGAS-DP-01000	MT0019
D71934		440IP1-DP-063003					04W0237	HGAS-DP-00953	6T-2193
D72127		569IP1-DP-012703					3017	HGAS-DP-00442	6T1684
D72128		440IP1-DP-030104					04W0161	HGAS-DP-00877	6T1686
D72133		440IP1-DP-052903					04W0251	HGAS-DP-00967	6T1703
D72136		440IP1-DP-062104					04W0306	HGAS-DP-01021	6T-2173
D72566		440IP1-DP-062304					04W0301	HGAS-DP-01016	6T1703
D72620		440IP1-DP-071404					04W0330	HGAS-DP-01045	6R-039
D72622		440IP1-DP-062304					04W0301	HGAS-DP-01016	6T1692
D73285		440IP1-DP-062504					04W0297	HGAS-DP-01012	MT0049
D73295		440IP1-DP-060904					04W0299	HGAS-DP-01014	6T-2179
D73667		440IP1-DP-033004					04W0224	HGAS-DP-00940	MT0073
D76199		440IP1-DP-032904					04W0224	HGAS-DP-00940	6T1703
D76287		440IP1-DP-061804					04W0297	HGAS-DP-01012	MT0049
DD8523	D72619[c]	569IP1-DP-012403	WCS-03-01	ALD03011M	ALD03006V ALD03008N	ALD03006S	03W0074	HGAS-DP-00433	6T-1701
DD8528	D64344[c]	569IP1-DP-012403	WCS-03-01	ALD03011M	ALD03006V ALD03008N	ALD03006S	03W0074	HGAS-DP-00433	5T-0329
DD8531	D76183[c]	569IP1-DP-012803	WCS-03-01	ALD03011M	ALD03006V ALD03008N	ALD03006S	03W0085	HGAS-DP-00442	5T-0329
DE0466	O01360[c]	440FM1-DP-071403	WCS-03-11	ALD03026M	ALD03023V ALD03026N	ALD03023S	03W0272	HGAS-DP-0603	5T-0337
DE0467	O01366[c]	440FM1-DP-071403	WCS-03-11	ALD03026M	ALD03023V ALD03026N	ALD03023S	03W0272	HGAS-DP-0603	5T-0337
DE0879	D74147[c]	559IP1-DP-012703	WCS-03-11	ALD03026M	ALD03023V ALD03026N	ALD03023S	03W0349	HGAS-DP-00682	5T-1703

NOTES:

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

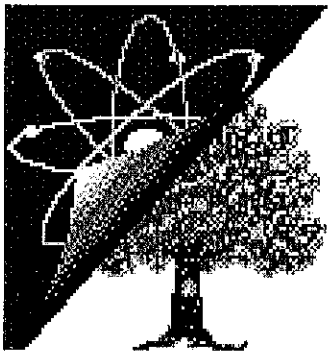
[b] All of the containers were characterized using radiography and none were selected for visual examination to confirm radiography.

[c] Containers were solid sampled in accordance with References 25 and 26.

Acceptable Knowledge Summary

WSPF # RF139.01

RMRS-WIPP-98-100, Acceptable Knowledge TRU/TRM Waste Stream Summaries, Section 7.31, TRM Wastewater Treatment Sludge (D004, D005, D009, D010, F001, F002, F005, F006, F007, F009) (attached).



Rocky Flats Environmental Technology Site

ACCEPTABLE KNOWLEDGE INFORMATION

ACCEPTABLE KNOWLEDGE TRU/TRM WASTE STREAM SUMMARIES

RMRS-WIPP-98-100

Section 7.31

TRM Wastewater Treatment Sludge

(D004, D005, D009, D010, F001, F002, F005, F006, F007, F009)

Profile No. RF139.01

Revision 1

Reviewed for Classification/UCNI
By: Unclassified Not UCNI
Reference Exemption Number CEX-032-00
Date: September 20, 2004

Approval signatures in Site Document Control history file

7.31 TRM Wastewater Treatment Sludge (D004, D005, D009, D010, F001, F002, F005, F006, F007, F009) Profile No. 139.01

Acceptable Knowledge (AK) Waste Stream Summary

Waste Stream Name: TRM Wastewater Treatment Sludge (D004, D005, D009, D010, F001, F002, F005, F006, F007, F009)

Generation Buildings: Buildings 750 Pad, 774, 776 (1,6)

Waste Stream Volume (Retrievably Stored): 57 55-gallon drums (1,6)

Generation Dates (Retrievably Stored): December 1972 - April 2005 (1,6)
NOTE: Includes dates that waste was repackaged in Buildings 774 and 776. Also, waste may be repackaged at the 750 Pad in the future.

Waste Stream Volume (Newly Generated): None (1)

Generation Dates (Newly Generated): N/A

Waste Stream Volume (Projected): None (1)

Generation Dates (Projected): N/A

TRUCON Content Code (2): RF111A/211A, RF111B/211B, RF111D/211D, RF111DF/211DF, RF111E/211E, RF111H/211H, RF111J/211J, RF111K/211K, RF111P/211P, RF111PF/211PF

Process Knowledge Demonstrates Flammable VOCs in Headspace < 500 ppm: No (see Section 7.31.6)

7.31.1 Transuranic Waste Baseline Inventory Report Information (3)

WIPP Identification Number(s): RF-MT0001

Summary Category Group: S3000 Waste Matrix Code Group: Solidified Inorganics

Waste Matrix Code: S3150 See Note A Waste Stream Name: Aqueous Sludge/TRM See Note A

Description from the WTWBIR: This waste stream is a solid cemented sludge. See Note A

Note A: The WTWBIR Waste Stream Name for RF-MT0001 is Aqueous Sludge/TRM. The Waste Stream Name has been changed to TRM Wastewater Treatment Sludge (D004, D005, D009, D010, F001, F002, F005, F006, F007, F009). The Waste Stream Description requires clarification in that any liquid present will be as residual liquid in a quantity that is less than one volume percent of the payload container that is reasonably achievable after pouring, pumping and/or aspirating. Waste Matrix Code S3150 has been changed to the more appropriate Waste Matrix Code S3121 since the waste is greater than 50 volume percent sludge from wastewater treatment processes. The Hazardous Waste Numbers in the WTWBIR are incorrect, and the waste stream is assigned Hazardous Waste Numbers D004, D005, D009, D010, F001, F002, F005, F006, F007, and F009 (see Section 7.31.5). The Waste

Stream Name, Description, Summary Category Group, Waste Matrix Code, and Environmental Protection Agency (EPA) Hazardous Waste Numbers are based on acceptable knowledge (see Section 7.31.2).

7.31.2 Waste Stream Description

Transuranic Mixed (TRM) Wastewater Treatment Sludge assigned EPA Hazardous Waste Numbers D004, D005, D009, D010, F001, F002, F005, F006, F007, and F009 consists of aqueous sludge [item description codes (IDCs) 001 and 002] originally generated from aqueous liquid waste treatment operations in Building 774. This material is similar in material, physical form, and hazardous constituents, and is therefore considered a single waste stream. Table 7.31-1 presents the waste matrix code and waste material parameters for the TRM Wastewater Treatment Sludge. (4)

Table 7.31-1, TRM Wastewater Treatment Sludge

IDC	IDC Description	Waste Matrix Code	Waste Material Parameters	Weight % (Average)
001	Aqueous Process Sludge	S3121, Wastewater Treatment Sludge	Inorganic Matrix	100%
002	Second-Stage Sludge	S3121, Wastewater Treatment Sludge	Inorganic Matrix	100%

Note: The above Waste Material Parameter addresses the waste material proper and does not include internal packaging (e.g. inner bags), container packaging (e.g. fiberboard liner), absorbent, secondary wastes, etc.

IDC 001, Aqueous Process Sludge: This material consists of inorganic sludge resulting from the treatment of aqueous liquids in the Building 774 Aqueous Liquid Waste Treatment System. During original packaging, Portland cement was added to the bottom of the IDC 001 drum prior to placing the sludge in the drum. In some cases, additional Portland cement was added on top of the sludge. Small quantities of absorbent [oil dry or NoChar® (i.e., a polymer absorbent)] may be added when necessary during repackaging to absorb potential residual liquid. (5,7,10)

IDC 002, Second-Stage Sludge: This material consists of inorganic sludge resulting from the treatment of aqueous liquids from the second stage of the Building 774 Aqueous Liquid Waste Treatment System. After 1978 sludge from the first- and second-stages of the Building 774 Aqueous Liquid Waste Treatment System were combined and packaged as IDC 001. Small quantities of absorbent (oil dry or NoChar®) may be added when necessary during repackaging to absorb potential residual liquid. (5,7,10)

7.31.3 Areas of Operation

TRM Wastewater Treatment Sludge assigned EPA Hazardous Waste Numbers D004, D005, D009, D010, F001, F002, F005, F006, F007, and F009 was generated by the following defense operations in Buildings 774, 776, and 750 Pad: (4,5,6,7)

- Waste Treatment Operations
- Waste Repackaging Operations

7.31.4 Generation Processes

TRM Wastewater Treatment Sludge assigned EPA Hazardous Waste Numbers D004, D005, D009, D010, F001, F002, F005, F006, F007, and F009 was generated from waste treatment operations in Building 774. The aqueous liquid waste treatment system received aqueous liquid waste via the process waste transfer system. The transfer system received acid, basic, scrubber, steam condensate, and process sink wastes that were chemically and/or radioactively contaminated from operations within Buildings 122, 123, 444, 559, 707, 771, 776, 778, 779, 865, 881, 883, and 889, as well as aqueous wastes generated within Building 774 (silver recovery effluent, seal liquid, and floor washdown). Acidic wastes were neutralized with sodium hydroxide in stage one. Ferric sulfate and Purifloc flocculant (comprised of hydrolyzed polyacrylamide, sodium carbonate, sodium sulfate, sodium sulfite) were added to the neutralized waste (containing metal ions) to precipitate the sludge prior to filtration. In stage two, ferric sulfate, magnesium sulfate, calcium chloride, and Purifloc flocculant were added to basic wastes during the two-stage treatment to precipitate sludge. The sludge slurry from the acidic and basic waste treatment was drawn through a diatomite filter media on a rotating drum filter to trap the solids. The filter media and sludge were continuously scraped off the drum filter and fed into a 55-gallon drum containing Portland cement. Additional Portland cement was added as necessary to the top of the sludge. [5]

Waste containers of wastewater treatment sludge have been repackaged in Buildings 774 and 776, and may be repackaged in the future in Building 750 Pad, as necessary, to correct original packaging and waste form deficiencies to meet WIPP-WAC requirements. Small quantities of absorbent (oil dry or NoChar®) may also be added when necessary during repackaging to absorb potential residual liquid. [1,5,7,10]

Process flow diagrams for the waste treatment and waste repackaging operations can be found in the Backlog Waste Reassessment Baseline Book (BWRBB) and Waste Stream and Residue Identification and Characterization (WSRIC) Building Books. [5,7]

7.31.5 RCRA Characterization

This waste stream is characterized as a mixed waste. The specific BWRBB Subpopulations and WSRIC Process Numbers associated with TRM Wastewater Treatment Sludge assigned EPA Hazardous Waste Numbers D004, D005, D009, D010, F001, F002, F005, F006, F007, F009 are listed in the WEMS AK Waste Stream Summary for Profile Number RF139.01. [6]

Visual examination of waste contents at the time of packaging/repackaging and/or real-time radiography (RTR) is used to verify that the waste stream is not a liquid waste and does not contain explosives, non-radionuclide pyrophoric materials, compressed gases, or reactive waste. Although materials in this waste stream are derived from the treatment of electroplating wastes containing cyanide, the waste is not cyanide-reactive since the cyanide concentrations are below land disposal treatment standards as

described in Reference 11. Therefore, this waste stream does not exhibit the characteristics of ignitability (D001), corrosivity (D002), or reactivity (D003). [5,11]

This waste stream is characterized as a listed waste based on the mixture and derived from rules. Therefore, the wastewater treatment sludge carries the same listed codes as the aqueous waste liquid feed to the Building 774 waste treatment system. EPA Hazardous Waste Numbers F001, F002, and F005 are assigned because the Building 774 waste treatment system had received aqueous waste liquids that were contaminated with regulated spent solvents including carbon tetrachloride, Freon TF (1,1,2-trichloro-1,2,2- trifluoroethane), methyl ethyl ketone, methylene chloride, and 1,1,1-trichloroethane. EPA Hazardous Waste Numbers F006, F007, and F009 are assigned because the Building 774 waste treatment system had received aqueous wastes from electroplating operations (e.g., spent cyanide bath and rinse solutions that contained cadmium, chromium, nickel, and silver). The Building 774 aqueous liquid operations treated waste that was characterized as hazardous waste due to characteristic of toxicity for arsenic (D004), barium (D005), cadmium (D006), chromium (D007), lead (D008), mercury D009), selenium (D010) and silver (D011). These characteristic codes were also originally identified in the TWBIR for this waste stream. Subsequently, and in accordance with 40 CFR 268.9, Rocky Flats Environmental Technology Site (RFETS) adopted the policy not to assign characteristic EPA Hazardous Waste Numbers to a listed waste where the treatment standards for the listed waste address the characteristic. Consequently, because the treatment standards for F006, F007 and F009 address the treatment standards for cadmium (D006), chromium (D007), lead (D008) and silver (D011), the waste stream was reassessed to remove EPA Hazardous Waste Numbers D006, D007, D008 and D011. Therefore, EPA Hazardous Waste Numbers D004, D005, D009, D010, F001, F002, F005, F006, F007 and F009 are assigned to the waste stream based on AK. [3,5,7]

Although F003-listed solvents, such as acetone, methanol, and xylene, were used in production operations, these solvents are listed solely for ignitability. Because the TRM solidified inorganic waste is not ignitable (i.e., are not assigned D001), EPA Hazardous Waste Number F003 is not assigned to this waste stream. [5,7]

No discarded chemical products, off-specification species, chemical residues, and spill residues thereof (40 CFR 261.33) were included in this waste stream and no hazardous waste from specific sources (40 CFR 261.32) was generated at the site. Therefore no K, U, or P listings have been applied to this waste stream. [5,7]

Beryllium parts were used in the manufacture/assembly of weapons components, and residual beryllium contamination of plutonium parts may have occurred; therefore, the wastewater treatment sludge may have been contaminated with beryllium and residual quantities of beryllium may be present in the waste stream. Any beryllium present (less than 1 % by weight) is as a contaminant of the process and not as unused commercial chemical product, and therefore is not a P015-listed waste. [8]

Confirmatory solid samples were analyzed for total metal, volatile organic compounds (VOCs), and semivolatile organic compound (SVOC) constituents. 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 "WIPP directed" method, the calculated 90 percent upper confidence limit (UCL_{90}) of the mean concentrations did exceed the associated regulatory threshold limit (RTL) value for chromium (D007). Because the treatment standard for EPA Hazardous Waste Numbers F006, F007, and F009 address the toxic characteristic for chromium (D007), EPA Hazardous Waste Number D007 was not assigned to this waste. Although the UCL_{90} values for arsenic (D004), barium (D005), mercury (D009), and selenium (D010) are not above the RTL, EPA hazardous waste numbers D004, D005, D009, and D010 assigned by AK, are conservatively retained for this waste stream. Therefore, D004, D005, D009, D010, F001, F002, F005, F006, F007, and F009 are assigned to this waste stream. [5,7,8]

Headspace gas sampling and analysis of containers assigned to this waste stream by AK detected 12 VOCs (1,1-dichloroethylene, acetone, benzene, carbon tetrachloride, chloroform, Freon TF (1,1,2-trichloro-1,2,2- trifluoroethane), methylene chloride, tetrachloroethylene, 1,1,1-trichloroethane, trichloroethylene, 1,2,4-trimethylbenzene, and toluene). 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 "WIPP directed" method, the calculated 90 percent upper confidence limit (UCL_{90}) of the mean concentrations for none of the analytes were found to exceed their associated RTL values. Therefore, the headspace data confirms the acceptable knowledge characterization that no additional characteristic volatile organic or F-listed solvent EPA codes are required. [9]

A portion of this waste stream, generated at RFETS, was sent to the Idaho National Engineering and Environmental Laboratory (INEEL) for storage; however, the INEEL waste stream (BNINW216) was also assigned EPA Hazardous Waste Numbers D006, D007, D008, D011, D022, and F003 in addition to D004, D005, D009, D010, F001, F002, F005, F006, F007, and F009. As explained previously, codes D006, D007, D008, and D011 are not applied to the RFETS waste stream, because the treatment standards for F006, F007, and F009 address the treatment standards for cadmium (D006), chromium (D007), lead (D008) and silver (D011). There is no RFETS AK that indicates chloroform (D022) is present in this waste stream. Because solid and headspace gas sampling performed at RFETS did not detect chloroform at concentrations above its RTL, EPA Hazardous Waste Number D022 is not applied to the RFETS waste stream inventory. EPA Hazardous Waste Number F003 is not assigned to the RFETS portion of the waste stream, because the waste does not meet the definition of ignitable (i.e., D001 is not assigned) and as such EPA Hazardous Waste Number F003 is not applicable per 40 CFR 261.3(g)(1). [3,13,14]

1,2-Benzenedicarboxylic acid, bis (2-ethylhexyl) ester, which is a U-listed compound, was detected as a tentatively identified compound (TIC) in the solid sampling data. An evaluation was completed that determined this compound was not used in the processes

that generated this waste stream and is not present as an unused commercial chemical product. Therefore, the presence of this TIC does not render the waste stream a U-listed hazardous waste. [12]

7.31.6 Transportation

The payload containers in the waste stream must also comply with the TRUPACT-II Authorized Methods for Payload Control (TRAMPAC) requirements. Flammable volatile organic compounds (VOCs) including acetone, methanol, and toluene were identified in this waste stream based on the descriptions in the *BWR Baseline Book* and headspace gas sampling and analysis. Therefore, flammable VOCs in the payload container headspace have the potential to exceed 500 ppm. All payload containers, including those that exceed 500 ppm flammable VOCs in the headspace gas, are evaluated for compliance with applicable TRAMPAC requirements using the eTRAMPAC system prior to shipment. Any containers not passing the eTRAMPAC compliance evaluation are identified and corrected through the site non-conformance reporting system. [5,7]

7.31.7 Radionuclides

Table 7.31-2 summarizes the radionuclides that may be present in TRM Wastewater Treatment Sludge assigned EPA Hazardous Waste Numbers D004, D005, D009, D010, F001, F002, F005, F006, F007, and F009. [4]

Table 7.31-2, TRM Wastewater Treatment Sludge Radionuclides

IDC	Description	Radionuclides
001	Aqueous Process Sludge	WG Pu, Am-241, Am-243, DU, EU, Np-237
002	Second-Stage Sludge	WG Pu, Am-241, Am-243, DU, EU, Np-237

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

7.31.8 References

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2. RFETS 2004. Transuranic (TRU) Waste Management Manual, Version 7, 1-MAN-008-WM-001.

3. DOE 1995. Transuranic Waste Baseline Inventory Report, Revision 0. DOE/CAO-95-1121.

4. RMRS 2004. RFETS TRU Waste Acceptable Knowledge Supplemental Information. RF/RMRS-97-018, Revision 13.

5. RFETS 2004. Backlog Waste Reassessment Baseline Book, Waste Form 55, Building 774 Aqueous Sludge.

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

7. RFETS 2004. Waste Stream and Residue Identification and Characterization Building 750_Pad, Version 7.0.

8. Interoffice Memorandum from Thomas R. Gatliffe to Eric L. D'Amico, Statistical Solid Analysis Data Evaluation Report For Transuranic Mixed (TRM) Wastewater Treatment Sludge (D004, D005, D009, D010, F001, F002, F005, F007, F009) Sampling Lot 2 (Waste Stream Profile RF139.01), TRG-231-04, July 27, 2004.

9. Interoffice Memorandum from Thomas R. Gatliffe to Eric L. D'Amico, Headspace Gas Analysis Data Evaluation Report For Waste Stream Profile RF139.01 (TRM Wastewater Treatment Sludge) Lot 1, TRG-257-04, August 19, 2004.

10. RFETS 2004. Solid Radioactive Waste Packing Requirements Manual, 1-M12-WO-4034, Version 10.

11. WASTREN 2003. Interoffice Memorandum from Scott Smith to Waste Records. Reactivity Characteristic Evaluation for Waste Derived from Aqueous Liquid Waste Treatment Operations, SMS-008-2003. November 17, 2003.

12. Interoffice memorandum from Vivian S. Sendelweck to Eric D'Amico, Tentatively Identified Compounds in RF139.01 TRM Wastewater Treatment Sludge (D004, D005, D009, D010, F001, F002, F005, F006, F007, F009) Solid Sampling Lot 2, VSS-033-2004, August 31, 2004.

13. BNFL-5232-RPT-TRUW-09, Acceptable Knowledge Summary for First/Second Stage Sludge, Revision 0B, January 2004.

14. AMWTP Waste Stream Profile for First/Second Stage Sludge, Rev. 1, March 28, 2003.