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

APR 2 1 2011

MAY 2011

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

ENTERED

Subject: Review of Central Characterization Project – Savannah River Site Profile Form Number, SR-LA-PAD1, Heterogeneous Debris from General Research and Development Operations

Dear Mr. Bearzi:

The Department of Energy Carlsbad Field Office has approved the Waste Stream Profile Form, SR-LA-PAD1, Heterogeneous Debris from General Research and Development Operations.

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,

for Ed Ziemianski

Edward Ziemianski
Acting Manager

Enclosure

cc: w/enclosure
S. Zappe, NMED *ED

cc: w/o enclosure
J. Kieling, NMED ED
J. R. Stroble, CBFO ED
N. Castaneda, CBFO ED
C. Fesmire, CBFO ED
G. Basabilvazo, CBFO ED
S. McCauslin, CBFO ED
K. Watson, CBFO ED
*ED denotes electronic distribution

CBFO:NTP:JRS:GS:11-0268:UFC 5900.00

110430

Attachment 2 – CCP Waste Stream Profile Form

(1) Waste Stream Profile Number: SR-LA-PAD1							
(2) Generator site name: Savannah River Site					(4)Technical contact: Craig Simmons		
(3) Generator site EPA ID: SC1890008989					(6) Technical contact phone number: (575)-234-7216		
(5) Date of audit report approval by New Mexico Environment Department (NMED): February 1, 2002, April 9, 2003, August 27, 2004, April 29, 2005, June 13, 2006, January 11, 2007, February 25, 2008, March 13, 2009; August 6, 2009, March 16,2010, March 3,2011							
(7) Title, version number, and date of documents used for WAP Certification: CCP-PO-001, CCP Transuranic Waste Characterization Quality Assurance Project Plan, Revision 19, December 29, 2010 CCP-PO-002, CCP Transuranic Waste Certification Plan, Revision 25, December 29, 2010 CCP-PO-004, CCP/SRS Interface Document, Revision 28, December 29, 2010							
(8) Did your facility generate this waste? YES			NO	X			
(9) If no, provide the name and EPA ID of the original generator: Los Alamos National Laboratory, NM0890010515							
Waste Stream Information[1]							
(10) WIPP ID: SR-LA-PAD1					(11) Summary Category Group: S5000		
(12) Waste Matrix Code Group: Heterogeneous Debris Waste					(13) Waste Stream Name: Heterogeneous Debris from General Research and Development Operations		
(14) Description from the TWBIR: This CH TRU waste stream consists of debris and Impure Oxide shipped to SRS from LASL in 1971 and 1972							
(15) Defense TRU Waste:	YES	X	NO				
(16) Check One:	CH	X	RH				
(17) Number of SWBs NA	(18) Number of Drums 241				(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] D004, D005, D006, D007, D008, D009, D010, D011, D022, F001, F002, and F005							
(22) Applicable TRUCON Content Numbers: SR125/225, SQ 154							
(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-SRS-10, Revision 1, March 14, 2011, Figure 5							
(23B) Facility mission description: CCP-AK-SRS-10, Revision 1, March 14, 2011, Section 4.1.3							
(23C) Description of operations that generate waste: CCP-AK-SRS-10, Revision 1, March 14, 2011, Section 4.3							
(23D) Waste identification/categorization schemes: CCP-AK-SRS-10, Revision 1, March 14, 2011, Section 4.5							
(23E) Types and quantities of waste generated: CCP-AK-SRS-10, Revision 1, March 14, 2011, Section 4.7							
(23F) Correlation of waste streams generated from the same building and process, as applicable: CCP-AK-SRS-10, Revision 1, March 14, 2011, Section 4.6							
(24) Waste certification procedures: CCP-TP-030, Revision 28, May 12, 2010							
(25)Required Waste Stream Information							
(25A) Area(s) and building(s) from which the waste stream was generated: CCP-AK-SRS-10, Revision 1, March 14, 2011, Section 5.1							

(25B) Waste stream volume and time period of generation: CCP-AK-SRS-10, Revision 1, March 14, 2011, Section 5.2			
(25C) Waste generating process description for each building: CCP-AK-SRS-10, Revision 1, March 14, 2011, Section 5.3			
(25D) Waste Process flow diagrams: CCP-AK-SRS-10, Revision 1, March 14, 2011, Figures 6, 7,8,9, 10 and 11			
(25E) Material inputs or other information identifying chemical/radionuclide content and physical waste form: CCP-AK-SRS-10, Revision 1, March 14, 2011, 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: Waste Stream SR-LA-PAD1			
(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: S2 AK#s on Attachment 1 to Summation of Aspects of AK Summary			
(27C) Safety Analysis Reports: S3 AK#s on Attachment 1 to Summation of Aspects of AK Summary			
(27D) Waste packaging logs: S4 AK#s on Attachment 1 to Summation of Aspects of AK Summary			
(27E) Test plans/research project reports: S5 AK#s on Attachment 1 to Summation of Aspects of AK Summary			
(27F) Site databases: S6 AK#s on Attachment 1 to Summation of Aspects of AK Summary			
(27G) Information from site personnel: S7AK#s on Attachment 1 to Summation of Aspects of AK Summary			
(27H) Standard industry documents: S8 AK#s on Attachment 1 to Summation of Aspects of AK Summary			
(27I) Previous analytical data: S9 AK#s on Attachment 1 to Summation of Aspects of AK Summary			
(27J) Material safety data sheets: S10 AK#s on Attachment 1 to Summation of Aspects of AK Summary			
(27K) Sampling and analysis data from comparable/surrogate Waste: S12 AK#s on Attachment 1 to Summation of Aspects of AK Summary			
(27L) Laboratory notebooks: NA			
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 04,2011		
(29)	Visual Examination: NA		

(30) Comments: For a list of the waste characterization procedures used and dates of the respective procedures see the list of procedures on the attached CIS

Reviewed by AK Expert:	**YES**	[X]		**Date:** 4-12-2011
Reviewed by STR (if necessary):	**YES**	[X]	**N/A** [ ]	**Date:** 4-7-2011

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)	(32)	(33)
Adela M Cantu for Craig Simmons	Adela M. Cantu	4-12-2011
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 activities: defense nuclear materials production, defense nuclear waste and materials by-products management

CHARACTERIZATION INFORMATION SUMMARY

Waste Stream #: SR-LA-PAD1

Lot #: 1

TABLE OF CONTENTS

CCP Characterization Information Summary Cover Page

Waste Stream # SR-LA-PAD1 Lot #: 1

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

SPM Review: Richard Kantrowitz Date: 4/19/2011

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):

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

Headspace Gas Sampling and Analysis (HSG):

CCP-TP-093	Rev. 14	12/29/07	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-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
CCP-TP-173	Rev. 1	09/30/09	CCP Analysis of Gas Samples for VOCs by GC/FID

Project Level Data Validation / DQO Reconciliation:

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. 20	11/01/10	CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 21	12/29/10	CCP Acceptable Knowledge Documentation
CCP-TP-030	Rev. 25	01/22/09	CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 26	05/27/09	CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 27	12/14/09	CCP TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 28	05/12/10	CCP 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-004	Rev. 27	05/22/09	CCP/SRS Interface Document
CCP-PO-004	Rev. 28	12/29/10	CCP/SRS Interface Document

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream # SR-LA-PAD1 Lot # 1

Container ID Number	NDA BDR	RTR BDR	VE BDR	Solids Sampling BDR	Solids Analytical BDR	Load Management/ Overpack Yes	Headspace Gas BDR		
							Sample	Analysis	
SR46001K	SRLBC0213	SRSRTR0358	N/A	N/A	N/A		N/A	N/A	N/A
SR46001N	SRLBC0213	SRSRTR0358	N/A	N/A	N/A		N/A	N/A	N/A
SR46001O	SRLBC0228	SRSRTR0358	N/A	N/A	N/A		SRHSG1101	ECL11002G	ECL11002M
SR46001S	SRLBC0213	SRSRTR0358	N/A	N/A	N/A		N/A	N/A	N/A
SR66256	SRLBC0266	SR4RTR0130	N/A	N/A	N/A		SRHSG1101	ECL11002G	ECL11002M
SR66271	SRLBC0267	SR4RTR0130	N/A	N/A	N/A		SRHSG1101	ECL11002G	ECL11002M
SR66274A	SRLBC0266	SR4RTR0130	N/A	N/A	N/A		SRHSG1101	ECL11002G	ECL11002M
SR66276	SRLBC0213	SRSRTR0358	N/A	N/A	N/A		SRHSG1101	ECL11002G	ECL11002M
SR70372	SRLBC0211	SR4RTR0108	N/A	N/A	N/A		SRHSG1101	ECL11002G	ECL11002M
SR70386	SRLBC0263	SRSRTR0408	N/A	N/A	N/A		SRHSG1101	ECL11002G	ECL11002M
** These containers were randomly selected for headspace gas sampling and analysis and are included for verification of hazardous waste number assignment for the waste stream.									
SR46003I**	SRLBC0228	SRSRTR0358	N/A	N/A	N/A		SRHSG1101	ECL11002G	ECL11002M
SR70364**	SRLBC0263	SRSRTR0407	N/A	N/A	N/A		SRHSG1101	ECL11002G	ECL11002M
SR70378**	SRLBC0263	SR4RTR0126	N/A	N/A	N/A		SRHSG1101	ECL11002G	ECL11002M

Signature of Site Project Manager

Richard Kantrowitz
Printed Name

4/19/2011
Date

CIS003

CCP Headspace Gas UCL_{90} Evaluation Form

WSPF #: SR-LA-PAD1 **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 Code
Benzene	Log	3	10	-1.61	-3.19	0.76	-2.86	10	2.30		
Bromoform	No	0	10	0.01	0.01	0.00	0.01	10	N/A		
Carbon tetrachloride	No	0	10	0.01	0.01	0.00	0.01	10	N/A		
Chlorobenzene	No	0	10	0.02	0.02	0.00	0.02	10	N/A		
Chloroform	Log	1	10	-1.66	-3.52	0.65	-3.24	10	2.30		
Cyclohexane[a]	No	0	10	0.03	0.03	0.00	0.03	10	N/A		
1,1-Dichloroethane	Log	1	10	-1.66	-3.92	0.79	-3.57	10	2.30		
1,2-Dichloroethane	Log	0	10	-3.52	-3.55	0.02	-3.55	10	2.30		
1,1-Dichloroethylene	No	0	10	0.02	0.02	0.00	0.02	10	N/A		
cis-1,2-Dichloroethylene	Log	0	10	-3.46	-3.49	0.01	-3.48	10	2.30		
trans-1,2-Dichloroethylene	No	0	10	0.03	0.03	0.00	0.03	10	N/A		
Ethyl benzene	Log	0	10	-4.14	-4.16	0.02	-4.16	10	2.30		
Ethyl ether	No	0	10	0.02	0.02	0.00	0.02	10	N/A		
Methylene chloride	Log	1	10	0.53	-3.11	1.28	-2.55	10	2.30		
1,1,2,2-Tetrachloroethane	No	0	10	0.01	0.01	0.00	0.01	10	N/A		
Tetrachloroethylene	No	0	10	0.02	0.02	0.00	0.02	10	N/A		
Toluene	No	6	10	6.90	2.54	2.42	3.60	10	N/A		
1,1,1-Trichloroethane	No	0	10	0.01	0.01	0.00	0.01	10	N/A		
Trichloroethylene	No	0	10	0.02	0.02	0.00	0.02	10	N/A		
Trichlorofluoromethane[a]	Log	0	10	-3.59	-3.63	0.02	-3.62	10	2.30		
1,1,2-Trichloro-1,2,2-trifluoroethane	No	0	10	0.01	0.01	0.00	0.01	10	N/A		
1,2,4-Trimethylbenzene[a]	No	0	10	0.02	0.02	0.00	0.02	10	N/A		
1,3,5-Trimethylbenzene[a]	No	0	10	0.02	0.02	0.00	0.02	10	N/A		
m,p-Xylene[b]	No	0	10	0.03	0.03	0.00	0.03	10	N/A		
o-Xylene	No	0	10	0.03	0.03	0.00	0.03	10	N/A		
Acetone	Log	10	10	2.48	0.71	1.31	1.29	100	4.61		
Butanol	No	0	10	0.04	0.04	0.00	0.04	100	N/A		
Methanol	No	0	10	15.00	14.45	0.28	14.57	100	N/A		

CIS004

CCP Headspace Gas UCL_{90} Evaluation Form

WSPF #: SR-LA-PAD1 **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 Code
Methyl ethyl ketone	SQRT	6	10	0.79	0.36	0.23	0.46	100	10.00		
Methyl isobutyl ketone	No	0	10	0.02	0.02	0.00	0.02	100	N/A		
Chloromethane[e]	Log	8	10	2.56	-0.73	1.86	0.09	10	2.30		
Carbon Disulfide[e]	Log	1	10	-3.00	-3.66	0.23	-3.55	10	2.30		
1,2-Dichloropropane[e]	Log	1	10	-2.92	-3.88	0.34	-3.73	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.

[e] These compounds are reported by the Laboratory and are included for completeness.

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.)

Signature of Site Project Manager

Richard Kantrowitz
Printed Name

4/19/2011
Date

CIS005

CCP Headspace Gas Summary Data

Waste Stream # SR-LA-PAD1 Lot Number (s) 1

Tentatively Identified Compound	Maximum Observed Estimated Concentrations (ppmv)	# Samples Containing TIC	% Detected
None	N/A	N/A	N/A

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 _____ Date 4/19/2011

CCP RTR/VE Summary of Prohibited Items and AK Confirmation

Waste Stream #: SR-LA-PAD1 Lot #: 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.	None of the containers in this lot had prohibited items identified during RTR.	VE was not used to certify any containers in this Lot.

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: Containers in this waste stream were characterized using RTR. RTR was selected as the characterization method for this Lot because the waste was already packaged and RTR meets all the Data Quality Objectives for NDE for waste stream SR-LA-PAD1.

Site Project Manager Signature | Richard Kantrowitz (Printed Name) | 4/19/2011 (Date)

CIS007

CCP Reconciliation with Data Quality Objectives

Waste Stream #: SR-LA-PAD1 Lot #: 1

Sampling Completeness:

NDE

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 (Random Sampling Lot 1)

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%)

CI5008

CCP Reconciliation with Data Quality Objectives

Waste Stream #: SR-LA-PAD1 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	N	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 HW Numbers 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.

CI5009

CCP Reconciliation with Data Quality Objectives

Waste Stream #: SR-LA-PAD1 Lot #: 1

8	Y	The data demonstrates whether the waste stream exhibits a toxicity characteristic under Title 40 Code of Federal Regulations (CFR), Part 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

Signature of Site Project Manager | Richard Kantrowitz (Printed Name) | 4/19/2011 (Date)

CIS010

SUMMATION OF ASPECTS OF AK SUMMARY REPORT: WASTE STREAM SR-LA-PAD1

Overview

Waste Stream SR-LA-PAD1 is Contact Handled transuranic (TRU) heterogeneous debris waste generated at the Technical Area-21 (TA-21) Delta Prime (DP) West Facility of the Los Alamos National Laboratory (LANL) and is stored at Aiken, South Carolina on PAD-1 in the Savannah River Site (SRS) burial ground. This material was originally sent to SRS as solid scrap for recovery (in 1971 and 1972) and was subsequently declared waste by SRS. The TA-21 DP West Facility was established in 1945 as LANL's main plutonium facility and became the first industrial plutonium processing facility in the U.S. and the world. The original 1945 DP West Facility structures consisted of four warehouses connected by enclosed corridors: Buildings 2 (TA-21-2), 3 (TA-21-3), 4 (TA-21-4), and 5 (TA-21-5). In 1963, a plutonium fuels development facility, Building 150 (TA-21-150), was constructed just east of Building 5 to support plutonium fuels development.

Based on the review of AK, TRU wastes generated by TA-21 operations are contaminated with materials from atomic energy defense activities conducted in the facility for defense nuclear materials production, defense nuclear waste and materials by-products management, and defense research and development (R&D). The mission of DP West operations was in direct support of LANL's core mission of nuclear weapons R&D. Therefore, waste stream SR-LA-PAD1 is defense related waste.

This Summation of Aspects of the AK Summary Report includes information to support Waste Stream Profile Form (WSPF) number SR-LA-PAD1 for CH TRU heterogeneous debris. The primary source of information for this summation is *CCP-AK-SRS-10, Central Characterization Project Acceptable Knowledge Summary Report for Los Alamos National Laboratory Transuranic Waste in Retrievable Storage at the Savannah River Site, Revision 1, 03/14/2011.* CCP-AK-SRS-10 includes information obtained from numerous sources, including facility safety basis documentation, historical document archives, generator and storage facility waste records and documents, program/processing documentation, and interviews with knowledgeable personnel.

Waste Stream Identification Summary

Waste Stream Name:	Heterogeneous Debris from General Research and Development Operations
Waste Stream Number:	SR-LA-PAD1
Site Where TRU Waste Was Generated:	Los Alamos National Laboratory
Facility Where TRU Waste Was Generated:	TA-21, DP West Facility
Site Where TRU Waste Is Currently Stored:	Savannah River Site, PAD-1 Burial Ground
Waste Stream Volume – Current:	241[1] 30-gallon drums
Waste Stream Volume – Projected:	0
Dates of Waste Generation:	Prior to 1972[2]
TRUCON Content Numbers:	SR 125/SR 225, SQ 154 (TYPE III.1, high wattage)
Summary Category Group	S5000
Waste Matrix Code:	S5400
Waste Matrix Code Group	Heterogeneous Debris Waste
Waste Stream ATWIR Identification:	SR-LA-PAD1[3]
RCRA EPA Hazardous Waste Numbers:	D004, D005, D006, D007, D008, D009, D010, D011, D022, F001, F002, and F005

Waste Stream Description and Physical Form

Waste stream SR-LA-PAD1 is comprised primarily of organic and inorganic debris waste items and generally consists of cellulosic, plastic, rubber, metal, and glass wastes. Specific items in this waste stream include combustibles, such as rags, paper, floor sweepings, gloves (including leaded gloves), and non-combustibles, such as graphite, oxides, slag, crucibles, alundum, plutonium metal, metal (miscellaneous metal, tools), tantalum, equipment (metal lathe, chain balance, drill press, furnace and furnace parts), glass, hydroxide, plastic, soda-lime, filters and filter residues.

The AK evaluation indicates an average organic debris (cellulosics, plastic, and rubber) content of more than 60 percent by volume. However, some drums in this waste stream contain less than 60 percent, by volume, organic debris. Based on this evaluation, Waste Matrix Code S5400, Heterogeneous Debris, is applied to this waste stream.

[1] The 30-gallon drums will either be direct-loaded or repackaged into 55-gallon drums for final disposal.

[2] The date of generation is likely from the late 1960s to the early 1970s. The earliest possible date of generation is 1959.

[3] This waste was originally identified under the Transuranic Waste Baseline Inventory Report identification numbers SR-W027-999-LASL-HET; SR-W027-999-LASL-HOM

The waste materials that comprise waste stream SR-LA-PAD1 have common physical form, contain similar hazardous constituents, and were generated from a single process or activity and is therefore a single waste stream. The waste described in this report was shipped to SRS as recoverable material in 1971 and 1972. It has been determined that this material originated from Pu-238 development work conducted at TA-21 DP West in Buildings 3, 4, 5, and 150.

Point of Generation

Location

Waste stream SR-LA-PAD1 was generated at LANL which is located in Los Alamos County in north-central New Mexico, approximately 60 miles north-northeast of Albuquerque and 25 miles northwest of Santa Fe. The waste is currently stored at Aiken, South Carolina on PAD-1 in the SRS Burial Ground.

Area and/or Buildings of Generation

The debris waste included in waste stream SR-LA-PAD1 was generated by Pu-238 development work in TA-21 DP West Facility and included Buildings 2 (TA-21-2), 3 (TA-21-3), 4 (TA-21-4), 5 (TA-21-5) and 150 (TA-21-150).

Generating Process

Description of Waste Generating Process

The debris waste included in waste stream SR-LA-PAD1 was generated by Pu-238 development work in TA-21 DP West Facility.

Waste was generated in TA-21 from materials used to produce metal and alloys of plutonium and other TRU elements from nitrate solution feedstock; fabricate the metals and alloys into precision shapes; measure the chemical and physical properties of plutonium metal and alloys; and recovery of plutonium. The operations included:

- Plutonium recovery operations
- Pyrochemical operations
- Metal operations
- Pu-238 processing
- Miscellaneous and special processing

In the 1960s and early 1970s, work was conducted for Pu-238 space electric power fuel development. The studies were focused around being able to predict the properties of solid solutions on the basis of known thermodynamic correlations. Research on diluents used to enhance the properties of the plutonium oxide showed the following:

- Thermal stability of the plutonium oxide could be increased, and the melting point could be increased.
- The power density of a given fuel body could be varied over a significant range.
- By judicious choice of diluents, the reactivity of plutonium oxide with water and with container materials could be reduced.
- The specific radioactivity of a given size respirable particle of the plutonium oxide could be reduced.

Performance of the Pu-238 oxide solid solutions research included blending unshaped plutonium oxide diluent (zirconium oxide and thorium oxide) oxide powders, followed by cold pressing and sintering. This would include process chemistry development, fabrication development, follow-on fabrication and properties work, properties measurements, and theoretical estimates of performance of various fuel compositions and various power densities.

Plutonium processing operations up to 1978 included recovery and purification processes, metal production, pyrochemistry, metal fabrication, and R&D. Americium research and recovery operations were also carried out at TA-21 DP West.

Plutonium Recovery Operations

The overall goal of the plutonium recovery operations was to recover plutonium from metal, metal alloys, scrap, and residues and produce a purified plutonium nitrate solution that was compatible with the processes used in the preparation of plutonium metal. The recovery operations are subdivided into pretreatment, dissolution, and purification operations.

Pretreatment

Pretreatment included physical processes used to prepare scrap and residues for dissolution, which included: thermal conversion to oxide; calcination; caustic leaching; chemical separation by hydroxide or oxalate precipitation; size reduction; grinding; shredding; distillation; filtering of liquids or oils; and incineration. As materials were received from various operations, they were sorted and sent to other pretreatment processes or directly to dissolution, depending on the physical nature of the scrap or residue and on the amount and type of plutonium associated with the material. Graphite items were size reduced; gloves, plastics, and some heating mantles were shredded.

Dissolution

Dissolution was comprised of numerous processes that generated a plutonium-nitrate solution for subsequent feed to a purification process. The primary mode of dissolution involved nitric acid, hydrofluoric acid leach solutions. In overview, filtered solids from the dissolution step were releached until plutonium concentrations were below the discard limit then sent to disposal.

Several dissolution processes involved the use of cascading dissolvers or dissolution pots. The choice of dissolution equipment was based on the concentration of plutonium present in the feed

material and the physical form of the feed material. The equipment for the batch extraction system consisted of large-diameter equilibration tanks equipped with stirrers for equilibration and settling. Feed materials included ash, glovebox sweepings, ground slag or crucibles, hydroxides, metal, oxides, residues, salts, and sand. Metal dissolvers were used for the dissolution of plutonium metal by nitric and hydrofluoric acid using vessels made by adding a ground glass ball joint to a standard five-liter round bottom flask. Hydrochloric acid solutions, chloride residues, and organics not compatible with nitric acid were often sent to the caustic dissolver. After dissolution, the solutions were filtered and then sent to purification. The filtered solids were sent to other dissolution processes if plutonium concentrations were above the DL, or disposed as debris waste if concentrations were below the DL (References D033, D043, D059).

Purification

Plutonium-bearing solutions generated in the dissolution step were sent to purification for plutonium recovery. Purification consisted of both ion-exchange and precipitation processes. After ion-exchange and/or dissolution of precipitates in nitric acid, plutonium bearing nitrate solutions were sent to the metal fabrication line.

Pyrochemical Operations (Metal Production)

Pyrochemical operations included the metal preparation line, developmental direct oxide reduction, and electrorefining. Plutonium nitrate solutions produced by plutonium recovery operations were processed in the metal production operations. Plutonium peroxide was precipitated from the nitrate solution and converted to plutonium tetrafluoride. The plutonium tetrafluoride was in turn mixed with calcium metal and heated in a metal "bomb." The highly reactive calcium combines with the fluorine in the plutonium tetrafluoride, leaving molten metallic plutonium that forms a disc or button in the bottom of the bomb. After cooling, the plutonium button was sent on to the metal fabrication section.

Metal Preparation Line

The metal preparation line produced plutonium metal using the reduction of plutonium tetrafluoride with calcium in a sealed pressure vessel. Plutonium nitrate solutions produced by the plutonium recovery operations were processed in the metal production operations.

Direct Oxide Reduction

In the direct oxide reduction process plutonium oxide and calcium metal were reacted in molten calcium chloride or calcium chloride mixed with calcium fluoride, to produce plutonium metal.

Electrorefining

The electrorefining process took impure plutonium metal and produced high purity plutonium metal. Impure plutonium was cast as an anode, which was then placed in a magnesium oxide crucible with a salt mixture, a metal cathode (typically tungsten), and a seeding reagent - usually magnesium chloride

or plutonium chloride. After the anode and salt melted, current was applied to the system, and plutonium at the anode was oxidized. The plutonium ions traveled through the molten salt to the cathode, where reduction to the metal state occurred. Impurities in the original plutonium anode that were more easily reduced than plutonium (including cadmium, chromium, lead, and silver) remained in the anode, while impurities more easily oxidized than plutonium (including americium and barium) were left in the molten salt. After cooling, the crucible was broken and the residues were physically separated from the high purity product metal.

Metal Operations (Production and Fabrication)

The metal operations consisted of metal production and metal fabrication, which included casting and machining. Assembly and disassembly operations were also carried out, as well as experimental operations in fabrication, preparation of test specimens, and metal handling. The metal fabrication section operated a foundry and machine shop devoted exclusively to casting and machining plutonium and its alloys. Throughout the production and fabrication process, metal alloys and components were inspected to ensure predetermined specifications.

Pu-238 Heat Source/Fuel Forms Production

The Pu-238 processing operations involved the production of Pu-238 based heat sources along with the recovery of Pu-238 from processing residues and scrap materials. The primary programs included the Systems for Nuclear Auxiliary Power heat source, the artificial heart program, the Solid Solution Cermet fuel form, the Plutonia Molybdenum Cermet fuel form, the Plutonia-Iridium Cermet fuel form, and the Pure Plutonium Oxide fuel form.

Table 1 identifies toxicity characteristic and F-listed constituents in waste stream SR-LA-PAD1.

Miscellaneous and Special Processing

The miscellaneous and special processing operations included the development of new recovery processes, metallography, and preparations of isotopes. The overall goal of miscellaneous and special processing involved the study and improvement of operations associated with the purification, extraction, recovery, and characterization of actinides often performed on a small scale or in support of other processes.

Table 1 –Toxicity Characteristic and F-Listed Constituents in Waste Stream SR-LA-PAD1

Constituent	CAS #	EPA Hazardous Waste Number (HWN)
Arsenic	7440-38-2	D004
Barium	7440-39-3	D005
Cadmium	7440-43-9	D006
Chromium	7440-47-3	D007
Lead	7439-92-1	D008
Mercury	7439-97-6	D009
Selenium	7782-49-2	D010
Silver	7440-22-4	D011
Carbon tetrachloride	56-23-5	F001
Chlorobenzene	108-90-7	F002
Chloroform	67-66-3	D022
Benzene	71-43-2	F005
Methylene chloride	75-09-2	F001/F002
Methyl ethyl ketone	78-93-3	F005
Pyridine	110-86-1	F005
Tetrachloroethylene	127-18-4	F001/F002
Toluene	108-88-3	F005
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

Waste stream SR-LA-PAD1 has historically been managed in accordance with the generator site requirements and in compliance with the requirements of the South Carolina Department of Health and Environmental Control. Based on historical information, LANL and SRS originally managed this waste as recoverable material (i.e., product). A review of available AK documentation has determined that this waste is hazardous; however, SRS did not assign specific HWNs to this waste stream. The plutonium operations that generated waste stream SR-LA-PAD1 are a result of operations conducted in TA-21 DP West at LANL during the late 1960s and early 1970s. The operations are the same or similar to those described in LA-MHD04.001. It is assumed that SR-LA-PAD1 containers would have been included in the LA-MHD04.001 population of containers, except that they produced assay

results that exceeded the discard limits for plutonium and were sent to SRS for recovery. Therefore, consistent with waste stream LA-MHD04.001, EPA HWNs D004, D005, D006, D007, D008, D009, D010, D011, D022, F001, F002, and F005 are applied.

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 (RTR) or Visual Examination (VE) 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. Therefore, this waste stream does not exhibit the characteristic for ignitability (D001), corrosivity (D002), or reactivity (D003).

Ignitability

The waste does not exhibit the characteristic of ignitability as identified in 40 CFR 261.21. The waste is not a liquid, an ignitable compressed gas, or an oxidizer, and is not capable of causing fire through friction, absorption of moisture, or spontaneous chemical change.

Ignitable liquids were used in TA-21 DP West operations and some examples include acetone, n-butyl alcohol, ethanol, toluene, and xylene. Many organic liquids in use had high vapor pressures. Ignitable solvents would have been air-dried to remove any potential for ignitability because hazardous waste treatment under RCRA was not a consideration at DP West until the late 1970s. Although oxidizers (e.g., calcium nitrate, and magnesium perchlorate), were identified as being used at DP West, these reagents were used in small quantities as needed, and should only be present as trace contaminants (C015, D036, D038, D039, D059, D086, M002).

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) (References C001, D001, D013, and D059).

Corrosivity

This waste does not meet the definition of corrosivity as defined in 40 CFR 261.22.

Corrosive liquids were used in TA-21 DP West operations and some examples include ammonium hydroxide, formic acid, hydrochloric acid, hydrofluoric acid, nitric acid, and potassium hydroxide. Waste management practices required corrosive liquids be transferred to the liquid waste treatment facility at Building 257 or solidified.

To ensure the waste does not exhibit the characteristic of corrosivity, liquid in excess of TSDF-WAC limits will be removed or immobilized prior to WIPP disposal. Therefore, this waste does not exhibit the characteristic of corrosivity (D002) (References D001, D002, D013, and D059).

Reactivity

This waste stream does not meet the definition 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. The materials do not contain cyanides or sulfides and are not capable of detonation or explosive reaction.

For items contaminated with salt waste, it has been demonstrated that the unspent calcium metal in direct oxide reduction (DOR) salts is not pyrophoric. Experimental results on the reactivity of LANL DOR salts with water and the reactivity in air of heated calcium metal nodules from DOR salts indicate the absence of "dangerous when wet" materials and pyrophoricity in these salts (References C008, D013 and D059).

Reactive materials present or used during plutonium operations were excluded from waste packaging or reacted prior to disposal (References D013, D017, and D059).

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 this waste stream does not exhibit the characteristic of reactivity (D003) (References D001, D013, and D059).

Toxicity Characteristic

This waste stream exhibits the characteristic of toxicity per 40 CFR 261.24. The toxicity characteristic contaminants fall into two categories; metals and organics. 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.

Based on review of AK relative to chemicals used or present in the facility and operations potentially contaminating the debris waste, SR-LA-PAD1 meets the definition of toxicity for metal compounds as defined in 40 CFR 261.24.

The AK identified the potential presence and use of the following toxicity characteristic metals and examples of their uses are as follows: Arsenic (D004) used as a reagent in a sputtering process; barium (D005) was a contaminant of the plutonium feed, hydroxide cake, ash, and actinide separation waste; cadmium (D006) was a contaminant of the plutonium feed, hydroxide cake, anode heels, ash, actinide separation waste, and a solvent metal used in electrorefining; chromium (D007) was a contaminant of the plutonium feed and potentially leached from stainless steel materials; lead (D008) was used in shielding, gloves, and as a solvent metal used in electrorefining; mercury (D009), in the form of mercuric nitrate, was used as a catalyst and considered a contaminant; selenium (D010) was a contaminant of liquids, filtrates, ash, hydroxide cake, and analytical solutions; silver (D011), in the form of silver nitrate, was used as a titrant and considered a contaminant (References D007, D009, D036, D037, D038, D039, D040, D041, D059, and DR001).

Since data are not available that demonstrate the concentration of these metal constituents is less than the toxicity characteristic regulatory level, EPA HWNs D004, D005, D006, D007, D008, D009, D010, and D011 are assigned to this waste stream.

Waste stream SR-LA-PAD1 meets the definition of toxicity for organic compounds as defined in 40 CFR 261.24.

The following toxicity characteristic organic compounds were determined to have the potential of being present in the waste; however the more specific F-listed HWN has been assigned due to use as solvents: Benzene (D018), carbon tetrachloride (D019), chlorobenzene (D021), methyl ethyl ketone (D035), pyridine (D038), tetrachloroethylene (D039), and trichloroethylene (D040). Therefore, these characteristic EPA HWNs have not been assigned to this waste stream.

Toxicity characteristic organic compound chloroform (D022) was determined to have the potential of being present in this waste (as part of a cryogenic bath) and the associated D-Code has been assigned to SR-LA-PAD1. Since data are not available that demonstrate the concentration of this organic constituent is less than the toxicity characteristic regulatory level, EPA HWN D022 is assigned to this waste stream (References D036, D037, D038, D039, D040, and DR001).

Listed Waste

F-Listed Waste

Waste stream SR-LA-PAD1 was mixed with or derived from F-listed hazardous wastes from non-specific sources as listed in Title 40 CFR 261.31. F001, F002 and F005 listed solvents were used in TA-21 DP West and contaminate the waste (References D013, D036, D037, D038, D039, D040, D059, and DR001).

F003 constituents, including acetone, n-butyl alcohol, ethyl ether, methanol, methyl isobutyl ketone, and xylene are listed solely for ignitability in the liquid form. The waste stream will not exhibit the characteristic of ignitability (D001) because these wastes are not liquid; therefore, F003 is not assigned.

The following F001 listed organic solvents and uses are identified as follows: 1,1,1-trichloroethane (sample cleaning, degreasing solvent); 1,1,2-trichloro-1,2,2-triflouroethane (Freon) (cleaning, ultrasonic degreasing solvent); carbon tetrachloride (solvent); methylene chloride (paint stripper); tetrachloroethylene (degreasing, cleaning solvent); and trichloroethylene (clean and polish machined parts) were identified. Since TA-21 was a production facility, it is expected that operations like large-scale degreasing were performed. Therefore, F001 is assigned to this waste stream (References D013, D036, D037, D038, D039, D040, D059, and DR001).

The following F002 listed organic solvents and uses are identified as follows: 1,1,1-trichloroethane (sample cleaning, degreasing solvent); 1,1,2-trichloro-1,2,2-trifluoroethane (Freon) (cleaning, ultrasonic degreasing solvent); chlorobenzene (analytical lab and chloride operations solvent); methylene chloride (paint stripper); tetrachloroethylene (degreasing, cleaning solvent); and

trichloroethylene (clean and polish machined parts, solvent). Therefore, F002 is assigned to this waste stream (References D013, D036, D037, D038, D039, D040, D059, and DR001).

The following F005 listed organic solvents and uses are identified as follows: benzene (actinide processes solvent); methyl ethyl ketone (degreasing solvent); pyridine (solvent); and toluene (solvent). Therefore, F001 is assigned to this waste stream (References D013, D036, D037, D038, D039, D040, D059, and DR001).

U, K and P-Listed Chemicals

Waste stream SR-LA-PAD1 was not mixed with a discarded commercial chemical product, an off-specification commercial chemical product, or a container residue or spill residue thereof (40 CFR 261.33).

Beryllium and beryllium compounds may contaminate this waste stream. Beryllium from metal operations, in general, would be in the form of classified metal shapes and would, therefore, not be in this waste stream. In some cases, beryllium turnings were generated during machining operations. However, it is assumed that if present, beryllium is a minor contaminant well below one weight percent in any given waste container. 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.

Hydrofluoric acid (U134) was used during sample dissolution; however, there is no indication that unused acid or materials from spills of the acid were disposed of in this waste stream. Additionally, as described above, liquids were evaporated or absorbed prior to disposal.

Waste stream SR-LA-PAD1 does not include any of the manufacturing process wastes from the specific industries or sources listed in 40 CFR 261.32. Waste stream SR-LA-PAD1 is, therefore, not assigned a U, K, or P- listed HWN (References D008, D013, D029, D036, D038, D053, D059, and U002).

Other Waste Streams Generated From the Same Buildings and Processes

Another waste stream was generated in the TA-21 DP West facility at LANL (waste stream LA-MHD04.001). This waste stream was contaminated with the same or similar chemical constituents and is assigned the same EPA HWNs.

Headspace Gas/Volatile Organic Compound Information

Headspace gas analysis was completed on 10 randomly selected containers in Lot 1 of this waste stream. No new EPA HWNs were assigned as a consequence of headspace gas sampling and analysis. No UCL_{90} values exceeded the respective target analyte program required quantitation limits. No tentatively identified compounds were identified. The specifics of this information are included in the attached Characterization Information Summary report.

Conclusion

The EPA HWNs that apply to the waste stream are D004, D005, D006, D007, D008, D009, D010, D011, D022, F001, F002, and F005.

Polychlorinated Biphenyls

This waste stream contains PCBs, and therefore is regulated as Toxic Substances Control Act waste under 40 CFR 761.

Based on documentation reviewed during the AK investigation, some containers in this waste stream may contain polychlorinated biphenyls (PCBs) greater than 50 ppm. Common PCB items include fluorescent light ballasts and oil-filled equipment such as electrical transformers, capacitors, and hydraulic equipment. Because electrical equipment has been identified to be present in this waste stream, the potential exists for PCB contaminated equipment in waste stream SR-LA-PAD1.

Containers with PCB waste, identified during RTR and/or VE, are managed in accordance with the PCB disposal requirements in the Waste Isolation Pilot Plant Waste Acceptance Criteria (References D013, D059, and U002).

Prohibited Items

The absence of prohibited items is determined and documented through acceptable knowledge and characterization activities. Radiography or VE 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 wastes not occurring as co-contaminants with TRU mixed wastes (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 an 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

Containers in this Lot were characterized using RTR. RTR was selected as the characterization method for this Lot because the waste was already packaged and RTR meets all the Data Quality Objectives for NDE for waste stream SR-LA-PAD1.

Method for Determining Waste Material Parameter Weights per Unit of Waste

The waste material parameters (WMPs) for Waste stream SR-LA-PAD1 were derived primarily from information provided by SRS and LANL personnel. Included in the container-specific data provided by SRS were the number and type of internal containers found in each 30-gallon drum, dimensions of internal containers, and contents of internal containers.

To estimate WMPs weights and weight percentages for the waste stream, the various waste types listed for each drum were assigned to a WMP. Any non-specific metal was assigned to Iron-based Metals/Alloys. Waste items listed as sweepings, junk, and miscellaneous were assigned to cellulosics. Internal containers rarely contained more than one type of material; however, for any waste types sharing an internal container, the volume of the waste was divided equally between the corresponding WMPs.

The WMPs, average weight percent and weight percent range are presented in Table 2.

Table 2. Waste Stream SR-LA-PAD1 Waste Material Parameter Estimates

Waste Material Parameter	Average Weight Percent	Weight Percent Range
Iron-based Metals/Alloys	78.3%	0% – 100%
Aluminum-based Metals/Alloys	<0.1%	0% – 0.2%
Other Metals	0.6%	0% – 80.8%
Other Inorganic Materials	3.4%	0% – 100%
Cellulosics	12.1%	0% – 100%
Plastics (waste materials)	0.2%	0% – 78.1%
Rubber	5.3%	0% – 81.2%
Organic Matrix	0.0%	0% – 0.0%
Inorganic Matrix	<0.1%	0% – 48%
Soils/Gravel	0.0%	0% – 0%

List of Any AK Sufficiency Determinations Requested for the Waste Stream

No AK Sufficiency Determinations were requested for this waste stream.

Transportation

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

Beryllium

Beryllium will not be present in amounts greater than 1% by weight of the waste in each container.

Radionuclide Information

The two most prevalent radionuclides in this waste stream, by weight, based on the un-decayed data reported in AK are Pu-238 and Pu-239. The isotopes expected to be present in this waste stream are listed in Table 3.

The 10 WIPP tracked radionuclides are presented in Table 3 in addition to other radionuclides that are expected to be present in the waste stream.

Table 3 – Radionuclides in Waste Stream SR-LA-PAD1

WIPP Tracked	Other Radionuclides Present
Am-241 (not reported)	Am-243 (not reported)
Pu-238	Np-237 (not reported)
Pu-239	Pu-241
Pu-240	Th-232 (not reported)
Pu-242	U-235 (not reported)
U-233 (not reported)	
U-234 (not reported)	
U-238 (not reported)	
Cs-137 (not reported)	
Sr-90 (not reported)	

Payload management will not be implemented for this waste stream.

Attachment 1, AK SOURCE DOCUMENTS, SUPPLEMENTAL DOCUMENTATION

Source Document Tracking Number	AK #	Title	Document Number	Author	Date
C001	S7	Record of Communication (interview) with Tom Keenan re: DP Connections Arising out of the Pu-238 Space Heat Program	P2010-0778	Jim Foxx	01/08/2004
C002	S7	Record of Communication (Interview) with Jim Foxx re: TA-21 Acceptable Knowledge Discussion - Operations at Buildings 2, 3, 4, 5, and 150 and Pu-238 Questions	P2010-0695	Cathy Smith	01/08/2004
C004	S7	Record of Communication (Interview) with Jim Foxx re: TA-21 DP West Plutonium Processing Operations, 1970-1977, Production-Scale Evaporator not in Operation	P2010-0775	Catherine Smith	02/17/2004
C005	S7	Record of Communication (Interview) with Charles (Jim) Foxx re: TA-21 DP West Plutonium Processing Operations, 1970-1977, Waste Management Practices	P2010-0774	Catherine H. Smith	02/17/2004
C006	S7	Email from Jim Foxx to Catherine Smith re: TA-21 Processing Reactor Fuel Development Work Performed at DP West in the 1970's	P2010-0899	Charles Foxx (Jim)	2/27/2004
C007	S7	Record of Communication (Interview) with Charles (Jim) Foxx re: TA-21 DP West Plutonium Processing Operations, 1970-1977, Lack of Operating Procedures	P2010-0773	Catherine Smith	2/17/2004
C008	S5	Memo from C. L. Foxx to B. T. Reich re: WACCC Audit Finding # 1 (April 27 - May 1, 1987)	MST-12-ARO088-077/TWCP-03732/LA-UR-01-6170	C. L. Foxx	4/7/1988
C009	S7	Interview of J. Foxx TA-21 DP West Plutonium-238 Operations, 1970-1977, Purity of Pu-238 feed material, commingling of Pu-238 with other material types	TWCP-19900/P2010-0561	NA	2/17/2004

Source Document Tracking Number	AK #	Title	Document Number	Author	Date
C011	S7	Record of Communication (Interview) with Charles (Jim) Foxx re: TA-21 DP West Plutonium-238 Operations, 1970-1977, Purity of Pu-238 Feed Material; Commingling of Pu-238 with Other Material types	P2010-0561	Catherine Smith	02/17/2004
C013	S7	Email from Charles Foxx to Geoffrey Miller re: Response from Jim Foxx Regarding Bomb Reduction and Plutonium Peroxide	P2010-0889	Jim Foxx	01/21/2004
C015	S7	Review Sheet Documenting An Interview With Jim Foxx on CLS-1 Solvents	P2010-0891/CL-25	Rosemarie Glenn	9/23/1999
C016	S7	Interview with Jim Foxx re: All Process Waste in TA-50	TWCP-4166/LA-UR-03-7374	John Musgrave	10/17/2000
C017	S7	Interview with Jim Foxx re: Sources of Cs-137 and Ps-231 in TA-55 TRU waste	LA-UR-01-6170/TWCP-05164	Jim Foxx	04/02/2001
C018	S7	Interview with Jim Foxx re: Sources of Cs-137, Pa-231, and Cm-244 in TA-55 Waste	LA-UR-01-6170/TWCP-05165	Jim Foxx	4/11/2001
C022	S7	Memo to TWCP Records Center (LANL) re: Commingling of Defense and Nondefense TRU Waste	LA-UR-02-6087/TWCP-887	Charles L. Foxx	8/21/1997
C023	S7	Interview with Jim Foxx re: All Process Wastes (TA-50)	P2010-0109	John Musgrave	10/16/2000
C024	S7	Memo from K. W. French (SRS) to N. Stetson (SRS) re: Recovery of Pu-238 Scrap from Burial Ground	720000327	K. W. French, SRS	06/28/1972
C026	S7	Memo from David Barnes to John Gallimore re: Decommissioning and Decon of Building 4 Hot Cells at TA-21 DPW	HSE-1 86-447	David Barnes	10/20/1986
D001	NA	Guidelines for the Interim Storage of AEC-Generated Solid Transuranic Wastes	LA-5645	H-Division Staff, Environmental Studies Group, Waste Management Section	06/1974
D002	NA	Characterization of Transuranic Solid Wastes from a Plutonium Processing Facility	LA-5993-MS, TWCP-18938	Ray Mulkin	06/1975

Source Document Tracking Number	AK #	Title	Document Number	Author	Date
D004	S2	A Review of Operating Experience at the Los Alamos Plutonium Electrorefining Facility 1963-1977	LA-8943	L.J. Mullins and A.N. Morgan	12/1981
D007	S4	TA-55 Plutonium Facility, Acceptable Knowledge Report, Process AK Report for Pu-238 Operations at TA-55	TWCP-AK-2.1-009, R.0/IC1/LA-UR-01-4200/TWCP-15417	John Musgrove	08/07/2001
D008	NA	Historic Building Assessment for the DOE Conveyance and Transfer Project	LA-UR-00-1003, TWCP-18951	Ellen D. McGehee, Kari L.M. Garcia	12/23/1999
D009	NA	Acceptable Knowledge Report for Newly generated Waste from Metal/ Pyrochemical Operations at TA-55	TWCP-15421, LA-UR-02-6906	Wayne A. Punjak	10/22/2002
D013	NA	Acceptable Knowledge Operations Report for Plutonium Processing at the TA-21 DP West Facility-Review Draft	P2010-0898	Comments from Jim Foxx (no author identified)	3/23/04
D014	S3	TRANSIT RTG-Final Safety Analysis Report, Volume 1, Reference Design Document-Intro and Table 1-1 only	TRW(A)-11464-0491/TWCP-19438	Unknown	3/1/1971
D015	NA	Characterization of Direct Oxide Salts (U)	TWCP-03730, LA-CP-95-0098	C. L. Foxx	07/1995
D017	NA	Backlog Waste Reassessment Baseline Book	TWCP-02501, P2010-0670	Rocky Mountain Remediation Services	01/04/1995
D018	S5	The Atom, Remaking DP West	P2010-0698, Vol. 16, No. 6	Jeffery L. Peterson	07-08/1979
D023	S9, S12	TRU Waste-Sampling Program	LA-10479-MS/TWCP-19467	J.L. Warren and A. Zerwekh, LANL	08/1985
D027	S5	Direct Reduction of 238-PuO2 and 239-PuO2 to Metal	LA-9073/TWCP-22581	L. J. Mullins and C. L. Foxx, LANL	02/1982

Source Document Tracking Number	AK #	Title	Document Number	Author	Date
D029	S5	Six-Kilogram Scale Electrorefining of Plutonium Metal	LA-9469-MS	L. J. Mullins, A. N. Morgan, S. A. Apgar, III, D. C. Christensen, LANL	09/1982
D036	NA	Process AK Report for Chloride Operations at TA-55, TWCP-15411	TWCP-AK-2.1-002, LA-UR-02-1710, LA-UR-01-2557	John Musgrave	05/17/2001 (R.2) and 03/31/2002 (R.2/IC1)
D037	NA	Process AK Report for Metal Operations Processes at TA-55, TWCP-15412	TWCP-AK-2.1-003, LA-UR-01-2556, LA-UR-02-1716	John Musgrave	05/17/2001 (R.2) and 03/21/2002 (R.2/IC1)
D038	NA	Process AK Report for Miscellaneous Operations at TA-55, TWCP-15413	TWCP-AK-2.1-004, LA-UR-01-2559, LA-UR-02-1714	John Musgrave	05/17/2001 (R.2), 06/18/2001 (IC1), and 03/21/2002 (IC2)
D039	NA	Process AK Report for Nitrate Operations at TA-55, TWCP-15414	TWCP-AK-2.1-005, LA-UR-01-2555, LA-UR-02-1715	John Musgrave	05/17/2001 (R.2) and 03/21/2002 (R.2/IC1)
D040	NA	Process AK Report for Pyrochemical Processes at TA-55, TWCP-15415	TWCP-AK-2.1-006, LA-UR-01-2558, LA-UR-02-1713	John Musgrave	05/18/2001 (R.2) and 03/21/2002 (R.2/IC1)
D041	NA	Process AK Report for Special Processing at TA-55, TWCP-15416	TWCP-AK-2.1-007, LA-UR-01-2560, LA-UR-02-1712	John Musgrave	05/18/2001 (R.2) and 03/21/2003 (R.2/IC1)
D047	S5	Plutonium-238 Space Electric Power Fuel Development Program	LA-4476-MS/TWCP-21981	R. D. Baker, LANL	07/1970

Source Document Tracking Number	AK #	Title	Document Number	Author	Date
D048	S5	Helium Release of Pu-238-Molybdenum Cermet Fuel	LA-5820/ TWCP-21980	Barbara Mueller, Dana Douglass Rohr, C. C. Land, R. N. R. Mulford, LANL	12/1974
D049	S5	Initial Development and Characterization of Plutonia-Iridium Cermets (PIC)	LA-5255-MS/ TWCP-21979	M. Tokar, M. W. Shupe, R. A. Kent, R. W. Zocher, T. K. Keenan, LANL	05/1973
D053	NA	Plutonium Recovery at the Los Alamos Scientific Laboratory	LA-UR-80-1168/IAEA-SM-246/32	E. L. Christensen, LANL	04/1980
D059	NA	Acceptable Knowledge Operations Report for Plutonium Processing at the TA-21 DP West Facility	twcp-23596/P2010-0608/AK-00-023	Catherine Smith, LANL	06/21/2004
D060	S2	Acceptable Knowledge Information Summary for LANL Transuranic Waste Streams	AK-00-019/LA-UR-03-7488	C. Smith, LANL	09/22/2003
D061	S5	Quarterly Status Report on Plutonium-238 Space Electric Power Fuel Development Program (U), July 1 - September 30, 1968	LA-4068-MS/TWCP-23986	LASL	12/31/1968
D062	S5	Quarterly Status Report on Plutonium-238 Space Electric Power Fuel Development Program (U), October 1 - December 31, 1968	LA-4089-MS/TWCP-23987	LASL	02/03/1969
D063	S5	Quarterly Status Report on Plutonium-238 Space Electric Power Fuel Development Program (U) July 1-September 30, 1969	LA-4328-MS/TWCP-23988	LASL	12/08/1969
D064	S5	Quarterly Status Report on Plutonium-238 Space Electric Power Fuel Development Program (U) October 1 to December 31, 1969	LA-4419-MS/TWCP-23989	LASL	04/06/1970
D065	S5	Quarterly Status Report on Plutonium-238 Space Electric Power Fuel Development Program (U) July 1 to September 30, 1970	LA-4647-MS/TWCP-23990	LASL	03/1971

Source Document Tracking Number	AK #	Title	Document Number	Author	Date
D066	S5	Quarterly Status Report on Plutonium-238 Space Electric Power Fuel Development Program (U) October 1 to December 31, 1970	LA-4697-MS/TWCP-23991	LASL	06/1971
D067	S5	Quarterly Status Report on Plutonium-238 Space Electric Power Fuel Development Program(U), January 1 to March 31, 1971	LA-4819-MS/TWCP-23992	LASL	10/1971
D068	S5	Status of AM-241 Recovery and Purification at Los Alamos Scientific Laboratory	LA-UR-80-2414/TWCP-22579	H. D. Ramsey, D. G. Clifton, S. W. Hayter, R. A. Penneman, and E. L. Christensen	1980
D082	S3	Savannah River Site Solid Waste Management Facility Documented Safety Analysis	WSRC-SA-22	SRS	03/2007 - 07/2009
D083	S2, S9	Enhanced Clab Transuranic Waste Spreadsheet (CCP-AK-SRS-5, D010)	WSRC-TR-2000-00222	John Leyba	06/29/2000
D089	S3	Transit RTG Final Safety Analysis Report (Vol. 1)	NA	NA	03/01/1971
DR001	NA	Discrepancy Resolution Form for Historical and Current RCRA Characterization and Assignment of EPA Hazardous Waste Numbers	NA	Michael Papp	04/04/2007
M002	S6	An excerpt from Archive generator's database 95drum	TWCP-06988	NA	10/25/2001
M010	S10	Miscellaneous Material Safety Data Sheets (MSDSs) for Commercial Products and other Chemicals Identified	NA	Various	Various
P002	S2	Button Breaking Press Procedure	317-CAS/TWCP-3541/P2010-0890	David Olivas	UNK
P004	S2	Procedure for Measuring Physical Properties	116-MRD/TWCP-3541/MET-41/P2010=-903	LANL	UNK

Source Document Tracking Number	AK #	Title	Document Number	Author	Date
P009	S2	Operating Instructions, Procedures, and Equipment for the Los Alamos Plutonium Electrorefining Plant	LA-2981	L. J. Mullins, J. A. Leary, and A. N. Morgan, LANL	12/18/63
P023	S8	Nuclear Power in Space	NA	DOE	1979
P024	S2	SWMF Generated TRU Waste	SWMF-WM-TRU-02	SRS	05/11/2009
U002	NA	Memorandum to E.L. Albenesius, Re: Description of Mound and LASL Solid Pu-238 Waste Stored at SRP	DPST-81-647	O.A. Towler	09/18/1979

Alphanumeric Designations

C Correspondence
D Documents
DR Discrepancy Resolution
M Miscellaneous
P Published Documents
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