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

JUL 19 2010

JUL 2010

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

Subject: Review of CCP-SRS Waste Stream Profile Form Number SR-MD-PAD1, Heterogeneous Debris from Mound Site

Dear Mr. Bearzi:

The Department of Energy Carlsbad Field Office has approved the CCP-SRS Waste Stream Profile Form Number SR-MD-PAD1, Heterogeneous Debris from Mound Site.

Enclosed is a copy of the form as required by Section B-5a of the WIPP Hazardous Waste Facility Permit No. NM4890139088-TSDF.

If you have questions on this matter, please contact me at (575) 234-7300.

Sincerely,

David C. Moody

David C. Moody
Manager

Enclosure(s)

cc: w/enclosure

S. Zappe, NMED	* ED

cc: w/o enclosure

J. Kieling, NMED	ED
G. Basabilvazo, CBFO	ED
N. Castaneda, CBFO	ED
C. Fesmire, CBFO	ED
C. Gadbury, CBFO	ED
S. McCauslin, CBFO	ED
G. Sena, CBFO	ED
J. R. Stroble, CBFO	ED
K. Watson, CBFO	ED
W. Ledford, CTAC	ED
P. Gilbert, LANL	ED
G. Lyshik, LANL	ED
C. Walker, TechLaw	ED
CBFO M&RC	

*ED denotes electronic distribution

CBFO:NTP:JRS:GS:10-1448:UFC 5900.00

100726

Attachment 2 – CCP Waste Stream Profile Form

(1) Waste Stream Profile Number: SR-MD-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	
(7) Title, version number, and date of documents used for WAP Certification: CCP-PO-001, CCP Transuranic Waste Characterization Quality Assurance Project Plan, Revision 17, June 23, 2009 CCP-PO-002, CCP Transuranic Waste Certification Plan, Revision 23, April 7, 2010 CCP-PO-004, CCP/SRS Interface Document, Revision 27, May 22, 2009	
(8) Did your facility generate this waste? YES [X] NO [ ]	
(9) If no, provide the name and EPA ID of the original generator: Mound Site, EPA ID OH6890008984	
Waste Stream Information[2]	
(10) WIPP ID: SR-W027-999-MD-HET	(11) Summary Category Group: S5000
(12) Waste Matrix Code Group: Heterogeneous Debris Waste	(13) Waste Stream Name: Heterogeneous Debris from Mound Site
(14) Description from the TWBIR: This waste stream is primarily solids consisting of booties, lab coats, floor sweeping, labware, rags, and other job control waste.	
(15) Defense TRU Waste: YES [X] NO [ ]	
(16) Check One: CH [X] RH [ ]	
(17) Number of SWBs: 49[3]	(18) Number of Drums: 739[4]
(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: D004, D005, D006, D007, D008, D009, D010, D011, D019, D022, D027, D028, D029, D030, D032, D034, D037, D043, F002, F004 and F005	
(22) Applicable TRUCON Content Numbers: SR 125, SR 225 and SQ154	
(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-9, Revision 1, October 8, 2009, Figures 1, 2, 3, 4 and 5.	
(23B) Facility mission description: CCP-AK-SRS-9, Revision 1, October 8, 2009, Section 4.2	
(23C) Description of operations that generate waste: CCP-AK-SRS-9, Revision 1, October 8, 2009, Sections 4.3 & 5.3	
(23D) Waste identification/categorization schemes: CCP-AK-SRS-9, Revision 1, October 8, 2009, Section 4.5	
(23E) Types and quantities of waste generated: CCP-AK-SRS-9, Revision 1, October 8, 2009, Sections 4.4.1, 5.2 and 5.4	
(23F) Correlation of waste streams generated from the same building and process, as applicable: CCP-AK-SRS-9, Revision 1, October 8, 2009, Section 4.4.2	
(24) Waste certification procedures: CCP-TP-030, CCP CH TRU Waste Certification and WWIS/WDS Data Entry, Revision 27, December 14, 2009	
(25)Required Waste Stream Information	

(25A) Area(s) and building(s) from which the waste stream was generated: CCP-AK-SRS-9, Revision 1, October 8, 2009, Section 5.1			
(25B) Waste stream volume and time period of generation: CCP-AK-SRS-9, Revision 1, October 8, 2009, Section 5.2			
(25C) Waste generating process description for each building: CCP-AK-SRS-9, Revision 1, October 8, 2009, Sections 4.3 and 5.3			
(25D) Waste Process flow diagrams: CCP-AK-SRS-9, Revision 1, October 8, 2009, Figures 6, 7, 8, and 9.			
(25E) Material inputs or other information identifying chemical/radionuclide content and physical waste form: CCP-AK-SRS-9, Revision 1, October 8, 2009, 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: SR-MD-PAD1			
(26) Which Defense Activity generated the waste: (check one)[5]			
	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#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27C) Safety Analysis Reports: See S3 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27D) Waste packaging logs: NA			
(27E) Test plans/research project reports: NA			
(27F) Site databases: See S6 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27G) Information from site personnel: See S7 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27H) Standard industry documents: See S8 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27I) Previous analytical data: See S9 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27J) Material safety data sheets: See S10 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27K) Sampling and analysis data from comparable/surrogate Waste: NA			
(27L) Laboratory notebooks: NA			
Confirmation Information			
For the following, when applicable, enter procedure title(s), number(s) and date(s)			
(28)	Radiography: CCP-TP-053, Revision 7, October 21, 2009		
(29)	Visual Examination: NA		

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

Reviewed by AK Expert:	**YES** [X]		**Date:** 04/27/2010
Reviewed by STR (if necessary):	**YES** [X]	**NA** [ ]	**Date:** 05/04/2010

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) [signature]	(32) Craig Simmons	(33) 5/16/2010
Signature of Site Project Manager	Printed Name	Date

NOTE:
(1) Use back of sheet or continuation sheets, if required.
(2) If radiography, visual examination, headspace gas analysis, and/or homogeneous solids/soils/gravel sample analysis were used to determine EPA Hazardous Waste Codes, attach signed Characterization Information Summary documenting this determination.
(3) The volume is based on an estimated 253 m3 of waste presently packaged into 55 and 83-gallon drums and plywood boxes.
(4) This waste stream was also generated from defense nuclear material production.

CHARACTERIZATION INFORMATION SUMMARY

Waste Stream #: SR-MD-PAD1

Lot #: 1

TABLE OF CONTENTS

CCP Characterization Information Summary Cover Page

Waste Stream #	SR-MD-PAD1	Lot #:	1
AK Expert Review:	N/A	Date:	N/A
SPM Review:	Craig Simmons	Date:	5/10/2010

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. 6	03/04/08	CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 7	10/21/09	CCP Standard Real-Time Radiography (RTR) Inspection Procedure

Headspace Gas Sampling and Analysis (HSG):

CCP-TP-093	Rev. 13	03/19/07	CCP Sampling of TRU Waste Containers
CCP-TP-106	Rev. 6	07/12/07	CCP Headspace Gas Sampling Batch Data Report Preparation
CCP-TP-175	Rev. 0	05/02/07	CCP Analysis of Gas Samples for VOCs by GC/MS
CCP-TP-173	Rev. 0	05/03/07	CCP Analysis of Gas Samples for VOCs by GC/FID
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. 17	09/24/07	CCP Project Level Data Validation and Verification
CCP-TP-002	Rev. 20	08/18/08	CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 21	08/04/09	CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-003	Rev. 16	10/02/07	CCP Data Analysis for S3000, S4000, and S5000 Characterization
CCP-TP-003	Rev. 17	11/09/09	CCP Data Analysis for S3000, S4000, and S5000 Characterization
CCP-TP-005	Rev. 18	11/16/06	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

WAP Certification:

CCP-PO-001	Rev. 16	10/31/07	CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 17	06/23/09	CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-002	Rev. 21	01/26/09	CCP Transuranic Waste Certification 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-004	Rev. 26	08/28/08	CCP/SRS Interface Document
CCP-PO-004	Rev. 27	05/22/09	CCP/SRS Interface Document

CIS 02

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream # SR-MD-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	Headspace Gas BDR Analysis	
SR66205	SRSGS312	SR4RTR0077	N/A	N/A	N/A		SRHSGS090006	ECL09041M	ECL09041G
SR66206	SRSGS314	SR4RTR0076	N/A	N/A	N/A		N/A	N/A	N/A
SR66210	SRSGS311	SR4RTR0076	N/A	N/A	N/A		N/A	N/A	N/A
SR66211	SRSGS310	SR4RTR0076	N/A	N/A	N/A		SRHSGS090006	ECL09041M	ECL09041G
SR66212	SRSGS311	SR4RTR0076	N/A	N/A	N/A		SRHSGS090006	ECL09041M	ECL09041G
SR66213	SRSGS311	SR4RTR0076	N/A	N/A	N/A		SRHSGS090006	ECL09041M	ECL09041G
SR66214	SRSGS311	SR4RTR0076	N/A	N/A	N/A		N/A	N/A	N/A
SR66215	SRSGS311	SR4RTR0076	N/A	N/A	N/A		N/A	N/A	N/A
SR66216	SRSGS312	SR4RTR0077	N/A	N/A	N/A		SRHSGS090006	ECL09041M	ECL09041G
SR66217	SRSGS315	SR4RTR0077	N/A	N/A	N/A		N/A	N/A	N/A
SR66220	SRSGS312	SR4RTR0077	N/A	N/A	N/A		N/A	N/A	N/A
SR66221	SRSGS314	SR4RTR0076	N/A	N/A	N/A		SRHSGS090006	ECL09041M	ECL09041G
SR66222	SRSGS315	SR4RTR0077	N/A	N/A	N/A		N/A	N/A	N/A
SR66225	SRSGS311	SR4RTR0076	N/A	N/A	N/A		N/A	N/A	N/A
SR66226	SRSGS310	SR4RTR0076	N/A	N/A	N/A		N/A	N/A	N/A
SR66228	SRSGS312	SR4RTR0077	N/A	N/A	N/A		N/A	N/A	N/A
** 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.									
**SR66202	N/A	SR4RTR0077	N/A	N/A	N/A		SRHSGS090006	ECL09041M	ECL09041G
**SR66204	N/A	SR4RTR0077	N/A	N/A	N/A		SRHSGS090006	ECL09041M	ECL09041G
**SR66207	N/A	SR4RTR0077	N/A	N/A	N/A		SRHSGS090006	ECL09041M	ECL09041G
**SR66223	N/A	SR4RTR0076	N/A	N/A	N/A		SRHSGS090006	ECL09041M	ECL09041G

Signature of Site Project Manager

Craig Simmons
Printed Name

5/10/2010
Date

CCP Headspace Gas UCL_{90} Evaluation Form

WSPF #: SR-MD-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	5	10	-1.14	-2.56	1.01	-2.12	10	2.30		
Bromoform	Log	0	10	-2.04	-4.24	0.78	-3.90	10	2.30		
Carbon tetrachloride	Log	1	10	-1.90	-3.94	0.83	-3.58	10	2.30		
Chlorobenzene	Log	0	10	-1.39	-3.56	0.77	-3.23	10	2.30		
Chloroform	SQRT	3	10	0.59	0.29	0.19	0.38	10	3.16		
Cyclohexane[a]	Log	0	10	-1.29	-3.47	0.77	-3.13	10	2.30		
1,1-Dichloroethane	Log	0	10	-1.29	-3.47	0.77	-3.14	10	2.30		
1,2-Dichloroethane	Log	0	10	-1.20	-3.39	0.77	-3.05	10	2.30		
1,1-Dichloroethylene	Log	0	10	-1.47	-3.66	0.77	-3.32	10	2.30		
cis-1,2-Dichloroethylene	Log	0	10	-1.12	-3.31	0.77	-2.98	10	2.30		
trans-1,2-Dichloroethylene	Log	0	10	-0.84	-3.02	0.77	-2.69	10	2.30		
Ethyl benzene	Log	0	10	-1.39	-3.56	0.77	-3.22	10	2.30		
Ethyl ether	Log	0	10	-0.69	-2.87	0.77	-2.53	10	2.30		
Methylene chloride	Log	3	10	-0.99	-2.71	1.10	-2.23	10	2.30		
1,1,2,2-Tetrachloroethane	Log	0	10	-1.35	-3.53	0.77	-3.20	10	2.30		
Tetrachloroethylene	Log	0	10	-1.71	-3.90	0.77	-3.56	10	2.30		
Toluene	Log	7	10	2.14	-0.83	2.30	0.17	10	2.30		
1,1,1-Trichloroethane	Log	0	10	-1.63	-3.83	0.77	-3.49	10	2.30		
Trichloroethylene	Log	0	10	-1.71	-3.90	0.77	-3.56	10	2.30		
Trichlorofluoromethane[(2)]	Log	0	10	-1.90	-4.07	0.77	-3.74	10	2.30		
1,1,2-Trichloro-1,2,2-trifluoroethane	Log	0	10	-1.86	-4.06	0.77	-3.72	10	2.30		
1,2,4-Trimethylbenzene[a]	Log	0	10	-1.06	-3.25	0.77	-2.91	10	2.30		
1,3,5-Trimethylbenzene[a]	Log	0	10	-1.11	-3.29	0.77	-2.95	10	2.30		
m,p-Xylene[b]	Log	0	10	-1.41	-3.58	0.77	-3.24	10	2.30		
o-Xylene	Log	0	10	-1.27	-3.45	0.77	-3.12	10	2.30		
Acetone	Log	7	10	4.94	-0.29	2.46	0.79	100	4.61		
Butanol	Log	5	10	-0.43	-2.49	1.20	-1.97	100	4.61		
Methanol	Log	0	10	1.54	1.49	0.02	1.50	100	4.61		

CES 04

CCP Headspace Gas UCL_{90} Evaluation Form

WSPF #: SR-MD-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	Log	3	10	1.61	-2.18	1.50	-1.52	100	4.61		
Methyl isobutyl ketone	Log	2	10	-0.15	-3.37	1.24	-2.83	100	4.61		
Chloromethane[(2)]	Log	7	10	2.94	-0.63	2.40	0.42	10	2.30		
Carbon Disulfide[(2)]	Log	0	10	-0.69	-2.84	0.76	-2.51	10	2.30		
1,2-Dichloropropane[(2)]	Log	0	10	-1.80	-3.98	0.77	-3.65	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 the TRAMPAC and are flammable VOCs that do not appear in the QAPjP or the WIPP WAP. 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.

Comments:

(1) For analytes where there were no samples measured above the MDL value, 1/2 of the MDL value was used. (Per section B4 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 B3-2 of HWFP Attachment B3. The analytes are reported in the analysis Batch Data Report provided by the Idaho lab and included on the UCL_{90} for completeness.

[signature]
Signature of Site Project Manager

Craig Simmons
Printed Name

5/10/2010
Date

CCP Headspace Gas Summary Data

Waste Stream # SR-MD-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 [signature] Date 5/10/2010

CIS 06

CCP RTR/VE Summary of Prohibited Items and AK Confirmation

Waste Stream #: SR-MD-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.	RTR Data sheets confirm that none of the containers in this lot contain any prohibited items.	None of the containers in this lot were characterized using 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).

Site Project Manager Signature	Printed Name	Date
[signature]	Craig Simmons	5/10/2010

CES 07

CCP Reconciliation with Data Quality Objectives

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

Sampling Completeness

RTR/VE

Number of Valid Samples: 16 Number of Total Samples Analyzed: 16
Percent Complete: 100 (QAO is 100%)

NDA

Number of Valid Samples: 16 Number of Total Samples Analyzed: 16
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%)

CIS 09

CCP Reconciliation with Data Quality Objectives

Waste Stream #: SR-MD-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 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 Hazardous Waste Numbers 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 Hazardous Waste 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 Hazardous Waste Numbers were assigned as required. Samples were randomly collected.

CJS 09

CCP Reconciliation with Data Quality Objectives

Waste Stream #: SR-MD-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 B3-1 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 B3-2 through B3-9 prior to submittal of a waste stream profile form for a waste steam or waste stream lot.

14	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

Signature of Site Project Manager	Craig Simmons	5/10/2010
	Printed Name	Date

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

Overview

Waste stream SR-MD-PAD1 is contact-handled (CH) transuranic (TRU) heterogeneous debris waste generated in the Special Metallurgical (SM) Building and Research (R) Building at the Mound Site in Miamisburg, Ohio. The SM Building was used for Pu-238 processing until operations were transferred to the Plutonium Processing (PP) Building in 1967. Initial decontamination and decommissioning (D&D) of SM Building began in August 1968 and ceased in August 1972. The R Building was used for research and development (R&D) for the polonium (Po)-210 program, which was phased out by 1971. Plutonium (Pu)-238 research began in about 1959. Most of the Pu-238 work ended in about 1978. This waste was transferred to the Savannah River Site (SRS) between 1970 and 1972 for retrievable storage and is stored on Pads 1 and 2.

Waste stream SR-MD-PAD1 was generated from the development and research of Pu-238 heat sources. Pu-238 heat sources were used in both defense and non-defense-related programs. The defense programs included the Transit program, which was a defense program that produced Pu-238 heat sources used in United States Navy navigational satellites launched between 1961 and 1972. Non-defense applications of Pu-238 included use in meteorological satellites and the Apollo moon missions. Waste management practices did not require segregation of the waste derived from the analysis. Therefore, the waste generated from the analysis of these samples is commingled.

This Summation of Aspects of the AK Summary Report includes information to support Waste Stream Profile Form (WSPF) number SR-MD-PAD1. The primary source of information for this summation is CCP-AK-SRS-9, *Central Characterization Project Acceptable Knowledge Summary Report For Mound Site Transuranic Waste in Retrievable Storage at the Savannah River Site, Waste Stream SR-MD-PAD1*, Revision 1, 10/08/2009.

CCP-AK-SRS-9 includes information obtained from numerous sources, including facility safety basis documentation, historical document archives, generator and storage facility waste records and documents, and interviews with cognizant personnel.

Waste Stream Identification Summary

Waste Stream Name:	Heterogeneous Debris from Mound Site
Waste Stream Number:	SR-MD-PAD1
Site Where TRU Waste Was Generated:	Mound Site
Facility Where TRU Waste Was Generated:	SM Building and R Building
Site Where TRU Waste is Currently Stored	SRS
Waste Stream Volume – Current:	739 55-gallon drums (155 m^3) [1] 49 SWBs (93 m^3) [2]

[1]This volume consists of 678 55-gallon drums, and 61 55-gallon drums overpacked into 83 gallon drums, for an estimate of 739 55-gallon drums.
[2]This volume consists of 39 plywood boxes (93 m^3) that will be repackaged into SWBs.

Waste Stream Volume – Projected:	0 55-gallon drums 0 SWBs
Dates of Waste Generation:	1959 - 1972
TRUPACT-II Content code (TRUCON):	SR125, SR225, SQ154
Summary Category Group:	S5000
Waste Matrix Code:	S5400, Heterogeneous Debris
Waste Matrix Code Group:	Heterogeneous Debris
Waste Stream ATWIR Identification:	SR-W027-999-MD-HET
RCRA Hazardous Waste Numbers:	D004, D005, D006, D007, D008, D009, D010, D011, D019, D022, D027, D028, D029, D030, D032, D034, D037, D043, F002, F004, F005

Waste Stream Description and Physical Form

Waste stream SR-MD-PAD1 is comprised primarily of organic and inorganic debris waste items and generally consists of combustible, plastic, rubber, glass, and metal.

Examples of waste include High Efficiency Particulate Air (HEPA) filters containing asbestos filter media, fiberglass pre-filters, lime filters, hoods and hood fronts, large equipment (i.e., cut-off saw, evaporators, microscopes, presses, tanks), aerosol cans, batteries, bolts, dissolvers, metal beakers, hotplates, lathes, lead bricks, lead shot, nuts, pans, plastic and metal piping, plates, ring stands, spatulas, tables, plastic and metal tanks, valves, wrenches, glass flasks, glass and plastic sample vials, spun glass filters, cardboard, cartons, cloth rags, paper, wipes, wood, lead-lined gloves, gloves, o-rings, gaskets, tubing, evaporator and dissolver sludge, fused poly beads, resin, and diatomaceous earth.

Waste stream SR-MD-PAD1 is comprised of greater than 50 percent, by volume, heterogeneous inorganic and organic debris. Therefore, waste matrix code S5400, Heterogeneous Debris, is assigned to the waste stream.

The waste that comprises waste stream SR-MD-PAD1 was generated from a single process or from an activity that is similar in material, physical form, and hazardous constituents and is therefore a single waste stream.

Point of Generation

Location

Waste stream SR-MD-PAD1 was generated at the Mound Site, which is located in Miamisburg, Ohio. Most of the waste is stored on Pads 1 and 2 at SRS.

Area and/or Buildings of Generation

Waste stream SR-MD-PAD1 was generated in SM Building and R Building at the Mound Site. The waste in the waste stream was transferred to the SRS between 1970 and 1972 for retrievable storage.

Generating Processes

Description of Waste Generating Processes

Waste stream SR-MD-PAD1 was generated in the SM Building during Pu-238 heat source production, plutonium recovery, liquid waste treatment, R&D, analytical laboratory support, and D&D activities. In the R Building, waste stream SR-MD-PAD1 was generated during Pu-238 heat source research, analytical laboratory support, metallurgical analysis, and D&D activities.

During the period 1970 to 1972, Mound transferred potentially recoverable material containing Plutonium-238 to SRS. Recovery of the plutonium by SRS was determined not to be economically justifiable. Subsequently, the material which was packaged in plywood boxes was declared waste and placed in concrete boxes and concrete culverts on Pads 1 and 2 at the SRS burial ground. This portion of waste stream SR-MD-PAD1 will be repackaged into SWBs in accordance with the SRS Solid Waste Division Waste Acceptance Criteria (WAC) and the WIPP- WAC. As the waste is repackaged the containers will be tracked to ensure that they are in the correct waste stream.

Following are descriptions of the waste generating activities.

Plutonium-238 Heat Source Production

In the Pu-238 heat source production process, plutonium nitrate solution was precipitated with oxalic acid. The plutonium oxalate was filtered, and the filtrate was returned to plutonium recovery. The plutonium oxalate precipitate was washed and dried. The oxalate was placed in a platinum crucible and converted to plutonium tetrafluoride using hydrogen fluoride gas. The plutonium tetrafluoride was transferred to a magnesium crucible, and finely divided calcium metal and iodine were added. The crucible was placed in a steel reduction bomb, and the assembly was purged with argon gas and then sealed. The bomb assembly was heated. After the bomb was allowed to cool, it was opened, the Pu-238 metal was broken away from the slag and crucible, and it was cleaned with a brush to remove adherent slag and calcium metal. The slag and calcium metal were sent to plutonium recovery, and therefore, will not be in this waste stream. The clean plutonium metal then went to the foundry. The nitric acid wash solution and the slag from the reduction process were sent to plutonium recovery. The crucible went through a leaching process to recover the residual Pu-238. The solution went to plutonium recovery and the crucibles were packed and shipped for burial as high-risk waste. The plutonium metal "button" was placed in a crucible, melted, and poured into a mold. After the metal cooled, it was removed from the mold and was ready to be encapsulated. All solid materials coming in contact with plutonium in this process were treated to recover plutonium. Ash and leach solutions went to plutonium recovery for processing.

The metal production process ended in 1965 and was replaced by the "microsphere" process, which used powdered plutonium dioxide received from SRS. The plutonium dioxide material was dissolved in a mixture of nitric-hydrofluoric acids, and the resulting plutonium nitrate solution was adjusted with nitric acid. If necessary, a valence adjustment was made, and the resulting solution was treated with ammonium hydroxide to precipitate plutonium hydroxide. The solution was filtered, and the plutonium precipitate was washed with dilute ammonium hydroxide solution and then dried. The washed precipitate was then vacuum dried and air dried overnight. The dried plutonium precipitate was

Research and Development

Heat source R&D work was conducted in both SM and R Buildings. In addition to the metal and microsphere production processes described above, other heat source processes were developed. The two primary processes developed were the Plutonium-Molybdenum Cermet (PMC) process and the Pressed Plutonium Oxide (PPO) shard process. The PMC process received sintered plutonium dioxide shards that were then hot-pressed into disks, machined to required dimensions, and coated with molybdenum hexafluoride. The PPO processed plutonium dioxide shards into spheres.

The PPO process began by dissolving Pu-238 dioxide in a mixture of nitric acid-hydrofluoric acid. After dissolution, the resulting plutonium nitrate solution was adjusted with nitric acid. If necessary, a valence adjustment was made, and the resulting solution was treated with ammonium hydroxide to precipitate plutonium hydroxide. The solution was filtered, and the plutonium precipitate was washed with dilute ammonium hydroxide solution. The washed precipitate was dried, crushed to produce a fine powder, sieved, and heated to produce a sintered Pu-238/oxygen-16. The sintered oxide was then hot-pressed to produce a sphere. The die body was sprayed with colloidal graphite and then charged with plutonium dioxide particles. The die was loaded into the press, and sphere of plutonium dioxide was formed. The plutonium dioxide sphere was removed from the die, weighed, and gauged. The sphere was heated, allowed to outgas, and then encapsulated. Encapsulation involved welding a machined metal cover over the sphere. Encapsulation materials included iridium, graphite, tantalum, titanium, and Hastelloy (an alloy of cobalt, molybdenum, chrome, tungsten, and iron).

The initial steps of the PMC process were identical to the PPO process. Plutonium dioxide underwent dissolution with nitric acid and hydrofluoric acid followed by a hydrogen ion concentration and valance adjustment using nitric acid. Precipitation took place using ammonium hydroxide, and the plutonium precipitate was separated from the supernatant liquid by filtration. The precipitate was washed with dilute ammonium hydroxide and then dried. The dried precipitate was sized, sintered, coated with molybdenum, and pressed into discs. This cermet material was machined into discs. The discs were then assembled into the heat source capsules. The assembly of the machined cermet elements into containment capsules involved tungsten inert gas and electron beam welding of metal and metal alloy containers and internal components. Materials used in fabrication included inconel, tantalum, platinum-rhodium, yttrium, and iridium.

Plutonium Recovery

Plutonium-238 heat source activities resulted in byproducts and waste materials that were evaluated for appropriate treatment, recovery, and disposition.

During SM Building operations, plutonium-bearing solutions were accumulated in holding tanks. Aqueous liquids included nitric and hydrofluoric acids, hydroxylamine, sodium carbonate, ferrous sulfamate, and sodium hydroxide used in leaching and dissolution processes. Caustic wastes were generated when ammonium hydroxide was used to precipitate plutonium from the solution. These solutions were processed in a steam evaporator, and the evaporator condensate was processed by an ion exchange column. This system was taken out of service in 1962. From 1963 to 1968, the plutonium recovery process for aqueous wastes consisted of two ion exchange columns. The effluent from the ion exchange columns was sent to an in-line glovebox evaporator.

Recovery of plutonium from solids included physical and chemical processing. The physical processes included ultrasonic wash, evaporation, and filtration. Simple washing and leaching of glovebox material occurred in the process since the beginning of the program. Chemical processing included dissolution, precipitation, fusion, incineration, ion exchange, and fluorination. In gloveboxes, solid objects contaminated with plutonium were washed or leached in water or acid solutions, such as nitric and hydrofluoric acids, hydroxylamine, sodium carbonate, ferrous sulfamate, and sodium hydroxide, with the aid of ultrasonic cleaning equipment. The wash water and leachate were sent to plutonium recovery. Plutonium oxide and ceramic Radioisotopic Thermoelectric Generator (RTG) materials not meeting product specifications were dissolved in a mixture of nitric and hydrofluoric acid or underwent fusion with pyrosulfate. Glass fiber filters were dissolved in a hydrofluorinator, and the volatile silicon tetrafluoride generated in the process was removed using a caustic scrubber. The highly acidic solutions containing plutonium were sent to the plutonium recovery process. Other solid materials containing recoverable plutonium or off-specification RTG material that could not be dissolved underwent pyrosulfate fusion followed by dissolution.

Combustible wastes generated in the glovebox line were processed in one of two ways. If paper towels or rags accumulated significant quantities of Pu-238, the thermal energy released by the plutonium would cause the towel or rag to smolder. The towels and rags were placed in a metal can and allowed to react until the can contained carbonized ash that contained plutonium oxide. The volatile pyrolysis products were swept from the glovebox and, after HEPA filtration, were discharged to the atmosphere through the building's stack. All other combustible wastes including paper, wood, leaded neoprene gloves, and in-line glovebox HEPA filters were treated in an incinerator installed in a glovebox. The incinerator consisted of a large steel tub that was heated by means of a natural gas burner. The gaseous pyrolysate from the incinerator was scrubbed using a sodium hydroxide solution followed by glass fiber/asbestos filtration, and then was discharged to the atmosphere through the building stack. The ash residue from the incinerator was returned for dissolution and leaching.

Support Laboratories

Activities in support of the Pu-238 heat source programs included analytical laboratory and metallurgical laboratory operations conducted in SM and R Buildings. Specific analytical procedures included titration, alpha counting, atomic absorption, and mass spectroscopy. Thorium (Th)-232 was used to simulate plutonium because the physical characteristics are similar. The volume of waste generated by the analytical laboratories was very small. Solid wastes included glass, paper, and plastic contaminated with Pu-238 and Pu-239. Chemicals used during these operations included nitric acid, hydrofluoric acid, mercury, and complexing agents (e.g., ethylenediaminetetraacetic acid, and citrates).

Decontamination and Decommissioning

Waste stream SR-MD-PAD1 includes waste from D&D of SM Building. During D&D, process equipment inside a glovebox was cleaned by washing the external surfaces with water using a high pressure cleaning unit. All services connected to a glovebox (e.g., piping) were then dismantled. Gloveboxes and fume hoods were cleaned manually (e.g., sand paper, paint remover, or rags with nitric acid) or with a high pressure cleaning unit. To eliminate the expense and hazards of removing process equipment from the glovebox, the inside of the glovebox was filled with polyurethane foam.

Foam may not have been used in this way for the material that was sent to SRS as potentially recoverable because of the problems the foam inside the glovebox would create for subsequent plutonium recovery. Additional foam was used to stabilize gloveboxes in the shipping container. Stainless steel process tanks were emptied of their contents, and then cut up and packaged. Vacuum and acid transfer stainless steel piping was removed, cut into shorter lengths, and packaged. Small tools such as brushes were used to clean the piping. One of the last activities was the removal of the building HEPA filters and interior filter bank parts.

Liquid Waste Treatment

The SM waste treatment was used to process low- and high-risk wastes generated by plutonium production and plutonium recovery operations. The SM Building was phased out in 1967-1968 with the completion of a new plutonium facility in Building 38, also known as the PP Building. The treatment plant was in operation from the start of plutonium operations in 1961 until the waste transfer pipelines were installed from the SM to the Waste Disposal Buildings in 1967.

In the first few years of the SM Building's operations, all high-risk aqueous wastes were processed for plutonium recovery. Plutonium-bearing acidic solutions were accumulated in holding tanks and processed in a steam evaporator followed by ion exchange. The effluent from the ion exchange column was treated as either low-risk waste or released to the storm sewer. When Mound began to distinguish between recoverable and disposable high-risk wastes, the plutonium aqueous recovery operations were moved out of the waste treatment area into the process area. In 1964, service lines were extended from SM-1 to the R Building, where solid materials were sorted into recoverable and disposable wastes. High-risk liquids generated by the sorting operations were transferred to the SM building for processing.

The low-risk alpha wastewater from Pu-238 production and recovery operations was transferred to influent tanks located on the west side of SM Building. Wastewater was transferred from the influent tanks to a mixing tank where calcium chloride and ferrous sulfate were added, followed by activated carbon. Sodium hydroxide was used to adjust the solution in the mixing tank to pH 11. A precipitate formed as a consequence of the pH change and the contents of the tank were transferred to a clarifier. When the sludge blanket in the clarifier reached the desired depth, the clarification process was stopped. The water from the clarifier was siphoned off, filtered, and then pumped to a holding tank. The treated water in the holding tank was sampled and the activity of the water was determined. If the activity was below the Radioactivity Concentration Guide (RCG) value, the treated liquid was considered suitable for discharge to the SM storm sewers and the plant drainage ditch. If the activity of the treated liquid exceeded the RCG value, the waste was returned to the first step of the treatment process and underwent a second cycle of treatment. Sludge from the clarifier was transferred and packaged in 30-gallon, poly-lined steel drums. The 30-gallon drums were overpacked into 55-gallon drums and staged in the SM drum storage area. Waste stream SR-MD-PAD1 does not include these sludge drums.

Metallurgical Analysis

Metallurgical analysis of plutonium compounds was performed with Pu-238, Pu-239, and some Po-210 early in the program, especially in conjunction with the heat source programs. The highly corrosive Pu-238 compounds demanded alternative exploration. These materials were very fine oxide particles. From 1959 to 1960, the initial plutonium program activities were conducted in R Building. During this early phase, the program's effort was to understand the chemistry and metallurgy of Pu-238. During this phase of the program in the R Building, the majority of the wastes generated were solid materials. The glovebox atmosphere could not tolerate water vapor or oxygen. Therefore, water was not a significant ingredient in the process activity, nor in the generation of liquid wastes. The small quantities of liquid waste that were generated came from decontamination activities associated with production, glovebox operations, and the workplace. These aqueous wastes were solidified without prior treatment, packaged in 30-gallon drums, and shipped to the SRS for plutonium recovery. The gloveboxes in R-120 that were used for plutonium studies were eventually removed from service, packaged in a cargo trailer, and remained at Mound for approximately a year before being shipped offsite.

RCRA Determinations- Hazardous Waste Determinations

Table 1 identifies the toxicity characteristic (TC) and F-listed constituents in waste stream SR-MD-PAD1.

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

Constituent	CAS Number	EPA Hazardous Waste Number
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	D019
Chloroform	67-66-3	D022
1,4-Dichlorobenzene	106-46-7	D027
1,2- Dichloroethane	107-06-2	D028
1,1-Dichloroethylene	75-35-4	D029
2,4-Dinitrotoluene	121-14-2	D030
Hexachlorobenzene	118-74-1	D032
Hexachloroethane	67-72-1	D034
Pentachlorophenol	87-86-5	D037
Vinyl chloride	75-01-4	D043
Chlorobenzene	108-90-7	F002
Ortho-dichlorobenzene	95-50-1	F002
Methylene chloride	75-09-2	F002
Tetrachloroethylene	127-18-4	F002
1,1,1-Trichloroethane	71-55-6	F002
1,1,2-Trichloroethane	79-00-5	F002
Trichloroethylene	79-01-6	F002
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	76-13-1	F002
Nitrobenzene	98-95-3	F004

Constituent	CAS Number	EPA Hazardous Waste Number
Benzene	71-43-2	F005
Carbon disulfide	75-15-0	F005
2-Ethoxyethanol	110-80-5	F005
Isobutanol	78-83-1	F005
Methyl ethyl ketone	78-93-3	F005
2-Nitropropane	79-46-9	F005
Pyridine	110-86-1	F005
Toluene	108-88-3	F005

Ignitability, Corrosivity, Ractivity

Waste generated in this waste stream does not qualify for any of the exclusions outlined in Title 40 of the Code of Federal Regulations (CFR) 260 or 261. Real Time Radiography (RTR) and/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

This waste does not exhibit the characteristic of ignitability as defined 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.

According to procedure, containers of burnables (e.g., rags, paper, wood) must not include highly flammable materials. Residual liquids were removed from equipment. Burnable and non-burnable materials were dried to prevent chemical reaction. Absorbent was added if residual liquids or moisture was suspected (References C036, C037, C039, and P119).

Evaporator and dissolver sludges are listed as oxidizers due to the presence of nitrates (Reference I011). Tests performed by SRS in 1984 to determine burning characteristics of wipes and mop heads contaminated with nitric acid and potassium permanganate indicated that these wastes are not classified as oxidizers.

Pyrophoric plutonium metal fines (floor sweepings) were generated in SM Building, but were not sent to SRS for recovery. Oxide residue may be present on the equipment, but no free metal is present. Non-radionuclide pyrophorics were not used in production processes and are not present in this waste stream (References C036, C037, and C039). 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).

Corrosivity

This waste does not exhibit the characteristic of corrosivity as defined in 40 CFR 261.22. According to procedure, residual liquids were removed from equipment, and burnable and non-burnable materials were dried to prevent chemical reaction. Absorbent (e.g., diatomaceous earth) was added if residual liquids or moisture was suspected. In addition, acidic evaporator sludge and caustic filtration sludge were dried and then visually checked for dryness (References C036, C037, C039, and P119). 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)

Reactivity

This waste 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. It is not a cyanide or sulfide bearing material. The materials are not capable of detonation or explosive reaction or decomposition (References C036, C037, C039, and P119).

Calcium metal was used to reduce plutonium tetrafluoride to metal. After the reduction process, the Pu-238 metal was broken away from the slag, and the metal was cleaned with a brush to remove adherent slag and calcium metal. The slag and calcium metal were sent to plutonium recovery, and therefore, will not be in this waste stream (Reference I090). No other reactive chemicals were used in production processes. Laboratory operations may have used water-reactive chemicals, but only in small amounts and insufficient to result in reactive waste (References C036, C037, and C039).

Organic resins were exposed to various concentrations of nitric acid in the processes that generate this waste stream. The resin was packaged in a plastic bag that was then put into a half-gallon paint can. Tests conducted by Mound on stored resin showed no pressure increase in the can after a period of 14 years (References C020, U007, and U015). Therefore, the resins are stable.

Burnable and non-burnable materials, according to procedure, were dried to prevent chemical reaction and pressure build-up while in storage (Reference P119). Explosive chemicals were not used in production areas. It is possible that explosive chemicals were used in the laboratory areas, but if present, were only used in small quantities. Work with radioactive materials was kept separate from work done with explosive materials (References C036, C037, and C039). According to procedure, containers of burnables (e.g., rags, paper, wood) contaminated with plutonium did not include explosive materials (Reference P119). Any explosive materials would have been rendered non-explosive prior to disposal. Explosives that were not radiologically contaminated were also put into separate explosive waste containers, which are not part of this waste stream (References C019 and P020). Explosives were burned in Area H starting in the 1950s and continued into the 1990s (References I090 and P058). 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 reactivity (D003).

Toxicity Characteristic

This waste exhibits the characteristic of toxicity per 40 CFR 261.24. The toxicity characteristic contaminants fall into two categories: metals and organics. EPA HWNs assigned to this waste stream are: D004 (arsenic), D005 (barium), D006 (cadmium), D007 (chromium), D008 (lead), D009 (mercury), D010 (selenium), D011 (silver), D019 (carbon tetrachloride), D022 (chloroform), D027 (1,4-dichlorobenzene), D028 (1,2-dichloroethane), D029 (1,1-dichloroethylene), D030 (2,4-dinitrotoluene), D032 (hexachlorobenzene), D034 (hexachloroethane), D037 (pentachlorophenol), and D043 (vinyl chloride). Where a constituent has been identified and there is no quantitative data available to demonstrate that the concentration is below the regulatory threshold, the applicable EPA HWN is conservatively applied to the waste stream.

Uses and sources of toxicity characteristic constituents have been identified as follows: arsenic (used during analysis in R Building), barium (used during analysis in R Building), cadmium (used during analysis in R Building), chromium (used during analysis in R Building), lead (present in lead bricks), mercury (used in thermometers), selenium (used during analysis in R Building), silver (constituent of silver solder), carbon tetrachloride (used in solvent extraction in R Building), chloroform (identified in R Building chemical inventory), 1,4-dichlorobenzene (used in SM and R Building operations), 1,2-dichloroethane (identified in R Building inventory), 1,1-dichloroethylene (used in SM and R Building operations), 2,4-dinitrotoluene (used in SM and R Building operations), hexachlorobenzene(used in SM and R Building operations), hexachloroethane (used in SM and R Building operations), pentachlorophenol (used in SM and R Building operations), and vinyl chloride(used in SM and R Building operations). (References C009, C010, C016, C012, C016, C019, C020, C036, C037, C038, I008, I011, I067, I090, M004, P020, P096, P081, P111, and U003)

Since the more specific F-listed EPA HWNsHWNs have been assigned for benzene, chlorobenzene, methyl ethyl ketone, nitrobenzene, pyridine, tetrachloroethylene, and trichloroethylene, the corresponding toxicity characteristic HWNs D018 (benzene), D021 (chlorobenzene), D035 (methyl ethyl ketone), D036 (nitrobenzene), D038 (pyridine), D039 (tetrachloroethylene), and D040 (trichloroethylene) are not applied.

Listed Waste

F-Listed Waste

Waste stream SR-MD-PAD1 was mixed with or derived from F-Listed hazardous wastes from non-specific sources as listed in 40 CFR261.31. F002, F004, and F005 listed solvents were used in SM and R Buildings and contaminate the waste. (References C005, C007, C010, C011, C016, I045, I090, P065, P096).

F002 solvents in waste stream SR-MD-PAD1 include chlorobenzene (identified in R Building chemical inventory), ortho-dichlorobenzene (used in SM and R Building operations), methylene chloride (used in solvent extraction), tetrachloroethylene (used in SM and R Building operations), 1,1,1-trichloroethane (used in solvent extraction), 1,1,2-trichloroethane (used in SM and R Building operations), trichloroethylene (used in degreasing).

F004 solvent nitrobenzene was identified in R Building inventory.

F005 solvents in waste stream SR-MD-PAD1 include benzene (identified in R Building inventory), carbon disulfide (used in SM and R Building operations), 2-ethoxyethanol (used in SM and R Building operations), isobutanol (used in SM and R Building operations), methyl ethyl ketone (used in SM and R Building operations), 2-nitropropane (used in SM and R Building operations), pyridine (identified in R Building inventory), and toluene (identified in R Building inventory).

Although several F001-listed solvents were identified in the AK record (i.e., tetrachloroethylene, trichloroethylene, methylene chloride, and 1,1,1-trichloroethane), these listed solvents were not used in a "large-scale" degreasing operation such as cold cleaning or vapor degreasing. Large-scale degreasing operations were not conducted in the SM and R Buildings, and therefore, EPA HWN F001 is not assigned to this waste stream.

F003 constituents, including xylene, acetone, ethyl acetate, ethyl benzene, ethyl ether, methyl isobutyl ketone, n-butyl alcohol, cyclohexanone, and methanol were also used in the SM and R Buildings. These solvents are listed solely as ignitable in the liquid form. The waste stream does not exhibit the characteristic of ignitability because it is not liquid; therefore, F003 is not assigned.

The following F-listed constituents contaminate the waste and are applied:

(F002)
Chlorobenzene, ortho-dichlorobenzene, methylene chloride, tetrachloroethylene, 1,1,1 trichloroethane, 1,1,2-trichloroethane, trichloroethylene, 1,1,2-trichloro-1,2,2 trifluoroethane (Freon 113)

(F004)
Nitrobenzene

(F005)
Carbon disulfide, 2-ethoxyethanol, isobutanol, methyl ethyl ketone, 2-nitropropane, pyridine, toluene

U, K, and P-Listed Waste

Waste stream SR-MD-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).

EPA hazardous waste number P015, beryllium powder, was listed for Material Type Code 811 (Reference I011). Material Type Code 811 is sludge material that did not dissolve by normal recovery processing and is not present in this waste stream. Beryllium and beryllium compounds contaminate this waste stream. 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 had several uses in the laboratory. The review of the AK source documentation did not identify the disposal of unused hydrofluoric acid (U134) or disposal of materials contaminated with spills of this acid; therefore, the EPA HWN U134 is not assigned to waste stream SR-MD-PAD1.

Waste stream SR-MD-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-MD-PAD1 is not assigned any U-, K-, or P-Listed EPA HWNs.

Headspace Gas/Volatile Organic Compound Information

Headspace gas sampling was performed on 10 randomly selected containers in this waste stream. No UCL_{90} values exceeded respective target analyte Program Required Quantification Limits. No tentatively identified compounds were identified in this lot. No new EPA hazardous waste numbers were assigned as a consequence of headspace gas sampling and analysis. The specifics of this information are included in the attached Characterization Information Summary report.

Other Waste Streams Generated from the Same Building and Processes

Waste in SR-MD-PAD1 is similar to SR-MD-HET in that both waste streams include waste from SM and R Building D&D. However, waste from SR-MD-HET is primarily from D&D, while waste from SR-MD-PAD1 is primarily from processing. Waste from SR-MD-PAD1 includes material from the initial D&D of SM Building which began in August 1968 and ceased in August 1972. Waste stream SR-MD-HET includes material from the later D&D of several buildings, which SM and R Buildings are included, from approximately 1978 through 2005.

Conclusion

The EPA hazardous waste numbers that apply to the waste stream are D004, D005, D006, D007, D008, D009, D010, D011, D019, D022, D027, D028, D029, D030, D032, D034, D037, D043, F002, F004, and F005.

Polychlorinated Biphenyls (PCBs)

This waste stream contains PCBs greater than 50 parts-per-million (ppm) and is, therefore, regulated as a Toxic Substances Control Act (TSCA) waste under 40 CFR 761. The primary source for PCBs in this waste stream is from painted surfaces. According to 40 CFR 761.50, materials with painted surfaces are considered PCB bulk product waste if the PCBs were added to the paint during its manufacture. Because PCB use in manufacturing was not banned until 1979, it is assumed that paint from Mound contains PCBs greater than 50 ppm.

Service piping in SM Building was contaminated from past spills in the building. The contamination was affixed to the piping with several coats of paint (Reference U016). The inside of ductwork was painted using flat latex wall paint for contamination control during D&D. Although not certain, stainless-steel glovebox exteriors may also have been painted. Analytical gloveboxes constructed of Plexiglas would become contaminated so the interiors were covered with epoxy paint (References C036, C037, and C039). Waste items too large to fit into a can (e.g., piping) were packaged directly into drums labeled WD for whole drum. There are 201 drums labeled WD. Gloveboxes are packaged into plywood boxes. There are 12 plywood boxes described as containing hoods or hood fronts (the terms hood and glovebox were used interchangeably). (References C036, C037, C039, and U015).

Another common source for PCBs is fluorescent light ballasts. Light fixtures were mounted outside of gloveboxes, and since the materials in this waste stream were sent to SRS for recovery, ballasts are not expected (References C003 and C005). RTR and/or VE will determine if any of the containers include fluorescent light ballasts.

One other possible source of PCBs is from oil-containing equipment (e.g., presses). Liquids were removed from equipment but may not have been completely flushed so there could be some residual oil remaining in equipment (References C020, C036, C037, C039, P119, and U015). There are five plywood boxes described as containing a press, hood press, or Carver press. Any of these presses containing residual liquid are prohibited from WIPP disposal until the liquids have been completely flushed.

Containers with PCB waste, identified during RTR and/or VE, will be managed in accordance with the PCB disposal requirements in the Waste Isolation Pilot Plant-Waste Acceptance Criteria.

Prohibited Items

The absence of prohibited items is determined and documented through acceptable knowledge and confirmation activities. Radiography (RTR) or visual examination (VE) is performed on each container in this waste stream as a confirmation activity. The following items have been determined as not present in the waste:

- Liquid waste
- Non-radioactive pyrophoric materials
- Non-mixed hazardous wastes
- 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 B-8 of the WIPP Hazardous Waste Facility Permit, unless specifically approved through a Class 3 permit modification.
- Any waste container from a waste stream (or waste stream lot) which has not undergone either radiographic or visual examination of a statistically representative subpopulation of the waste stream in each shipment, as described in the WIPP Hazardous Waste Facility Permit, Attachment B7.

Each container of waste is certified and shipped only after VE or RTR:

- Did not identify any prohibited items in the waste container, or
  All prohibited items found in a waste container by VE or RTR 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 Lot 1 of this waste stream were characterized using RTR. RTR and VE are the acceptable characterization methods for S5000 waste. RTR meets all of the Data Quality Objectives for NDE of S5000 waste.

Method for Determining Waste Material Parameter Weights per Unit of Waste

To estimate the Waste Material Parameters (WMPs) for waste stream SR-MD-PAD1, container descriptions from a Mound Pad 1 Inventory were evaluated by Content Codes. This inventory, which is the only information available for the Mound drums and boxes, gives general waste descriptions and volumes on a drum-by-drum basis. However, of the 739 drums and 39 boxes, only 29 of the boxes had any information on the container's weight. To estimate WMPs for waste stream SR-MD-PAD1, the Content Codes were assigned to one of the WMP Descriptions. For example, if the Content Code for a drum was given as 801 – Combustibles (e.g., wood, rags, paper, cartons), the drum was assigned the WMP Description of Cellulosics. To account for the difference in the weight of different types of materials, the volume of the drum was multiplied by the density of the type of material in the drum to get an estimate of the weight of the drums. The WMPs, average weight percent, and weight percent range are presented in Table 2.

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

Waste Material Parameter	Weight Percent	Weight Percent Range
Iron-based Metals/Alloys	35.3%	0% – 100%
Aluminum-based Metals/Alloys	0.1%	0% – 100%
Other Metals	45.2%	0% – 100%
Other Inorganic Materials	14.4%	0% – 100%
Cellulosics	3.6%	0% – 100%
Plastics (waste materials)	0.9%	0% – 100%
Rubber	0.5%	0% – 29%
Organic Matrix	<0.1%	0% – 7%
Inorganic Matrix	<0.1%	0% – 2%
Soils/Gravel	<0.1%	0% – <0.1%

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 code and they are consistent.

Beryllium

Beryllium will not be present in amounts greater than 1% by weight of the waste in each container and will be less than 18.14 kilograms in any SWB.

Radionuclide Information

According to available radiological data, Pu-238 is the most prevalent radionuclide by mass, and Pu-239 is the second most prevalent radionuclide by mass. However, the radiological data has not been decay-corrected. U-234 will be present in significant quantities due to the decay of Pu-238. Based on decay correction of the heat source plutonium isotopic composition, Pu-238 will continue to be the most prevalent radionuclide by mass, but U-234 will be the second most prevalent radionuclide by mass. The isotopes expected to be present in this waste can be found in Table 3, Radionuclides in Waste Stream SR-MD-PAD1.

Table 3 – Summary of Radionuclides in Waste Stream SR-MD-PAD1

WIPP Tracked	Other Radionuclides Present
Am-241	Th-230
Pu-238	Np-237
Pu-239	Pu-236
Pu-240	Pu-241
Pu-242	
U-234	
U-233	
U-238	
Cs-137	
Sr-90	

Payload management will not be implemented for this waste stream.

Attachment 1 - AK SOURCE DOCUMENTS, SUPPLEMENTAL DOCUMENTATION

Source Document Number	[illegible]	Title	Document Number	Revision	Date
C003	S7	Interview with Bill Franz	NA	NA	3/4/2003
C005	S7	Interview/Dan Hopkins	NA	NA	NA
C007	S7	Interview with Dr. Bernie Kokenge	NA	NA	4/24/2003
C008	S2, S7	Interview with Toby Elswick	NA	NA	5/13/2003
C010	S7	Interview/Clyde Chong	NA	NA	5/15/2003
C011	S7	Interview/Ron Goss	NA	NA	04/22/2003, 05/21/2003
C012	S7	Interview/Bill Davis	NA	NA	4/25/2003
C016	S7	Interview/Ron Saun	NA	NA	6/4/2003
C019	NA	Interview/Mike Deaton	NA	NA	6/5/2003
C020	S2, S7	Record of Communication Don Luthey	NA	NA	6/10/2003
C036	NA	Interview with Don Luthey	NA	NA	2/02/2005
C037	S7	Interview with Bill Davis and Ron Saun	NA	NA	2/02/2005
C038	S7	Interview with Dick Blauvelt	NA	NA	1/03/2005
C039	S7	Interview with Toby Elswick	NA	NA	2/14/2005
I011	S8, S9	EPA Hazardous Waste Codes found in INEL Stored TRU Waste Content Code	NA	NA	NA
I090	NA	OPERABLE UNIT 9, SITE SCOPING REPORT; VOLUME 7 - WASTE MANAGEMENT (OU9)	NA	Revision 0	2/1993
M004	S13	"Summary Report on Mound Boxes," E-mail to KellyCR@wipp.carlsbad.nm.us [Clint Kelley]	NA	NA	3/31/2000
M017	S13	E-mail to HERTFR@doe-md.gov, Re: Emailing: space-desc [Office of Space and Defense Power System]	NA	NA	2/1/2002
M053	S13	Letter to J.E. Conaway, Re: Storage at the Burial Ground of Mound Laboratory Plutonium 238 Scrap	NA	NA	4/10/1970
P020	NA	Characterization of Mounds Hazardous, Radioactive, and Mixed Waste	MLM-ML-90-48-0001	NA	8/15/1990
P036	S3	Hazard Evaluation of the Special Metallurgical (SM) Building at Mound Laboratory	MLM-MU-76-66-0001	NA	8/6/1976
P058	NA	Mound Site Waste Management Reports and Site Plans 1977-1980	NA	NA	6/1/1977
P065	S13	Mound WIPP Certification Program for Newly Generated Contact Handled (CH) Transuranic Waste	MD-10203	Issues 1,2 excerpts,3,5 & 6	6/1/1985, 6/10/1986, 9/1/1988, 4/14/1989
P095	S10	List and directory of chemicals MSDSs	NA	NA	Various
P096	S6	1996 and 1998 Chemical Inventory and 1991 Carcinogen list.	NA	NA	1996, 1998, 1991
P119	S2, S7	Technical Manual MD-20734 Plutonium Processing-Material Control	MD-20734	Revision 4	9/15/1973
U007	NA	Content Code Assessments for INEL Contact Handled Stored TRU Waste	WM-F1-82-021	NA	Oct-1982

Source Document Number	AK #	Title	Document Number	Revision	Date
U015	NA	Memorandum to E.L. Albenesius, Re: Description of Mound and LASL Solid Pu-238 Waste Stored at SRP	DPST-81-647	NA	9/18/1979
U016	NA	Decommissioning of the Special Metallurgical Building at Mound Laboratory	MLM-2139 (OP)	NA	NA

Alphanumeric Designations

C	Correspondence
DR	Discrepancy Resolution
I	Internal Procedures and Notes
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
S13	Other
NA	Not applicable