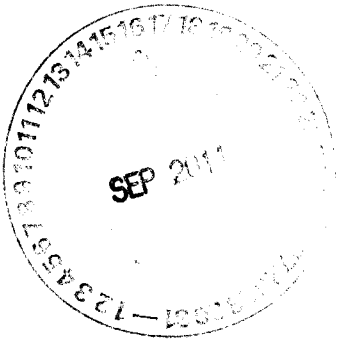
**Department of Energy**
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

ENTERED

SEP 1 2 2011




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

Subject: Review of Bettis Atomic Power Laboratory - Central Characterization Project Waste Stream Profile Form Number BT-T001

Dear Mr. Kieling:

The Carlsbad Field Office has approved the Waste Stream Profile Form (WSPF) Number, BT-T001, *Remote-Handled Metal Debris Waste from Bettis Laboratory*, for the Central Characterization Project at the Bettis Atomic Power Laboratory.

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

If you have any questions, please call the Director of the Office of the National TRU Program, Mr. J. R. Stroble, at (575) 234-7313.

Sincerely,

Edward Ziemianski
Interim Manager

Enclosure

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

cc: w/o enclosure
J. R. Stroble, CBFO ED
M. Pinzel, CBFO ED
B. Mackie, CBFO ED
T. Morgan, CBFO ED
CBFO M&RC
*ED denotes electronic distribution

110910

CBFO:NTP:MP:GS:11-1746:UFC 5900.00

Attachment 2 –CCP Waste Stream Profile Form

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **(1) Waste Stream Profile Number:** BT-T001 | | | | | | | |
| (2) Generator site name: Bettis Atomic Power Laboratory | | | | | (4)Technical contact: Irene Quintana | | |
| (3) Generator site EPA ID: PA0890090004 | | | | | (6) Technical contact phone number: 575-499-4579 | | |
| (5) Date of audit report approval by New Mexico Environment Department (NMED): August 23, 2011 | | | | | | | |
| (7) Title, version number, and date of documents used for WAP Certification: CCP-PO-001, CCP Transuranic Waste Characterization Quality Assurance Project Plan, Revision 20, June 16, 2011 CCP-PO-002, CCP Transuranic Waste Certification Plan, Revision 26, July 14, 2011 CCP-PO-511, CCP/BAPL RH TRU Waste Interface Document, Revision 0, August 18, 2010 CCP-AK-BAPL-500, Central Characterization Project Acceptable Knowledge Summary Report For Bettis Laboratory Remote-Handled Transuranic Debris Waste Waste Stream: BT-T001, Revision 2, May 16, 2011 | | | | | | | |
| (8) Did your facility generate this waste? YES | X | NO | | | | | |
| (9) If no, provide the name and EPA ID of the original generator: NA | | | | | | | |
| **Waste Stream Information**[1] | | | | | | | |
| (10) WIPP ID: BT-T001 | | | | | (11) Summary Category Group: S5000 | | |
| (12) Waste Matrix Code Group: Uncategorized Metal | | | | | (13) Waste Stream Name: RH Metal Debris Waste from Bettis Laboratory | | |
| (14) Description from the TWBIR: Specimen processing fines, material, and debris. | | | | | | | |
| (15) Defense TRU Waste: YES | X | NO | | | | | |
| (16) Check One: CH | | RH | X | | | | |
| (17) Number of SWBs: NA | | (18) Number of Drums: NA | | | (19) Number of Canisters: 5[3] | | |
| (20) Batch Data report numbers supporting this waste stream characterization: See Characterization Information Summary (CIS) Correlation of Container Identification Numbers to Batch Data Report Numbers | | | | | | | |
| (21) List applicable EPA Hazardous Waste Numbers:[2] D004, D005, D006, D007, D008, D009, D010, D011, D039, D040, and F002 | | | | | | | |
| (22) Applicable TRUCON Content Numbers: BE 321 | | | | | | | |
| (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-BAPL-500, Revision 2, May 16, 2011, Attachment 1 | | | | | | | |
| (23B) Facility mission description: CCP-AK-BAPL-500, Revision 2, May 16, 2011, Section 4.1 | | | | | | | |
| (23C) Description of operations that generate waste: CCP-AK-BAPL-500, Revision 2, May 16, 2011, Section 5.3 | | | | | | | |
| (23D) Waste identification/categorization schemes: CCP-AK-BAPL-500, Revision 2, May 16, 2011, Section 5.4 | | | | | | | |
| (23E) Types and quantities of waste generated: CCP-AK-BAPL-500, Revision 2, May 16, 2011, Sections 4.2.1 | | | | | | | |
| (23F) Correlation of waste streams generated from the same building and process, as applicable: N/A | | | | | | | |
| (24) Waste certification procedures: CCP-TP-530, Revision 10, CCP RH TRU Waste Certification and WWIS/WDS Data Entry, April 25, 2011 | | | | | | | |
| (25)Required Waste Stream Information | | | | | | | |

| | | | |
|---|---|---|---|
| (25A) Area(s) and building(s) from which the waste stream was generated: CCP-AK-BAPL-500, Revision 2, May 16, 2011, Section 5.1 | | | |
| (25B) Waste stream volume and time period of generation: CCP-AK-BAPL-500, Revision 2, May 16, 2011, Section 5.2 | | | |
| (25C) Waste generating process description for each building: CCP-AK-BAPL-500, Revision 2, May 16, 2011, Sections 4.2.2 and 5.3 | | | |
| (25D) Waste Process flow diagrams: CCP-AK-BAPL-500, Revision 2, May 16, 2011, Attachments 4 and 5 | | | |
| (25E) Material inputs or other information identifying chemical/radionuclide content and physical waste form: CCP-AK-BAPL-500, Revision 2, May 16, 2011, Sections 5.4 | | | |
| (25F) Waste Material Parameter Weight Estimates per unit of waste: See Table 2 of the Summation of Aspects of AK Summary Report: Waste Stream BT-T001 | | | |
| (26) Which Defense Activity generated the waste: (check one)[4] | | | |
| | Weapons activities including defense inertial confinement fusion | X | Naval Reactors development |
| | Verification and control technology | | 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: NA | | | |
| (27D) Waste packaging logs: See S4 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report | | | |
| (27E) Test plans/research project reports: See S5 AK#s on Attachment 1 of the Summation of Aspects of AK Summary Report | | | |
| (27F) Site databases: N/A | | | |
| (27G) Information from site personnel: See S7 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report | | | |
| (27H) Standard industry documents: NA | | | |
| (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: See S12 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report | | | |
| (27L) Laboratory notebooks: See S11 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report | | | |
| **Confirmation Information**[2] | | | |
| *For the following, when applicable, enter procedure title(s), number(s) and date(s)* | | | |
| (28) | Radiography: NA | | |
| (29) | Visual Examination: CCP-TP-500, Rev.11 4/21/11 | | |

(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:** 8/30/11

**Reviewed by STR (if necessary):** **YES** [X] **NA** [ ] **Date:** 9/1/11

**Waste Stream Profile Form Certification:**

I hereby certify that I have reviewed the information in this Waste Stream Profile Form, and it is complete and accurate to the best of my knowledge. I understand that this information will be made available to regulatory agencies and that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

| (31) | (32) Irene Quintana | (33) 9/2/11 |
|---|---|---|
| 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 stream consists of 15 55-gallon drums that will be loaded into 5 RH canisters.
(4) This waste was also generated by the following defense activity: defense research and development.

# CHARACTERIZATION INFORMATION SUMMARY

WSPF # BT-T001

Lot 1

TABLE OF CONTENTS

## CCP Characterization Information Summary Cover Page

Waste Stream # BT-T001 Lot #: 1

AK Expert Review: Jim Luginbhyl Date: 9/30/2011

SPM Review: Irene Quintana Date: 9/2/11

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:**

**Headspace Gas Sampling and Analysis (HSG):**

| | | | |
|---|---|---|---|
| CCP-TP-093 | Rev. 13 | 03/19/07 | CCP Sampling of TRU Waste Containers |
| CCP-TP-093 | Rev. 14 | 12/29/10 | CCP Sampling of TRU Waste Containers |
| CCP-TP-093 | Rev. 15 | 03/10/11 | CCP Sampling of TRU Waste Containers |
| CCP-TP-106 | Rev. 6 | 07/12/07 | CCP Headspace Gas Sampling Batch Data Report Preparation |
| CCP-TP-106 | Rev. 7 | 12/29/10 | CCP Headspace Gas Sampling Batch Data Report Preparation |
| CCP-TP-173 | Rev. 1 | 09/30/09 | CCP Analysis of Gas Samples for VOCs by GC/FID |
| CCP-TP-175 | Rev. 2 | 12/29/10 | CCP Analysis of Gas Samples for VOCs by GC/MS |
| CCP-TP-175 | Rev. 3 | 06/02/11 | CCP Analysis of Gas Samples for VOCs by GC/MS |

**Visual Examination (VE):**

| | | | |
|---|---|---|---|
| CCP-TP-500 | Rev. 9 | 06/30/10 | CCP Remote-Handled Waste Visual Examination |
| CCP-TP-500 | Rev. 10 | 12/29/10 | CCP Remote-Handled Waste Visual Examination |
| CCP-TP-500 | Rev. 11 | 04/21/11 | CCP Remote-Handled Waste Visual Examination |

**Project Level Data Validation / DQO Reconciliation:**

| | | | |
|---|---|---|---|
| CCP-TP-001 | Rev. 19 | 12/29/10 | CCP Project Level Data Validation and Verification |
| CCP-TP-002 | Rev. 23 | 12/29/10 | CCP Reconciliation of DQOs and Reporting Characterization Data |
| CCP-TP-003 | Rev. 18 | 12/29/10 | CCP Data Analysis for S3000, S4000, and S5000 Characterization |
| CCP-TP-005 | Rev. 23 | 06/30/11 | CCP Acceptable Knowledge Documentation |
| CCP-TP-530 | Rev. 10 | 04/25/11 | CCP RH TRU Waste Certification and WWIS/WDS Data Entry |

**WAP Certification:**

| | | | |
|---|---|---|---|
| CCP-PO-001 | Rev. 20 | 06/16/11 | CCP Transuranic Waste Characterization Quality Assurance Project Plan |

CIS 3

# CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # BT-T001 Lot # 1

| Container ID Number | Historical Container ID | NDA BDR or Radiological Characterization BDR (CH only) | VE BDR | RTR BDR | Solids Sampling BDR | Solids Analytical BDR | Load Management/ Overpack Yes | Permit Required Headspace Gas BDR | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Sample | Analysis | | |
| HIP-41-23-4 | NA | NA | RHBAPLVE100001 | NA | NA | NA | NA | BAHSGS100001 | ECL10037M | ECL10037G | NA |
| HIP-41-20-1 | NA | NA | RHBAPLVE100001 | NA | NA | NA | NA | BAHSGS100001 | ECL10037M | ECL10037G | NA |
| HIP-41-16-8 | NA | NA | RHBAPLVE100001 | NA | NA | NA | NA | BAHSGS100001 | ECL10037M | ECL10037G | NA |
| HIP-41-06-10 | NA | NA | RHBAPLVE100001 | NA | NA | NA | NA | BAHSGS100001 | ECL10037M | ECL10037G | NA |
| HIP-41-33-9 | NA | NA | RHBAPLVE100001 | NA | NA | NA | NA | BAHSGS100001 | ECL10037M | ECL10037G | NA |
| HIP-41-24-7 | NA | NA | RHBAPLVE100001 | NA | NA | NA | NA | BAHSGS100001 | ECL10037M | ECL10037G | NA |
| HIP-41-30-3 | NA | NA | RHBAPLVE100001 | NA | NA | NA | NA | BAHSGS100001 | ECL10037M | ECL10037G | NA |
| HIP-41-18-2 | NA | NA | RHBAPLVE100001 | NA | NA | NA | NA | BAHSGS100001 | ECL10037M | ECL10037G | NA |
| HIP-41-32-6 | NA | NA | RHBAPLVE100001 | NA | NA | NA | NA | BAHSGS100001 | ECL10037M | ECL10037G | NA |
| HIP-41-13-5 | NA | NA | RHBAPLVE100001 | NA | NA | NA | NA | BAHSGS100001 | ECL10037M | ECL10037G | NA |
| HIP-41-28-11 | NA | NA | RHBAPLVE100001 | NA | NA | NA | NA | NA | NA | NA | NA |
| HIP-41-15-12 | NA | NA | RHBAPLVE100001 | NA | NA | NA | NA | NA | NA | NA | NA |
| HIP-41-05-13 | NA | NA | RHBAPLVE100001 | NA | NA | NA | NA | NA | NA | NA | NA |
| HIP-41-27-14 | NA | NA | RHBAPLVE100001 | NA | NA | NA | NA | NA | NA | NA | NA |
| HIP-41-21-15 | NA | NA | RHBAPLVE100001 | NA | NA | NA | NA | NA | NA | NA | NA |

Signature of Site Project Manager

Irene Quintana
Printed Name

9/1/2011
Date

# CCP Headspace Gas $UCL_{90}$ Evaluation Form

**WSPF #:** BT-T001 **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 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | No | 0 | 10 | 0.03 | 0.03 | 0.00 | 0.03 | 10 | N/A | | |
| Bromoform | Sqrt | 0 | 10 | 0.09 | 0.09 | 0.00 | 0.09 | 10 | 3.16 | | |
| Carbon tetrachloride | log | 0 | 10 | -4.42 | -4.43 | 0.02 | -4.42 | 10 | 2.30 | | |
| Chlorobenzene | log | 0 | 10 | -3.96 | -3.99 | 0.02 | -3.98 | 10 | 2.30 | | |
| Chloroform | log | 0 | 10 | -0.37 | -3.71 | 0.02 | -3.70 | 10 | 2.30 | | |
| Cyclohexane [a] | log | 0 | 10 | -3.46 | -3.49 | 0.01 | -3.48 | 10 | 2.30 | | |
| 1,1-Dichloroethane | log | 0 | 10 | -4.14 | -4.16 | 0.02 | -4.15 | 10 | 2.30 | | |
| 1,2-Dichloroethane | log | 0 | 10 | -3.51 | -3.54 | 0.02 | -3.53 | 10 | 2.30 | | |
| 1,1-Dichloroethylene | log | 0 | 10 | -4.14 | -4.16 | 0.02 | -4.16 | 10 | 2.30 | | |
| cis-1,2-Dichloroethylene | log | 0 | 10 | -3.44 | -3.47 | 0.01 | -3.46 | 10 | 2.30 | | |
| trans-1,2-Dichloroethylene | log | 0 | 10 | -3.58 | -3.61 | 0.02 | -3.60 | 10 | 2.30 | | |
| Ethyl benzene | no | 0 | 10 | 0.02 | 0.02 | 0.00 | 0.02 | 10 | N/A | | |
| Ethyl ether | log | 0 | 10 | -4.05 | -4.09 | 0.02 | -4.08 | 10 | 2.30 | | |
| Methylene chloride | log | 0 | 10 | -3.46 | -3.50 | 0.02 | -3.49 | 10 | 2.30 | | |
| 1,1,2,2-Tetrachloroethane | SQRT | 0 | 10 | 0.11 | 0.11 | 0.00 | 0.11 | 10 | 3.16 | | |
| Tetrachloroethylene | no | 0 | 10 | 0.02 | 0.02 | 0.00 | 0.02 | 10 | N/A | | |
| Toluene | log | 0 | 10 | -3.46 | -3.50 | 0.02 | -3.49 | 10 | 2.30 | | |
| 1,1,1-Trichloroethane | no | 0 | 10 | 0.01 | 0.01 | 0.00 | 0.01 | 10 | N/A | | |
| Trichloroethylene | log | 0 | 10 | -4.14 | -4.16 | 0.02 | -4.16 | 10 | 2.30 | | |
| 1,1,2-Trichloro-1,2,2-trifluoroethane | no | 0 | 10 | 0.01 | 0.01 | 0.00 | 0.01 | 10 | N/A | | |
| 1,2,4-Trimethylbenzene[a] | log | 0 | 10 | -3.86 | -3.90 | 0.02 | -3.89 | 10 | 2.30 | | |
| 1,3,5-Trimethylbenzene[a] | log | 0 | 10 | -4.07 | -4.12 | 0.02 | -4.11 | 10 | 2.30 | | |
| m,p-Xylene[b] | log | 0 | 10 | -3.63 | -3.67 | 0.02 | -3.66 | 10 | 2.30 | | |
| o-Xylene | log | 0 | 10 | -3.54 | -3.57 | 0.02 | -3.56 | 10 | 2.30 | | |
| Acetone | no | 10 | 10 | 1.50 | 0.77 | 0.45 | 0.97 | 100 | N/A | | |
| 1-Butanol | log | 0 | 10 | -3.09 | -3.12 | 0.02 | -3.11 | 100 | 4.61 | | |
| Methanol | no | 0 | 10 | 15.00 | 14.65 | 0.24 | 14.76 | 100 | N/A | | |
| Methyl ethyl ketone | log | 0 | 10 | -3.75 | -3.78 | 0.02 | -3.77 | 100 | 4.61 | | |
| Methyl isobutyl ketone | log | 0 | 10 | -3.96 | -3.98 | 0.02 | -3.98 | 100 | 4.61 | | |

# CCP Headspace Gas $UCL_{90}$ Evaluation Form

CIS 5

**WSPF #:** BT-T001 **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 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloromethane[c] | log | 1 | 10 | -2.38 | -3.45 | 0.38 | -3.29 | 100 | 2.30 | | |
| Carbon Disulfide[c] | log | 0 | 10 | -3.67 | -3.71 | 0.02 | -3.70 | 10 | 2.30 | | |
| 1,2-Dichloropropane[c] | no | 0 | 10 | 0.02 | 0.02 | 0.00 | 0.02 | 10 | N/A | | |
| Trichlorofluoromethane[c] | log | 0 | 10 | -3.58 | -3.61 | 0.02 | -3.60 | 10 | 2.30 | | |

[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] Compounds are reported as target analytes by the Idaho Laboratory and have been added to the evaluation accordingly.

## Comments:

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

Signature of Site Project Manager

Irene Quintana
Printed Name

9/1/2011
Date

# CCP Headspace Gas Summary Data

Waste Stream Number BT-T001 Lot Number (s) 1

| Tentatively Identified Compound | Maximum Observed Estimated Concentrations (ppmv) | # Samples Containing TIC | % Detected |
|---|---|---|---|
| None | NA | NA | NA |

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 9/1/2011

# CCP RTR/VE Summary of Prohibited Items and AK Confirmation

Waste Stream Number: BT-T001 Lot #: 1

| Container Number | RTR Prohibited Items [a] | Visual Examination Prohibited Items [a] |
|---|---|---|
| See correlation of container ID numbers for list of remaining drum numbers in this Lot. | RTR was not used to certify any containers in this lot. | None of the containers in this Lot had prohibited items identified during Visual Examination technique. |

a. See Batch Data Reports

Justification for the selection of RTR and/or VE: VE was selected as the characterization method for this lot because the waste had to be repacked and VE met all the Data Quality Objectives for NDE for waste stream BT-T001.

Site Project Manager Signature | Irene Quintana (Printed Name) | 9/1/2011 (Date)

# CCP Reconcilliation with Data Quality Objectives

WSF# BT-T001 Lot # 1

**Sampling Completeness**

**VE**

Number of Valid Samples: 15 Number of Total Samples Analyzed: 15

Percent Complete: 100 (QAO is 100%)

**RTR**

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

Percent Complete: NA (QAO is 100%)

**HSG**

Number of Valid Samples: 10 Number of Total Samples collected: 10

Percent Complete: 100 (QAO is ≥90%)

**Total VOC**

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

Percent Complete: NA (QAO is ≥90%)

Number of Valid Samples: NA Number of Total Samples analyzed: NA

Percent Complete: NA (QAO is ≥90%)

**Total SVOC**

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

Percent Complete: NA (QAO is ≥90%)

Number of Valid Samples: NA Number of Total Samples analyzed: NA

Percent Complete: NA (QAO is ≥90%)

**Total Metals**

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

Percent Complete: NA (QAO is ≥90%)

Number of Valid Samples: NA Number of Total Samples analyzed: NA

Percent Complete: NA (QAO is ≥90%)

# CCP Reconcilliation with Data Quality Objectives

WSF# BT-T001 Lot # 1

| | Y/N/NA | Reconcilliation Parameter |
|---|---|---|
| 1 | Y | Waste Matrix Code. |
| 2 | Y | Waste Material Parameter Weights. |
| 3 | Y | The waste matrix code identified is consistent with the type of sampling and analysis used to characterize the waste. |
| 4 | Y | The TRU activity reported in the BDRs for each container demonstrates with a 95% probability that the container of waste contains TRU radioactive waste. |
| 5 | NA | AK Sufficiency. Is there an approved AK sufficiency Determination for this waste stream? |
| 6 | Y | Mean concentrations, UCL90 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, UCL90 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, UCL90 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, (UCL90) 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. |

# CCP Reconcilliation with Data Quality Objectives

WSF# BT-T001 Lot # 1

| | | |
|---|---|---|
| 8 | Y | The data demonstrates whether the waste stream exhibits a toxicity characteristic under Title 40 Code of Federal Regulations (CFR), Part 261, Identification and Listing of Hazardous Waste, Subpart C, Characteristics of Hazardous Waste. |
| 9 | Y | Does the waste stream contain listed waste found in 20.4.1.200 NMAC incorporating 40 CFR Part 261, Subpart D, Lists of Hazardous Wastes. |
| 10 | Y | Waste stream can be classified as hazardous or nonhazardous at the 90-percent confidence level. |
| 11 | Y | Appropriate packaging configuration and Drum Age Criteria (DAC) is applied and documented in the headspace gas sampling documentation, and the drum age met prior to sampling. |
| 12 | Y | TICs were appropriately identified and reported in accordance with the requirements of Section C3-1 of the QAPjP. |
| 13 | Y | The PRQLs for headspace gas VOCs were met for all analyses as evidenced by the analytical batch data reports. |
| 14 | | The overall completeness, comparability, and representativeness QAOs were met for each of the analytical and testing procedures as specified in CCP-PO-001 Sections C3-2 through C3-9 prior to submittal of a waste stream profile form for a waste steam or waste stream lot. |

| | Completeness | Comparability | Representativeness |
|---|---|---|---|
| Radiography | NA | NA | NA |
| VE | Y | Y | Y |
| 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: N/A

Signature of Site Project Manager | Irene Quintana (Printed Name) | 9/1/2011 (Date)

# SUMMATION OF ASPECTS OF AK SUMMARY REPORT: WASTE STREAM BT-T001

## Overview

Waste Stream BT-T001 is Remote Handled (RH) metal debris generated and stored at Bettis Atomic Power Laboratory, West Mifflin, Pennsylvania. The Bettis Laboratory mainly focuses on the design and development of nuclear power for the United States (U.S.) Navy. Waste stream BT-T001 originated from the destructive analysis of post-irradiated nuclear fuel assemblies from Naval Reactors programs.

Waste Stream BT-T001 was generated in Bettis Atomic Power Laboratory Materials Evaluation Laboratory (MEL) operations and is contaminated with materials from atomic energy defense activities associated with naval reactors development and defense research and development activities. The RH transuranic (TRU) waste in this waste stream was generated during the examination of fuel elements from primarily naval reactor fuels for evaluation of fuel performance. The fuel elements were from nuclear-powered warships, prototype plants, irradiated test specimens, and the Shippingport Atomic Power Station.

This Summation of the AK Summary Report includes information to support Waste Stream Profile Form (WSPF) number BT-T001 for Remote Handled (RH) TRU metal debris. The primary source of information for this Summation is CCP-AK-BAPL-500, *Central Characterization Project Acceptable Knowledge Summary Report For Bettis Laboratory Remote-Handled Transuranic Debris Waste, Waste Stream: BT-T001*, Revision 2, May 16, 2011. CCP-AK-BAPL-500 includes information obtained from numerous sources, including facility safety basis documentation, historical document archives, generator and storage facility waste records and documents, interviews with cognizant personnel, and program/process documents (e.g., plans, procedures, etc.).

## Waste Stream Identification Summary

| | |
|---|---|
| Waste Stream Name: | RH Metal Debris Waste from Bettis Laboratory |
| Waste Stream Number: | BT-T001 |
| Site Where TRU Waste Was Generated: | Bettis Atomic Power Laboratory |
| Facilities Where TRU Waste Was Generated: | MEL 'N' Building Bettis Laboratory |
| Site Where TRU Waste is Currently Stored: | Bettis Atomic Power Laboratory |
| Waste Stream Volume – Current: | 15 55-gallon Drums ($3.12m^3$) * |

| | |
|---|---|
| Waste Stream Volume – Projected: | none |
| Dates of Waste Generation: | July 1973 – July 1992 |
| Remote-Handled Transuranic Waste Content Code (RH TRUCON): | BE 321 |
| Summary Category Group: | S5000 – Debris Waste |
| Waste Matrix Code: | S5110 – Metal Debris |
| Waste Matrix Code Group: | Uncategorized Metal |
| Annual Transuranic Waste Inventory Report Identification Numbers: | BT-T001 |
| RCRA EPA Hazardous Waste Numbers: | D004, D005, D006, D007, D008, D009, D010, D011, D039, D040, and F002 |

*Footnote 1: The waste was originally packaged in 15 High Pressure Inner Containers. The waste was repackaged into 15 55-gallon drums that will be loaded into 5 RH canisters.

## Waste Stream Description and Physical Form

The waste stream is a total of 15 High Pressure Inner (HIP) containers of inorganic RH TRU waste generated during analysis of post-irradiated nuclear fuel assemblies from Naval Reactors programs, using destructive examination methods. Wastes were generated in the MEL between 1973 and 1992. The waste consists predominantly of dry metal debris. The organic debris includes plastics (e.g., bags) and rubber (e.g., binder used in abrasive cut-off wheel blades, stoppers, and RTV silicon rubber). The inorganic debris includes metals (ferrous materials made from stainless steel and iron; non-ferrous materials made from aluminum, lead, Inconel, and zirconium [Zircaloy]), glass, Pyrex, quartz, resin, and silicon carbide grit from cut-off wheels. The waste may also include homogeneous solids such as absorbed water. Waste Stream BT-T001 contains less than 50 percent by volume of homogeneous inorganic materials in any container. Water used as the cutting wheel coolant was allowed to air dry. No liquids were placed in the waste.

Waste stream BT-T001 was generated from a single process or activity that produced waste materials that have a common physical form and hazardous constituents and is, therefore, a single waste stream.

## Point of Generation

### Location

Waste stream BT-T001 was generated and is stored at the Bettis Atomic Power Laboratory, Materials Evaluation Laboratory (MEL), in West Mifflin, Pennsylvania.

### Area and/or Buildings of Generation

Waste stream BT-T001 was generated at the Bettis Laboratory Materials Evaluation Laboratory (East end of Wing-5-Right in the 'N' Building).

## Generating Process

### Description of Waste Generating Processes

The Bettis waste stream consists of metal debris originally generated from the destructive examination of post-irradiation nuclear fuel assemblies from Naval Reactors programs for analysis of the fuel properties. The waste includes metals (iron-based metals/alloys, aluminum-based metals/alloys, other metals), other inorganic materials, cellulosics, rubber, and plastics.

Waste generating operations in the MEL occurred in four cell banks, East, Met, Central and West Cell banks and in the Alpha Cell. The East Cell Bank was where the cut-off-wheel, specimen etching and Fuel Punch operations occurred. The Central Cell Bank was where photographic and tensile tests were performed. The Central Cell Bank generated very little TRU waste. The Met Cell Bank housed the metallographic mount polishing and grinding equipment. The Hydrogen and Fission Gas Extraction operations were performed in the West Cell Bank. The Alpha Cell also generated waste from a dissolution process.

*Fuel Element Sectioning Process Description*

The slow speed abrasive cut-off wheel was used for sectioning specimens in preparation for destructive tests such as metallography, density, chemical analysis, and/or hydrogen analysis.

Sectioning of the fuel elements requires a method that minimizes airborne contamination to reduce filter loads and contain contamination. A slow speed, wet abrasive cut-off wheel was used for that purpose. The cut-off wheels were composite blades with no reinforcement. They were made of silicon carbide grit and rubber bonding particles. The lower portion of the cutting wheel was immersed in water. The water served to cool the wheel and the specimen. The water also restricted the spread of contamination by entrapping small particles in the water. The water was allowed to dry completely before the waste was placed into the waste containers. The abrasive wheel had to be changed regularly because it was designed to wear as it cut the material.

*Lathe Operations*

A small lathe was used to part the Zircaloy tubing of an irradiation test fuel rod. The test rod was parted to remove samples for subsequent analysis.

*Metallographic Specimen Process*

Metallographic specimens were mounted, polished, etched and examined for microstructure, hydriding, corrosion attack and cracking. Photomicrographs were obtained of the structure and any abnormalities. Hardness testing, grain size, corrosion and/or crud (corrosion and wear products) thickness measurements were also obtained.

Pressure mounting specimens were used to prevent loss of fissionable material during subsequent handling and processing operations. The process involved placing the specimen in a pre-formed metal mold and covering with epoxy resin (Hysol). After curing, the pressure mounted specimens were removed from the mounting fixture and were then ready for sectioning.

Metallographic mounts were produced for the evaluation of the specimen surfaces. It involved ultrasonic cleaning, mounting, grinding, polishing and etching the specimen.

The polishing process was performed using an Automet machine. Polishing of the specimens was accomplished by placing the specimen in contact with a cloth material on the polishing wheel. During the process, Linde "B" (>93% powdered aluminum oxide) mixed with water, was deposited on the cloth.

The etching process used several different types of acids to etch the specimen. The acids were lactic, nitric, hydrofluoric, and hydrochloric. The etching process was accomplished by dipping the specimen into the acid solution and swabbing the surface with a cotton ball. Etching time was approximately 30 seconds per etch. All etchant solutions were neutralized (such as acetic acid and hydrochloric acid added to basic solutions) after use. The volume of each etchant solution was 100 milliliters. The neutralized solutions are not part of this waste.

When the met mount was to be scrapped, it was split using the splitter and hydraulic pump. As much epoxy as possible was removed. The split specimen was placed in a storage can and was included in waste stream BT-T001. The epoxy that was removed and the Met mounting rings were disposed of separately.

*Decrudding/Descaling of Irradiation Samples*

All foreign materials that were deposited on the specimen surface were removed using alkaline permanganate/ammonium citrate (APAC) solutions and other chemicals (such as EDTA, deionized water, hydrazine versenate). The foreign materials were removed for visual and dimensional examinations.

*Dye Penetrant and Fluorescent Penetrant Inspections*

The dye and fluorescent penetrant inspections were used to check irradiated specimens for cracks, pits or other surface deformities. A commercial dye penetrant was placed on the surface of the specimen and any flaw would appear as red. The flaw indications were determined from the rate and extent of bleeding as well as from the richness of the red colored flaw patterns on the white developer background. The fluorescent penetrant inspection was similar but, a different penetrant was used and the surface was inspected using an ultraviolet light to see the flaws in the specimen.

*Fission Gas Analysis*

The purpose of the fission gas extraction operation was to determine the quantitative release of gases from fuel and poison specimens resulting from irradiation, heat treatment or other fabrication processes. The specimen was loaded into the vacuum chamber of the Fission Gas Apparatus. The specimen was then punctured using a drilling fixture and the pressure (due to the released gases) was measured. The gases were then collected in sample bulbs using the Mercury and Toepler pumps. The bulbs were then sent to Mass Spectrometry and Radiochemistry for quantitative analysis of the gases.

The mercury pump was located outside the shielded cell so any spills from the pump were not part of the TRU waste. However, the drill inside the shielded cell had a mercury seal that could have leaked small amounts of mercury inside the shielded cell.

*Fuel Crush and Clad Etching Process*

In preparation for the operations in the Alpha Cell, the fuel would be punched from the clad. The clad would be placed in a beaker of acid. This is a process called Fast Fluence. The fuel would be crushed by placing it in a fixture and striking it with a modified hammer until the material size is equal to a standard. The acid, cladding and crushed fuel sample was then transferred to the Alpha Cell.

*Alpha Cell Operations*

The Alpha Cell was used for dissolution of the samples. Specimens were chemically dissolved to separate and purify some of the elements in the sample for further analysis. Potassium pyrosulfate, nitric acid and oxalic acid were some of the chemicals used in the dissolution of the specimen. The dissolution waste was heated and evaporated prior to disposal.

*Packaging of Waste into HIP Containers*

The waste was stored in the East Cell Bank in various thin wall Dolly Tubes and waste cans. Dolly tubes are thin walled aluminum containers approximately 1-inch in diameter. Those containers were low integrity containers. The waste was repackaged into high integrity HIP

containers in December 2005 to January 2006 to provide more substantial containment of the waste material.

*Visual Examination (VE) and Repackaging of Waste*

VE of each HIP container was performed prior to shipment to WIPP. Each HIP was opened in the Hot Cell, the contents placed into a transparent container, and examined by a trained VE operator. The waste was then placed back into the HIP container. Samples were taken for analysis. One of the HIP containers had a much higher radiological load. Some of the material from this HIP was moved to other HIPs to balance the radiological loading. Void space at the top of the HIP was filled with steel wool. Each HIP container was placed into a 55-gallon drum which will be loaded into RH canisters for shipment to WIPP.

Table 1 identifies the toxicity characteristic and F-listed constituents in waste stream BT-T001.

**Table 1 – Toxicity Characteristic and F-Listed Constituents in Waste Stream BT-T001**

| Constituent | CAS Number | EPA Hazardous Waste Numbers |
|---|---|---|
| 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 |
| Tetrachloroethylene (Perc) | 127-18-4 | D039 |
| 1,1,1-Trichloroethane | 71-55-6 | F002 |
| Trichloroethylene | 79-01-6 | D040 |
| Trichlorotrifluoroethane (1,1,2-Trichloro-1,2,2-trifluoroethane) | 76-13-1 | F002 |

## RCRA Determinations - Hazardous Waste Determinations

### Historical Waste Management

The subject waste has historically been managed in accordance with the generator site requirements and in compliance with the requirements of the Pennsylvania Department of Environmental Protection. Based on historical waste management, the containers in this waste stream were managed as non-hazardous. A review of available AK documentation has determined that this waste is hazardous.

## Ignitability, Corrosivity, Reactivity

Waste generated in this waste stream does not qualify for any of the exclusions outlined in 40 Code of Federal Regulations (CFR) 260 or 261. 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. The materials are not compressed gases, nor does the waste contain compressed gases. Although ignitables (such as hexone, methanol, n-butyl alcohol, and xylene) were identified as being used in the MEL, liquids were allowed to evaporate prior to packaging into the HIP Containers. The materials are not liquid, and VE is performed to ensure the absence of liquids. Waste Stream BT-T001 is, therefore, not ignitable and is not assigned EPA HWN D001. (References C125, C128, P139, U255, U264 and U267)

## Corrosivity

This waste does not meet the definition of corrosivity as defined in 40 CFR 261.22. The waste materials are not liquid and VE was performed to ensure the absence of liquids. Aqueous liquids generated during operations were allowed to air dry prior to waste packaging. Waste Stream BT-T001 is, therefore, not corrosive and is not assigned EPA HWN D002 (References U224, U246, U255, and U267).

## 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. Met mount material tested at Argonne National Laboratory (ANL) indicated that those materials are similar to the met mounts in the MEL are not reactive (Reference P138).

The waste is not pyrophoric. The waste contains some Zircaloy swarf from the processing of spent fuel assemblies. Because of reported concerns that finely divided zirconium may spontaneously combust, tests were performed on the Zircaloy swarf. Zircaloy particles of various sizes, including Zircaloy powder, were tested at the Naval Reactors Facility (NRF) in Idaho. The test results showed that even particles much smaller than what is included in the waste were not

pyrophoric. Waste Stream BT-T001 is, therefore, not reactive and is not assigned EPA HWN D003. (Reference C014)

## Toxicity Characteristic

This waste stream exhibits the characteristic of toxicity per 40 CFR 261.24. The toxicity characteristic contaminants fall into two categories; metals and organics. Where a constituent has been identified and there is no quantitative data available to demonstrate that the concentration is below regulatory threshold, the applicable EPA HWN is applied to the waste stream.

Arsenic (D004), Barium (D005), Cadmium (D006), Chromium (D007), Lead (D008), Selenium (D010), and Silver (D011) were found in the post-irradiated fuel. Barium was also found as barium hydroxide for a machined part. Lead was also found in bricks, and as a cell-window mineral oil contaminant. Mercury (D009) was used in fission gas ring seals (References C031, C125, C211, U226, U239, and U264).

The AK identified the potential presence of organic toxicity characteristic compounds including tetrachloroethylene (D039) and trichloroethylene (D040) used as a coolant not as a solvent. Therefore, HWNs D039 and D040 are assigned to waste stream BT-T001 (References C125, C128, P139, and U214)

Since analytical data are not available to demonstrate the concentrations of these metal and organic compounds in this debris waste stream are less than the toxicity characteristic regulatory level, EPA hazardous waste numbers D004, D005, D006, D007, D008, D009, D010, D011, D039 and D040 are assigned to waste stream BT-T001.

## Listed Waste

### F-Listed Waste

Waste stream BT-T001 was mixed with or derived from F-listed hazardous waste from non-specific sources as listed in Title 40 CFR 261.31. F002 listed solvents were used in the MEL and contaminate the waste (References C125, C128, P139, and U214).

The F002-listed solvents 1,1,1-Trichloroethane and 1,1,2-Trichloro-1,2,2-trifluoroethane were used as organic solvents in the laboratory. Therefore, EPA hazardous waste number F002 is assigned to this waste stream (References C125, C128, P139, and U214).

1,1,1-Trichloroethane and 1,1,2-Trichloro-1,2,2-trifluoroethane are also F001-listed contaminants; however, F001 does not apply to the waste because the waste is not from a large scale degreasing operation.

F003-listed constituents, including acetone, methyl isobutyl ketone, methanol, and n-butyl alcohol were also used in the MEL. 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. (References C125, C128, P139, U216, U225, U252, U255, and U264)

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

(F002)
1,1,1-Trichloroethane, 1,1,2-Trichloro-1,2,2-trifluoroethane

**U, K, and P-Listed Chemicals**

Waste stream BT-T001 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.

No specific source for beryllium powder was identified for this waste stream in the AK record. Therefore, the waste stream does not meet the definition of P015 waste.

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 BT-T001.

Waste stream BT-T001 does not include any of the manufacturing process wastes from the specific industries or sources listed in 40 CFR 261.32.

Waste Stream BT-T001 is not assigned any U-, K-, or P-Listed EPA HWNs.

**Headspace Gas/Volatile Organic Compound Information**

Headspace gas sampling was performed on ten randomly selected containers in this waste stream. None of the analytes calculated to exceed the program required quantitation limit (PRQL) and tentatively identified compounds (TICs) were not identified; therefore, no new EPA HWNS have been applied.

**Conclusion**

The EPA HWNs that apply to the waste stream are: D004, D005, D006, D007, D008, D009, D010, D011, D039, D040, and F002.

## Polychlorinated Biphenyls (PCBs)

No sources of PCBs have been identified in this waste stream. MEL waste management practices required identification, segregation, and special management of suspect PCB containing materials (e.g., ballast, capacitors, and transformers). The waste is not managed pursuant to the Toxic Substances Control Act (Reference U264).

## Prohibited Items

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

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

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

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

## Justification for the Selection of VE

Visual Examination was selected as the characterization method for this lot because the waste had to be repacked and VE met all the Data Quality Objectives for NDE for waste stream BT-T001.

## Method for Determining Waste Material Parameter Weights per Unit of Waste

The waste material parameters (WMPs) for waste stream BT-T001 were estimated based on the descriptions of waste observed during the repackaging of the waste from Dolly Tubes and waste containers to the HIP containers in 2005 and 2006. This waste stream is greater than 50 percent by volume material that meets the criteria for debris.

The WMP volumes were estimated for each HIP based on the descriptions of the waste from the repackaging. Weights were calculated based on volume averages for each waste parameter. The

calculations conclude that the relative waste weight percentages for inorganic waste materials and organic waste materials for Waste Stream BT-T001 are 98.1 percent and 1.9 percent, respectively. The results of the assessment are presented in Table 2, Waste Stream BT-T001 Waste Material Parameter Estimates.

**Table 2. Waste Stream BT-T001 Waste Material Parameter Estimates**

| Waste Material Parameter | Average Weight Percent | Weight Percent Range |
|---|---|---|
| Iron-based Metals/Alloys | 93.80 % | 90.0 – 95.0 % |
| Aluminum-based Metals/Alloys | 0.61 % | 0 – 2 % |
| Other Metals | 0.62 % | 0 – 2 % |
| Other Inorganic Materials | 3.0 % | 0 – 5 % |
| Cellulosics | 0.02 % | 0 – 10 % |
| Rubber | 0.05 % | 0 – 1 % |
| Plastic (waste materials) | 1.8 % | 0 – 3 % |
| Organic Matrix | 0 % | 0 – 0 % |
| Inorganic Matrix | 0.1 % | 0 – 1 % |
| Soils/Gravels | 0 % | 0 – 0 % |

## List of AK Sufficiency Determinations

No AK Sufficiency Determinations were requested for this waste stream.

## Transportation

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

## Radionuclide Information

The two most prevalent radionuclides in this waste stream, by weight, based on the calculations Bettis used to determine the radiological distribution, are Th-232 and U-235.

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

Payload management was not used for this waste stream.

**Table 3. Summary of BT-T001 Radionuclides**

| WIPP Tracked Radionuclides | Additional Reported Radionuclides |
|---|---|
| Am-241 | Ba-137m |
| Pu-238 | Th-232 |
| Pu-239 | U-235 |
| Pu-240 | U-236 |
| Pu-242 | Y-90 |
| U-233 | |
| U-234 | |
| U-238 | |
| Cs-137 | |
| Sr-90 | |

**Attachment 1**

# AK SOURCE DOCUMENTS, SUPPLEMENTAL DOCUMENTATION

| Source Document Tracking Number | AK # | Title | Document Number | Revision | Date |
|---|---|---|---|---|---|
| C014 | S9 | Letter to Jeff W. Frazier from Timothy L. Cox, Vicente Munne, and Michael S. Wilkie, Re: DOT Hazard Categorization of Zircaloy Swarf (NOFORN) | B-NRF(E)-073 | N/A | 9/12/2007 |
| C031 | N/A | Letter to Joe Nagel; RE: TCLP Testing of Fuel Core Material | 2802940 | N/A | 1/5/1994 |
| C117 | N/A | Letter to H.F. Hoffman; RE: Fission Gas Analyzer Historical Data | NRFE-P-1813 | N/A | 6/6/1991 |
| C125 | N/A | Letter to K.M. Tomko; RE: Near Cell Filter Hazardous Waste Evaluation | WAPD-DLO(MEL) FE-437 | N/A | 6/6/1990 |
| C128 | N/A | Letter to W.R. Maxwell and K.D. Richardson; RE: Use of Alternative Cleaning Solvent for Test Specimens | WAPD-MT(FZCT)-1215 | N/A | 4/18/1990 |
| C129 | S10 | Letter to M.A. DiBattista and J.F. Ruch, RE: Review of Fryquel 150 Oil | WAPD-RC/E(EE)-292 | N/A | 5/9/1988 |
| C211 | N/A | Letter to T.E. Reed; RE: Disposition of Waste Generated from Process | WAPD-DLO(MEL) O-623 | N/A | 2/15/1988 |
| P105 | N/A | Nuclear Material Balance Area 4 Accountability Manual | WAPD-NMM-1004 | Issue II Rev. 5 | May 1989 |
| P107 | S2 | Preparation of Metallographic Specimens | MEL(T)1-2 | Rev. 1 | 1/15/1985 |
| P108 | N/A | Pressure Mounting of Fuel Rod Specimens | MELT 2-3 | Original | 3/3/1980 |
| P109 | N/A | NRF 1662.20 Descale Solutions and Operations | MEL(T) 3-4 NRF1662.20 | Rev. 9 | 6/30/1973 |
| P110 | N/A | Operation of Lathe to Part Fuel Rods | MEL(T)2-14 | Original | 4/1/1981 |
| P112 | N/A | Sectioning Specimens on the Slow Speed Abrasive Cut Off Wheel | MEL(T) 2-6 | Rev. 11 | 4/16/1986 |
| P113 | N/A | Sectioning Specimens on the Precision Cut-Off Wheel | MEL (T) 3-6 | Rev. 6 | 6/18/1987 |
| P115 | N/A | Operation of Gas Fission Rig Cleaning Box | MEL-(T) 2-13 | Rev. 3 | 4/22/1982 |
| P116 | S2 | Fission Gas Collection Operations | MEL(T)2-5 | Rev. 3 | 10/9/1991 |
| P120 | S2 | Procedure for Decontaminating Items in the 10KW Ultrasonic Cleaner | HLP No 29 | Rev. 1 | 6/13/1967 |
| P121 | N/A | APAC Decrudding of Irradiated Specimens | HLP #22 | Rev. 3 | 7/31/1974 |
| P123 | S2 | Dye Penetrant Examination of Irradiated Specimens | HLP #27 | Original | 10/29/1973 |
| P124 | S2 | Fluorescent Penetrant Inspection | MEL(T)3-10 | Rev. 2 | 8/23/1990 |
| P126 | N/A | Curie and Transuranic Content Determination for Radioactive Waste Packages | RM-AG-001 | Rev. 3 | 3/23/1988 |

| Source Document Tracking Number | AK # | Title | Document Number | Revision | Date |
|---|---|---|---|---|---|
| P127 | N/A | Alpha Cell Waste Nuclide Distribution | Work Request 20001430 | Rev. 0 | 7/10/2001 |
| P128 | N/A | Fission Gas Rig Decon and Repair | HLP-278 90-068-MEL | Rev. 0 | 12/4/1990 |
| P129 | N/A | Repackaging of MEL TRU Waste Material | HLP-433 RCE # 2005-781-MEL | Rev. 0 | 12/14/2005 |
| P130 | N/A | Quality Assurance Packaging Study Guide | N/A | N/A | Dec. 2004 |
| P133 | S2 | MEL Scrap Fuel Program | MEL(G)-2-7 | Rev. 2 | 2/16/1987 |
| P134 | N/A | Activity Calculation for MEL Central Cell Bank Waste | RM-AG-071 | Rev. 0 | 3/4/1996 |
| P135 | N/A | 1957 Nuclear Engineering and Science Congress: The Bettis Fission Gas Apparatus | WAPD-T-437 56745536 | N/A | March 10-16, 1957 |
| P137 | S2 | Fuel Element Puncturing for Containment of Evolved Gasses | HLP #30 | Original | 11/19/1973 |
| P138 | S12 | Results of Testing Metallographic (Met) Mounts for the Presence of Sodium, Performed in the Alpha Gamma hot Cell Facility (AGHCF) at Argonne National Laboratory | NOD-215-00-00 | Rev. 0 | 5/1/2010 |
| P139 | S2 | Alpha Facility Procedure Manual | WAPD-CL-(RC)-1821 | Rev. 2 | October 1983 |
| U208 | N/A | Technical Work Records: Back-up Data for TRU Waste Forecast Request by Radioactive Materials | TWR 20536, 21716, and 21894 | N/A | 10/15/94 and 11/16/2002 |
| U209 | N/A | Phase I of the Metallographic Process for the East Cell Bank | N/A | N/A | N/A |
| U212 | N/A | Operation Record of Met Cell Equivalent Gram Loss | Book #2 and #3 | N/A | 3/3/82 through 11/11/86 |
| U213 | S4 | Grinding Equivalent Gram Loss Logbook No. 1 | Book #1 | N/A | 2/77 through 2/81 |
| U214 | S4, S11 | Book #1 Ultrasonic Cleaning Logbook | Book 1 | N/A | 3/12/1975 |
| U216 | S2, S11 | Book #1 Fuel Crush & Etching Data Records Logbook | Book #1 | N/A | 3/77 through 8/79 |
| U217 | S4 | Logbook COW #3, Old Slow Speed COW, Waste Disposal Log Cell 12 | COW #3 | N/A | 3/17/1980 |
| U219 | S4 | Sludge Information Data Sheet | N/A | N/A | 3/22/1993 |
| U220 | N/A | Technical Work Record No. 70084 - Depletion Reviews | TWR 70084 | N/A | May 1995 |
| U223 | N/A | Technical Work Record No. Z02397 - MEL TRU Nuclide Distribution | TWR No. Z02397 | N/A | 9/27/2005 |
| U224 | N/A | Flow Charts for MEL Waste | N/A | N/A | N/A |
| U225 | S2 | Route Card M-894 | M-894 | N/A | 8/13/1982 |

| Source Document Tracking Number | AK # | Title | Document Number | Revision | Date |
|---|---|---|---|---|---|
| U226 | S2, S5 | Route Card G-468 - Barium Hydroxide | G-468 | N/A | 4/28/1981 |
| U231 | S4 | Sludge Information Data Sheet | N/A | N/A | 3/18/93 |
| U236 | S4 | COW Logbook #2, Waste Disposal Log | COW #2 | N/A | 1/73 through 11/79 |
| U239 | N/A | Interview with D. Chapas - Operations - Chemicals - Pre-NAC | N/A | N/A | N/A |
| U241 | N/A | Specimens Which Contributed to Sludge Activity | N/A | N/A | 2/29/1992 |
| U246 | S4 | Handwritten Notes on the Packaging of HIPs | N/A | N/A | 1/7/2006 |
| U247 | S4 | Technical Work Record 22277, TRU Repackaging in MEL 12/05 to 1/19/2006 | TWC 22277 | N/A | 1/21/2006 |
| U251 | S2 | Technical Work Record 12314 | TWR 12314 | N/A | 1/8/1981 |
| U252 | S11 | Logbook #2 for Fuel Crush Etching ClAD Rinse | N/A | N/A | 8/17/1979 |
| U253 | S4 | List of Samples in AC-93-1 to AC93-7 | N/A | N/A | N/A |
| U254 | S2 | Route Card G492, Specimens For Fission Gas Sampling | G-492 | N/A | 3/8/1982 |
| U255 | N/A | Trouble Record Response, Evaluation of Radiation Effects on Organics/Plastics in Containers in MEL Cell Banks | TRR-ECF(FP291) FPO1036-TR1 | N/A | N/A |
| U258 | N/A | Fission Gas Drilling Operations | N/A | N/A | 2/11/1983 to 3/20/1983 |
| U259 | S4 | Containers - HIPs and Waste Cans | N/A | N/A | 4/6/92 |
| U260 | S2 | Route Card G-502, Fuel Specimens from alt clad R.B. Trans #1 | G-502 | N/A | 9/29/1982 |
| U261 | S2 | Route Card G503, Fuel Specimens from Type 6 Transient #1 | G503 | N/A | 9/29/1982 |
| U262 | S2 | Route Card, G518, Transverse MET Sections in Most Severe Overload Regions | G518 | N/A | 4/26/1983 |
| U263 | S2 | Route Card G543, Prime Specimens 76-7821 from AHT TR#3 | G543 | N/A | 7/27/1983 |
| U264 | S7 | Personnel Interview with Ron Minkus and Ron Pfeifer | N/A | N/A | 3/10/2010 |
| U267 | N/A | Technical Work Record 23070, HIP Contents Examination | TWR 23070 | N/A | 12/2/2009 |
| U269 | N/A | Visual Exam of HIPs | N/A | N/A | N/A |
| U270 | N/A | HIP Material Parameters | N/A | N/A | N/A |

## Alphanumeric Designations

| | |
|---|---|
| C | Correspondence |
| D | Document |
| 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 |
| N/A | Not applicable |