Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221
November 16, 2010

NOV 2010

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

Subject: Review of Central Characterization Project – Idaho National Laboratory Waste Stream Profile Form, ID-GEVNC-02, Hot Cell Debris Waste

Dear Mr. Bearzi:

The Department of Energy Carlsbad Field Office (CBFO) has approved the Waste Stream Profile Form (WSPF), ID-GEVNC-02, Hot Cell Debris Waste.

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

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

Sincerely,

Edward Ziemianski
Acting Manager

Enclosure

cc: w/enclosure

S. Zappe, NMED	*ED
CBFO M&RC	

cc: w/o enclosure

J. Kieling, NMED	ED
J.R. Stoble, CBFO	ED
G. Basabilvazo, CBFO	ED
N. Castaneda, CBFO	ED
C. Fesmire, CBFO	ED
C. Gadbury, CBFO	ED
S. McCauslin, CBFO	ED
K. Watson, CBFO	ED
W. Ledford, CTAC	ED
P. Gilbert, LANL	ED
G. Lyshik	ED
C. Walker, Techlaw	ED

*ED denotes electronic distribution

101126

CBFO:NTP:JRS:MDA:10-2011:UFC 5900.00

Attachment 2 – CCP Waste Stream Profile Form

(1) Waste Stream Profile Number: ID-GEVNC-02				
(2) Generator site name: Idaho National Laboratory		(4)Technical contact: Jim Vernon		
(3) Generator site EPA ID: ID4890008952		(6) Technical contact phone number: 575-234-7141		
(5) Date of audit report approval by New Mexico Environment Department (NMED): September 19, 2005, June 29, 2006; August 6, 2007, September 22, 2008, September 11, 2009, October 20, 2010				
(7) Title, version number, and date of documents used for WAP Certification: CCP-PO-001, CCP Transuranic Waste Characterization Quality Assurance Project Plan, Revison18 June 30, 2010 CCP-PO-002, CCP Transuranic Waste Certification Plan, Revision 24, June 30, 2010 CCP-PO-024, CCP/INL Interface Document, Revision 9 March 16, 2009				
(8) Did your facility generate this waste?	YES		NO	X
(9) If no, provide the name and EPA ID of the original generator: General Electric Vallecitos Nuclear Center CAL000327615				
Waste Stream Information[1]				
(10) WIPP ID: VN-GEVNC.02[3]		(11) Summary Category Group: S5000		
(12) Waste Matrix Code Group: Heterogeneous Debris Waste		(13) Waste Stream Name: Hot Cell Debris Waste		
(14) Description from the TWBIR: This waste will be generated from refurbishment of an alpha high-level hot cell.				
(15) Defense TRU Waste:	YES	X	NO	
(16) Check One:	CH	X	RH	
(17) Number of SWBs NA	(18) Number of Drums 6		(19) Number of Canisters NA	
(20) Batch Data Report numbers supporting this waste stream characterization: See Characterization Information Summary for correlation of containers identification numbers to batch data report numbers				
(21) List applicable EPA Hazardous Waste Numbers:[2] D007,D008,D009,F002 and F005				
(22) Applicable TRUCON Content Numbers: SQ 125				
(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- INL-019, Revision 0, July 15, 2010 Figures 1,2,3 and 8				
(23B) Facility mission description: CCP-AK- INL-019, Revision 0, July 15, 2010 Section 4.3				
(23C) Description of operations that generate waste: CCP-AK- INL-019, Revision 0, July 15, 2010 Section 4.5				
(23D) Waste identification/categorization schemes: CCP-AK- INL-019, Revision 0, July 15, 2010 4.6.2				
(23E) Types and quantities of waste generated: CCP-AK- INL-019, Revision 0, July 15, 2010 Section 4.6.1				
(23F) Correlation of waste streams generated from the same building and process, as applicable: CCP-AK- INL-019, Revision 0, July 15, 2010 Section 4.6.3				
(24) Waste certification procedures: CCP-TP-030, Revision 28, May12, 2010				
(25)Required Waste Stream Information				
(25A) Area(s) and building(s) from which the waste stream was generated: CCP-AK- INL-019, Revision 0, July 15, 2010 Section 5.1				
(25B) Waste stream volume and time period of generation: CCP-AK- INL-019, Revision 0, July 15, 2010 Section 5.2				

(25C) Waste generating process description for each building: CCP-AK- INL-019, Revision 0, July 15, 2010 Sections 4.5 and 5.3			
(25D) Waste Process flow diagrams: CCP-AK- INL-019, Revision 0, July 15, 2010 Figures 9 and 10			
(25E) Material inputs or other information identifying chemical/radionuclide content and physical waste form: CCP-AK- INL-019, Revision 0, July 15, 2010 Section 5.4			
(25F) Waste Material Parameter Weight Estimates per unit of waste: Table 2 of the Summation of Aspects of AK Summary Report: ID-GEVNC-02			
(26) Which Defense Activity generated the waste: (check one)[4]			
	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: See S1 AK#s on Attachment 1 to Summation of Aspects of AK			
(27B) Standard operating procedures: See S2 AK#s on Attachment 1 to Summation of Aspects of AK			
(27C) Safety Analysis Reports: See S3 AK#s on Attachment 1 to Summation of Aspects of AK			
(27D) Waste packaging logs: See S4 AK#s on Attachment 1 to Summation of Aspects of AK			
(27E) Test plans/research project reports: See S5 AK#s on Attachment 1 to Summation of Aspects of AK			
(27F) Site databases: See S6 AK#s on Attachment 1 to Summation of Aspects of AK			
(27G) Information from site personnel: See S7 AK#s on Attachment 1 to Summation of Aspects of AK			
(27H) Standard industry documents: See S8 AK#s on Attachment 1 to Summation of Aspects of AK			
(27I) Previous analytical data: See S9 AK#s on Attachment 1 to Summation of Aspects of AK			
(27J) Material safety data sheets: See S10 AK#s on Attachment 1 to Summation of Aspects of AK			
(27K) Sampling and analysis data from comparable/surrogate Waste: See S12 AK#s on Attachment 1 to Summation of Aspects of AK			
(27L) Laboratory notebooks: See S11 AK#s on Attachment 1 to Summation of Aspects of AK			
Confirmation Information[2]			
For the following, when applicable, enter procedure title(s), number(s) and date(s)			
(28)	Radiography: See procedures listed on the attached CIS, CCP-TP-053, Revision 8, 6/30/10		
(29)	Visual Examination: N/A		

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

Reviewed by AK Expert: **YES** [X] **Date:** **10-15-2010**

Reviewed by STR (if necessary): **YES** [X] **N/A** [ ] **Date:** **10-18-2010**

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) Jim Vernon	(33) 11-4-2010
Signature of Site Project Manager	Printed Name	Date

NOTE: (1) Use back of sheet or continuation sheets, if required.
(2) If, radiography, visual examination were used to confirm EPA Hazardous Waste Numbers, attach signed Characterization Information Summary documenting this determination.
(3) This Waste does not currently have an INL specific Annual Transuranic Waste Inventory Report. identification number. The number listed corresponds to the GEVNC waste stream identified in DOE/TRU-09-3425, Annual Transuranic Waste Inventory Report-2009."
(4) This waste was also generated by the following defense activity: Naval reactors development.

CHARACTERIZATION INFORMATION SUMMARY

WSPF # ID-GEVNC-02

Lot 1

TABLE OF CONTENTS

CCP Characterization Information Summary Cover Page

Waste Stream #	ID-GEVNC-02	Lot #:	1
AK Expert Review:	N/A	Date:	N/A
SPM Review:	Jim Vernon	Date:	11/9/2010

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:

Real-Time Radiography (RTR):

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

Non Destructive Assay (NDA):

CCP-TP-109	Rev. 6	03/16/09	CCP Data Reviewing, Validating, and Reporting Procedure
CCP-TP-115	Rev. 4	06/24/09	CCP SWEPP Gamma-Ray Spectrometer (SGRS) Operating Procedure

Headspace Gas Analysis:

CCP-TP-093	Rev. 13	03/19/07	CCP Sampling of TRU Waste Containers
CCP-TP-173	Rev. 1	09/30/09	CCP Analysis of Gas Samples for VOCs by GC/FID
CCP-TP-175	Rev. 1	03/29/10	CCP Analysis of Gas Samples for VOCs by GC/MS

Project Level Data Validation / DQO Reconciliation:

CCP-TP-001	Rev. 18	08/09/10	CCP Project Level Data Validation and Verification
CCP-TP-002	Rev. 22	06/30/10	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-005	Rev. 19	07/06/10	CCP Acceptable Knowledge Documentation
CCP-TP-030	Rev. 28	05/12/10	CCP CH TRU Waste Certification and WWIS/WDS Data Entry

WAP Certification:

CCP-PO-001	Rev. 18	06/30/10	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-001	Rev. 16	10/31/07	CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-002	Rev. 24	06/30/10	CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 23	04/07/10	CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 22	01/12/10	CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 21	01/26/09	CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 20	11/02/07	CCP Transuranic Waste Certification Plan

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # ID-GEVNC-02 Lot # 1

Container ID Number	Alternate Container ID	NDA BDR	RTR BDR	Solids Sampling BDR	Solids Analytical BDR	Load Management/ Overpack Yes	Headspace Gas BDR			
							Sample	Analysis		
GE001	10367527	INNDAS100127	INRTR5100023	N/A	N/A	N/A	INHSGS100005	IN10FG1026	ECL10022G	ECL10022M
GE002	10367526	INNDAS100146	INRTR5100023	N/A	N/A	N/A	INHSGS100005	IN10FG1026	ECL10022G	ECL10022M
GE098	10367528	INNDAS100127	INRTR5100023	N/A	N/A	N/A	INHSGS100005	IN10FG1026	ECL10022G	ECL10022M
GE117[a]	10367533	N/A	N/A	N/A	N/A	N/A	INHSGS100005	IN10FG1026	ECL10022G	ECL10022M
GE125	10367534	INNDAS100146	INRTR5100023	N/A	N/A	N/A	INHSGS100005	IN10FG1026	ECL10022G	ECL10022M
GE142	10367525	INNDAS100146	INRTR5100023	N/A	N/A	N/A	INHSGS100005	IN10FG1026	ECL10022G	ECL10022M
GE147	10367529	INNDAS100127	INRTR5100023	N/A	N/A	N/A	INHSGS100005	IN10FG1026	ECL10022G	ECL10022M

[a] This container is included only as it was required to be sampled to meet RCRA requirements and CCP-PO-001, section B2-1b requirements for HSG sampling and analysis. This container's TRU Alpha Activity Concentration is less than 100 nCi/g and will not be certified for shipment.

Signature of Site Project Manager

Jim Vernon
Printed Name

11/9/2010
Date

CCP Headspace Gas UCL_{90} Evaluation Form

WSPF #: ID-GEVNC-02 **Waste Stream 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
Acetone	SQRT	5	7	3.6056	1.8420	1.3105	2.5551	100	10.0000		
Benzene	Log	0	7	-2.4079	-3.4218	0.4475	-3.1783	10	2.3026		
Bromoform	Log	0	7	-3.1236	-4.1365	0.4472	-3.8931	10	2.3026		
Butanol	SQRT	3	7	0.7681	0.4337	0.1994	0.5422	100	10.0000		
Carbon Disulfide[a]	Log	6	7	0.2624	-1.0643	1.1319	-0.4484	10	2.3026		
Carbon Tetrachloride	SQRT	5	7	0.2950	0.2053	0.0508	0.2329	10	3.1623		
Chlorobenzene	Log	0	7	-2.7334	-3.7331	0.4413	-3.4930	10	2.3026		
Chloroform	Log	1	7	-2.7334	-3.6142	0.4941	-3.3453	10	2.3026		
Chloromethane[a]	Log	0	7	-2.3026	-3.3043	0.4420	-3.0637	10	2.3026		
Cyclohexane[a]	Log	0	7	-2.1203	-3.1464	0.4528	-2.9000	10	2.3026		
1,1-Dichloroethane	Log	0	7	-2.1628	-3.1991	0.4572	-2.9503	10	2.3026		
1,2-Dichloroethane	Log	0	7	-2.2538	-3.2928	0.4586	-3.0432	10	2.3026		
1,1-Dichloroethylene	Log	0	7	-2.2073	-3.2075	0.4414	-2.9673	10	2.3026		
cis-1,2-Dichloroethylene	Log	0	7	-2.5903	-3.5974	0.4446	-3.3555	10	2.3026		
trans-1,2-Dichloroethylene	Log	0	7	-1.9310	-2.9373	0.4441	-2.6956	10	2.3026		
1,2-Dichloropropane[a]	Log	0	7	-2.5257	-3.5668	0.4593	-3.3168	10	2.3026		
Ethyl benzene	Log	0	7	-2.4079	-3.4270	0.4498	-3.1822	10	2.3026		
Ethyl Ether	Log	0	7	-1.8643	-2.8964	0.4555	-2.6486	100	4.6052		
Methanol	No	0	7	8.0000	7.5714	0.1890	7.6743	100	N/A		
Methyl Ethyl Ketone	Log	4	7	0.5306	-1.0845	1.4425	-0.2996	100	4.6052		
Methyl Isobutyl Ketone	No	3	7	0.6600	0.2210	0.2541	0.3593	100	N/A		
Methylene Chloride	Log	0	7	-2.2538	-3.2658	0.4467	-3.0227	10	2.3026		
1,1,2,2-Tetrachloroethane	Log	0	7	-3.0900	-4.1057	0.4485	-3.8616	10	2.3026		
Tetrachloroethylene	Log	0	7	-2.7334	-3.7691	0.4571	-3.5204	10	2.3026		
Toluene	Log	5	7	1.0296	-0.8370	1.7878	0.1359	10	2.3026		
1,1,1-Trichloroethane	Log	7	7	-2.3434	-2.9139	0.3813	-2.7064	10	2.3026		
Trichoroethylene	Log	0	7	-2.4651	-3.4916	0.4530	-3.2451	10	2.3026		
Trichlorofluoromethane[a]	Log	0	7	-2.5903	-3.6319	0.4597	-3.3818	10	2.3026		
1,1,2-Trichloro-1,2,2-trifluoroethane	No	6	7	0.0560	0.0465	0.0060	0.0498	10	N/A		

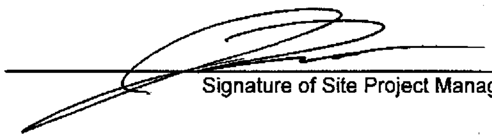
WSPF #:	ID-GEVNC-02						**Waste Stream Lot Number**		1 through 1			
ANALYTE	Transform Data Used (No, Data-Log, SQRT, other)	# Samples above MDL (1)	# Samples	Maximum (ppmv)	Mean (ppmv)	SD (ppmv)	UCL_{90} (ppmv)	PRQL (ppmv)	Transformed PRQL (N/A or Value)	UCL_{90} > PRQL Yes	EPA Code
1,3,5-Trimethylbenzene[a]	Log	0	7	-2.3026	-3.3182	0.4482	-3.0743	10	2.3026		
1,2,4-Trimethylbenzene[a]	Log	0	7	-2.3539	-3.3910	0.4578	-3.1419	10	2.3026		
m/p-Xylene[b]	SQRT	3	7	0.4123	0.2326	0.1055	0.2900	10	3.1623		
o-Xylene	SQRT	2	7	0.4000	0.2319	0.0991	0.2859	10	3.1623		

[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."

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.)



Signature of Site Project Manager

Jim Vernon
Printed Name

11/9/2010
Date

CCP Headspace Gas Summary Data

Waste Stream Number ID-GEVNC-02 Lot Number (s) 1 through 1

Tentatively Identified Compound	Maximum Observed Estimated Concentrations (ppmv)	# Samples Containing TIC	% Detected
2-Methyl-1-propanol	0.63	1	14.29%

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 11/9/2010

CCP RTR/VE Summary of Prohibited Items and AK Confirmation

Waste Stream Number: ID-GEVNC-02 Lot(s)#: 1

Container Number	RTR Prohibited Items [a, b]	Visual Examination Prohibited Items [a, b]
See correlation of container ID numbers for list of remaining drum numbers in this Lot.	None of the containers in this lot had prohibited items identified during RTR Examination.	No Containers in this lot were processed through Visual Examination

a. See Batch Data Reports

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

Justification for the selection of RTR and/or VE: RTR was selected as the characterization method for this lot because the waste containers were previously packaged and RTR is an acceptable characterization method to meet all the Data Quality Objectives for NDE of waste stream ID-GEVNC-02.

Site Project Manager Signature	Printed Name	Date
[signature]	Jim Vernon	11/9/2010

CCP Reconciliation with Data Quality Objectives

WSPF# ID-GEVNC-02 Lot # 1

Sampling Completeness

RTR:

Number of Valid Samples: 6 Number of Total Samples Analyzed: 6

Percent Complete: 100 (QAO is 100%)

NDA

Number of Valid Samples: 6 Number of Total Samples Analyzed: 6

Percent Complete: 100 (QAO is 100%)

HSG

Number of Valid Samples: 7 Number of Total Samples collected: 7

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%)

Total SVOC

Number of Valid Samples: NA Number of Total Samples collected: 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%)

CCP Reconciliation with Data Quality Objectives

WSPF# ID-GEVNC-02 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 HWNs were assigned as required. Samples were randomly collected.
7c	NA	Mean concentrations, (UCL_{90}) values for the mean concentration, standard deviations, and the number of samples collected for total metals were calculated and compared with the program required quantitation limits and regulatory thresholds, as reported in the Characterization Information Summary, CCP-TP-003 Attachment 6, and additional EPA HWNs were assigned as required. Samples were randomly collected.

CCP Reconciliation with Data Quality Objectives

WSPF# ID-GEVNC-02 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.

	Completeness	Comparability	Representativeness
Radiography	Y	Y	Y
VE	N/A	N/A	N/A
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:

Signature of Site Project Manager	Printed Name	Date
[signature]	Jim Vernon	11/9/2010

SUMMATION OF ASPECTS OF AK SUMMARY REPORT: WASTE STREAM ID-GEVNC-02

Overview

Waste stream ID-GEVNC-02 is contact-handled (CH) transuranic (TRU) heterogeneous debris waste generated at the General Electric Vallecitos Nuclear Center (GEVNC) in Hot Cell 4, Building 102. GEVNC is located in Sunol, California. The waste is currently stored at Idaho National Laboratory (INL) in the Radioactive Waste Management Complex. The GEVNC hot cells were built in 1958 for post-irradiation examination (PIE) work with uranium fuel and reactor components. Hot Cell 4 was used for government-sponsored work as early as 1965. Between 1965 and 1967, the hot cell was decontaminated and a stainless-steel enclosure was installed to allow work with plutonium and mixed oxide (MOX) fuel to be conducted. From the late 1960s through the late 1970s research was performed with MOX fuel from the Liquid Metal Fast Breeder Reactor (LMFBR) program. Hot Cell 4 was designed to accommodate nondestructive examinations (NDEs) on fuel rods and destructive examinations on fuel rods that had failed. Other work involved source manufacture and waste stabilization studies. Work in Hot Cell 4 associated with the DOE ceased in 1982. Since that time, Hot Cell 4 has been infrequently used for source production. All of the waste in this waste stream was generated from operations associated with the decontamination of the Building 102 Hot Cell 4 conducted from 2008 through 2009. These operations involved the size reduction and packaging of debris and equipment in the cell and the repackaging of waste packaged by historic operations.

Waste stream ID-GEVNC-02 was generated by atomic energy defense activities listed in Section 10101(3) of the Nuclear Waste Policy Act of 1982 (NWPA). A variety of defense-related research activities were conducted in Hot Cell 4. Based on the review of available documentation, TRU wastes generated by Hot Cell 4 operations are contaminated with materials from defense activities naval reactors development, and defense research and development (R&D) activities. Therefore the waste is defense related.

This Summation of Aspects of the AK Summary Report includes information to support Waste Stream Profile Form (WSPF) number ID-GEVNC-02 for CH TRU heterogeneous debris. The primary source of information for this summation is CCP-AK-INL-019, *Central Characterization Project Acceptable Knowledge Summary Report for Idaho National Laboratory, General Electric Vallecitos Nuclear Center Hot Cell Debris Waste, Waste Stream: ID-GEVNC-02*, Revision 0, July 15, 2010. CCP-AK-INL-019 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
1

Waste Stream Name:	Hot Cell Debris Waste
Waste Stream Number:	ID-GEVNC-02
Site Where TRU Waste Was Generated:	General Electric Vallecitos Nuclear Center
Site Where TRU Waste Is Currently Stored:	Idaho National Laboratory
Facility Where TRU Waste Was Generated:	Hot Cell 4, Building 102
Waste Stream Volume – Current:	6 55-gallon drums
Waste Stream Volume – Projected:	0 containers
Dates of Waste Generation:	October 2008 – December 2009
TRUPACT-II Content code (TRUCON):	SQ 125
Summary Category Group	S5000- Debris Waste
Waste Matrix Code:	S5400, Heterogeneous Debris
Waste Matrix Code Group	Heterogeneous Debris Waste
Waste Stream ATWIR Identification:	VN-GEVNC.02[1]
RCRA EPA Hazardous Waste Numbers:	D007, D008, D009, F002, and F005

Waste Stream Description and Physical Form

Waste stream ID-GEVNC-02 is comprised primarily of decontamination debris including used high efficiency particulate air (HEPA) filters, pre-filters, respirator filters, hot cell equipment, materials used during examinations, and materials generated during the decontamination activities such as wipes. Organic debris materials identified from review of AK documentation include filter media, wipes, paper, cotton personal protective equipment (PPE), coveralls, shoe covers, cloth hoods, leather gloves, Masselin cloth, cotton absorbent pads and swabs, tape, paper sheeting, wood pieces, vacuum bags, nalgene bottles, plastic (manipulator boots, bags, pieces, funnels, sheeting, tubing, PPE), nylon rope, nylon cloth, Lucite containers, scouring pads, Plexiglas, poly vinyl chloride (PVC) pipe, rubber filter components (gaskets), rubber (hoses, caps, tubing, gloves, booties), and electrical wire insulation. Inorganic debris identified includes glass, lab glassware such as pipettes and beakers, glass tubes, fire blankets, insulation fiberglass, Oil-Dri, scabbling and concrete debris, vials, aluminum and tin filter components, aluminum (tubing, pans, storage racks), stainless-steel puncture blocks, drill bits, Variacs (variable transformers or rheostats), hot plates, empty one-gallon paint-type cans, metal containers, air-actuated motor, pump, electrical cords, lathe, electric motors, fire extinguisher bodies, ultrasonic tanks, grinders, saber saws, saw-zalls, hand tools, crowbar, c-clamps, hose clamps, Swagelok fittings, storage box, bicycle chain chainfall, hot cell equipment including Whirlmet-Automet (for metallurgical sample preparation), the metallograph enclosure, syntron (vibratory polisher), lathe-profilometer, vacuum, slitter, fission gas puncture apparatus, waste

[1] This waste does not currently have an INL specific ATWIR identification number. The number listed above corresponds to the GEVNC waste stream identified in DOE/TRU-09-3425, *Annual Transuranic Waste Inventory Report – 2009.*

compactor, monorail crane, hoist, pneumatic trolley, shelving, chain, I-beam, light fixtures, cuttings, shavings, plasma torch tips, scabbler parts, jack hammer, buckets, lead, stainless-steel enclosure, ventilation materials, metal pieces, metal rings, metal plates, tubes, plugs, vice, and source capsules (small steel cylinders). Water-based non-hazardous sealer or fixative, such as Trewax Gold Label Sealer, was added to the waste to control contamination. Small quantities of abrasives residues (predominantly silicon carbide and diamond powder), and liquid waste (such as neutralized acids and bases, alcohols, lubricants, and solvents) absorbed in inorganic materials such as Drierite, Microcel (calcium silicate), cement or diatomaceous earth, or absorbed in Supersorb (a cellulose polymer), and solidified during historic operations may also be included. Water used for decontamination or fire suppression may have also been absorbed during packaging operations. Absorbed liquids are expected to be a minor contribution to the waste volume and any payload container consisting of more than 50 percent by volume homogeneous solids will be excluded from this waste stream.

The waste material that comprises waste stream ID-GEVNC-02 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 ID-GEVNC-02 was generated at the General Electric Vallecitos Nuclear Center in Sunol, CA. The waste is currently stored at INL.

Area and/or Buildings of Generation

Waste stream ID-GEVNC-02 was generated in Hot Cell 4 of the Radioactive Materials Laboratory (RML) in Building 102 of the GEVNC.

Generating Processes

Description of Waste Generating Processes

All of the waste described in this document was generated from operations associated with the decontamination of the Building 102 Hot Cell 4 conducted from 2008 through 2009. These operations involved the packaging of debris and equipment in the cell and the repackaging of waste packaged by historic operations. A plasma torch or grinder/sawzall was used to cut the stainless-steel enclosure and portions of the ventilation ducting free from the hot cell structure. Water was used to suppress hot sparks and as a fire suppression system during hot work. A portable hand-operated sprayer holding about two gallons of water (similar to those used for insecticide application), was used inside the hot cell. After use, the liquid was wiped up and the material allowed to dry before disposal. Decontamination efforts included the use of a water-based non-hazardous sealer (e.g., Trewax Gold Label Sealer) to control contamination.

Waste packaging was performed in Hot Cell 4. One-gallon cans that were packaged during historical operations were opened and repackaged. Items were removed from the hot cell without decontamination. Size reduction was performed only as needed to fit materials through the pass-out port; larger pieces of the steel enclosure and ventilation system were brought out through the cell door and staged for direct loading into a 55-gallon drum. Items were bagged out into a heat-sealed plastic tube which was then vented with a razor knife and placed directly into a 55-gallon drum.

To facilitate removal of larger items, the sphincter was removed. Items were staged in the interlock; however a secondary containment structure was used. Once the steel enclosure was removed the concrete surfaces of the hot cell were decontaminated using either a non-hazardous stripper or scabbling.

Hot Cell 4 was historically utilized for R&D operations in support of nuclear fuels, control rods, reactor structural materials, and reactor components and instrumentation development. The waste may include some materials originally generated from historical operations and repackaged as part of decontamination operations.

Historical Hot Cell 4 Operations

Due to the nature of the research conducted by GEVNC, it was necessary to construct a facility to conduct experiments to support the development of nuclear fuels, control rods, reactor structural materials, and reactor components and instrumentation. The Building 102 hot cells were constructed in 1958 to support this research.

The general sequence for PIE is NDE followed by destructive examination. NDE was not typically performed in Hot Cell 4 unless a fuel pin had failed. NDE includes VE, gamma scan, profilometry, macrophotography, eddy current testing, and autoradiography. Destructive examinations include fission gas sample, void volume determination, defueling, sectioning, fuel dissolution, preparing metmounts, and metallurgical examinations.

Once the material was inside the hot cells, several NDE techniques could be performed. Fuel assemblies would be dimensionally measured and photographed. Each rod was photographed, weighed, measured, and tested. The NDE could include material preparation (e.g., marking, cutting, and grinding), eddy current testing, profilometry, horizontal and vertical bow, fuel bulk density, and a gamma scan. Fission gases were collected and analyzed from a hole drilled in the cladding. Fuel rods were cut using a tubing cutter, splitter, or an abrasive wheel. Cladding should not be found in the hot cell; however, cladding residue contaminates the waste.

Rods were marked with paint or a black felt-tip pen for orientation when cutting, sectioning, or mounting met sample locations. Specimens (metmounts) of fuel rods were prepared by mechanical (dry) cutting and grinding techniques. The samples were mounted in Hysol resin (a two-part non-hazardous epoxy). Excess Hysol was reacted and allowed to dry prior to disposal. The metmounts were ground to the desired thickness; polished, washed (with alcohol or water), and acid-etched (such as nitric or oxalic acid) in Hot Cell 4 or 5. Specimens were then photographed using a Metallograph in Hot Cell 5. Metmount preparation generally involved vacuum potting in Hysol after sectioning. The specimen was then ground using silicon carbide lubricated with kerosene and cleaned with alcohol. Polishing was then performed using diamond paste and kerosene was used as a lubricant. The specimen was then macrographed (photographed). The metal capsules that contained the source material which was brought into the cell are expected to be found in the waste.

When fuel samples were dissolved in acids (such as nitric and hydrochloric), an off-gas scrubber procedure was used to neutralize the corrosive gases emitted. Ammonium hydroxide or sodium hydroxide was used to trap and neutralize the corrosive gases during dissolution of fuel, cladding, or isotope preparation.

A description of the Hot Cell 4 projects follows:

Decontamination of Hot Cell 4 and Installation of the Alpha Box

Hot Cell 4 was used for fuel rod examination as early as 1965. Later in 1965, the cell was decontaminated and the alpha box installation began. The alpha box was operational on April 30, 1967. The waste generated during decontamination and installation of the alpha box was removed and is not in this waste stream.

MOX Fast Breeder Fast Ceramic Reactor (FCR) Program

The FCR PIE process included removing and reacting sodium-potassium (NaK) found in the fuel pins with Dowanol (propylene glycol monomethyl ether) in Hot Cell 1 or 2, neutrography of the pin (or rod), fission gas sampling, length measurements, profile measurements, gamma scan, fuel dissolution for burn-up determinations using nitric acid, metmount preparation in Hysol resin, although one mount was in Bakelite (a plastic), and metallography. Metmount etching (using oxalic acid, a sulfuric acid/hydrogen peroxide solution, or a nitric acid/hydrogen peroxide solution) may have been performed in either Hot Cell 4 or 5, but was typically performed in Hot Cell 5.

During disassembly of FCR fuel pins, sodium-fuel reaction products were preserved in dehydrated kerosene or xylene (dehydrated with sodium), inerted with argon gas, and stored in Hot Cell 4. The specimens were mounted in Hysol resin (Hysol 2038 resin and Hysol 3418 hardener), ground with silicon-carbide paper lubricated with dehydrated kerosene, polished with diamond paste (also lubricated with dehydrated kerosene), cleaned with dehydrated xylene, and examined in Hot Cell 5. Mounted specimens were stored in an inerted container of dehydrated xylene. The back of the mounts were sealed with lead-backed tape.

Other pins which did not require the same preservation were also mounted in Hysol; ground with silicon-carbide; polished with diamond paste lubricated with kerosene, DYMO Thinner (an alcohol based lubricant), Monsanto HB-40 oil diluted with Freon TE, or water. The pins were cleaned using kerosene or isopropyl alcohol and etched with oxalic acid, a sulfuric acid/hydrogen peroxide solution, or a nitric acid/hydrogen peroxide solution prior to photographing. Etched samples were then cleaned with glyceregia (glycol, hydrochloric acid, and nitric acid solution). Other cleaning agents identified include xylene, methyl alcohol, isopropyl alcohol, ethanol, acetic acid, hydrochloric acid, hexane, and water.

The FCR program tested the dimensional behavior of MOX during irradiation and LMFBR defects. The fuel was typically a mix of PuO_2, and UO_2. In 1965, FCR materials were shipped to reactors such as Transient Reactor Test Facility (TREAT), Material Test Reactor (MTR), Experimental Breeder Reactor-II (EBR-II), and General Electric Test Reactor (GETR).

The Advanced Alloy Development program (ring ductility testing), was performed from 1972 to 1979 and involved cleaning cladding samples with Ajax, Comet or Boraxo, and then cleaning them with Linde Compound (an aluminum oxide polishing compound). The samples were then shipped – no destructive testing was performed.

Power Reactor and Nuclear Fuel Development Corporation (PNC)

PNC specialized in special breeder reactors and the Advanced Thermal Reactor. PNC contracted GEVNC to conduct PIE on fuel specimens.

Fermi

GEVNC metallographically prepared and examined cross sections from a PNC Fermi fuel pin irradiated in GETR. The pin was neutrographed; then transferred to Hot Cell 4 for the removal of the NaK coolant due to integrity issues. The fuel pin was cleaned with water, visually examined, and sampled for fission gasses. The collection of the fission gases involved bubbling argon through a solution of sodium hydroxide and sodium hydrogen sulfate. Four samples were collected from the fuel pin. The samples were potted in epoxy resin, ground on silicon carbide papers using water and polished using kerosene. The fuel was etched with nitric acid and hydrogen peroxide to show the grain structure. After completion of the visual inspection and sectioning, the Fermi samples and material were removed from Hot Cell 4, loaded into a cask and shipped to a different department.

GETR Failed Fuel Exams

From about 1968 through 1971, encapsulated fuel rods were irradiated in GETR to determine certain fuel characteristics. When the capsules and rods were examined, the cooling water in the capsules was removed, absorbed with cotton pads, compacted, and disposed. Absorbed cooling water is not anticipated in this waste stream. The chimney tube (a thin-walled tube inside the capsule and around the fuel rod), was removed after sectioning and analyzed using gamma scan.

GETR-S Toshiba

Four fuel pins identified as GETR-S Toshiba were examined and sectioned in Hot Cell 4.. The capsules were opened and the NaK reacted prior to transfer into Hot Cell 4. The fission gas was sampled and analyzed. The metmounts were then prepared and vacuum mounted in Hysol resin. After the completion of the project, the components were prepared for shipment back to the customer.

GETR-T

Examination of the fuel from GETR-T, a NaK cooled fast reactor, began in Hot Cell 2. Integrity of the fuel required transfer to Hot Cell 4 for examination. The NaK was drained from the capsule and reacted with a mixture of isobutyl alcohol and kerosene in can containing Metal-X (fire extinguishing media), for disposal. The capsule was then sliced to gain access to the fuel pins. During the process, residual NaK was reacted using several methods; reacted with air and then extinguished using argon, or by placing wet swabs on the exposed areas, or the NaK was reacted using isobutyl alcohol. Upon removal of the NaK, the capsule and associated hardware were immersed in Isobutyl alcohol to react remaining NaK. The reacted NaK was screened to collect fuel "crumbs" or chips. The fuel pins were cut, sectioned, and cleaned using xylene and kerosene. The samples were transferred to Hot Cell 5 for examination. Fuel pins, samples and chips were shipped back to the customer.

Big Rock Point Recycle Fuel

The Plutonium Recycle Demonstration Program (PRDP) studied the use of MOX in pressurized water reactors. A MOX core design was developed and fueled with MOX assemblies. This work involved experiments with ten MOX bundles from Big Rock Point Cycle 7. Four of the ten, including a suspected leaker, were shipped to GEVNC for PIE.

Big Rock Point Edison Electric Institute Destructive Exam

GEVNC experimented with MOX fuel in boiling water reactors. GEVNC performed PIE on rods irradiated at Big Rock Point, some of which failed and were examined in Hot Cell 4.

Additionally, three irradiated mixed oxide fuel rods from Oak Ridge National Laboratory (ORNL) were sent to GEVNC for destructive examination and testing. The testing included scanning electron microscopy analysis on fuel rods specimens. In addition, fission gas and fuel burnup analyses, fuel cladding evaluations, and other tests were performed.

Fuel rods were punctured and the fission gas was collected in Hot Cell 4. The gas samples were sent to the lab for analyses. The rods were then sectioned and the fuel ends were vacuum-potted in Hysol resin. Some of the sections were carbon coated. All sections were removed from cell 4 and transferred to other hot cells for additional testing and examination. After completion of the project all materials were returned to the ORNL.

Pacific Northwest Laboratory (PNL)

In 1970, GEVNC performed destructive examination and testing on two MOX fuel pins for the PNL. The pins were examined and sectioned in Hot Cell 4, but additional examination and testing was performed in other cells at the GEVNC. The sectioning process included removal and reaction of NaK using Dowanol. The pins were sectioned then "potted" to facilitate the visual inspection of the pin sections. Once inspected, the fuel pins were returned to the customer.

Fast Flux Test Facility (FFTF) Fuel Vendor Program

GEVNC participated in the FFTF Fuel Vendor program for the Hanford Engineering Development Laboratory (HEDL). PIE was performed including marking the rod orientation prior to sectioning, gamma scan, selected isotope scan, profilometry, and eddy current analysis. Samples were dissolved in nitric acid and hydrofluoric acid for burn up determinations.

PIE for PNC-Saxton (Japan)

The Saxton reactor was a pressurized water reactor that used MOX fuel rods. Two rods from the Saxton reactor were encapsulated and then irradiated at GETR. PIE was performed and included sectioning, burn-up determination, dissolution, cladding inspections, fission gas sampling, burst testing (using argon at high pressure), and tensile testing (glued samples with Technovit [a non-hazardous glue consisting of methyl-methacrylate, N,N.3,5-tetramethylanline, dibenzoyl peroxide]). Cladding residues contaminate the hot cell waste, but cladding is not included in the waste stream.

In 1972, GE performed burn-up analysis of fuel discharged in 1968. Samples were dissolved in nitric acid and hydrofluoric acid. Corrosive gases were scrubbed with a sodium hydroxide solution. Later experiments in GETR included encapsulated fuel similar to that used in the Saxton reactor. The fuel rod was neutrographed and destructively examined. The cladding was examined. Fission gas sampling, burst testing, and tensile testing were also performed.

GE-Knolls Atomic Power Laboratory (KAPL) Start Up Sources

Americium-beryllium neutron sources were made for KAPL at GEVNC. Americium-241 (Am-241) was was mixed with beryllium and in a stainless steel bar that was machined into a capsule. This source material was weighed, processed in a micromill, poured and pressed into the source body, welded, cleaned with nitric acid, neutralized with ammonium hydroxide, rinsed with water, and mechanically cleaned with a slurry alumina, then cleaned again with acetone. The source capsule was leak tested, dye penetrant tested, and finally cleaned with acetone. The metal capsules that contained the bulk source material are anticipated in the waste.

Americium, Beryllium, Curium (ABC) Sources

GEVNC produced sources for several clients using americium oxide and beryllium powder. Curium-242 was produced in GETR using Am-241. An ABC source is an Am-Be source that is irradiated in GETR.

1974 Southwest Experimental Fast Oxide Reactor (SEFOR)

GEVNC designed, constructed, operated, and decommissioned a fast breeder reactor in the late 1960s to demonstrate the safety characteristics of breeder reactors. SEFOR MOX fuel assemblies were sent to NTR for neutrography, returned to Hot Cell 4 and measured for length, profilometry, and PIE. Fuel assemblies were opened in Hot Cell 1, NaK reacted in isobutyl alcohol, photos were collected, and the rods were cleaned with acetone. The remaining NaK was neutralized with isobutyl alcohol. The rods were then wiped with acetic acid, fission gas sampled, burnup samples were prepared (using nitric acid, hydrofluoric acid, and sodium hydroxide), profilometry bow measurements collected, gamma scans made, extensometer measurements conducted, and the rods were sectioned for metmounts potted in Hysol resin.

Cs-137 Microsphere Sources

GEVNC manufactured cesium microspheres. A cesium chloride solution was coated onto a ceramic sphere and fired to affix the cesium to the sphere. Two campaigns were run but only one of them had activities in Hot Cell 4. The Cs-137 microspheres were prepared in Hot Cell 6 and packaged in Hot Cell 4 for subsequent return to the customer.

SYNROC-D for Lawrence Livermore National Laboratory (LLNL)

Hot Cell 4 was used to assist LLNL with studies in immobilization of high level defense waste, specifically the fabrication and testing of SYNROC-D materials. SYNROC-D is a titanate mineral powder that was mixed with plutonium and other radioactive materials to study radiological effects on waste matrices. The SYNROC-D material was doped with cesium or uranium to simulate oxidation states of plutonium, pelletized and tested. A pellet doped with plutonium was fabricated and tested to demonstrate the ability of the SYNROC-D material to absorb plutonium isotopes. The initial mixtures included U-238 powder and plutonium nitrate solutions. The plutonium fabrication was done in the Hot Cell 4.

Pellets from Hot Cell 4 and nonfissile pellets from LLNL were shipped to ORNL for irradiation. The pellets were returned to GEVNC for testing such as sectioning, cleaning with isopropyl and ethyl alcohol, and leach testing (using nitric or hydrochloric acid. Specimens were stored in lead pigs (which may be included in the waste stream). SYNROC-D program waste was returned to LLNL.

Cf-252 Sources

Hot Cell 4 was used to prepare Cf-252 sources. The sources consisted of a palladium-californium alloy cermet (ceramic/metallic composite) wire. The wire was cleaned with Dowanol. Sources were placed in a manganese sulfate water bath to activate the manganese, and stored in lead sheeting.

The wire was cut, weighed, and welded into small metal containers. Components were cleaned with ethyl alcohol and rinsed with acetone. The welds were leak-checked and alcohol bubble tested using Dowanol EB. The containers were then washed with acetone, helium leak tested, and polished with aluminum oxide. They were then cleaned with acetone, or washed with nitric acid and ammonium hydroxide, cleaned with an alumina slurry and rinsed with water. The Cf-252 sources were then removed from Hot Cell 4 for welding into an outer container, leak tested (liquid nitrogen and Dowanol), and washed with nitric acid and ammonium hydroxide, cleaned with an alumina slurry and washed again with water. The completed sources were calibrated using a manganese sulfate bath (activation by neutrons from the source).

This process of cleaning and sealing small capsules was also used to make irradiation capsules for experimental studies.

Non-Defense Am-Be Sources

GEVNC manufactured neutron test source assemblies. Am-241 oxide and beryllium powder were combined and welded into nested stainless steel capsules. The inner capsule welding was inspected using a dye penetrant test. The source was cleaned with nitric acid, neutralized with sodium hydroxide, cleaned with a slurry of alumina, and rinsed with water. The outer capsule was installed, welded, and leak-tested outside of Hot Cell 4.

GE Boiling Water Reactor Irradiation Capsules

GEVNC fabricated test capsules for a commercial utility Fabrication was similar to that performed for encapsulation of sources.

Maintenance Activities

GE conducted maintenance on the cells as needed. Manipulator boot repair and HEPA filter change-out were occasionally required. Lights were never replaced.

Table 1, Metal and Organic Toxicity Characteristic and F-Listed Waste Stream Contaminants, identifies toxicity characteristic and F-listed constituents in waste stream ID-GEVNC-02.

Table 1 – Metal and Organic Toxicity Characteristic and F-Listed Waste Stream Contaminants

Constituent	CAS #	EPA Hazardous Waste Number
Chromium	7440-47-3	D007
Lead	7439-92-1	D008
Mercury	7439-97-6	D009
1,1,2-Trichloro- 1,2,2-Trifluoroethane	76-13-1	F002
Methylene chloride	75-09-2	F002
Isobutanol	78-83-1	F005
Toluene	108-88-3	F005

RCRA Determinations – Hazardous Waste Determinations

<u>Ignitability, Corrosivity, Reactivity</u>

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) 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).

<u>Ignitability</u>

The waste does not exhibit the characteristic of ignitability as identified in 40 CFR 261.21. The materials are not liquid, compressed gases, or oxidizers, and are not capable of causing fire through friction, absorption of moisture, or spontaneous chemical change.

Potentially ignitable chemicals were prohibited during the decontamination and packaging of the TRU waste in Hot Cell 4. Although many of the liquids used in the hot cell, such as acetone, n-butyl alcohol, methanol, hexane, and xylene, are ignitable, the waste materials are not liquid and examination was performed during waste packaging to ensure prohibited liquids were not present or added to the containers during packaging. This material will not cause fire through friction, absorption of moisture, or spontaneous chemical changes. This material is not a compressed gas or an oxidizer. The materials in this waste stream are therefore not ignitable wastes.

Technovit is an epoxy hardened with dibenzoyl peroxide, which is an oxidizer. The Technovit system was completely reacted and no unused hardener will be found in the waste (References C012 and P028).

To ensure the waste does not exhibit the characteristic of ignitibility, liquid in excess of TSDF-WAC limits was removed or immobilized, and compressed gases (e.g. aerosol cans) were removed or vented prior to WIPP disposal. Therefore, this waste does not exhibit the characteristic of ignitibility (D001) (References C012, and P028).

Corrosivity

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

Potentially corrosive chemicals were prohibited during the decontamination and packaging of the TRU waste in Hot Cell 4. Although many of the liquids used in the hot cell, such as ammonium hydroxide, hydrochloric acid, hydrofluoric acid, and nitric acid, are corrosive, the waste materials are not liquid. Waste examination was performed to ensure prohibited liquids are not present in the waste, or were not added to containers during packaging.

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

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.

Potentially reactive chemicals were prohibited during the decontamination and packaging of the TRU waste in Hot Cell 4. Although sodium-potassium bonded fuel was disassembled in the hot cell facility, the sodium and sodium-potassium were reacted with isobutanol or methanol. The materials are not liquid and examination was performed to ensure reactive materials were not added to containers during packaging. The materials in these waste streams are therefore not reactive wastes.

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 P011, U014, U017, and U025).

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 conservatively applied to the waste stream.

Chromic acid (D007) was used as an etching agent (Reference P004). Lead (D008) was used as sealing tape component, shielding (e.g., pigs) and brick material (References P004, P010 and P013). Mercury (D009) was used in mercury thermometers (References C013, DR001, and P013).

The AK sources did not identify the use of any organic toxicity characteristic compounds in the hot cell (References U001, and U023).

Since analytical data are not available to demonstrate the concentrations of these metal compounds in this debris waste stream are less than the toxicity characteristic regulatory levels, EPA hazardous waste numbers D007, D008, and D009 are assigned to waste stream ID-GEVNC-02.

Listed Waste

F-Listed Waste

Waste stream ID-GEVNC-02 was mixed with or derived from F-listed hazardous wastes from non-specific sources as listed in Title 40 *Code of Federal Regulations* (CFR) 261.31. F002 and F005-listed solvents were used in the hot cell and contaminate the waste. In addition, it could be expected that common cleaning agents, solvents, glues, or lubricants used in the vicinity of the hot cells could have been used in the hot cell to meet specific needs. In these cases the HWNs have been added as a conservative measure (References C013, C014, DR001, and M006). F-listed solvents that may be present include Freon (1,1,2-Trichloro- 1,2,2-trifluoroethane), isobutanol, and methylene chloride. Based on headspace gas results on the first lot of remote-handled (RH) drums generated from Hot Cell 4 decontamination operations, waste stream GEVNC.01, EPA HWN F005 is also assigned to this waste stream for toluene even though a specific source for this chemical was not identified in the AK record. (Reference DR001).

Although F001-listed solvents were identified in the AK record (i.e., methylene chloride and 1,1,2-trichloro-1,1,2-trifluoroethane), EPA has provided a regulatory clarification that the F001 listing is only appropriate when the listed solvents are used in a "large-scale" degreasing operation such as cold cleaning or vapor degreasing on an industrial scale. Large-scale degreasing operations were not conducted in the hot cell, and therefore, EPA HWN F001 is not assigned to the waste stream. Waste stream ID-GEVNC-02 is assigned F-listed EPA HWN F002 for methylene chloride, and 1,1,2-trichloro-1,2,2-trifluoroethane and HWN F005 for isobutanol and toluene (References DR001, P011, P013, U016, and U023).

The flammable F003-listed solvents acetone, n-butyl alcohol, methanol, and xylene were used in the hot cell. However, F003-listed solvents are listed solely because these solvents are ignitable in the liquid form. The waste stream will not exhibit the characteristic of ignitability because it is not liquid; therefore, HWN F003 is not assigned (References DR001, P011, P013, U016, and U023).

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

(F002)
methylene chloride, 1,1,2-trichloro-1,2,2-trifluoroethane

(F005)
isobutanol, toluene

U, K and P-Listed Wastes

Waste stream ID-GEVNC-02 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). Based on the AK documentation reviewed, there is no evidence that unused commercial products were disposed of in TRU waste drums.

Beryllium and beryllium compounds may contaminate this waste stream. During the production of sources, only the amount of beryllium needed was taken into the hot cell. Beryllium powder is not present in the waste as a pure commercial chemical product, an off-specification commercial chemical product, or a spill residue thereof. Therefore, the waste stream does not meet the definition of P015 waste.

Hydrofluoric acid 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 absorbed prior to disposal. Waste stream ID-GEVNC-02 is therefore not assigned EPA HWN U134 (References C012, P010, P013, U003, U004, U007, and U008).

The material in waste stream ID-GEVNC-02 is not a hazardous waste from any of the sources specified in 40 CFR 261.32. Waste stream ID-GEVNC-02 is therefore not assigned a K-listed HWN.

Waste Stream ID-GEVNC-02 is not assigned any U-, K-, or P-Listed EPA HWNs.

Headspace Gas/Volatile Organic Compound Information

Headspace gas (HSG) analysis was performed on all the containers of this waste stream. No new EPA hazardous waste numbers were added as a consequence of headspace gas sampling and analysis. One Tentatively Identified Compound (TIC), 2-methyl-1-propanol, was detected in the HSG sample of one drum. No TIC was found in greater than 25 percent of the containers in this lot. The 90 percent upper confidence limit (UCL_{90}) calculated values, using either the transformed or untransformed value, for all of the target analytes are below the program required quantification limits (PRQLs). The specifics of this information are included in the attached Characterization Information Summary.

Other Waste Streams Generated From the Same Buildings and Processes

Waste stream ID-GEVNC-02 was generated from Hot Cell 4 decontamination operations. Both CH- and RH-TRU waste was generated. All of the waste containers were packaged and handled as RH-TRU with CH-TRU containers delineated into the GEVNC waste stream GEVNC.02 following dose measurement. The CH-TRU waste has been shipped to the INL for storage and characterization at the AMWTP as waste stream ID-GEVNC-02. The RH-TRU waste component was characterized and shipped directly to WIPP from GEVNC as waste stream GEVNC.01. There were no differences in the assignment of EPA HWNs for these waste streams.

<u>Conclusion</u>

The EPA HWNs that apply to the waste stream are D007, D008, D009, F002, and F005.

Polychlorinated Biphenyls

This waste stream is not regulated as a Toxic Substances Control Act (TSCA) waste under 40 CFR Part 761. No sources of PCBs have been identified in this waste stream.

Prohibited Items

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

- Liquid waste
- Non-radioactive pyrophoric materials
- Hazardous 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 B-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 either:

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

Justification for the Selection of Radiography or VE

RTR was selected as the characterization method for this lot because the waste containers were previously packaged and RTR is an acceptable characterization method to meet all the Data Quality Objectives for NDE of waste stream ID-GEVNC-02.

Method for Determining Waste Material Parameter Weights per Unit of Waste

The waste material parameters (WMPs) for waste stream ID-GEVNC-02 were estimated by observation of the debris material that could be seen through the hot cell viewing windows and WMP estimates for similar debris waste streams at other DOE hot cell laboratory facilities. The WMP average weight percent and weight percent ranges are presented in Table 2.

Table 2. Waste Stream ID-GEVNC-02 Waste Material Parameter Estimates

Waste Material Parameter	Average Weight Percent	Weight Percent Range
Iron-based Metals/Alloys	60.7%	0% – 98%
Aluminum-based Metals/Alloys	6.9%	0% – 72%
Other Metals	6.2%	0% – 66%
Other Inorganic Materials	6.2%	0% – 56%
Cellulosics	9.6%	0% – 100%
Rubber	2.1%	0% – 65%
Plastics (waste materials)	6.2%	0% – 58%
Organic Matrix	1.4%	0% – 31%
Inorganic Matrix	0.7%	0% – 27%
Soil/Gravel	0%	0% – 0%

List of Any AK Sufficiency Determinations

No AK Sufficiency Determinations were requested for this waste stream.

Transportation

This waste stream and its chemical constituents have been reviewed for consistency with 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 drum.

Radionuclide Information

The two most prevalent radionuclides in this waste stream, by weight, based on the un-decayed data reported in AK are U-238 and U-235. The isotopes expected to be present in this waste stream are listed in Table 3, Summary of ID-GEVNC-02 Radionuclides.

Table 3 – Summary of ID-GEVNC-02 Radionuclides

WIPP Tracked	Other Radionuclides Present
Am-241	Co-60
Pu-238	Eu-154
Pu-239	Pu-241
Pu-240	U-235
Pu-242	U-236
U-233	
U-234	
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	AK #	Title	Document Number	Author	Date
C001	S1,S2,S3,S4, S5,S6,S7,S8, S9,S10,S11, S12	California EPA Identification Number	NA	NA	12/10/2007
C005	S7	Letter from Robert E. Lillge to John Lee listing GE-H Documents Needed to Support Acceptable Knowledge (AK) Report	NA	Robert E. Lillge	05/16/2008
C007	S9	Memorandum to R.E. Butler regarding Estimate of Surface Contamination in Cell Four	NA	Ben Murray	11/18/1982
C008	S5	Letter to Ralph Holland regarding Information Concerning Defense Related Nature of Material in Cell #4 and Emission Spectrograph Glovebox	NA	Redacted	12/15/2006
C009	S11	Memo to R.W. Darmitzel regarding Cell 4 Alpha Facility Use For AEC/DOE Funded Programs	NA	D.L. Zimmerman, L.A. Hanson	01/29/1991
C012	S7	Interview by Mark Doherty of Joseph Tenorio, Manager, RH Operations Re: GEVNC Hot Cell 4 Operations Information	Attachment 2	Mark Doherty	05/08/2008
C013	S7	Interview by Mark Doherty of Stan Lukezic, Hot Cell Operator Re: GEVNC Hot Cell Operations Information	Attachment 3	Mark Doherty	05/10/2008
C014	S7	Interview by Mark Doherty of Joseph Tenorio, Manager, RH Operations at GEVNC Re: GEVNC Hot Cell 4.	Attachment 2	Mark Doherty	08/25/2008
C021	S7	Khaled M. Edrisi Resume	NA	NA	October 2006
C022	S7	Jacqueline M. Ranger	NA	NA	May 2006
C024	S8	Correspondance from Mike Dammann to Rodney Melgard regarding a request for service with a price quotation.	NA	Mike Dammann	07/29/2008
C025	S12	Correspondence from Melissa	NA	Melissa	09/18/2008

Source Document Number	AK #	Title	Document Number	Author	Date
		Mannion to Steve Croslin regarding Purchase Order No. PO-004366 EAC R806140-3773 and R806141-3774		Mannion	
DR001	S7	Discrepancy Report - Use of Paint Products in Hot Cell 4	NA	K Peters	12/03/2008
M002	NA	1996 BEMR General Electric Vallecitos Nuclear Center	NA	U.S. Department of Energy Office of Environmental Management	11/08/1999
M004	NA	Waste Profile Data Input	NA	J. Tenorio	08/01/1991
M006	NA	Chemical Inventory for WEP, RHO Cribb, RHO Controlled Area, RHO Shop Area and Elec. Shop	NA	NA	NA
M010	S7	Vallecitos Boiling Water Reactor	NA	R.D. Ramsay Ralph D. Bennett	NA
M015	S4	Container Certification No. 1080 - USA DOT-7A Type A - Radioactive Materials	NA	Andy Lopez	05/30/2002
M016	NA	Visual Examination Data Forms for Repackaged Drums - Container Paperwork	NA	CCP	Various
M017	S8	Purchase Order No: PO-004366 from Energy Solutions to Eberline Services	PO-004366	Kathrine V Hatfield	07/21/2008
M019	S12	Southwest Research Institute Sample Analysis Data Sheet	080802-1	Southwest Research Institute	08/01/2008
P002	S2	Remote Handling Technician Training Checklist - R54 (1/77); Irradiated Materials Examination - Special, Section J. Fission Gas Puncture and Collection System (Fission Gas Release Program)	Serial No. RPoS362; N/A	J. I. Tenorio; G. P. Wozadlo	01/28/1977; 08/02/1978
P004	NA	Metallographic Examination of Specimens	XIII: B-Part 4	R.E. Smith	06/12/1972
P010	NA	Am-Be and ABC Source Products	NA	B.M. Murray	03/22/1974

Source Document Number	AK #	Title	Document Number	Author	Date
P011	S10	Cell 4 Chemical List and MSDSs	NA	NA	N/A
P012	S2	Design Change Authorizations for conversion of existing beta-gamma hot cell to an alpha-gamma hot cell, operation of the Cell 4 interlock, and procedure for chemical plutonium separation and transfer from Alpha Cell to N.L. Bldg. 103.	NA	NA	1965-1972
P013	S2	Cell 4 Standard Operating Procedures and Ce-137 Procedure	NA	NA	NA
P015	NA	Radioactive Waste Shipments to Hanford Retrievable Storage from the General Electric Vallecitos Nuclear Center, Pleasanton, California	WHC-EP-0672	E. J. Vejvoda, J. A. Pottmeyer, D. S. DeLorenzo, M. I. Weyns-Rollosson, D. R. Duncan	October 1993
P016	S2,S8	File Drawer Cell 4: Flanders Alpha Cell PB-1401-1003, Operating Experience of G.E. Alpha Cell, Conversion of a Beta-Gamma Hot Cell for Examination of Plutonium-Enriched Fuel Capsules; Letter from J. E. Corrigan to W. H. Bone regarding Proposed Alpha SOP	NA	Flanders; G. L. Stimmell and N. C. Howard; E. Corrigan, N. C. Howard, and G. L. Stimmell; J. E. Corrigan	2003, 1969, NA, 04/11/1966
P017	S8,S10	MetalX B-913 MSDS and Ansul Red Line Model 5 Multi-Purpose Dry Chemical Fire Extinguisher Specification Sheet	BPYSB; NA	G. Coffey; Koetter Fire Protection	04/01/1991; NA
P018	S10	Material Saftey Data Sheets for Technovit 9100 Hardener 1 NEW, Technovit 9100 Hardener 2 NEW, Technovit 9100 Liquid NEW, and Technovit 9100 Powder NEW.	NA	NA	07/30/2007
P028	S8,S10	Huron Industries, Inc. Neolube No.1 Lubricant Technical Data	NA	Huron Industries, Inc.	06/27/2007

Source Document Number	AK #	Title	Document Number	Author	Date
		Sheet			
P030	S10	MSDS for Ajax Scouring Cleanser	NA	NA	NA
P032	S2	Fuel Pin Cleaning and Assembly in REDACTED Capsule	NA	S. K. Jain	10/02/1972
P033	S2	REDACTED Operations Change Notice; Section D. Part 1. Failed Low Enrichment Fuel Rods	Serial No. REDACTED 606; NA	Bonnie Streitz; J. A. Cook	02/01/1979; 06/13/1972
P034	S2	REDACTED Operations Change Notice; Section B. Part 2.2 Storage of Capsule Sections for Analysis	NA	Bonnie Streitz; S. K. Jain	02/01/1979; 03/10/1972
P035	S2	X. Processed Isotope Procedures, HHH. Californium-252 Sources	NA	R. E. Jones	11/20/1978
P037	S8	Flanders FFI Nuclear Grade HEPA Filters	PB-2016-0907	NA	2007
P038	S2	PNC-Saxton Fuel Pins RP&S Detailed Work Plan No.11, Burst Testing of Fuel Cladding	NA	B. A. Ferguson	04/07/1977
P040	S10	Duxseal MSDS	BFPZW	Johns-Manville Corp. & Subsidiaries	01/01/1985
P041	S2	High Activity Waste Handling at Vallecitos	NEDO-30152	R. E. Butler and T. C. Hall	June 1983
P043	S10	MSDS Boraxo Special Heavy-Duty Powdered Hand Soap	L-102	The Dial Corporation	08/30/07
P046	S9	Emmision Spectrographic Glovebox Utilization	NA	NA	02/14/1991
P052	S2	Section E. Part 2. REDACTED NaK Filling Procedure	NA	S. K. Jain	10/19/1972
P053	S2	REDACTED Operations Change Notice; Section F. Part 1. Preparation of Capsule for Shipment to REDACTED	Serial No. REDACTED 609; N/A	Bonnie Streitz; J. A. Cook	02/01/1979; 09/25/1972
P054	S2	Chapter XII. Irradiated Materials Examination - General, Section K. Fuel Rod Decrudding	N/A	R. W. Burton	06/06/1978
P055	S10	MSDS Collection for N-Butanol, Calcium Silicate, Charcoal (Activated), Chromic	NA	NA	NA

Source Document Number	AK #	Title	Document Number	Author	Date
		Acid, Diatomaceous Earth, Kerosene, Turco 4215, Turco 5351, Turco 6813, and SuperSorb.			
P056	S2	HEDL Vender Fuel Irradiation Program RP&S Detailed Work Plan #6 - Destructive Examination	NA	NA	06/14/1974
P057	S11	Logbook RML-59?: REDACTED Materials Hazard Control	NA	S. P. Ferguson; J. A. Cook	12/06/1971; 09/16/1972
P078	S2	Sampling and Analysis Plan, GE Vallecitos Nuclear Center Hot Cell #4 (Project No. 137076)	CS-OP-PN-015	Energy Solutions, LLC	05/30/2008
P079	S2	Energy Solutions Work Plan Decontamination and disposal of Hot Cell 4 Waste for the GE-Hitachi Radioactive Materials Laboratory (Project No. 137076)	CS-OP-PN-017	Energy Solutions, Inc.	UNK; 09/29/2008
P081	S2	Preparation and Revision of Documented Procedures	SOP-01-4.2.1	Chemistry and Chemical Engineering Division	January 2006
P082	S2	Purchasing	SOP-01-7.4.1	Chemistry and Chemical Engineering Division	September 2008
P083	S2	Monitoring and Measurement	SOP-01.8.2.4	Chemistry and Chemical Engineering Division	January 2005
P084	S2	Data Control and Reporting	SOP-01-4.2.2	Chemistry and Chemical Engineering Division	February 2008
P085	S2	Item Identification and Traceability	SOP-01-7.5.1	Chemistry and Chemical Engineering Division	August 2003
P086	S2	Nonconformance Reporting	SOP-01-8.3.1	Chemistry and Chemical Engineering Division	April 2007

Source Document Number	AK #	Title	Document Number	Author	Date
P087	S2	Management Review	SOP-01-5.6.1	Chemistry and Chemical Engineering Division	March 2007
P088	S2	Handling, Storage, Packaging, Protection, and Delivery of Items	SOP-01-7.5.3	Chemistry and Chemical Engineering Division	February 2008
P089	S2	Processing of Client Complaints	SOP-01-8.3.2	Chemistry and Chemical Engineering Division	September 2008
P090	S2	Qualification and Training	SOP-01-6.2.1	Chemistry and Chemical Engineering Division	February 2008
P091	S2	Internal Quality Audits and Surveillances	SOP-01.8.2.2	Chemistry and Chemical Engineering Division	March 2007
P092	S2	Corrective and Preventive Action Program	SOP-01-8.5.1	Chemistry and Chemical Engineering Division	April 2007
P093	S2	Laboratory Notebook Requirements	SOP-01-4.2.3	Chemistry and Chemical Engineering Division	February 2008
P094	S2	Storage and Maintenance of Quality Records	SOP-01-4.2.4	Chemistry and Chemical Engineering Division	July 2003
P095	S2	Organization of the Chemistry and Chemical Engineering Division	SOP-01-5.5.1	Chemistry and Chemical Engineering Division	February 2008
P096	S2	Preparation, Review, and Approval of Proposals	SOP-01-7.2.1	Chemistry and Chemical Engineering Division	August 2003
P097	S2	Review, and Approval of Contracts	SOP-01-7.2.2	Chemistry and Chemical Engineering Division	August 2003

Source Document Number	AK #	Title	Document Number	Author	Date
P098	S2	Quality System Trending	SOP-01-8.4.1	Chemistry and Chemical Engineering Division	September 2008
P104	S9	Reactor Waste Work Plan	NA	NA	NA
P105	S9	Reactor Waste Work Plan - 7/14/08	NA	NA	07/14/2008
U001	S11	Materials Hazard Control, Other Data Sheets and Supporting Documentation	NA	NA	1981 to 1982
U002	S11	Logbook RML-957	RML-957	NA	4/21/1981
U003	S2	M&QCP Data Package for Irradiation Capsules	NA	NA	2/14/1989
U004	S2	Manufacturing Data Package Californium-252 Primary Neutron Source Pins	NA	NA	4/30/86
U005	S11	Logbook RML-603	RML-603	NA	6/1972
U006	S11	RP&S Materials Hazard Control	NA	NA	NA
U007	S2	Manufacturing and Quality Control Plan for Californium-252 Primary Neutron Source Pin	NA	NA	4/30/86
U008	S2	Manufacturing and Quality Control for Am-Be Sources for the redacted.	NA	NA	February 1986
U009	S11	Logbook RML-575	RML-575	NA	1971 to 1975
U010	S11	Logbook RML-598	RML-598	NA	2/1986
U011	S11	Logbook RML-402	RML-402	NA	2-10-1969
U012	S11	Logbook RML-320	RML-320	NA	Aug. to Sept. 1967
U013	S11	Logbook RML-417	RML-417	R.E. Smith	9-29-1969
U014	S11	Logbook RML-451	RML-451	R.E. Smith	2-24-1970
U015	S11	Logbook RML-453	RML-453	R.E. Smith	10-23-1969
U016	S11	Logbook RML-479	RML-479	R.E. Smith	07/02/1970
U017	S11	Logbook RML-231	RML-231	R.E. Smith	1967
U023	NA	Logbook RML-720	RML-720	NA	1974
U025	S11	Logbook RML-190	RML-190	NA	1966

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