ENTERED

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

JUN 14 2011

JUN 2011

Mr. John Kieling, Acting Chief
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, NM 87505-6303

Subject: Rescind and Replace the Review of Central Characterization Project – Hanford Site Profile Form Number, RLM231ZD.001, Hanford 231-Z Building Contact-Handled Transuranic Waste

Dear Mr. Kieling:

On June 8, 2011, the Department of Energy Carlsbad Field Office (CBFO) reviewed the subject Waste Stream Profile Form (WSPF) RLM231ZD.001, Hanford 231-Z Building Contact-Handled Transuranic Waste with the incorrect enclosure.

The Department of Energy Carlsbad Field Office has approved the correct Waste Stream Profile Form, RLM231ZD.001, Hanford 231-Z Building Contact-Handled Transuranic Waste, which is enclosed. Enclosed is a copy of the form as required by Section C-5a of the WIPP Hazardous Waste Facility Permit No. NM4890139088-TSDF.

If you have questions on this matter, please contact J. R. Stroble at (575) 234-7313.

Sincerely,

Edward Ziemianski
Acting Manager

Enclosure

cc: w/enclosure
T. Hall, NMED *ED
J. Davis, NMED ED

cc: w/o enclosure
J. R. Stroble, CBFO ED
N. Castaneda, CBFO ED
C. Fesmire, CBFO ED
G. Basabilvazo, CBFO ED
S. McCauslin, CBFO ED
D. Toft, CTAC ED
CBFO M&RC

*ED denotes electronic distribution

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CBFO:NTP:JRS:GS:11-0335:UFC 5822.00

Attachment 2 – CCP Waste Stream Profile Form

(1) Waste Stream Profile Number: RLM231ZD.001							
(2) Generator site name: Hanford Site					(4)Technical contact: Veronica Waldram		
(3) Generator site EPA ID: WA7890008967					(6) Technical contact phone number: (575) 234-7187		
(5) Date of audit report approval by New Mexico Environment Department (NMED):September 2, 2010							
(7) Title, version number, and date of documents used for WAP Certification: CCP-PO-001, CCP Transuranic Waste Characterization Quality Assurance Project Plan, Rev.19, December 29, 2010 CCP-PO-002, CCP Transuranic Waste Certification Plan, Rev. 25, December 29, 2010 CCP-PO-011, CCP/CH2M HILL Plateau Remediation Company Interface Document, Rev.4, March 2, 2011							
(8) Did your facility generate this waste? YES	X	NO					
(9) If no, provide the name and EPA ID of the original generator:							
Waste Stream Information[1]							
(10) WIPP ID: RL231Z-01					(11) Summary Category Group: S5000		
(12) Waste Matrix Code Group: Heterogeneous Debris Waste					(13) Waste Stream Name: Hanford 231-Z Building Contact-Handled Transuranic Debris		
(14) Description from the TWBIR: Combustible and noncombustible debris waste generated during operations, cleanout, and D&D activities of the 231-Z Building at Hanford. Combustible waste may include wood, plastics, paper, and rags. Noncombustible waste items may include metals, glass, concrete, and absorbed liquids. The 231-Z Building has also been called the 231-W Building, the Concentration Building, the Isolation Building, the Plutonium Metallurgical Laboratory, and the 231-Z Materials Engineering Laboratory							
(15) Defense TRU Waste: YES	X	NO					
(16) Check One: CH	X	RH					
(17) Number of SWBs: 1		(18) Number of Drums: 230 55-gallon drums and 27 85-gallon drums			(19) Number of Canisters NA		
(20) Batch Data Report numbers supporting this waste stream characterization: See Characterization Information Summary (CIS) Correlation of Container Identification Numbers to Batch Data Report Numbers							
(21) List applicable EPA Hazardous Waste Numbers:[2] D006, D007, D008, D009, F001, F002, and F005							
(22) Applicable TRUCON Content Numbers: RH125/RH225							
(23)**Acceptable Knowledge Information**[1]							
(For the following, enter the supporting documentation used [i.e., references and dates])							
Required Program Information							
(23A) Map of site: CCP-AK-RL-103, Revision 0, July 14, 2010, Figures 1, 2, and 3							
(23B) Facility mission description: CCP-AK-RL-103, Revision 0, July 14, 2010, Section 4.1.3							
(23C) Description of operations that generate waste: CCP-AK-RL-103, Revision 0, July 14, 2010, Sections 4.3 and 5.3							
(23D) Waste identification/categorization schemes: CCP-AK-RL-103, Revision 0, July 14, 2010, Section 4.4							
(23E) Types and quantities of waste generated: CCP-AK-RL-103, Revision 0, July 14, 2010, Sections 5.2, and 5.4							
(23F) Correlation of waste streams generated from the same building and process, as applicable: CCP-AK-RL-103, Revision 0, July 14, 2010, Section 4.2.2							
(24) Waste certification procedures: CCP-TP-030, CCP TRU Waste Certification and WWIS/WDS Data Entry Rev. 29, April 26, 2011							

Attachment 2 – CCP Waste Stream Profile Form (Continued)

(25)Required Waste Stream Information			
(25A) Area(s) and building(s) from which the waste stream was generated: CCP-AK-RL-103, Revision 0, July 14, 2010, Sections 4.3 and 5.1			
(25B) Waste stream volume and time period of generation: CCP-AK-RL-103, Revision 0, July 14, 2010, Section 5.2			
(25C) Waste generating process description for each building: CCP-AK-RL-103, Revision 0, July 14, 2010, Section 4.3 and 5.3			
(25D) Waste Process flow diagrams: NA			
(25E) Material inputs or other information identifying chemical/radionuclide content and physical waste form: CCP-AK-RL-103, Revision 0, July 14, 2010, Section 5.4			
(25F) Waste Material Parameter Weight Estimates per unit of waste: See Table 2 of the Summation of Aspects of AK Summary Report: RLM231ZD.001			
(26) Which Defense Activity generated the waste[3]: (check one)			
	Weapons activities including defense inertial confinement fusion		Naval Reactors development
	Verification and control technology	X	Defense research and development
	Defense nuclear waste and material by products management		Defense nuclear material production
	Defense nuclear waste and materials security and safeguards and security investigations		
(27)Supplemental Documentation			
(27A) Process design documents: NA			
(27B) Standard operating procedures: See S2 AK# on Attachment 1 to Summation of Aspects of AK Summary Report			
(27C) Safety Analysis Reports: See S3 AK# on Attachment 1 to Summation of Aspects of AK Summary Report			
(27D) Waste packaging logs: See S4 AK# on Attachment 1 to Summation of Aspects of AK Summary Report			
(27E) Test plans/research project reports: NA			
(27F) Site databases: NA			
(27G) Information from site personnel: See S7 AK# on Attachment 1 to Summation of Aspects of AK Summary Report			
(27H) Standard industry documents: NA			
(27I) Previous analytical data: See S9 AK# on Attachment 1 to Summation of Aspects of AK Summary Report			
(27J) Material safety data sheets: See S10 AK# on Attachment 1 to Summation of Aspects of AK Summary Report			
(27K) Sampling and analysis data from comparable/surrogate Waste: NA			
(27L) Laboratory notebooks: See S11 AK# on Attachment 1 to Summation of Aspects of AK Summary Report			
Confirmation Information[2]			
For the following, when applicable, enter procedure title(s), number(s) and date(s)			
(28)	Radiography: CCP-TP-053, Revision 10, March 4, 2011		
(29)	NA		

Attachment 2 – CCP Waste Stream Profile Form (Continued)

(30)Comments:

For a list of the waste characterization procedures used and date of the respective procedures see the list of procedures on the attached CIS.

Reviewed by AK Expert:	**YES**	[X]		**Date: 4-25-2001**
Reviewed by STR (if necessary):	**YES**	[X]	**N/A** [ ]	**Date: 4-25-2011**

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.

(31) Veronica Waldram	(32) Veronica Waldram	(33) 5-20-2011
Signature of Site Project Manager	Printed Name	Date

NOTE: (1) Use back of sheet or continuation sheets, if required.
(2) If, radiography, visual examination were used to confirm EPA Hazardous Waste Numbers, attach signed Characterization Information Summary documenting this determination.
(3) This waste was also generated by the following defense activity: defense nuclear materials production.

CHARACTERIZATION INFORMATION SUMMARY

WSPF # RLM231ZD.001

Lot 1

TABLE OF CONTENTS

CCP Characterization Information Summary Cover Page

Waste Stream # RLM231ZD.001 Lot #: 1

AK Expert Review: N/A Date: N/A

SPM Review: Veronica Waldram Veronica Waldram Date: 6/2/2011

SPM signature certifies that through Acceptable Knowledge testing and/or analysis that the waste identified in this summary is not corrosive, ignitable, reactive, or incompatible with the TSDF.

A summary of the Acceptable Knowledge regarding this waste stream containing specific information about the corrosivity, reactivity, and ignitability of the waste stream is included as an attachment to the Waste Stream Profile Form. By reference, that information is included in this lot.

List of procedures used:

Radiography (RTR/NDE):

CCP-TP-053	Rev. 7	10/21/09	CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 8	06/30/10	CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 9	09/30/10	CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 10	03/04/11	CCP Standard Real-Time Radiography (RTR) Inspection Procedure

Non Destructive Assay (NDA):

CCP-TP-070	Rev. 0	01/11/10	CCP Gamma Energy Assay (GEA) Calibration, Confirmation, and Verification Procedure
CCP-TP-071	Rev. 0	01/11/10	CCP Gamma Energy Assay (GEA) Operating Procedure
CCP-TP-071	Rev. 1	02/17/11	CCP Gamma Energy Assay (GEA) Operating Procedure
~~CCP-TP-072~~	~~Rev. 0~~	~~01/12/10~~	~~CCP Gamma Energy Assay (GEA) Data Review, Validation, and Reporting Procedure~~
CCP-TP-072	Rev. 1	01/28/11	CCP Gamma Energy Assay (GEA) Data Review, Validation, and Reporting Procedure

Headspace Gas Sampling and Analysis (HSG):

CCP-TP-093	Rev. 13	03/19/07	CCP Sampling of TRU Waste Containers
CCP-TP-093	Rev. 14	12/29/10	CCP Sampling of TRU Waste Containers
CCP-TP-093	Rev. 15	03/10/11	CCP Sampling of TRU Waste Containers
CCP-TP-106	Rev. 6	07/12/07	CCP Headspace Gas Sampling Batch Data Report Preparation
CCP-TP-106	Rev. 7	12/29/10	CCP Headspace Gas Sampling Batch Data Report Preparation
CCP-TP-173	Rev. 1	09/30/09	CCP Analysis of Gas Samples for VOCs by GC/FID
CCP-TP-175	Rev. 0	05/02/07	CCP Analysis of Gas Samples for VOCs by GC/MS
CCP-TP-175	Rev. 1	03/29/10	CCP Analysis of Gas Samples for VOCs by GC/MS
CCP-TP-175	Rev. 2	12/29/10	CCP Analysis of Gas Samples for VOCs by GC/MS

Project Level Data Validation / DQO Reconciliation:

CCP-TP-001	Rev. 17	09/24/07	CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 18	06/09/10	CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 19	12/29/10	CCP Project Level Data Validation and Verification
CCP-TP-002	Rev. 21	08/04/09	CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 22	06/30/10	CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 23	12/29/10	CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-003	Rev. 17	11/09/09	CCP Data Analysis for S3000, S4000, and S5000 Characterization
CCP-TP-003	Rev. 18	12/29/10	CCP Data Analysis for S3000, S4000, and S5000 Characterization
CCP-TP-005	Rev. 18	11/16/06	CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 19	07/06/10	CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 20	11/01/10	CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 21	12/29/10	CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 22	04/21/11	CCP Acceptable Knowledge Documentation
CCP-TP-030	Rev. 27	12/14/09	CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 28	06/12/10	CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 29	04/28/11	CCP CH TRU Waste Certification and WWIS/WDS Data Entry

WAP Certification:

CCP-PO-001	Rev. 17	06/23/09	CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 18	06/30/10	CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 19	12/29/10	CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-002	Rev. 22	01/12/10	CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 23	04/07/10	CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 24	06/30/10	CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 25	12/29/10	CCP Transuranic Waste Certification Plan
CCP-PO-011	Rev. 0	07/22/09	CCP/CH2M Hill Plateau Remediation Company Interface Document
CCP-PO-011	Rev. 1	12/22/09	CCP/CH2M Hill Plateau Remediation Company Interface Document
CCP-PO-011	Rev. 2	07/27/10	CCP/CH2M Hill Plateau Remediation Company Interface Document
CCP-PO-011	Rev. 3	10/05/10	CCP/CH2M Hill Plateau Remediation Company Interface Document
CCP-PO-011	Rev. 4	03/02/11	CCP/CH2M Hill Plateau Remediation Company Interface Document

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # RLM231ZD.001

Container ID Number	NDA BDR	RTR BDR	VE BDR	Solids Sampling BDR	Solids Analytical BDR	Load Management/ Overpack Yes	Headspace Gas BDR		
							Sample	Analysis	
RL0069123	RLGEAA0052	RLRTRB0056	NA	NA	NA		RLHSGS100003	ECL10021M	ECL10021G
RL0069923	RLGEAB0050	RLRTRA0070	NA	NA	NA		RLHSGS100005	ECL10025M	ECL10025G
RL0070194	RLGEAA0052	RLRTRA0071	NA	NA	NA		RLHSGS100005	ECL10025M	ECL10025G
RL0070224	RLGEAA0052	RLRTRA0070	NA	NA	NA		RLHSGS100003	ECL10021M	ECL10021G
RL0071066	RLGEAB0050	RLRTRB0056	NA	NA	NA		RLHSGS100003	ECL10021M	ECL10021G
RL0071258	RLGEAB0050	RLRTRB0056	NA	NA	NA		RLHSGS100003	ECL10021M	ECL10021G
RL0071646	RLGEAB0050	RLRTRA0070	NA	NA	NA		RLHSGS100003	ECL10021M	ECL10021G
RL0071678	RLGEAA0052	RLRTRA0070	NA	NA	NA		RLHSGS100003	ECL10021M	ECL10021G
RL0071717	RLGEAB0050	RLRTRA0069	NA	NA	NA		RLHSGS100003	ECL10021M	ECL10021G
RL0071746	RLGEAA0052	RLRTRB0056	NA	NA	NA		RLHSGS100003	ECL10021M	ECL10021G

Veronica Waldram
Signature of Site Project Manager

Veronica Waldram
Printed Name

6/2/2011
Date

CTS003

CCP Headspace Gas UCL_{90} Evaluation Form

WSPF #: RLM231ZD.001 **Waste Stream Headspace Gas Lot Number** 1 through 1

ANALYTE	Transform Data Used (No, Data-Log, SQRT, other)	# Samples above MDL (1)	# Samples	Maximum (ppmv)	Mean (ppmv)	SD (ppmv)	UCL_{90} (ppmv)	PRQL (ppmv)	Transformed PRQL (N/A or Value)	UCL_{90} > PRQL Yes	EPA Hazardous Waste Number
Benzene	SQRT	6	10	4.90	1.88	1.44	2.52	10	3.16		
Bromoform	Log	0	10	0.44	-2.41	2.02	-1.53	10	2.30		
Carbon tetrachloride	Log	5	10	4.79	-0.36	3.77	1.29	10	2.30		
Chlorobenzene	Log	1	10	0.83	-1.70	1.95	-0.84	10	2.30		
Chloroform	Log	6	10	5.08	0.64	3.71	2.26	10	2.30		
Cyclohexane[a]	Log	2	10	1.41	-0.82	2.01	0.06	10	2.30		
1,1-Dichloroethane	SQRT	2	10	1.97	0.92	0.69	1.23	10	3.16		
1,2-Dichloroethane	SQRT	3	10	1.88	0.90	0.63	1.17	10	3.16		
1,1-Dichloroethylene	Log	0	10	1.36	-1.48	2.01	-0.60	10	2.30		
cis-1,2-Dichloroethylene	Log	2	10	0.97	-1.69	1.87	-0.87	10	2.30		
trans-1,2-Dichloroethylene	Log	0	10	1.61	-1.20	2.01	-0.32	10	2.30		
Ethyl benzene	Log	1	10	1.13	-1.58	1.92	-0.74	10	2.30		
Ethyl ether	Log	0	8	0.50	-1.87	1.54	-1.10	10	2.30		
Methylene chloride	Log	3	10	2.40	-0.66	2.37	0.38	10	2.30		
1,1,2,2-Tetrachloroethane	Log	1	10	0.47	-1.97	2.05	-1.07	10	2.30		
Tetrachloroethylene	SQRT	5	10	2.59	1.25	0.91	1.65	10	3.16		
Toluene	Log	9	10	3.89	1.57	1.34	2.16	10	2.30		
1,1,1-Trichloroethane	Log	6	10	2.71	-0.81	2.72	0.38	10	2.30		
Trichloroethylene	SQRT	3	10	1.70	0.88	0.56	1.12	10	3.16		
Trichlorofluoromethane[(2)]	Log	1	10	1.67	-1.83	2.14	-0.89	10	2.30		
1,1,2-Trichloro-1,2,2-trifluoroethane	Log	6	10	6.48	0.04	4.42	1.97	10	2.30		
1,2,4-Trimethylbenzene[a]	Log	0	10	1.18	-1.67	2.01	-0.78	10	2.30		
1,3,5-Trimethylbenzene[a]	Log	0	10	1.25	-1.58	2.02	-0.70	10	2.30		
m,p-Xylene[b]	Log	6	10	1.86	-1.29	2.05	-0.40	10	2.30		
o-Xylene	Log	1	10	1.05	-1.70	1.94	-0.85	100	4.61		
Acetone	SQRT	8	10	10.00	4.93	3.63	6.52	100	10.00		
Butanol	Log	4	10	2.30	0.09	1.72	0.85	100	4.61		
Methanol	No	0	10	7.50	7.50	0.00	(3)	100	N/A		
Methyl ethyl ketone	Log	4	10	3.00	0.69	1.77	1.47	100	4.61		

CCP Headspace Gas UCL_{90} Evaluation Form

WSPF #: RLM231ZD.001 **Waste Stream Headspace Gas Lot Number** 1 through 1

ANALYTE	Transform Data Used (No, Data-Log, SQRT, other)	# Samples above MDL (1)	# Samples	Maximum (ppmv)	Mean (ppmv)	SD (ppmv)	UCL_{90} (ppmv)	PRQL (ppmv)	Transformed PRQL (N/A or Value)	UCL_{90} > PRQL Yes	EPA Hazardous Waste Number
Methyl isobutyl ketone	Log	5	10	4.04	-0.38	2.18	0.57	10	2.30		
Chloromethane[2]	Log	5	10	3.22	0.28	2.28	1.27	10	2.30		
Carbon Disulfide[2]	SQRT	5	8	1.32	0.83	0.37	1.02	10	3.16		
1,2-Dichloropropane[2]	Log	1	10	0.99	-1.44	2.03	-0.56	10	2.30		
Formaldehyde[c]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Hydrazine[d]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

[a] These compounds are from CCP-PO-003, CCP Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPAC) and are flammable VOCs that do not appear in CCP-PO-001. These are not part of the target analyte list, but samples may be analyzed for these compounds.

[b] These xylene isomers cannot be resolved by the analytical methods employed in the program. m-Xylene and p-Xylene will be reported as "Total m-p-Xylene."

[c] Required only for homogenous solids and soil/gravel waste from Savannah River Site.

[d] Required only for homogenous solids and soil/gravel waste from Oak Ridge National Laboratory and Savannah River Site.

CH SOS

Comments:

(1) For analytes where there were no samples measured above the MDL value, 1/2 of the MDL value was used. (Per section C4 of the WAP, 1/2 of the MDL value is used in calculating the mean concentration.)

(2) The noted analytes are not included in the target analyte list Table C3-2 of HWFP Attachment C3. The analytes are reported in the analysis Batch Data Report provided by the Idaho lab and included on the UCL_{90} for completeness.

(3) Because the noted analyte had <2 different obervations, no meaningful covariance exists and the UCL90 value could not be calculated. Therefore, the PRQL was compared to the maximum for the purpose of confirming HWNs.

Veronica Waldram
Signature of Site Project Manager

Veronica Waldram
Printed Name

6/2/2011
Date

CCP Headspace Gas Summary Data

Waste Stream Number RLM231ZD.001 Lot Number (s) 1

Tentatively Identified Compound	Maximum Observed Estimated Concentrations (ppmv)	# Samples Containing TIC	% Detected
1,1,2-Trichloroethane	0.62	1	10.00%

Data Supports EPA Hazardous Waste Numbers Assigned by AK? ☑ Yes ☐ No

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

SPM Signature Veronica Waldram Date 6/2/2011

CISOOb

CCP RTR/VE Summary of Prohibited Items and AK Confirmation

Waste Stream Number: RLM231ZD.001 Lot(s)#: 1

Container Number	RTR Prohibited Items [a,b]	Visual Examination Prohibited Items [a,b]
See correlation of container ID numbers for list of remaining drum numbers in this Lot.	RTR Data confirm that none of the containers in this lot contain any prohibited items.	None of the containers in this lot were processed through VE.

a. See Batch Data Reports

b. If AK has assigned U134 to this waste stream, then any liquids in these containers are prohibited items (not acceptable by the TSDF).

Justification for the selection of RTR and/or VE: RTR was selected as the characterization method for this lot because the waste containers are packaged by host site personnel and RTR is an acceptable characterization method to meet all the Data Quality Objectives for NDE of waste stream RLM231ZD.001.

Veronica Waldram — Site Project Manager Signature

Veronica Waldram — Printed Name

6/2/2011 — Date

CCP Reconciliation with Data Quality Objectives

WSF# RLM231ZD.001 Lot # 1

Sampling Completeness

RTR:

Number of Valid Samples: 10 Number of Total Samples Analyzed: 10

Percent Complete: 100 (QAO is 100%)

NDA

Number of Valid Samples: 10 Number of Total Samples Analyzed: 10

Percent Complete: 100 (QAO is 100%)

HSG

Number of Valid Samples: 10 Number of Total Samples Collected: 10

Percent Complete: 100 (QAO is ≥90%)

Number of Valid Samples: 10 Number of Total Samples Analyzed: 10

Percent Complete: 100 (QAO is ≥90%)

Total VOC

Number of Valid Samples: NA Number of Total Samples Collected: NA

Percent Complete: NA (QAO is ≥90%)

Number of Valid Samples: NA Number of Total Samples Analyzed: NA

Percent Complete: NA (QAO is ≥90%)

Total SVOC

Number of Valid Samples: NA Number of Total Samples Collected: NA

Percent Complete: NA (QAO is ≥90%)

Number of Valid Samples: NA Number of Total Samples Analyzed: NA

Percent Complete: NA (QAO is ≥90%)

Total Metals

Number of Valid Samples: NA Number of Total Samples Collected: NA

Percent Complete: NA (QAO is ≥90%)

Number of Valid Samples: NA Number of Total Samples Analyzed: NA

Percent Complete: NA (QAO is ≥90%)

CCP Reconciliation with Data Quality Objectives

WSF# RLM231ZD.001 Lot # 1

	Y/N/NA	Reconciliation Parameter
1	Y	Waste Matrix Code.
2	Y	Waste Material Parameter Weights.
3	Y	The waste matrix code identified is consistent with the type of sampling and analysis used to characterize the waste.
4	Y	The TRU activity reported in the BDRs for each container demonstrates with a 95% probability that the container of waste contains TRU radioactive waste.
5	NA	AK Sufficiency. Is there an approved AK sufficiency Determination for this waste stream?
6	Y	Mean concentrations, UCL_{90} values for the mean concentration, standard deviations, and the number of samples collected for each VOC in the HSG of each container were calculated and compared with the program required quantitation limits, as reported in CCP-TP-003 Attachment 3, and additional U.S. Environmental Protection Agency (EPA) Hazardous Waste Numbers were assigned as required. Samples were randomly collected (when appropriate).
7a	NA	Mean concentrations, UCL_{90} values for the mean concentration, standard deviations, and the number of samples collected for solids VOCs were calculated and compared with the program required quantitation limits and regulatory thresholds, as reported in the Characterization Information Summary, CCP-TP-003 Attachment 4, and additional EPA HWNs were assigned as required. Samples were randomly collected.
7b	NA	Mean concentrations, (UCL_{90}) values for the mean concentration, standard deviations, and the number of samples collected for solids SVOCs were calculated and compared with the program required quantitation limits and regulatory thresholds, as reported in the Characterization Information Summary, CCP-TP-003 Attachment 5, and additional EPA HWNs were assigned as required. Samples were randomly collected.
7c	NA	Mean concentrations, (UCL_{90}) values for the mean concentration, standard deviations, and the number of samples collected for total metals were calculated and compared with the program required quantitation limits and regulatory thresholds, as reported in the Characterization Information Summary, CCP-TP-003 Attachment 6, and additional EPA HWNs were assigned as required. Samples were randomly collected.

CCP Reconciliation with Data Quality Objectives

WSF# RLM231ZD.001 Lot # 1

8	Y	The data demonstrates whether the waste stream exhibits a toxicity characteristic under Title 40 CFR 261, Identification and Listing of Hazardous Waste, Subpart C, Characteristics of Hazardous Waste.
9	Y	Does the waste stream contain listed waste found in 20.4.1.200 NMAC incorporating 40 CFR Part 261, Subpart D, Lists of Hazardous Wastes.
10	Y	Waste stream can be classified as hazardous or nonhazardous at the 90-percent confidence level.
11	Y	Appropriate packaging configuration and Drum Age Criteria (DAC) is applied and documented in the headspace gas sampling documentation, and the drum age met prior to sampling.
12	Y	TICs were appropriately identified and reported in accordance with the requirements of Section C3-1 of the QAPjP.
13	Y	The PRQLs for headspace gas VOCs were met for all analyses as evidenced by the analytical batch data reports.
14		The overall completeness, comparability, and representativeness QAOs were met for each of the analytical and testing procedures as specified in the WAP Sections C3-2 through C3-9 prior to submittal of a waste stream profile form for a waste steam or waste stream lot.

	Completeness	Comparability	Representativeness
Radiography	Y	Y	Y
VE	NA	NA	NA
Headspace Gas Analysis	Y	Y	Y
Solids Sampling	NA	NA	NA
Solids VOCs	NA	NA	NA
Solids SVOCs	NA	NA	NA
Solids Metals	NA	NA	NA

Comments: NONE

Veronica Waldram — Signature of Site Project Manager

Veronica Waldram — Printed Name

6/2/2011 — Date

SUMMATION OF ASPECTS OF AK SUMMARY REPORT: RLM231ZD.001

Overview:

The RLM231ZD.001 waste stream consists of transuranic (TRU) contact-handled (CH) mixed heterogeneous debris resulting from research and plutonium fabrication, decontamination and decommissioning (D&D) technology development, and facility cleanout activities at the 231-Z Building at the Hanford Site, located north of Richland, WA. Waste stream RLM231ZD.001 was generated from 1970 to present.

TRU waste generated by 231-Z Building operations is contaminated with radiological materials generated from atomic energy defense activities as follows: defense nuclear materials production and defense research and development. The 231-Z Building was originally constructed in 1944 for the purpose of processing plutonium for defense weapons production. From 1945 to 1956, the 231-Z Building concentrated and purified plutonium nitrate solution that had been processed in the Hanford Site's bismuth phosphate radiochemical separations facilities. The plutonium nitrate solution that was sent to the 231-Z Building was originally produced by a chemical separations process at Hanford's T- and B-Plants, where aluminum fuel jackets had been removed from irradiated uranium elements. Following chemical separations to purify the plutonium, the plutonium nitrate solutions were decontaminated and concentrated at the 224-T and 224-B bulk reduction buildings before reaching the 231-Z Building. Operations at the 231-Z Building involved receiving plutonium in a nitrate solution and then further concentrating and purifying it into a thick paste-like product. The facility was given the letter "Z" because it housed the last step in the process at Hanford before the plutonium nitrate was shipped to the Los Alamos Site for conversion to metallic plutonium that was shaped into weapons parts. Therefore, this waste is defense related.

This Summation of the Acceptable Knowledge Summary Report includes information to support Waste Stream Profile Form (WSPF) RLM231ZD.001 for Hanford's 231-Z Building debris waste. The primary source of information for this report is CCP-AK-RL-103, *Central Characterization Project Acceptable Knowledge Summary Report for Hanford 231-Z Building Contact-Handled Transuranic Debris Waste, Waste Stream: RLM231ZD.001,* Revision 0, dated July 14, 2010. CCP-AK-RL-103 includes information obtained from numerous sources, including facility safety basis documentation, historical document archives, generator and storage facility waste records and documents including databases, and interviews with operational and waste management personnel.

Waste Stream Identification Summary:

Waste Stream Name:	Hanford 231-Z Building Contact-Handled Transuranic Debris
Waste Stream Number:	RLM231ZD.001
Site Where TRU Waste Was Generated:	Hanford
Facility Where TRU Waste was Generated:	231-Z Building Materials Engineering Laboratory
Site Where TRU Waste is Currently Stored:	Hanford

Waste Stream Volume - Current:	1 SWB, 27 85-gallon drums and 88 55-gallon drums (27.15 m^3)
Waste Stream Volume – Projected:	30 m^3
Dates of Waste Generation:	1970 – Present
TRUCON Content Number (TRUCON):	RH125, RH225
Summary Category Group:	S5000
Waste Matrix Code:	S5400
Waste Matrix Code Group:	Heterogeneous Debris Waste
Waste Stream ATWIR Identification:	RL231Z-01
RCRA EPA Hazardous Waste Numbers:	D006, D007, D008, D009, F001, F002, F005

Waste Stream Description and Physical Form:

The RLM231ZD.001 waste stream consists of TRU CH mixed heterogeneous debris resulting from research and plutonium fabrication, D&D technology development, and facility cleanout activities at the 231-Z Building.

Based on a review of data generated previously by the Hanford TRU Waste Certification Program, examples of potential waste items in the RLM231ZD.001 waste stream are provided below:

Iron-based Metals/Alloys:

- Spent equipment
- Failed machinery
- Tools
- Lathes
- Pumps
- Piping
- Fans
- Gloveboxes
- Tanks

Aluminum-based Metals/Alloys:

- Metal cans
- Aerosol cans

Other Metals:

- Lead (bricks and sheeting)
- Alkaline batteries

- Conduit
- Wire
- Duct work

Other Inorganic Materials:

- Insulation materials
- Brick
- Floor tiles
- Glass (Glovebox panels and lab equipment)
- Sheet rock

Cellulosics:

- Cloth (rags)
- Wood
- Ladder(s)
- Paper
- HEPA filters

Rubber:

- Gloves

Plastics:

- Plexiglass
- Polyethylene bottles
- Piping

Organic Matrix:

- Absorbed combustible liquids such as oils, sample residues from fuel pellets, tank waste, ceramics and grouted plutonium in cans

Inorganic Matrix:

- Absorbents (e.g., kitty litter, Vermiculite, diatomaceous earth)

The Waste Matrix Code S5400, Heterogeneous Debris, is assigned to the waste stream. The material that comprises waste stream RLM231ZD.001 was generated from activities within the 231-Z Building and meets the WIPP-WAP waste stream definition of waste materials that have common physical form, that contain similar hazardous constituents, and that are generated from a single process or activity. Based on review of historical drum records, containers in this waste stream are identified only as originating from the 231-Z Building, and no additional information is available to identify a more specific point of origin within the facility.

Point of Generation - Area and Building of Generation

Location

Waste stream RLM231ZD.001 was generated from the 231-Z Building at the Hanford site. The waste is currently stored at the Hanford site in above ground storage in at the Hanford Burial Grounds.

Area and/or Building of Generation

Waste stream RLM231ZD.001 was generated by the 231-Z metallurgical research and plutonium fabrication, D&D technology development and facility cleanout activities. The waste was shipped to either the Central Waste Complex or the Burial Grounds at the Hanford Site for storage. Some of the waste has been repackaged by Hanford personnel.

Generating Process

Description of Waste Generating Processes

Containers assigned to waste stream RLM231ZD.001 were generated from 1970 and later. Historical facility operations prior to 1970 are provided in this section as background reference information and because waste contamination may have originally resulted from activities conducted prior to 1970. 231-Z Building facility operations are described below:

Bismuth Phosphate Process Plutonium Isolation

From 1945 until 1957, plutonium was originally recovered from irradiated fuel at Hanford using the bismuth-phosphate separation process. The separation of Pu-239 was carried out with a batch precipitation process that involved repeatedly dissolving and centrifuging the plutonium-bearing solutions. The steps of this process occurred at T Plant, the 224-T Bulk Reduction Building, and the 231-Z Building. The first step, dissolving the plutonium, was carried out in the T Plant canyon. The aluminum fuel cladding was removed from irradiated uranium fuel elements, producing "coating removal waste." The decladded metal fuel rods were then charged into a dissolver and nitric acid was added. During the second step, extraction, the plutonium was separated from most of the uranium and the plutonium remained in solution. This extraction process was then repeated to further decontaminate the fuel rods.

The resulting plutonium-bearing solution was transferred from T Plant to the 224-T Building where it was treated to form concentrated plutonium nitrate. The concentrated plutonium nitrate solution was sent to the 231-Z Building for the final step of the processing. The process of concentrating the plutonium nitrate solution at the 231-Z Building first required the addition of ammonium nitrate to adjust the valence state of the plutonium. The solution underwent three peroxide "strikes" (additions of hydrogen peroxide to further separate the plutonium from its carrier solutions). Following the addition of sulfates and hydrogen peroxide, plutonium was precipitated as plutonium peroxide. This precipitate was dissolved with the addition of nitric acid. The plutonium nitrate solution was placed in small shipping cans and the solution was concentrated, or reduced, to a wet nitrate paste by boiling the solution in the cans using hot air. The paste was sent to Los Alamos, New Mexico.

In 1950, the 231-Z Building also accomplished the first separation of Americium-241. During the next few years, small amounts of americium were recovered from the plutonium nitrate solution via a standardized process of peroxide precipitation at the 231-Z Building.

Plutonium Metallurgy Laboratory

Originally located at the Plutonium Finishing Plant (PFP), the plutonium metallurgy laboratory was moved to the 231-Z Building in 1956, and continued metallurgical operations until 1984. The metallurgy laboratory was involved with examining and studying plutonium, including alloys, tensile properties, stability, fabrication, and coating methods. The facility routinely handled and stored large quantities of plutonium for use with the research program.

In 1973, the 231-Z Building facility was remodeled to accommodate a metallurgy process. In the subsequent years, there was an increase in the development of metallurgy projects. Decontamination techniques capable of reducing surface contamination for TRU metallic wastes were also developed by the 231-Z Building.

Metallurgy Research Activities

Metallurgical operations were conducted at the 231-Z Building from 1945 until the research and development (R&D) activities were terminated in 1984. Metallurgical operations included the following:

- Physical metallurgy (phase transformation, deformation, structure, phase stability, and metastability)
- Property determination (static properties and brief transient effects)
- Alloy development (plutonium alloys with properties appropriate to highly complex uses in special environments)
- Process development that devised new processes for the production of highly specialized metallic plutonium components.

Metallurgy Operations Description

The Metallurgy Development Department performed research activities and fabrication development on plutonium, plutonium alloys and reactor fuels. The following is a list of R&D and metallurgical activities that took place at the 231-Z Building

- Rolling: a recirculating oil system provided coolant and lubrication for the roll bearings
- Pressing: hydraulic presses which used hydraulic oil
- Gauging (precision inspection of plutonium components): hydraulic oil was used in hydraulically operated door locks
- Radiography

- Plutonium Heat-Treating and Quenching: heat-treatment in static vacuum was done in salt baths after specimens are sealed in quartz or glass
- Electron Beam Welding: lead shielding was built into the work chamber to reduce x-ray levels
- Electrical Discharge Machining: plutonium was held for cutting partially submerged in oil. The oil was either pumped through a filter where plutonium fines were removed, pumped into a high speed centrifuge where the fines accumulated as a cake, or routed directly back through the tool
- Criticality Polycube Fabrication: hydraulic oil was recirculated through cube fabrication glovebox line. Acetone was a component in the Krylon silver aerosol used as a fixative
- X-Ray Diffractometers
- Structure and Impurity Analyses: acetone was used to soften sample preparation tape. The final replica is cleaned in hydrochloric acid and finally in distilled water
- Vapor Degreasing-Ultrasonic Cleaning: trichloroethylene was used as degreasing fluid. 1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113) was used in ultrasonic agitation tank
- Arc Melting
- Vapor Deposition
- Sulfamic Acid Dissolution
- Plutonium Casting: mercury was used to check the void volume of casting molds
- Machining: beryllium was used in the machining process
- Metallography: benzene and alcohol (unidentified) were used in the etching process
- Mechanical Property Determinations
- Density Determinations: metal densities were determined using carbon tetrachloride and 1,1,2-Trichloro-1,2,2-trifluoroethane as liquid displacement fluids
- Spallation Testing
- Plutonium Burning: plutonium scheduled for burning was rinsed in 1,1,2-Trichloro-1,2,2-trifluoroethane prior to burning.

Development of D&D Technologies

From 1972 through 1983, the 231-Z Building developed advanced D&D technologies that involved sectioning, vibratory finishing, electropolishing, solution processing, and bench-scale metallography. A brief description of the 231-Z D&D processes follows:

- In situ electropolishing techniques were used for decontaminating large tanks, long pipes, hot cell walls and other surfaces. This process used a 75-85 percent phosphoric acid solution that contained chromium from the electropolishing of stainless steel.

- Vibratory finishing decontamination techniques were developed that were capable of rapidly converting large volumes of surface-contaminated metallic and non-metallic TRU waste into non-TRU waste. For decontamination, this process used a sodium hydroxide solution along with metal and ceramic media. The caustic solution was shown to be a rust inhibitor that would preserve the steel media although generating a corrosive ceramic sludge.

- Disassembly and sectioning techniques were used to prepare material for decontamination using electropolishing and vibratory finishing.

- Contamination control coatings (fixatives) to facilitate removal, disassembly, and sectioning of equipment. Fixatives included Butval Alara (a thick vinyl paste), polybutyl dispersion, and polyvinyl alcohol.

Clean-out Activities

Over the years, as missions for the 231-Z Building changed, various cleanout campaigns that generated TRU waste took place. In 1973, cleanout activities of the building were initiated to accommodate processes that had been successfully demonstrated by the Process Development Laboratory. Large amounts of equipment and fixtures were torn out and disposed of as solid waste. Floor tiles, lagging, and other insulation materials contained asbestos.

In 1975, the Division of Military Application (DMA) advised the 231-Z Building to phase out development of weapons and a cleanout campaign was initiated. The building was cleaned out and refurbished to support the U.S. Energy Research and Development Agency (ERDA), a predecessor agency to the U. S. Department of Energy (DOE). Gloveboxes were removed for burial and packaged in fiberglass reinforced plywood (FRP) boxes, although not transported for burial until 1980. The 1975 cleanout campaign included removal of contaminated equipment items such as vacuum pumps, hydraulic systems, and refrigeration equipment that were external, but attached to the gloveboxes. These items were buried with the gloveboxes when practical.

Objectives and activities of the 1975 cleanout campaign included the following:

- Complete removal of all gloveboxes and related plutonium processing equipment including ventilation systems, drainage systems, and other obsolete service systems

- Decontamination of the facility to the extent that future laboratory operations may be conducted without Radiation or Controlled-Zone restrictions

- Restoration of the facility to render it fit for use as a "cold laboratory".

Additional 231-Z Building clean out campaigns took place from 1982 through 1986. Large quantities of plutonium were routinely handled and stored at the 231-Z Building in two plutonium storage vaults. Waste stored in the vaults was packaged for disposal during these clean outs.

Handling of Special Nuclear Materials

During metallurgical operations, each glovebox was examined to assure plutonium holdup and special nuclear material was removed. The results of the plutonium holdup evaluation were reviewed and approved prior to the decision of whether to hold the special nuclear material for future use or to slate it for disposal. Hydraulic, vacuum, and refrigeration systems; glovebox secondary filter cages; and filters that were identified with significant plutonium holdup during decontamination and refurbishing were managed similarly. Plutonium turnings were degreased by rinsing with 1,1,2-Trichloro-1,2,2-trifluoroethane and burned in a special glovebox. The resulting oxide residues were sent to PFP for future recovery.

Table 1 identifies toxicity characteristic (TC) and F-listed constituents in waste stream. RLM231ZD.001

Table 1 –TC and F-Listed Constituents in Waste Stream RLM231ZD.001

Chemical	CAS Number	EPA Hazardous Waste Numbers
Benzene	71-43-2	F005
Cadmium	7440-43-9	D006
Carbon disulfide	75-15-0	F005
Carbon tetrachloride	56-23-5	F001
Chromium	7440-47-3	D007
Lead	7439-92-1	D008
Mercury	7439-97-6	D009
Methyl ethyl ketone	78-93-3	F005
Methylene chloride	75-09-2	F001, F002
Tetrachloroethylene	127-18-4	F001, F002
Trichloroethylene	79-01-6	F001, F002
1,1,1-Trichloroethane	71-55-6	F001, F002
1,1,2-trichloro-1,2,2-trifluoroethane	76-13-1	F001, F002

RCRA Determinations - Hazardous Waste Determinations

Historical Waste management

The waste stream described in this report has been historically managed in accordance with Hanford waste management practices in compliance with the requirements imposed by the Washington State Department of Ecology. Based on a review of Hanford historic waste management practices and characterization performed previously by the Hanford TRU Waste Certification Program, the U.S. Environmental Protection Agency (EPA) hazardous waste numbers (HWNs) assigned to this waste stream have been maintained, with the exception of the assignment of F003 for constituents listed solely for ignitability. The HWN assignments have been applied on a waste stream basis; individual containers will not contain all of the hazardous materials listed for the waste stream as a whole.

Ignitability, Corrosivity, Reactivity

Waste generated in this waste stream does not qualify for any of the exclusions outlined in 40 Code of Federal Regulations (CFR) 260 or 261. Real Time Radiography is used to verify that

the waste stream is not a liquid waste and does not contain explosives, non-radioactive pyrophoric materials, compressed gases or reactive waste. Based on the Hanford waste management practices, all liquids and reactive materials were solidified, evaporated, neutralized, and/or deactivated prior to disposal. Therefore, this waste stream does not exhibit the characteristic for ignitability (D001), corrosivity (D002), or reactivity (D003). (References C064 and P270).

Ignitability

The waste does not exhibit the characteristic of ignitability as identified in 40 CFR 261.21. The materials are not liquid, compressed gases, or oxidizers, and are not capable of causing fire through friction, absorption of moisture, or spontaneous chemical change. The materials are not liquid, and RTR is performed to ensure the absence of prohibited liquids. Based on the Hanford waste management practices, all ignitable liquids such as acetone, methyl ethyl ketone, or alcohols were solidified, evaporated, neutralized, and/or deactivated prior to disposal. (References C064 and P270).

To ensure the waste does not exhibit the characteristic of ignitability, liquid in excess of TSDF-WAC limits will be removed or immobilized, and compressed gases (e.g., aerosol cans) will be removed or vented prior to WIPP disposal. Therefore, this waste does not exhibit the characteristic of ignitability (D001) (Reference C064 and P270).

Corrosivity

This waste does not exhibit the characteristic of corrosivity as defined in 40 CFR 261.22. The materials are not liquid, and RTR is performed to ensure the absence of prohibited liquids. Potentially corrosive reagents, such as hydrochloric acid, sodium hydroxide, and sulfuric acid were managed by the laboratory; however, these materials were neutralized, absorbed, deactivated, and solidified. To ensure the waste does not exhibit the characteristic of corrosivity, liquid in excess of TSDF-WAC limits will be removed or immobilized. The material in this waste stream is therefore not corrosive waste (D002). (References C064 and P270).

Reactivity

This waste stream does not exhibit the characteristic of reactivity as defined in 40 CFR 261.23. The materials are stable and will not undergo violent chemical change. The materials will not react violently with water, form potentially explosive mixtures with water, or generate toxic gases, vapors, or fumes when mixed with water.

Debris materials in this waste stream which came in contact with cyanide materials are not capable of detonation or explosive reaction. Sulfides were not used in the 231-Z Building. Reactive metals and alloys were reacted prior to disposal and potentially reactive reagents were not placed into the waste.

To ensure the waste does not exhibit the characteristic of reactivity, liquid in excess of TSDF-WAC limits will be removed or immobilized, and compressed gases (e.g., aerosol cans) will be removed or vented prior to WIPP disposal. Therefore, the waste does not exhibit the characteristic of reactivity (D003) (Reference C064 and P270).

Toxicity Characteristic

This waste stream exhibits the characteristic of toxicity per 40 CFR 261.24. Where a constituent has been identified and there is no quantitative data available to demonstrate that the concentration is below regulatory threshold, the applicable EPA HWN is applied to the waste stream. Hexachloroethane (D034) was identified as a tentatively identified compound in headspace gas sampling and analysis performed by the previous Hanford TRU Waste Certification Program, however the concentration of hexachlorethane was below the program required quantitation level; therefore, D034 is not assigned to this waste stream (References C356 and P270)

The waste stream contains or is contaminated with toxicity characteristic metals and toxicity characteristic organic compounds. Based on the review of chemicals identified for the 231-Z Building and HSG sampling, the following EPA HWNs have been assigned to waste stream RLM231ZD.001 D006 (cadmium), D007 (chromium), D008 (lead), D009 (mercury) in accordance with RCRA (Reference C356):

- D006 (cadmium) – Used in laboratory operations and as a neutron poison.
- D007 (chromium) – Used in the electropolishing process on stainless steel causing chemical breakdown.
- D008 (lead) – Used in operations as shielding and also in electron beam welding.
- D009 (mercury) – Used in casting and found in broken instruments.

The AK sources identified the use of organic toxicity characteristic compounds, including benzene (D018), carbon tetrachloride (D019), tetrachloroethylene (D039), trichloroethylene (D040), and methyl ethyl ketone (D035). EPA HWNs F001, F002 and F005 are assigned to the waste stream for these solvents. Because the more specific F-listed HWNs have been assigned for these compounds, assignment of the corresponding toxicity characteristic HWN is not necessary.

F-Listed Waste

Waste stream RLM231ZD.001 was mixed with or derived from F-listed hazardous wastes from non-specific sources as listed in Title 40 *Code of Federal Regulations* (CFR) 261.31. Waste stream RLM231ZD.001 is assigned the following F-listed EPA HWNs:

- F001 (carbon tetrachloride) – Used in density determinations and as a solvent. Identified in headspace gas sampling results.
- F001, F002 (1,1,1-trichloroethane) – Used as a solvent and in degreasing.
- F001, F002 (1,1,2-trichloro-1,2,2-trifluoroethane) – Used in degreasing, ultrasonic cleaning, and density determinations.
- F001, F002 (methylene chloride) – Used as a paint stripper.
- F001, F002 (tetrachloroethylene) – Use not identified. Identified in headspace gas sampling results and the EPA HWN is assigned.
- F001, F002 (trichloroethylene) - Used in degreasing and identified in headspace gas sampling results.
- F005 (benzene) – Used in etching and glovebox operations.
- F005 (carbon disulfide) – Use not identified. Identified in headspace gas sampling results and the EPA HWN is assigned.
- F005 (methyl ethyl ketone) – Use not identified. Identified in headspace gas sampling results and the EPA HWN is assigned.

Hanford previously assigned the F003 HWN to the RLM231ZD.001 waste stream on the basis of the F003-listed solvents used in the 231-Z Building and potential presence in tank farms waste, including acetone, butanol, methanol, methyl isobutyl ketone, and zylenes. These F003 constituents are listed solely because these solvents are ignitable in the liquid form. The waste stream will not exhibit the characteristic of ignitability because it is not liquid; therefore, F003 is not assigned (References C066, C356, M061, P255, P257, and P262).

Electroplating was not performed at the 231-Z Building; therefore, the F-Listed Codes for cyanide electroplating will not be assigned (Reference C363 and DR012).

U, K, and P-Listed Chemicals

Based on a review of AK documentation, the RLM231ZD.001 waste stream is not mixed with a discarded commercial chemical product, an off-specification commercial chemical product, or a container residue or a spill residue thereof (40 CFR 261.33). The waste is not contaminated with hydrofluoric acid (HWN U134) (References C064, C079, C080, and P270).

Beryllium was used in the 231-Z Building during metallurgical research for fuels development. A review of solid waste storage and disposal records indicates the presence of beryllium in trace amounts (i.e., less than one weight percent). Based on the AK documentation reviewed, the form of beryllium used does not meet the definition of commercial chemical product beryllium powder (40 CFR 261.33). Therefore, the waste stream does not meet the definition of P015 waste (References M021, M061, and P255).

Waste stream RLM231ZD.001 does not include any of the manufacturing process wastes from the specific industries or sources listed in 40 CFR 261.32.

Waste Stream RLM231ZD.001 is not assigned any U-, K-, or P-Listed EPA HWNs.

CCP Headspace Gas/Volatile Organic Compound Information

Headspace gas sampling has been performed on 10 randomly selected containers in Lot 1 in this waste stream. The UCL_{90} values for chloroform exceeded the respective target analyte Program Required Quantitation Limits. 1,1,2-trichloroethane was identified in lot one as a tentatively identified compound, but in less than 25% of the samples. No new EPA HWN have been assigned to the waste stream based on the identification of 1,1,2-trichlorethane. The specifics of this information are included in the attached Characterization Information Summary report. (Reference DR018)

Other Waste Streams Generated from the Same Buildings and Processes

The waste stream, RLM231ZD.001, previously certified and shipped under the Hanford TRU Waste Program from the 231-Z Building is similar in physical form and hazardous constituents to this waste stream. Hanford applied F003 because it was used historically. However, the waste stream has been determined to not be ignitable, so F003 does not apply.

Conclusion

The following EPA HWNs are assigned to this waste stream: D006, D007, D008, D009, F001, F002, and F005

Polychlorinated Biphenyls

This waste stream contains PCBs, and is therefore regulated as Toxic Substances Control Act waste under 40 CFR 761. The primary source for PCBs in this waste stream is from absorbed hydraulic oils. Containers with PCB waste, identified during RTR, will be managed and shipped in accordance with the PCB disposal requirements in the WIPP-WAC. (References C064, C080, M101, P255, and P258).

Prohibited Items

The absence of prohibited items is determined and documented through acceptable knowledge and characterization activities. Radiography is performed on each container to verify the absence of prohibited items. The following items have been determined as not present in the waste:

- Liquid waste
- Non-radioactive pyrophoric materials
- Hazardous waste not occurring as co-contaminants with TRU mixed waste (non-mixed hazardous waste)
- Waste incompatible with backfill, seal and panel closure materials, container and packaging materials, or other wastes
- Explosives or compressed gases
- Waste with PCBs not authorized under EPA PCB waste disposal authorization
- Waste exhibiting the characteristics of ignitability, corrosivity, or reactivity
- Waste that has ever been managed as high-level waste and waste from tanks specified in Table C-8 of the WIPP HWFP, unless specifically approved through a Class 3 permit modification

Each container of waste is certified and shipped only after radiography 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.

Justification for the Selection of Radiography or VE

Radiography will be used to characterize waste stream RLM231ZD.001. Radiography will be used to examine this waste stream because the waste is packaged by host site personnel and radiography is an acceptable characterization method to meet all the Data Quality Objective for NDE of waste stream RLM231ZD.001.

Method for Determining Waste Material Parameter (WMPs) Weights Per Unit of Waste

The WMPs for waste stream RLM231ZD.001 were estimated by reviewing WWIS/WDS WMP data for 16 55-gallon drums. It is assumed that the WMP data for the 16 containers are representative of waste stream RLM231ZD.001 as a whole. Average, minimum, and maximum WMP weight percentages were calculated using the WWIS/WDS data. The results of this analysis are presented in the Table 2, Waste Stream RLM231ZD.001 Waste Material Parameters. Although the estimates represent a fraction of the total projected waste volume, these ranges are representative of the entire waste stream and are consistent with records reviewed during AK data collection (References C355 and M061).

Table 2. Waste Stream RLM231ZD.001 Waste Material Parameters

Waste Material Parameter	Average Weight Percent	Weight Percent Range
Iron-based Metals/Alloys	74%	1 - 98%
Aluminum-based Metals/Alloys	<1%	0 - <1%
Other Metals	<1%	0 – 10%
Other Inorganic Materials	3%	0 – 38%
Cellulosics	10%	0 – 86%
Rubber	2%	0 - 19%
Plastics (waste materials)	11%	2 – 58%
Inorganic Matrix	Not reported	NA
Organic Matrix	Not reported	NA
Soils/Gravel	Not reported	NA

List of AK Sufficiency Determinations

No AK Sufficiency Determinations were requested for this waste stream.

Transportation

This waste stream and its chemical constituents have been reviewed for consistency with listed TRUCON codes and they are consistent.

Beryllium

The level of beryllium contamination in individual drums is expected to be less than one weight percent.

Radionuclide Information

The two predominant radionuclides by mass in the RLM231ZD.001 waste stream are Pu-239 and U-238. Previous characterization results provided by Hanford were evaluated to determine the radionuclide distribution in the waste stream. The result of this evaluation identified the isotopes listed in Table 3.

Table 3 – Radionuclides in Waste Stream RLM231ZD.001

WIPP Tracked	Other Radionuclides
Am-241	Am-243
Cs-137	Cm-243
Pu-238	Co-60
Pu-239	Na-22
Pu-240	Np-237
Pu-242	Pu-241
Sr-90	U-232
U-233	U-235
U-234	
U-238	

Payload management will not be applied to this waste stream.

Attachment 1, AK Source Documents – Supplemental Documentation

Source Doc. Tracking Number	AK Element #	Title	Document Number	Rev.	Date
C013	S7, S9	Interview of Michael Wesselman by Richard Clinton concerning Sr-90/Cs-137 Ratio Determination	NA	NA	03/28/2002
C016	S7	21-Z Facility	NA	NA	02/16/2007
C017	NA	Dan Moder E-Mail: Estimated # SWBs for 231-Z Waste	NA	NA	07/23/07
C060	S7	Record of Communication with Karl Husted 10/12/2007 re: Adding U-232 as Trace Radionuclide to MPUREXD and MPFPD AK	NA	NA	10/12/2007
C064	NA	231-Z Record of Communication – M. McCoy, L. Fetrow, and V. Asmund	NA	NA	01/25/2005
C066	S7	Questions about 231-Z Containers, Addended Source Summary to Reflect that Drums with Phosphoric Acid are Non-Debris Waste	NA	NA	04/14/2008
C079	NA	231-Z TRU Debris Designation Revision 1 for FRPs	231Z-DES-02-01	NA	05/17/2006
C080	NA	231-Z TRU Debris Waste Stream Designation Cement Box Container	231Z-DES-03-00	NA	03/14/2006
C115	S7	WRP Strategy for Managing Polychlorinated Biphenyl's Under the Toxic Substances Control Act	NA	NA	01/30/2008
C116	S7	Proposal to Delay Assignment of TSCA Status to Retrievably Stored Low-Level Waste	F9000-07-019	NA	06/25/2007
C355	NA	WWIS Data for Waste Stream RLM231ZD	NA	NA	01/30/2008
C356	NA	Data Quality Objective Reconciliation, HSG Analysis Report, and AK Confirmation Checklist for 17 Containers from Waste Stream RLM231ZD	M4T00-TRU-07-148.1	NA	08/30/2007
C363	S7	Record of Communication – Subject Electroplating in 231-Z	NA	NA	04/08/2010
C367	S7	Email from E. Grohs to R. Swan – Subject: 231-Z	NA	NA	05/12/2010
DR012	NA	Discrepancy Form with Resolution that "electroplating" was not performed at the 231-Z Building	NA	NA	04/08/2010
DR018	S9	Discrepancy Resolution for the UCL90 for Chloroform found above the PRQL for this waste stream.	NA	NA	02/28/11
M014	S10	MSDS for Phosphoric Acid, Sodium Hydroxide and Quick-Zorb	NA	NA	1997-2006
M021	S4	Shipping Records: Solid Waste Burial Records	NA	NA	1972-1978

Source Doc. Tracking Number	AK Element #	Title	Document Number	Rev.	Date
M022	S9	231-Z Excel Spreadsheet and Radcalc 1 isotopic Calculations, RLM231ZD	NA	NA	07/07/2007
M061	S4	Shipping Records: Solid Waste Burial Records	NA	NA	1978-1983
M101	NA	231-Z TRU Debris Waste Stream Designation	231-Z-DES-05-01	NA	11/20/2007
M309	S4	Solid Waste Burial Records	NA	NA	1970-2010
P085	S4	Vibratory Finishing as a Decontamination Process	PNL-3336/UC-70	NA	10/1980
P094	S3	231-Z Building Documented Safety Analysis	CP-14640	Rev 1	10/1985
P095	S3	231-Z Safety Analysis and Documentation for Characterization	HNF-4022	Rev. 0	04/26/1999
P096	S11	231-Z Basis for Interim Operation	HNF-SD-CP-BIO-001	Rev. 0	10/03/1997
P103	S11	Hanford Engineer Works Laboratory Manual 231 Methods Section	NA	NA	12/1945
P106	S3	231-Z Building Pre-Existing Conditions Report	HNF-SD-CP-PECR-001	Rev. 0	03/27/1997
P255	NA	Characterization of Past and Present Solid Waste Streams	WHC-EP-0659	NA	06/7/1993
P256	NA	Safety Analysis Report 231-Z Building	BNWL-CC-1924	NA	03/01/1969
P257	NA	Detailed Plan for the Decontamination and Restoration of the 231-Z Facility	BNWL-B-479 UC-70	NA	03/01/1976
P258	NA	WRAP Module 1 Sampling Strategy and Waste Characterization Alternatives Study	WHC-SD-W026-ES-013 Rev. 0	NA	09/01/1994
P262	NA	TRU Waste Decontamination: A Progress Update (1978-1980)	N/A	NA	01/1981
P264	S2	Review and Update of Isotope Data for Retrieval of Transuranic Waste	WMP-370, Section 1.1.5	Rev. 5	01/24/2005
P270	NA	231-Z TRU Debris Waste Stream Designation	231Z-DES-01-00	NA	03/01/2005
P272	S2	Specifications and Standards for the Packaging, Storage and Disposal of Richland Operations Solid Wastes	ARH-3032	NA	04/1974
P414	S2	Waste Retrieval Process Description	HNF-5597	Rev. 3	03/31/2004

Source Doc. Tracking Number	AK Element #	Title	Document Number	Rev.	Date
P415	S3	Transuranic (TRU) Waste Phase 1 Retrieval Plan	HNF-4781	Rev. 1	09/28/2000
P416	S3	WRAP Final Safety Analysis Report	HNF-SD-W026-SAR-002	Rev. 2	07/2001
P1088	S2	TRU Sorting Glovebox	WRP1-OP-0725	Rev. C, Chg 20	06/24/2009
P1089	S2	TRU Loadout Glovebox Operation	WRP1-OP-0725	Rev. E, Chg 0	07/02/2009

Alphanumeric Designations

C Correspondence
D Documents (e.g. published reports)
DR Discrepancy Resolution
M Miscellaneous (e.g. unpublished data)
P Procedures
U Unpublished Documents

AK Numbers

S1 Process Design Documents
S2 Standard Operating Procedure
S3 Safety Analysis Reports
S4 Waste Packaging Logs
S5 Test plans/research project reports
S6 Site databases
S7 Information from site personnel
S8 Standard industry documents
S9 Previous analytical data
S10 Material safety data sheets
S11 Laboratory Notebooks
S12 Comparable or surrogate sampling and analysis data
NA Not applicable