



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



AUG - 3 2012

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

Subject: Review of Los Alamos National Laboratory Central Characterization Project Waste Stream Profile Form Number LA-OS-00-04

Dear Mr. Kieling:

The Department of Energy, Carlsbad Field Office has approved the Waste Stream Profile Form (WSPF) Number LA-OS-00-04, *Mixed Waste Sealed Sources*, for the Central Characterization Project at the Los Alamos National 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.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

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

Sincerely,


 Jose R. Franco, Manager
 Carlsbad Field Office

Enclosure

cc: w/enclosure
 S. Holmes, NMED *ED
 T. Kliphuis, NMED ED
 RCRA Chronology Record ED
 WIPP Operating Record ED
 CBFO M&RC

*ED denotes electronic distribution



Attachment 2 – CCP Waste Stream Profile Form

(1) Waste Stream Profile Number: LA-OS-00-04		
(2) Generator site name:	Los Alamos National Laboratory	(3) Generator site EPA ID: NM0890010515
(4) Technical contact:	Terri-Anne Groover	(5) Technical contact phone number: 505-606-2344
(6) Date of audit report approval by New Mexico Environment Department (NMED): September 23, 2011		
(7) Title, version number, and date of documents used for WIPP-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-012, CCP/LANL Interface Document, Revision 9, January 4, 2012		
(8) Did your facility generate this waste? YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>		
(9) If no, provide the name and EPA ID of the original generator: NA		
Waste Stream Information		
(10) WIPP ID ¹ :	None	(11) Summary Category Group: S5000 – Debris Waste
(12) Waste Matrix Code Group:	Uncategorized Metal	(13) Waste Stream Name: Mixed Waste Sealed Sources
(14) Description from the ATWIR: Waste stream LA-OS-00-04 consists of manufactured sealed sources in metal or Lexan (plastic polymer) containers which are placed inside 55-gallon metal POC configuration drums. Waste stream LA-OS-00-04 contains non-volatile hazardous constituents present in the encapsulating material or as shielding, particularly Cd and Pb. Therefore, this is a mixed waste stream with EPA HWNs D006 and D008.		
(15) Defense TRU Waste:	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	
(16) Check One:	CH <input checked="" type="checkbox"/> RH <input type="checkbox"/>	
(17) Number of SWBs: NA (17a) Number of SLB2 NA	(18) Number of Drums: 1 55-gallon drum 1 drum/year projected	(19) Number of Canisters: NA
(20) Batch Data Report numbers supporting this waste stream characterization: See Characterization Information Summary (CIS) Correlation of Container Identification Numbers to Batch Data Report Numbers.		
(21) List applicable EPA Hazardous Waste Numbers: ² D006 and D008		
(22) Applicable TRUCON Content Numbers: LA 120 / 220		
(23) Acceptable Knowledge Information		
(For the following, enter the supporting documentation used [i.e., references and dates])		
Required Program Information		
(23A) Map of site: CCP-AK-LANL-008, Revision 9, May 3, 2012, Figures 1, 2, 3, 4 and 5		
(23B) Facility mission description: CCP-AK-LANL-008, Revision 9, May 3, 2012, Section 4.3		
(23C) Description of operations that generate waste: CCP-AK-LANL-008, Revision 9, May 3, 2012, Section 4.7		
(23D) Waste identification/categorization schemes: CCP-AK-LANL-008, Revision 9, May 3, 2012, Section 4.6.3		
(23E) Types and quantities of waste generated: CCP-AK-LANL-008, Revision 9, May 3, 2012, Section 4.6.1		

(23F) Correlation of waste streams generated from the same building and process, as applicable: CCP-AK-LANL-008, Revision 9, May 3, 2012, Section 4.6.2	
(24) Waste certification procedures: CCP CH TRU Waste Certification and WWIS/WDS Data Entry, CCP-TP-030, Revision 30, May 21, 2012	
(25) Required Waste Stream Information	
(25A) Area(s) and building(s) from which the waste stream was generated: CCP-AK-LANL-008, Revision 9, May 3, 2012, Section 7.1	
(25B) Waste stream volume and time period of generation: CCP-AK-LANL-008, Revision 9, May 3, 2012, Section 7.2	
(25C) Waste generating process description for each building: CCP-AK-LANL-008, Revision 9, May 3, 2012, Section 7.3	
(25D) Waste Process flow diagrams: NA	
(25E) Material inputs or other information identifying chemical/radionuclide content and physical waste form: CCP-AK-LANL-008, Revision 9, May 3, 2012, Section 7.4	
(25F) Waste Material Parameter Weight Estimates per unit of waste: See table entitled Waste Stream LA-OS-00-04 Waste Material Parameters in Summation of Aspects of AK Summary Report: Waste Stream LA-OS-00-04.	
(26) Which Defense Activity generated the waste:	
<input checked="" type="checkbox"/>	Weapons activities including defense inertial confinement fusion
	Naval Reactors development
	Verification and control technology
	Defense research and development
<input checked="" type="checkbox"/>	Defense nuclear waste and material by products management
<input checked="" type="checkbox"/>	Defense nuclear material production
<input checked="" type="checkbox"/>	Defense nuclear waste and materials security and safeguards and security investigations
(27) Supplemental Documentation	
(27A) Process design documents: NA	
(27B) Standard operating procedures: See P001, P002, P004 and P005 in the Summation of Aspects of AK Summary Report: Waste Stream LA-OS-00-04, Source Documents.	
(27C) Safety Analysis Reports: NA	
(27D) Waste packaging logs: See C065 and M031 in the Summation of Aspects of AK Summary Report: Waste Stream LA-OS-00-04, Source Documents.	
(27E) Test plans/research project reports: See D006 and D022 in the Summation of Aspects of AK Summary Report: Waste Stream LA-OS-00-04, Source Documents.	
(27F) Site databases: See M006 in the Summation of Aspects of AK Summary Report: Waste Stream LA-OS-00-04, Source Documents.	
(27G) Information from site personnel: See C009, C016 and C024 in the Summation of Aspects of AK Summary Report: Waste Stream LA-OS-00-04, Source Documents.	
(27H) Standard industry documents: See M002 and M069 in the Summation of Aspects of AK Summary Report: Waste Stream LA-OS-00-04, Source Documents.	
(27I) Previous analytical data: See M237 in the Summation of Aspects of AK Summary Report: Waste Stream LA-OS-00-04, Source Documents.	
(27J) Material safety data sheets: NA	
(27K) Sampling and analysis data from comparable/surrogate Waste: See M002 in the Summation of Aspects of AK Summary Report: Waste Stream LA-OS-00-04, Source Documents.	
(27L) Laboratory notebooks: NA	
Confirmation Information	
For the following, when applicable, enter procedure title(s), number(s) and date(s)	
(28)	Radiography: NA
	Visual Examination: CCP Sealed Source Visual Examination and Packaging, CCP-TP-069, Revision 5, November 9, 2010

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

Reviewed by AK Expert: YES Date: 6/11/2012

Reviewed by STR (if necessary): YES N/A Date: 6/11/2012

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.



Terri-Anne Groover

7-18-2012

Signature of Site Project Manager

Printed Name

Date

- NOTE:** (1) This waste stream is expected to be virtually identical to waste stream LA-OS-00-01.001 except for Cadmium and/or lead cladding integral to the sealed source construction. This waste stream is not listed in the Annual Transuranic Waste Inventory Report.
- (2) If, radiography, visual examination were used to confirm EPA Hazardous Waste Numbers, attach signed Characterization Information Summary documenting this determination.

Characterization Information Summary

WSPF # LA-OS-00-04

Lot 1

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CCP Characterization Information Summary Cover Page

Waste Stream #	LA-OS-00-04	Lot #:	1
AK Expert Review:	N/A	Date:	N/A
SPM Review:	Jim Eastham	Date:	3/23/2012

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:

Visual Examination (VE):

CCP-TP-069	Rev. 4	11/16/06	CCP Sealed Source Visual Examination and Packaging
CCP-TP-069	Rev. 5	11/09/10	CCP Sealed Source Visual Examination and Packaging

Non Destructive Assay (NDA):

CCP-TP-101	Rev. 4	11/02/07	CCP Off-Site Source Recovery Project Sealed Source Radiological Characterization
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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-002	Rev. 24	12/28/11	CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-003	Rev. 18	12/28/10	CCP Data Analysis for S3000, S4000, and S5000 Characterization
CCP-TP-005	Rev. 23	08/30/11	CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 24	11/28/11	CCP Acceptable Knowledge Documentation
CCP-TP-030	Rev. 29	04/26/11	CCP CH TRU Waste Certification and WW/S/WDS Data Entry
CCP-TP-030	Rev. 30	05/21/12	CCP CH TRU Waste Certification and WW/S/WDS Data Entry

WAP Certification:

CCP-PO-001	Rev. 20	06/16/11	CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-002	Rev. 26	07/14/11	CCP Transuranic Waste Certification Plan
CCP-PO-012	Rev. 8	12/29/10	CCP/Los Alamos National Laboratory (LANL) Interface Document
CCP-PO-012	Rev. 9	01/04/12	CCP/Los Alamos National Laboratory (LANL) Interface Document

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

WSP: # LA-OS-00-04

Lot # 1

Container ID Number	Headspace Gas BDR		NDA BDR	RTR BDR	VE BDR	Solids Sampling BDR	Solids Analytical BDR	Load Management/Overpack Yes
	Sample	Analysis						
LA00000065416	NA	NA	LA11-OSR-CH-010	NA	LA11-OSR-VE-010	NA	NA	NA



Signature of Site Project Manager

Jim Eastham
Printed Name

3/23/2012
Date

CCP RTR/VE Summary of Prohibited Items and AK Confirmation

Waste Stream Number: LA-OS-00-04

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 underwent the RTR process.	None of the containers in this Lot had any prohibited items detected in 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 VE is: VE was selected as the characterization method for this lot because the containers were newly generated and met all of the Data Quality Objectives for NDE for the waste.


 Site Project Manager Signature

Jim Eastham
 Printed Name

3/23/2012
 Date

013-04

CCP Reconciliation with Data Quality Objectives

WSF# LA-OS-00-04

Lot # 1

Sampling Completeness

VE

Number of Valid Samples: 1
 Percent Complete: 100 (QAO is 100%)

Number of Total Samples Analyzed: 1

NDA

Number of Valid Samples: 1
 Percent Complete: 100 (QAO is 100%)

Number of Total Samples Analyzed: 1

HSG

Number of Valid Samples: NA
 Percent Complete: NA (QAO is $\geq 90\%$)
 Number of Valid Samples: NA
 Percent Complete: NA (QAO is $\geq 90\%$)

Number of Total Samples Collected: NA

Number of Total Samples Analyzed: NA

Total VOC

Number of Valid Samples: NA
 Percent Complete: NA (QAO is $\geq 90\%$)
 Number of Valid Samples: NA
 Percent Complete: NA (QAO is $\geq 90\%$)

Number of Total Samples Collected: NA

Number of Total Samples Analyzed: NA

Total SVOC

Number of Valid Samples: NA
 Percent Complete: NA (QAO is $\geq 90\%$)
 Number of Valid Samples: NA
 Percent Complete: NA (QAO is $\geq 90\%$)

Number of Total Samples Collected: NA

Number of Total Samples Analyzed: NA

Total Metals

Number of Valid Samples: NA
 Percent Complete: NA (QAO is $\geq 90\%$)
 Number of Valid Samples: NA
 Percent Complete: NA (QAO is $\geq 90\%$)

Number of Total Samples Collected: NA

Number of Total Samples Analyzed: NA

	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?

CCP Reconciliation with Data Quality Objectives

WSF# LA-OS-00-04

Lot # 1

6	NA(1)	Mean concentrations, UCL ₉₀ values for the mean concentration, standard deviations, and the number of samples collected for each VOC in the HSG of each container were calculated and compared with the program required quantitation limits, as reported in CCP-TP-003 Attachment 3, and additional Environmental Protection Agency (EPA) Hazardous Waste Numbers were assigned as required. Samples were randomly collected (when appropriate).
7a	NA	Mean concentrations, UCL ₉₀ values for the mean concentration, standard deviations, and the number of samples collected for solids VOCs were calculated and compared with the program required quantitation limits and regulatory thresholds, as reported in the Characterization Information Summary, CCP-TP-003 Attachment 4, and additional EPA Hazardous Waste Numbers were assigned as required. Samples were randomly collected.
7b	NA	Mean concentrations, UCL ₉₀ values for the mean concentration, standard deviations, and the number of samples collected for solids SVOCs were calculated and compared with the program required quantitation limits and regulatory thresholds, as reported in the Characterization Information Summary, CCP-TP-003 Attachment 5, and additional EPA Hazardous Waste Numbers were assigned as required. Samples were randomly collected.
7c	NA	Mean concentrations, UCL ₉₀ values for the mean concentration, standard deviations, and the number of samples collected for total metals were calculated and compared with the program required quantitation limits and regulatory thresholds, as reported in the Characterization Information Summary, CCP-TP-003 Attachment 6, and additional EPA Hazardous Waste Numbers were assigned as required. Samples were randomly collected.
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	N	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	NA(1)	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	NA(1)	TICs were appropriately identified and reported in accordance with the requirements of Section C3-1 of the QAPjP.

CCP Reconciliation with Data Quality Objectives

WSF# LA-OS-00-04

Lot # 1

13	NA(1)	The PRQLs for headspace gas VOCs were met for all analyses as evidenced by the analytical batch data reports.		
14		The overall completeness, comparability, and representativeness QAOs were met for each of the analytical and testing procedures as specified in the WAP Sections C3-2 through C3-9 prior to submittal of a waste stream profile form for a waste stream or waste stream lot		
		Completeness	Comparability	Representativeness
	Radiography	NA	NA	NA
	VE	Y	Y	Y
	Headspace Gas	NA(1)	NA(1)	NA(1)
	Solids Sampling	NA	NA	NA
	Solids VOCs	NA	NA	NA
	Solids SVOCs	NA	NA	NA
	Solids Metals	NA	NA	NA
Comments: (1) In accordance with the WIPP WAP Attachment C4, Paragraph C4-2c, LANL sealed source waste streams do not require headspace gas sampling and analysis.				


Signature of Site Project Manager

Jim Eastham
Printed Name

3/23/2012
Date

SUMMATION OF ASPECTS OF AK SUMMARY REPORT: Waste Stream LA-OS-00-04**Overview:**

Waste Stream LA-OS-00-04 is a Contact Handled (CH) transuranic (TRU) Uncategorized Metal mixed waste stream generated and stored at Los Alamos National Laboratory (LANL). Waste stream LA-OS-00-04 is newly generated waste and will continue to be generated as the sealed sources are identified as waste by the Off-Site Source Recovery Project (OSRP). The mission of the OSRP is to recover and manage radioactive sealed sources generated by the public and private sectors that present a risk to public health or homeland security. OSRP personnel estimate that projected generation will be no more than one drum per year for this waste stream.

Waste stream LA-OS-00-04 is comprised of Americium (Am)-241, Plutonium (Pu)-238, and Pu-239 sealed sources. All of the sealed sources in this waste stream meet the definition of defense waste as defined in the Nuclear Waste Policy Act of 1982 because they were derived from weapons activities including defense inertial confinement fusion; defense nuclear materials production; defense nuclear waste and materials by-products management; and because they are being recovered to support defense nuclear material security and safeguards (References C004, D011, D023, and D025).

This Summation of the AK Summary Report includes information to support Waste Stream Profile Form (WSPF) number LA-OS-00-04 for mixed uncategorized metal debris stored at LANL. The primary source of information for this Summation is CCP-AK-LANL-008, Central Characterization Project Acceptable Knowledge Summary Report for Los Alamos National Laboratory Off-Site Source Recovery Project Sealed Sources: Waste Streams LA-OS-00-01.001, LA-OS-00-03, and LA-OS-00-04, Revision 9, May 3, 2012.

Waste Stream Identification Summary:

Waste Stream Name:	Mixed Waste Sealed Sources
Waste Stream Number:	LA-OS-00-04
Dates of Waste Generation:	10/12/2011 - current
Waste Stream Volume – Current:	1 drum
Waste Stream Volume – Projected:	1 drum per year
Summary Category Group:	S5000 – Debris Waste
Waste Matrix Code Group:	Uncategorized Metal
Waste Matrix Code:	S5100
TRUPACT-II Content Code Numbers:	LA120 / 220

Annual Transuranic Waste Inventory
Report Identification Number:

None

Waste Stream Description and Physical Form:

Waste stream LA-OS-00-04 consists of manufactured sealed sources in metal or Lexan (plastic polymer) containers which are placed inside 55-gallon metal pipe overpack (POC) configuration. Waste stream LA-OS-00-04 contains non-volatile hazardous constituents present in the encapsulating material or as shielding, particularly cadmium (Cd) and lead (Pb). Therefore, this is a mixed waste stream with Hazardous Waste Numbers (HWNs) D006 and D008.

Waste stream LA-OS-00-04 consists of sealed sources that are encapsulated in various metals that include stainless steel, Armco 17-4 PH steel, beryllium (Be), aluminum (Al), tantalum (Ta), platinum (Pt)-20% iridium (Ir), silicon (Si)-sodium (Na)-magnesium (Mg) oxide, tungsten (W), silver (Ag), palladium (Pd), nickel (Ni), copper (Cu), gold (Au), cesium (Cs), and iron (Fe) metals. The confining barrier (the metal capsule) prevents dispersion of the radioactive material under normal and most accidental conditions related to the use of the source. The sealed sources contain varying amounts and combinations of Am, or other TRU nuclides, and may contain Be or other light elements to create neutron emission (Reference D003 and M133). The material in this waste stream meets the following definition of a sealed source: "Radioactive material that is contained in a sealed capsule, sealed between layers of non-radioactive material, or firmly fixed to a non-radioactive surface by electroplating or other means"

The waste stream meets the definition of waste materials that have common physical form, that contain similar hazardous constituents, and that are generated from a single process or activity. This waste stream was generated from OSRP activities pertaining to the disposal of transuranic sealed sources.

Point of Generation:

Location

Waste stream LA-OS-00-04 was generated at the Los Alamos National Laboratory. The waste is currently stored at Los Alamos National Laboratory.

Area and/or Building of Generation

Waste stream LA-OS-00-04 is generated when sealed sources are identified as waste with hazardous constituents in addition to their radiological content. Most sealed sources in LA-OS-00-04 are recovered, consolidated as needed, and visually examined during packaging at off-site locations, after which they are shipped to LANL. Once received, the containers are examined to ensure the TID is intact and declared waste for future management at one or more of the following LANL facilities (Reference P004):

- TA-3, SM-30, initial receipt of OSRP sealed sources at LANL by the LANL Shipping and Receiving Organization (Reference M029)
- TA-54, Area G, interim storage and packaging of non-Pu-239-containing OSRP sealed sources (Reference M030)
- TA-55, Interim storage and packaging of OSRP sealed sources (Reference M030)

The Off-Site Source Recovery Program (OSRP) is based at LANL TA-46 (References P001 and P004).

Generating Processes:

Description of Waste Generating Processes

OSRP personnel confirm eligibility of sealed sources for collection by the OSRP, obtain AK documentation for them, and arrange for their recovery from off-site locations. The DOE may declare a sealed source as waste if it is not suitable for recycling or reuse. In this case, sealed sources that are designated as defense related and meet the criteria for WIPP disposal enter the process for WIPP certification (References C004, C005, C006, and P004).

OSRP personnel perform characterization and packaging activities, including assembling AK documentation and conducting VE during packaging of the sealed sources (References P001, P004, and P007). Records of the design history/specifications and radiological content are assembled and compiled as part of the AK documentation for each TRU sealed source. Detailed, source-specific information for each individual source also is available, including documentation on the content and design/construction from the NRC Sealed Source and Device Registry and the manufacturer or owner, the original shipping paper and specification sheet, data from the NRC/DOE NMMSS, and other physical information about the source (References D010, D031, M005, M007, M012, M013, M014, M017, M024, M025, M026, M027, and M038). A large volume of source-specific AK information may be compiled once a source is identified for recovery.

This information is included in the batch data reports (BDRs) prepared during packaging and radiological characterization of the source. During VE, the source is verified against the documentation and that it matches the actual source that is packaged (Reference P001).

Sealed sources that are special form (e.g., have undergone special DOT testing to ensure no dispersion in the event of an accident) may be placed in a metal or Lexan (plastic polymer) container to consolidate the sources. During recovery when non-special form sources are encountered, they are encapsulated in certified special form containers (SFCs). The source containers are then either placed into standard 55 gallon drums or into 55-gallon metal POC drums that are centered within cane fiberboard dunnage or neutron shielding material (depending upon packaging configuration) (Reference P001). The packaging configurations that may be used for POCs include a standard pipe overpack with 12-inch pipe component, S100, S200, or S300 overpacks (Reference P001). Sealed source masses are typically well documented by the source manufacturers and are verified during VE (References D005, M005, M007, and P001).

The OSRP is based at LANL TA-46. However, most sealed sources in the subject waste stream are recovered, consolidated as needed, and visually examined during packaging at off-site locations, after which they are shipped to LANL (Reference P004). Once received, they are examined to ensure the TID is intact and declared waste for future management at one or more of the LANL facilities previously identified (Reference P001).

Waste Stream Material and Chemical Inputs

The following table identifies the Resource Conservation and Recovery Act (RCRA) toxicity characteristic and listed constituents identified in this waste stream.

Toxicity Characteristic and F-Listed Constituents in Waste Stream LA-OS-00-04

Chemical	EPA HWN	Use	References
Cadmium	D006	Plated onto copper encapsulating layer	M058, M062
Lead	D008	Source holder material	C024

RCRA Determinations**Historical Waste Management**

Waste stream LA-OS-00-04 is newly generated and was not packaged by OSRP until the receipt of a RCRA permit modification in 2010 that allowed LANL to bring this type of waste onsite. Currently, it is one of three waste streams that will be certified under CCP procedures.

Hazardous Waste Determinations**Ignitability, Corrosivity, Reactivity****Ignitability**

The waste material in waste stream LA-OS-00-04 does not meet the definition of ignitability as defined in 40 CFR 261.21. A solid waste exhibits the characteristic of ignitability as defined in 40 CFR 261.21 if it has any of the following properties: 1) It is a flammable liquid (flash point less than 60°C), 2) It is not a liquid and is capable, under standard temperature and pressure, of causing fire through friction, absorption of moisture, or spontaneous chemical change, 3) It is an ignitable compressed gas, or 4) It is an oxidizer (a substance such as a chlorate, permanganate, inorganic peroxide, or a nitrate, that yields oxygen readily to stimulate the combustion of organic matter).

Sealed sources constitute closed systems (manufactured, solid isotopic sources sealed in a metal jackets or metal casings) that preclude the introduction of extraneous materials (such as liquids) that would be ignitable (Reference D005 and M005). The sources will not cause fire through friction, absorption of moisture, or spontaneous chemical changes. The sources are not compressed gases or oxidizers (Reference C001, D002, D003 and M133). Therefore, the hazardous waste number for ignitability (D001) does not apply to this waste stream.

Corrosivity

The waste material in waste stream LA-OS-00-04 is not liquid and does not contain unreactive corrosive chemicals; therefore, it does not meet the definition of corrosivity as defined in 40 CFR 261.22. A solid waste exhibits the characteristic of corrosivity as defined in 40 CFR 261.22 if it has any of the following properties: 1) It is aqueous and has a pH less than or equal to 2 or greater than or equal to 12.5, or 2) It is a liquid and corrodes steel at a rate greater than 0.25 inches per year.

Sealed sources constitute closed systems (manufactured, solid isotopic sources sealed in a metal jackets or metal casings) that preclude the introduction of extraneous materials (such as liquids) that would be corrosive (References D005 and M005). Therefore, the hazardous waste number for corrosivity (D002) does not apply to this waste stream.

Reactivity

The waste material in waste stream LA-OS-00-04 does not meet the definition of reactivity as defined in 40 CFR 261.23. A solid waste exhibits the characteristic of reactivity as defined in 40 CFR 261.23 if it has any of the following properties: 1) It is normally unstable and readily undergoes violent change without detonating, 2) It reacts violently with water, 3) It forms potentially explosive mixtures with water, 4) When mixed with water, it generates toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment, 5) It is a cyanide or sulfide bearing waste which, when exposed to pH conditions between 2 and 12.5, can generate toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment, 6) It is capable of detonation or explosive reaction if it is subjected to a strong initiating source or if heated under confinement, 7) It is readily capable of detonation or explosive decomposition or reaction at standard temperature and pressure, or 8) It is a forbidden explosive, or Class A or Class B explosive as defined in 49 CFR 173, Shippers – General Requirements for Shipments and Packagings.

Lithium is present in some of the sources in this waste stream. All lithium sources are doubly encapsulated, with the nuclide/lithium mixture contained in a welded stainless steel cylinder additionally encapsulated in an outer welded capsule. The EPA allows the use of best engineering judgment when determining if a material is reactive. Best engineering judgment includes observation of the waste material and the use of manufacture information. Based on the lithium containing sources construction, they would not react violently with water or generate toxic gases harmful to human health or the environment. In addition, the lithium sources are not expected to rupture or react violently if exposed to a strong initiating source or if heated under confinement. The sources as manufactured articles are not reactive which is substantiated by the fact that manufactures do not manage these sources as reactive (Reference D031). Conservative calculations addressing the potential for radiolytic decay estimate that the sources could withstand approximately 750 degrees Fahrenheit of heat before a rupture is possible. A similar observation and position was made for small arms ammunition (i.e., the ammunition was exposed to 160 degrees Fahrenheit of heat for 48 hours and showed no evidence of detonation or explosion) and the EPA concurred that the material was nonreactive. Further the sources are packaged in ORSP SFCs, which are tested to withstand 800 degrees Celsius without leaking and meet other requirements in 49 CFR. Therefore, the hazardous waste number for reactivity (D003) does not apply to this waste stream (References C032, C039, and D031).

The containers in the waste stream will be evaluated in accordance with the WIPP-WAP using visual examination prior to shipment to ensure the waste is not ignitable, reactive, or corrosive. (References M031 and P001).

Toxicity Characteristic

Waste stream LA-OS-00-04 exhibits the characteristic of toxicity for metals as defined in 40 CFR 261.24, Subpart C). This waste stream contains sealed sources that are either encapsulated or surrounded by lead or cadmium materials (References C024, M058, and M062). Sources encapsulated in copper-plated cadmium have been determined to contain about 0.76 wt% Cd, which is substantially higher than the RCRA toxicity characteristic threshold of 1 part per million (ppm) (Reference M062). In addition, sources in holders that contain lead or otherwise have lead associated with them are expected to be hazardous for lead (Reference C024). Therefore, this waste stream is considered mixed waste and assigned EPA HWNs D006 (Cd) and D008 (Pb).

Waste stream LA-OS-00-04 does not contain solvents or any other constituents that qualify as toxicity characteristic waste; therefore, LA-OS-00-04 does not exhibit the characteristic of toxicity for organic compounds as defined in 40 CFR 261, Subpart C (40 CFR 261.24) (References C001, C002, D002, D003, M003, M004, M033, and M133).

Listed Waste

F-Listed Waste

Waste stream LA-OS-00-04 is not mixed with or derived from the treatment of a waste listed in 40 CFR 261, *Identification and Listing of Hazardous Waste*, Subpart D, as a hazardous waste from non-specific sources (40 CFR 261.31).

Waste stream LA-OS-00-04 is not hazardous waste due to the presence of F-listed solvents because there are no solvents present in the manufacturing or waste generation processes (References C001, D002, and D003).

K-Listed Waste

Waste stream LA-OS-00-04 does not include any of the manufacturing process wastes from the specific industries or sources listed in 40 CFR 261.32.

P and U-Listed Wastes

Waste stream LA-OS-00-04 is not mixed with a discarded commercial chemical product, an off-specification commercial chemical product, or a container residue thereof (40 CFR 261.33). Consequently, P- and U-listed EPA hazardous waste numbers are not assigned to this waste stream.

Some of the sources contain Be metal that is sealed within the source. The physical form of the Be is typically powder or sintered solid (References D005 and D011). However, the U.S. EPA has concurred that Be-containing sealed sources are not P- listed because the Be is not a sole active ingredient. (References C001 and D002). Therefore, P015 is not applied.

Polychlorinated Biphenyls (PCBs)

Waste stream LA-OS-00-04 does not contain polychlorinated biphenyls (PCBs) greater than 50 ppm, and therefore is not regulated as a Toxic Substance Control Act (TSCA) waste under 40 CFR 761.

OSRP review of manufacturing documentation verifies the absence of PCBs in waste stream LA-OS-00-04 (References M005 and D005). Sealed sources are strictly inorganic and do not contain organic material, such as PCBs (Reference D002). In addition, OSRP VE personnel verify the absence of PCBs and liquids in waste containers during packaging as documented on the Container Packaging and VE Data Record (Reference M031 and P001).

Prohibited Items

Prohibited items have not been identified for this waste stream. OSRP VE personnel verify that there are no prohibited items in the containers in LA-OS-00-04 (References M031 and P001).

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

Waste stream LA-OS-00-04 is assigned the Waste Material Parameters (WMPs) Iron Based Metals/Alloys and Other Metals (OM). The waste constituents, including actinide oxide, Be, and encapsulating materials, are all described by the "Other Metals" WMP. The sources in this waste stream may be encapsulated in cadmium-plated copper and/or have lead as an integral part of the source holder (References C024, M058, and M062). Other WMPs expected for OSRP waste packaging materials are Stainless steel (ST), Plastic Packaging (PP), and Cellulosics (C) (Reference P001). The basis for estimation of these WMPs is manufacturer documentation collected for the sources and VE. The sources are packaged under the requirements for TRUCONs LA 120A and LA 220A.

In accordance with CCP-TP-005, WMPs shall be estimated on a wt% basis for the waste stream, documenting the assumptions and justification for deriving the estimated WMP. All TRU sources recovered by OSRP that are not already special form are encapsulated in stainless steel SPCs, and shipped to WIPP. Sources in this waste stream are unique from those in waste stream LA-OS-00-01.001 in that they are encapsulated in cadmium plated copper or have lead bound to the source in such a way that it is difficult to remove without damaging the source (References C024, M058, and M062). SFCs developed and used by the OSRP are also made of 304 austenitic stainless. Metal composition of the source compounds are given in the International Atomic Energy Agency (IAEA) Certificate of Competent Authority, which has been issued for the OSRP SFCs (M145). These materials are categorized as Iron Based Metals/Alloys and OM.

Waste Stream LA-OS-00-04 Waste Material Parameters

Waste Material Parameter	Average Weight Percent	Weight Percent Range
Iron-based Metals/Alloys	85 %	0.0 – 100%
Other Metals	15 %	0.0 – 30.0 %

List of AK Sufficiency Determinations Requested for the Waste Stream

There are no AK sufficiency determination requests for this waste stream.

Transportation

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

Beryllium

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

Radionuclide Information

Waste stream LA-OS-00-04 will have a radioisotopic composition consistent with that described below and in Tables 1, 2, 3, and 4. The sources currently in the waste stream are Pu-239

sources of a composition consistent with Table 2. As such, the prevalent radionuclides by mass are Pu-239 and Pu-240. The radiological characterization approach is described below. Waste Stream LA-OS-00-04 will be comprised of actinide-bearing sealed sources, and the primary radionuclides contributing to the curie (Ci) content will be Pu-238, Pu-239, Am-241, and Pu-240 (References D003, D031, M001, M036, M058, and M133). Cs-137 is also expected to be present in the sources. Other radionuclides will be present as impurities or as a result of decay and nuclear interactions within the sources (References C003, D006, and D007). The radiological characterization of LA-OS-00-04 makes use of the extensive documentation and information on the nuclear material content of each source and the radionuclide distributions within the nuclear material.

AK is used in lieu of NDA because current WIPP-approved NDA equipment and techniques do not reliably measure the radioactive contents of sealed sources (Reference D007). In the atypical case where adequate AK information and documentation is not available for a particular sealed source, it will not be offered for disposal (References P002 and P004).

In general, the radiological characterization approach for the sealed source waste streams involves three steps. The first step is the determination and quantification of the primary radionuclide in a sealed source based on AK and data, as well as an estimated manufacturer date. The second step is the application of the specific radionuclide distribution and uncertainties that have been developed from AK for the primary radionuclide material in the source. The third step is the decay correction of the source material from the time of manufacture to the time of shipment for disposal (References C010, D007, and D008).

When determining the primary radionuclide and the quantity, values may be derived from a set of documents that are considered primary information sources. Primary information sources contain all of the necessary information to establish the source type (primary radionuclide) and the quantity of radionuclide material, documents were qualified as suitable for this use by a peer review panel (References D007, D008, D031, and P002). The primary information source documents include:

- Source Certificates (References D031, M022, and M034)
- Source Shipping Data Forms (References D031, M007, M025, M026, M027, M038, and M237)
- NMMSS Database (References M006 and M020)
- Source Fabrication Documents (References D031, M007, M026, and M027)

Secondary information source documents may also be used to address the identification and quantity of the primary radionuclide in the sealed source, but are not sufficient alone. Secondary information may include the following:

- Source and Device Markings (usually etched or stamped on the source) (References D031 and M023)
- NRC Device Registry (References C038, C041, and M005)

- Source Manufacturer's Sales Catalogues (References D010, M133, and M210)
- Source Drawings or Photos (References C040, C041, D031, M012, M023, M025, M026, and M027)
- Source Physical Dimensions (measured at the time of recovery)
- NRC or Agreement State Licenses (References C014, and M022)
- Source Manufacturer Databases (Reference D008)

The derivation of radionuclide distributions and quantification of uncertainties are based on analytical data sheets for different production batches of source materials, source manufacturers' certifications on individual sources that also include the isotopic content of the batch of source material, AK information on material types from WIPP-approved LANL AK documents, and other data (References D009, D020, M021, M026, M028, M040, M050, and M051). The representative distributions were developed based on available analytical information for each sealed source type (i.e., Pu-238, Pu-239, Am-241, and Cs-137). The data, calculations, and results of the calculations to derive the representative radionuclide distributions and uncertainties are described in supporting calculation documents (References D007, D013, D016, D017, D018, D019, D021, M008, M009, M010, M011, and M133).

Summaries of the representative radionuclide distributions for both mass and activity are provided in the following tables: Summary of Representative Radionuclide Distribution and Associated Uncertainties for Pu-238 Sealed Sources, Summary of Representative Radionuclide Distribution and Associated Uncertainties for Pu-239 Sealed Sources, and Summary of Representative Radionuclide Distribution and Associated Uncertainties for Am-241 Sealed Sources, for Pu-238, Pu-239, and Am-241, respectively. The tables also provide the total uncertainty in the distributions. Summary of Representative Radionuclide Distribution and Associated Uncertainties for Am-241/Be/Cs-137 Combination Sealed Sources summarizes the isotopic distribution and associated uncertainties for combination sources.

Table 1 - Summary of Representative Radionuclide Distribution and Associated Uncertainties for Pu-238 Sealed Sources

Radionuclide	Mass Fraction (g of isotope per gram of Pu in source)	Curie (Ci) of Isotope per Gram of Pu in Source	Total Uncertainty
Pu-238	8.03E-1	1.39E+01	1.5%
Pu-239	1.61E-1	1.01E-04	3.2%
Pu-240	2.63E-2	6.05E-03	3.7%
Pu-241	6.90E-3	7.17E-01	23.0%
Pu-242	2.33E-3	9.25E-06	54.3%
Am-241	2.84E-4	9.84E-04	23.0%
U-233	NA	NA	NA
U-234	3.40E-9	2.15E-11	1.5%
U-235	4.25E-7	9.32E-13	3.2%
U-238	1.7E-4	5.77E-11	51.4%
Cs-137	2.31E-7	2.04E-05	81.5%
Sr-90	1.33E-7	1.83E-05	81.5%

Sources: References M008, M009, C022, and C027

Table 2 - Summary of Representative Radionuclide Distribution and Associated Uncertainties for Pu-239 Sealed Sources

Radionuclide	Mass Fraction (g of isotope per gram of Pu in source)	Curie (Ci) of Isotope per Gram of Pu in Source	Total Uncertainty
Pu-238	1.48E-04	2.56E-03	150.8%
Pu-239	9.32E-01	5.86E-02	2.4%
Pu-240	6.50E-02	1.50E-02	23.7%
Pu-241	2.44E-03	2.53E-01	64.2%
Pu-242	3.62E-04	1.44E-06	244.5%
Am-241	2.84E-04	9.84E-04	64.2%
U-233	NA	NA	NA
U-234	3.40E-09	2.15E-11	150.8%
U-235	4.25E-07	9.32E-13	2.4%
U-238	1.70E-04	5.77E-11	51.4%
Cs-137	2.31E-07	2.04E-05	81.53%
Sr-90	1.33E-07	1.83E-05	81.53%

Source: References M008, M010, C027, and C034

Table 3 - Summary of Representative Radionuclide Distribution and Associated Uncertainties for Am-241 Sealed Sources

Radionuclide	Mass Fraction (g of isotope per gram of Am-241 in source)	Curie (Ci) of Isotope per gram of Am-241 in Source	Total Uncertainty
Am-241	1.00E+00	3.47E+00	1.4%
Pu-238	2.06E-06	3.56E-05	55.6%
Pu-239	2.76E-03	1.74E-04	54.4%
Pu-240	5.57E-04	1.28E-04	54.5%
Pu-241	3.98E-05	4.14E-03	54.4%
Pu-242	1.20E-05	4.75E-08	55.6%
U-233	NA	NA	NA
U-234	1.15E-11	7.26E-14	55.6%
U-235	1.44E-09	3.14E-15	54.4%
U-238	5.73E-07	1.95E-13	74.8%
Cs-137	7.80E-10	6.87E-08	98.0%
Sr-90	4.48E-10	6.18E-08	98.0%

Source: References D007, M008, M011, and C027

Table 4 - Summary of Representative Radionuclide Distribution and Associated Uncertainties for Am-241/Be/Cs-137 Combination Sealed Sources

Radionuclide	Mass Fraction (g of isotope per gram of Am-241 in source)	Curie (Ci) of Isotope per gram of Am-241 in Source	Total Uncertainty
Am-241	1.00E+00	3.47E+00	1.4%
Pu-238	1.85E-06	3.20E-05	55.6%
Pu-239	2.84E-03	1.79E-04	54.4%
Pu-240	5.72E-04	1.31E-04	54.5%
Pu-241	1.74E-05	1.81E-03	54.4%
Pu-242	1.23E-05	4.89E-08	55.6%
U-233	NA	NA	NA
U-234	2.73E-07	1.73E-09	55.6%
U-235	1.43E-06	3.13E-12	54.4%
U-238	5.89E-07	2.00E-13	74.8%
Cs-137	8.96E-03	7.88E-01	25.5%
Sr-90	1.03E-06	1.42E-04	25.5%

Source: References D007, M008, M011, and C027
An assumed Source Date of Birth of 1/1/1990 ($\Delta T = 16.75\text{yr.}$) was used to allow decay and in-growth.

The decay of the radioactive material in a sealed source begins at the time of manufacture and produces a variety of daughter radionuclides, including U-233. Each type of source (i.e., Am-241, Pu-238, Pu-239) decays to common and unique radionuclides. To account for radioactive decay of the materials in the sealed sources from the time of manufacture to the time of shipment, the OSRP uses a commercially developed software product (Reference D007). This software requires entry of an initial radionuclide quantity and a beginning and end date for the decay period. The output includes those radionuclides produced by decay processes and the activity present after the specified period of decay. The contribution of radionuclides from fission and activation were found to be very small relative to uncertainties in material impurity concentrations (References M008, M009, M010, M011, M050, and M133). Also, the half lives of the TRU isotopes prevent significant decreases in their quantities during decay correction.

Completed characterization reports and supporting documentation are submitted with Radiological Characterization BDRs for certification (Reference P002).

Waste stream LA-OS-00-04 will have a radioisotopic composition consistent with that described in the tables on the previous pages. The sources that comprise the one drum currently in the waste stream are Pu-239 sealed sources of a composition consistent with the Summary of Representative Radionuclide Distribution and Associated Uncertainties for Pu-239 Sealed Sources Table listed above (References C034, M058, and M237). As such, the prevalent radionuclides by mass are Pu-239 and Pu-240 until drums of sources containing Pu-238 and/or Am-241 are added to LA-OS-00-04.

Payload management will not be utilized for this waste stream.

Source Documents

Source Document Number	Document Title
C001	Letter to R. Scott re: "RCRA Status of AmBe Sealed Sources"
C002	Letter to J. Browne (LANL) re: Approval to Generate OSRP Waste with No Disposal Path
C003	Memo to LANL TWCP Records Management re: Estimation of U-234 Resulting from Pu-238 Decay
C004	Memos and Other Documentation Supporting Pu-239 Defense Relationship
C005	Memo to K. Hargis re: Transfer Planning Letter for Shipment of Special Nuclear Material (UCNI)
C006	Memos to S. Leonard and other re: Release of Sources to DOE (UCNI)
C007	Memo and Supporting Documentation to L. Leonard re: Special Form Character of MRC-N-SS-W-AmBe Sealed Sources
C008	Memo to J. Whitworth re: Drum Weights with RTR Scale
C009	Email to J. Whitworth re: Major TRU Sealed Source Manufacturers
C010	Memo re: Evaluating the Radionuclide Characterization of the OSRP Waste Stream LA-OS-00-01
C011	Defense Documentation for Eight SRS-Owned Sealed Sources
C012	Memo to J. Whitworth re: MRC Pu8Be-47A and 47B
C013	Memo to OSRP File re: SRS Source SN: MRPU8BE47 A & B, Two Capsules Recovered
C014	Memo to R. Williams, Department of Army, re: Interagency Agreement for Plutonium Number 3004 License SNM 318
C015	Memo to OSRP File, L. Porter, and M. Percy re: Packaging VOC Source Term for OSR Drums
C016	Memos re: POC Packaging Practices for Sealed Source Waste
C017	Memo to S. Schafer and OSRP File re: Radiological Characterization of Source N800I25
C018	Memo to T. Taulbee re: Radioactive Sources at the Portsmouth Gaseous Diffusion Plant (PORTS)
C019	Memo to R. Erickson (LASO) re: Expanded Scope for the Off-Site Source Recovery Program
C020	Memo to J. Whitworth re: Projected Recovery Numbers
C021	Memo to OSRP File re: Number of Containers in OSR Waste Stream
C022	Memo to J. Whitworth re: Data Input for Pu-238 Source Characterization

Source Document Number	Document Title
C023	Memo to A. Feldman re: Selection Criteria for Manufacture Dates for sources in BDR LA06-OSR-Ch-017
C024	Sources with Lead
C025	Methodology Used to Determine Input Parameters for Characterization of NRD Recovered Sources
C026	SOURCE RECOVERY AT CPN April 4,2007
C027	Memorandum: EXPLANATION OF TABLE REVISIONS TO CCP-AK-LANL-008 FOR INCORPORATION OF 241-Am / Be / 137 Cs COMBINATION SOURCES
C028	Attachment 8: OSRP Email Requests for VE BDR Drums approved and entered by CCP into the AKTSS . LA07-OSR-VE-009, 011, 012, 014 and LA08-OSR-VE-001, 002, 003, 004, 007.
C029	OSRP email requests for drums characterized between May 2007 to April 2008 to be added to the LANL AK tracking spreadsheet
C030	Texas Department of Health Records: Request: For Gulf Nuclear (L02995) Sealed Source Logbook
C031	Recommendations for Determination of Default Manufacture Date for Americium 241 Sources With No Documented Date of Manufacture
C032	OSRP Correspondence on Lithium Sources are nonreactive and confirmation to be added into Waste Stream LA-OS-00-01.001
C033	Isotopic Mass % Evaluation for NRD Waste Stream LA-OS-00-03
C034	Isotopic Mass % Evaluation for Mixed Waste Stream LA-OS-00-04
C035	Waste Stream # LA-OS-00-01.001 Characterization of Sources Containing "Other Light Metals"
C036	Waste Material Parameters for Mixed Waste Stream #LA-OS-00-03
C037	OSRP email requests for drums characterized between April 2008 to March 2009 to be added to the LANL AK tracking spreadsheet
C038	Universal application of the Registry of Radioactive Sealed Sources and Devices for NSR-F model sources
C039	OSRP email requests for drums characterized between April 2009 to February 2010 to be added to the LANL AK tracking spreadsheet
C040	Field Differentiation Between NSR-D and NSR-F Sources
C041	Use of the NRC Registry of Radioactive Sealed Sources and Devices for Characterization of NSR-D Model Sources
C042	Source of Am-241 Purchased by NRD for Sealed Source Manufacture
C043	OSRP email requests for drums to be characterized between March 2010 to April 2011 to be added to the LANL AK tracking spreadsheet

Source Document Number	Document Title
C044	Memorandum from Donald L. Cook regarding Offsite Source Recovery Project Request for Approval to Generate Waste with No Disposal Pathway, dated March 4, 2011
C045	Interview of Patrick Goff by Christopher Chancellor regarding UC Berkeley Am-241 foil generation dates
C053	Letter from S. R. Sapirie to Dr. C. E. Larson regarding Np-237 and Am-241 Distribution
C059	Memorandum from Julia Whitworth regarding Use of Foreign-Origin Radioactive Material in Sealed Sources
C060	Engineering Evaluation of Nuclear Powered Pacemakers as Special Form Radioactive Material
C061	Memorandum from Alex Feldman to Julia Whitworth regarding History of Non-US Origin Transuranics in Sources of US Manufacture
C062	Memorandum from Alex Feldman to Ben Gutierrez regarding Acceptable Methods for Establishing a Default Manufacturer Date of Birth for Sealed Sources with No Documented Date of Manufacture
C063	Memorandum from J. Andrew Tompkins to Rick Rasmussen regarding Acceptable Knowledge for Am-241 foil sources used in Smoke Detectors
C064	Gammatron approximate last date of manufacture for NSR-GB sealed sources
C065	OSRP email requests for drums to be characterized between July 2011 to December 2011 to be added to the LANL AK Tracking Spreadsheet
C066	Interview of Jim Matzke and Jerry McAlpin re: Cigar tubes for leaky sources
D001	Headspace Gas Sampling and Analysis Evaluation for LANL Sealed Sources
D002	RCRA Designation of Discarded Americium/Beryllium Sealed Sources
D003	Hazardous Waste Determination for Actinide-Bearing Sealed Sources to be Received at LANL
D004	The Off-Site Source Recovery Project at Los Alamos
D005	Summary of Sealed Source Types, OSR Project
D006	Encapsulation and Source Activities of Alpha-n Neutron Sources
D007	Radiological Characterization of Actinide Sealed Source Waste for Disposal at WIPP
D008	Sealed Sources Peer Review Report
D009	Acceptable Knowledge Report for Debris Waste Streams Containing Pu-239
D010	Amersham Source Catalogue, Manufacturer Data
D011	Special Form Documentation for AmBe and PuBe Neutron Test Sources (UCNI)
D012	Engineering Evaluation of New England Nuclear Model NER-478C Sealed Sources as Special Form Radioactive Material

Source Document Number	Document Title
D013	Development of Representative Radionuclide Distributions for Use in Radiological Characterization of Sealed Sources Based on Acceptable Knowledge Information
D014	Inspection and Recanning Program of PuBe Neutron Sources
D015	Characterization of Actinide-Bearing Sealed Sources by Acceptable Knowledge - Justification and Methods
D016	Manual for Nuclear Materials Management and Safeguards System Reporting and Data Submission
D017	An Evaluation of the Use of Calorimetry for Shipper-Receiver Measurements of Plutonium
D018	American National Standard Calibration Techniques for the Calorimetric Assay of Plutonium-Bearing Solids Applied to Nuclear Materials Control
D019	Standard Test Methods for Nondestructive Assay of Plutonium, Tritium, and Am-241 by Calorimetric Assay
D020	Acceptable Knowledge Report for Legacy Debris TA-55 Waste Streams Containing Pu-239, LA-UR-02-6665
D021	Handbook of Nuclear Safeguards Measurement Methods
D022	Test Report for Los Alamos National Laboratory on 3" Special Form Radioactive Material Capsules
D023	WIPP Eligibility Determination of U.S. Army Research Laboratory Pu-239 Fission Foils
D024	Statement of Work, Mitigate Radioactive Sources at Savannah River Site, 777-10A
D025	Transuranic Waste Defense Determination Approval Forms
D026	IAEA Certificate of Competent Authority Special Form Radioactive Materials Certificate Number USA/0036/S, Revision 7
D027	NRD - Your Source for Alpha Foils
D028	Summary of Nuclear Atomcell Characteristics and Testing
D029	Neutron Soil Density and Moisture Gauges MC-1, MCM-2 and MC-3 (CPN International) Registry of Radioactive Sealed Sources and Devices Safety Evaluation
D030	Transuranic Waste Defense Determination Approval Forms, Waste Stream LA-OS-NS-04
D031	Waste Determination of Encapsulated Radioactive Sources Containing Small Quantities of Lithium
DR001	Discrepancy Resolution re: Difference Between NMMSS and Shipping Data for Seven LLNL Sealed Sources
DR002	Discrepancy Resolution re: Source MRC-PuBe-8-8
DR003	Discrepancy Resolution re: Manufacture Dates on Recanned Monsanto Sources

Source Document Number	Document Title
DR004	Discrepancy Resolution re: Source Pu8Be47-A&B from SRS
DR005	Discrepancy Resolution re: Pu Value on Source M-1228
DR006	Discrepancy Resolution re: Pu Value on Source M561
DR007	Discrepancy Resolution re: Sources MRPUBE346-348
DR008	Discrepancy Resolution re: Sources in Container 60384
DR009	Discrepancy Resolution re: Sources MRPU228-252
DR010	Discrepancy Resolution re: Certain Dates in NMMSS Database
DR011	Discrepancy Resolution of manufacturing orders for AmBe neutron sources made by Monsanto Research Corp. for Schlumberger Well Services.
M001	Summary of Waste Stream Containers / Spreadsheet of OSR Defense Related Drums
M002	Batch Data Report Number LA02-HGAS/IA-006 for Headspace Gas Analysis to Determine OSR Packaging Source Term
M003	Facilities Review, Neutron Source Storage at TA-55 AREA G
M004	LANL Waste Profile Form # 31353
M005	Query of "Registry of Radioactive Sealed Sources and Devices," MAY 21, 1982
M006	NMMSS Report SS-2 From "Nuclear Material Management and Safeguards System" (Listing of Sealed Sources by RIS as of 12/31/85)
M007	Manufacturer Data from Mound Monsanto and GE Schenectady-Navy
M008	Calculation: Verification Check Calculation of ACCESS Characterization Calculations Performed in the OSR Characterization Database
M009	Calculation: Development of Radionuclide Distribution and Uncertainties in Pu-238 Sealed Source Material
M010	Calculation: Development of Radionuclide Distribution and Uncertainties in Pu-239 Sealed Source Material
M011	Calculation: Development of Radionuclide Distribution and Uncertainties in Am-241 Sealed Source Material
M012	Sealed Source Drawings
M013	Shipping Data Sheets from Monsanto Chemical Company (Mound) to Westinghouse
M014	Welding Test Records
M015	Purchase Orders for Pu-238 Batch Material
M016	Purchase Orders for Am-241 Batch Material

Source Document Number	Document Title
M017	Purchase Records for Am-241 Batch Material
M018	Memo to S. Leonard re: Examples of NRC Form 741 for the ARCO Nuclear Pacemakers
M019	Special Form Traveler Sheets
M020	NMMSS Listing of Sealed Sources by RIS
M021	Am-241 Analysis on Product Batches in the DOE Sales Pool
M022	Manufacturer's Data for Sources MRPUBE-315, 1501-NK, AND C-589
M023	Manufacturer's Data for Kentucky Sources
M024	Manufacturer's Data for NUMEC Sources at Cornell College, 320C23
M025	Manufacturer's Data for LLNL Sources (LLNL - MRC-Pu-Be- 8-1, MRC - PuBe-8-7, MRC - PuBe-8-15, MRC-PuBe-8-9, MRC-Pu8Be-26, MRC-PuBe-28)
M026	Pu-239/Be Sealed Source Supporting Documentation
M027	Manufacturer Data for Monsanto Sources at Knolls Atomic Power Lab
M028	Analytical Chemistry Reports for Am Oxide Batches
M029	Visitor's Guide, Los Alamos National Laboratory
M030	Maps from the LANL Website
M031	Container Packaging and VE Data Records
M032	Contamination Survey Forms
M033	LANL Waste Profile Form #32779
M034	Special Form Certificates
M035	Waste Stream Profile Form for LA-OS-00-01, Change Notice #1
M036	Calculation of Prevalent Radionuclides for the OSR Waste Stream
M037	OSR Plutonium Weight Percent Calculation
M038	Mound Site Purchase Orders and Shipping Data
M039	Regulatory Information on the Status of Lead used as Shielding in Waste Containers
M040	Specification for Plutonium-238-Beryllium Annular Pellets (OUO)
M041	NUMEC Plutonium-Beryllium Neutron Sources Catalog
M042	Monsanto Radioactive Source Catalog
M043	Oak Ridge Data Sheets for Pu-238 Shipments

Source Document Number	Document Title
M044	General Atomic Battery Data
M045	Documentation of Sources in Special Form Capsules
M046	ARCO Nuclear Technical Document, 039274
M047	General Atomic QA Data on PuN Capsules
M048	General Atomic QA Data on Battery 3b89
M049	General Atomic QA Data on Battery 3b73
M050	Calculation re: Estimation of the Sr-90/Cs-137 Ratio in Sealed Source Materials
M051	Isotopic Composition of U and Th Mixtures
M052	Shipping Documents from Donald Douglas to Gulf Atomic
M053	Information on U.S. Army TACOM Sealed Sources
M054	Monsanto Data for Pu-238/Be Neutron Sources Shipped to Gulf Energy
M055	Current Projection of OSR Waste Stream Volume LA-OS-00-01
M056	Shipping Data for Recanned Sealed Sources
M057	Shipping Data Form for Source MRC-PuBe-8-8
M058	Shipping Data Form for Sources MRC-TD-Pu-228 through -254
M059	Evaluation of Isotopic Activity as a Function of Source Date of Birth
M060	Analysis for Beryllium Weight Percent for Waste Stream LA-OS-00-01
M061	Analytical Batch Data Report for LA05-HGAS/LA-046, Standard POC with Cane Fiberboard Insert
M062	Calculation of Cadmium Weight Percent in Drum 61603
M063	Shipping Data Sheet for Source "Q" at Brookhaven NL
M064	Shipping Data Form for U-Nebraska Sources
M065	Shipping Data Form for Source MRC-PuBe-230
M066	Form 741 Nuclear Material Transaction Report to Arco
M067	OSR VE Operator Logbook from NRD Recovery (OUO)
M068	NRD Spreadsheet Data on Source-Containing Cans and Drum Log Correction Spreadsheets
M069	Amersham International Transport Containers MNEMONICS

Source Document Number	Document Title
M070	Amersham Corp Product Specifications Report
M071	Logbook: Amersham, Source number. Serial number and Model number
M072	Certificate of Analysis - GEL Laboratories LLC
M073	Registry of Radioactive Sealed Sources and Devices Safety Evaluation of Sealed Sources
M074	Nuclear Sources and Services Inc. Sealed Source Certificates NSR-GB 2104 to 4471-Schlumberger Well Services (Owner)
M075	OSR - Manufacturer's Data -Pkg-002, Monsanto - Texas Nuclear Division; Pu8Be-497
M076	OSR - Manufacturer's Data -Pkg-002, Monsanto - Schlumberger Well Services; AmBe-2155 thru 2176
M077	OSR - Manufacturer's Data - Pkg-002 Medtronic - Battery Data Technical Report on the Medtronic TM Model 9000 Isotopic Pulse Generator
M078	OSR -Manufacturer's Data - Pkg-002 Monsanto - Schlumberger; AmBe-3353 thru 3507
M079	OSR - Manufacturer's Data - Pkg-002 TWCP - 05659 Mound/Monsanto Source Design Data Monsanto - Schlumberger; AmBe-3016 thru 3080
M080	OSR - Manufacturer's Data - Pkg-002 Mound/Monsanto Source Design Data Monsanto - Schlumberger; SWS-3548 thru 3587
M081	Radioactive Source Test Report
M082	Material Transfer Form - Leased Material (Monsanto Research Corporation to University of Nebraska)
M083	Registry of Radioactive Sealed Sources and Devices
M084	Registry of Radioactive Sealed Sources and Devices
M085	Registry of Radioactive Sealed Sources and Devices (No: IL-604-D-801-S)
M086	RDECOM Edgewood; C5279
M087	Manufacturer's Data- Pkg-002 VA Medical Center; Siemens Anatomical Markers Registry of Radioactive Sealed Sources and Devices
M088	OSR-Manufacturer's Data - Pkg-002 Commonwealth Virginia; AmBe-1557; Model 2725
M089	OSR-Manufacturer's Data - Pkg-002 TWCP- 05659 Mound/Monsanto Monsanto -J.L. Shepherd, Inc.; Serial Numbers Pu8Be-436 and 437; Model #2725B

Source Document Number	Document Title
M090	OSR-Manufacturer's Data - Pkg-002 Gulf Nuclear - Test Data Test Results on Model 71-1
M091	Brookhaven; Foils #1,2,3,4, 9649, 6286LA; S1828; Shipping record and NMMIS record
M092	OSR-Manufacturer's Data - Pkg-002 Monsanto -Seismograph Service Corp; Pu8Be 273 thru 292
M093	Shipping Data Plutonium Neutron Source
M094	OSR-Manufacturer's Data - Pkg-002 Monsanto - J. L. Shepherd & Associates; MRC- Pu8Be-496 and 437; Model #2725B?
M095	U.S. Department of Energy Nuclear Material Transaction Report
M096	Sealed Radioactive Source Test Report
M097	Sealed Radioactive Source Test Report
M098	Registry of Radioactive Sealed Sources and Devices
M099	Registry of Radioactive Sealed Sources and Devices Safety Evaluation of Device (Amended in its Entirety)
M100	Neutron Sources
M101	Registry of Radioactive Sealed Sources and Devices
M102	Radioactive Source Test Report
M103	Radioactive Source Test Report
M104	Radioactive Source Test Report
M105	Sealed Radioactive Source Test Report
M106	Amersham Catalog Information (partial)
M107	IAEA Certificate of Competent Authority Special Form Radioactive Material Certificate Number USA/0357/S, Revision 6
M108	Qal-Tek Associates Instrumentation and Professional Services
M109	Sources Catalog from AEA Technology
M110	OSR-Manufacturer's Data - Pkg-002 Monsanto-Defense Personnel Support Center; Am-1506 thru 1525; Model 2704
M111	Amersham Catalog (portion)
M112	Registry of Radioactive Sealed Sources and Devices (Amended in its Entirety)

Source Document Number	Document Title
M113	OSR-Manufacturer's Data - Pkg-002 Monsanto-Ohmart Corp; Am--241; Model 2438
M114	Amersham Catalog
M115	OSR-Manufacturer's Data - Pkg-002 Schlumberger - Sealed Source Certificates NSR-F A-1111 A2325
M116	OSR-Manufacturer's Data - Pkg-002 Halliburton - Source Certificates
M117	OSR - Manufacturer's Data - Pkg-002 TWCP-05659 Mound/Monsanto Source Design Data Monsanto- Schlumberger; AmBe-3016 thru 3080
M118	OSR - Manufacturer's Data - Pkg-002 Monsanto- Portland Gas and Electric; Pu8Be-359; Model 2722-B
M119	CH AK8 Evaluation to Add Containers to CCP-AK-LANL-8; 5/15/06 - 4/11/07
M120	Table of Excess Sealed Sources of Isotopic Material
M121	Shipping Data Forms for Monsanto Sources at Brookhaven
M122	Monsanto Manufacturing Orders for Pu-238/Be Sources for Brookhaven
M123	Manufacturing Specifications for Sources for Schlumberger Well Services
M124	Manufacturing Specifications for Sources for Seismograph Service Corp
M125	Manufacturer Data (NSSI), Gammatron to Birdwell, Sealed Source Certificates for Serial Number BP-01 T0-28 AND BP-100 TO -105
M126	Engineering Specifications for Sources for Seismograph/Birdwell.
M127	Accufix Correspondence to LANL Radioactive Materials License, Reports on Nuclear Ommni-Stanicor Pacer Model 184A, 184B,
M128	Registry of Radioactive Sealed Sources and Devices, Safety Evaluation of Devices for Nuclear Powered Cardiac Pacemakers (NR-975-D-801-S, NR-8042-D-801-S) and Miniature Nuclear Batteries (CA309D102S, CA309D101S)
M129	Mound/Monsanto Source design Data, Monsanto to Kennedy Space Center, NASA ,Pu8Be Model 2723, TWCP-07185.
M130	Gulf General Atomic, Battery Data, Radiological Safety of Miniature Nuclear Batteries,
M131	Gulf General Atomic, Alcatel, Hitman, Miniature Nuclear Battery Design Specifications, TWCP- 05666
M132	NMMSS Report extracts as of 12-31-85 on Sealed Sources # SS-1 and # SS-2, MRC Shipping Data to Seismograph and to JF Kennedy Space Center-NASA, Gulf General Atomic Data on Miniature Nuclear Batteries.
M133	Characterization of AM-241/Be/CS-137 Combination Sources

Source Document Number	Document Title
M134	Amersham source test reports for Am241/Be sources in drum LA00000062310
M135	Troxler Source Data from Monsanto Research Corporation Engineered Products Department
M136	Amersham and Monsanto Source Activity Information for Am241/Be Sources in drum LA00000062753
M137	Amersham Radioactive Sealed Source Test Reports for Am241/Be Sources "NJ series" in drum LA00000062753
M138	Registry of Radioactive Sealed Sources and Devices Safety Evaluation of Sealed Source (Amended in its Entirety) AMN.V997, AMN.V340
M139	Registry of Radioactive Sealed Sources and Devices, Safety Evaluation of Device, Troxler Depth Moisture Probe model 1255 and 1257
M140	Shipping File Documentation Listing Location: Florida State University
M141	Amersham International and Monsanto Corp. Source Activity Information on Am241/Be Sources Present in drum LA00000062305
M142	OSR-Registry of Radioactive Sealed Sources and Devices, Safety Evaluation of Device, Troxler Asphalt Content Gauge containing Amersham Sources Model No. AMNV.340, AMNV.339
M143	AK Documentation for Characterization BDR LA07-OSR-CH-013, drums LA00000061600, LA00000061661, LA00000061566, LA00000061596, LA00000062761
M144	AK Documentation for Characterization BDR LA08-OSR-CH-001, drums 64000, 64001, 64003, 64004, 64005, 64006, 64007, 64008, 64009, 64010, 64012
M145	IAEA Certificate of Complete Authority Special Form Radioactive Materials Certificate Number USA/0695/S-96, REVISION 3
M146	AK Documentation for Characterization BDR LA08-OSR-CH-002, drums LA00000061459, LA00000061460, LA00000061461, LA00000061570, LA00000061659, LA00000064014
M147	AK Documentation for Characterization BDR LA07-OSR-CH-010, drums: LA00000062775, 62774, 62773, 62772, 62771, 61591, 62762
M148	AK Documentation for Characterization BDR LA08-OSR-CH-003, drum LA00000061567
M149	Registry of Radioactive Sealed Sources and Devices Safety Evaluation of Device (LA08-OSR-VE-004)
M150	Manufacturing order for MRC AmBe neutron source model 2726-B, serial number AmBe 2951 for IAEA project in Ecuador, TWCP-07079
M151	AK Documentation for Characterization BDR LA08-OSR-CH-006, drums: LA00000058701, LA00000058727, LA00000058798, LA00000061509, LA00000062720, LA00000062721
M152	AK Documentation for Characterization BDR LA08-OSR-CH-005, drum: LA00000060281

Source Document Number	Document Title
M153	AK Documentation for Characterization BDR LA08-OSR-CH-008, drums:LA00000064002, LA00000064011, LA00000062763, LA00000062764, LA00000059909, LA00000059918, LA00000059919
M154	AK Documentation for Characterization BDR LA08-OSR-CH-010, drums: LA00000062708, LA00000062712, LA00000062713
M155	AK Documentation for Characterization BDR LA08-OSR-CH-009, drums: LA00000058684, LA00000059901, LA00000060090, LA00000060207
M156	AK Documentation for Characterization BDR LA08-OSR-CH-012 drum: LA00000060302
M157	AK Documentation for Characterization BDR LA08-OSR-CH-014 drums: LA00000060216, LA00000060364, LA00000060341, LA00000060358, LA00000060327, LA00000060344, LA00000060380, LA00000060343, LA00000060368
M158	AK Documentation for Characterization BDR LA08-OSR-CH-015 drums: LA00000060346, LA00000060348, LA00000060351, LA00000060352, LA00000060354, LA00000061403, LA00000061404, LA00000061405
M159	AK Documentation for Characterization BDR LA08-OSR-CH-016 drums: LA00000060374, LA00000060375, LA00000060388, LA00000060394, LA00000061687
M160	AK Documentation for Characterization BDR LA08-OSR-CH-017 drums: LA00000058638, LA00000060223, LA00000060389, LA00000060391, LA00000062388, LA00000064038
M161	AK Documentation for Characterization BDR LA08-OSR-CH-018 drums: LA00000058794, 60224, 60230, 60360, 61409, 61505, 62309
M162	AK Documentation for Characterization BDR LA08-OSR-CH-019 drums: LA00000059900, LA00000061635, LA00000061662, LA00000062767, LA00000064069, LA00000064074, LA00000064075, LA00000064076
M163	AK Documentation for Characterization BDR LA09-OSR- CH-001 DRUMS: LA00000059961, LA00000061594, LA00000061695, LA00000064047, LA00000064049, LA00000064066
M164	AK Documentation for Characterization BDR LA09-OSR-CH-002 drums: LA00000064060, LA00000064061, LA00000064062, LA00000064063, LA00000064065
M165	AK Documentation for Characterization BDR LA09-OSR-CH-003 drum: LA 0000004046
M166	AK Documentation for Characterization BDR LA09-OSR-CH-004 drums: LA00000064040
M167	AK Documentation for Characterization BDR LA09-OSR-CH-006 drums: LA00000061674, 61679, 61680, 61681, 61682, 61683, 61684, 61685, 61686, 61689, 61690, 61692, 62766, 64048, and 64073.
M168	AK documentation for Characterization BDR LA09-OSR-CH-007 drums: LA00000061493, 61664, 61666, 61667, 61669, 61670, 61671, 61675, 61676,61677, 61678, 61691, 64039, 64071
M169	AK Documentation for Characterization BDR LA09-OSR-CH-005 drums: LA00000061641, 61642, 62300, 62312, 62717, 64036, and 64070.

Source Document Number	Document Title
M170	AK Documentation for Characterization BDR LA09-OSR-CH-015 drums: LA00000062746, 62747, 62748, 62750, 62751, 64050, 64507, 64508, 64515, 64521, 64522, 64524.
M171	AK Documentation for Characterization BDR LA09-OSR-CH-009 drums: LA00000060381, 64517, 64518, 64520.
M172	OUO - Reducing Nuclear and Radiological Threats Worldwide Office of Global Threat Reduction Internal Control Procedures to Verify and Certify Performance Results REV2. November 2008
M173	OSRP Documentation and Calculations for Current and Projected Recoveries
M174	AK Documentation for Characterization BDR LA09-OSR-CH-017 drums: LA00000062776, LA00000064523, LA00000064526, LA00000064528, LA00000064529, LA00000064530.
M175	AK Documentation for Characterization BDR LA10-OSR-CH-003 drums: LA00000058730, 58749, 58762, 59944, 59945, 59966, 59967, 59969, 59977, 59978, 59979, 59980, 59992, 59998, 60001, 60057, 60257, 60306, 60307, 60313.
M176	AK Documentation for Characterization BDR LA10-OSR-CH-005 drums: LA00000059985, 59988, 59994, 59991, 59999, 60003, 60009, 60017, 60018, 60020, 60021, 60027, 60028, 60029, 60031, 60032, 60035, 60037, 60046, and 60050.
M177	AK Documentation for Characterization BDR LA10-OSR-CH-006 drums: LA00000058728, 58729, 58731, 58732, 58733, 58734, 58735, 58736, 58737, 58738, 58739, 58740, 58741
M178	AK Documentation for Characterization BDR LA10-OSR-CH-004 drums: LA00000064041, LA00000064042, LA00000064043, LA00000064044, LA00000064549
M179	AK Documentation for Characterization BDR LA10-OSR-CH-008 drums: LA00000059952, 59953, 59955, 59957, 59958, 59984, 59986, 59987, 59989, 59990, 59991, 59993, 59996, 60013, 60015, 60033, 60034, 60036, 60038, 60043
M180	AK Documentation for Characterization BDR LA10-OSR-CH-009 drums: LA00000059933, 59935, 59937, 59939, 59946, 59947, 59951, 59964, 59965, 59970, 59974, 59975, 59976, 60041, 60055, 60058, 60060, 60068, 60069, 60071
M183	AK Documentation for Characterization BDR LA10-OSR-CH-007 drums: LA00000058742, 58743, 58744, 58745, 58746, 58747, 58769, 58770, 58776, 58787, 58788, 58789, 58790, 58791
M184	AK Documentation for Characterization BDR LA10-OSR-CH-010 drums: LA00000059962, 59963, 59968, 59981, 60004, 60006, 60008, 60010, 60016, 60019, 60022, 60023, 60024, 60025, 60026, 60030, 60039, 60053, 60309, 60310
M185	AK documentation for Characterization BDR LA10-OSR-CH-011 drums: LA00000060040, 60042, 60044, 60045, 60047, 60049, 60052, 60054, 60059, 60062, 60063, 60064, 60066, 60067, 60070, 60074, 60075, 60200, 60308, 60311
M186	AK documentation for Characterization BDR LA10-OSR-CH-012 drums: LA00000060077, 60237, 60238, 60241, 60242, 60246, 60248, 60250, 60253, 60254, 60255, 60274, 60275, 60312, 60325, 60328, 60330, 60333, 60339, 60340

Source Document Number	Document Title
M187	AK documentation for Characterization BDR LA10-OSR-CH-013 drums: LA00000059923, 59943, 60073, 60244, 60247, 60258, 60260, 60273, 60283, 60285, 60286, 60289, 60292, 60298, 60299, 60319, 60323, 60335, 60336, 60337
M188	AK Documentation for Characterization BDR LA10-OSR-CH-014 drums: LA00000058706, 58748, 58750, 58764, 58765, 58771, 58772, 58773, 58774, 58775, 58777, 58780, 58781, 58782, 58783, 58784, 58785, 58786, 60355, 61518
M189	Manufacturing Order for Sources A2675-A2699; A3001-A3115 - for Schlumberger
M190	Manufacturing Orders from Monsanto for Sources A3001-A3014; A3015-A3026; A3027-A3041; A3042 - A3069; A3070-A3089; and A3090-A3117
M191	AK Documentation for Characterization BDR LA10-OSR-CH-017 drums LA00000060098, 60314, 60316, 60320, 60321, 60322, 60324, 60326, 60329, 60331, 60332, 60334, 60338, 60345, 60347, 60356, 61519, 61524, 61527, & 61624.
M192	AK Documentation for Characterization BDR LA10-OSR-CH-016 drums: LA00000064051, 64052, 64577, 64578, 64583.
M193	AK documentation for characterization BDR LA10-OSR-CH-018: LA00000059954, 60218, 60233, 60243, 60245, 60249, 60251, 60256, 60262, 60263, 60264, 60268, 60269, 60282, 60284, 60287, 60291, 60296, 60317, 60318
M194	AK Documentation for Characterization BDR LA10-OSR-CH-019 drums: LA00000059931, 59938, 59940, 59941, 59942, 59956, 59959, 60007, 60076, 60201, 60259, 60261, 60265, 60267, 60270, 60271, 60272, 60288, 60305, 60366
M195	AK Documentation for Characterization BDR LA10-OSR-CH-021 drums: LA00000058751, 58779, 59982, 59983, 59995, 60000, 60002, 60005, 60011, 60012, 60014, 60061, 60065, 60072, 60221, 60239, 61539
M196	AK Documentation for Characterization BDR LA10-OSR-CH-002 drum LA00000064550.
M197	BDR LA10-OSR-CH-001 DRUMS LA00000064020, 64033, 64034 and 64536.
M198	AK Documentation for Characterization BDR LA10-OSR-CH-022 drums: LA00000058686, 59902, 59903, 59910, 60217, 60219, 60220, 60232, 60349, 60357, 60359, 61410, 61604
M199	AK Documentation for Characterization BDR LA11-OSR-CH-001 drums: LA00000064018, 64019, 64511, 64534, 64580, 64581, 64597
M200	AK Documentation for Characterization BDR LA11-OSR-CH-002 drums: LA00000058797, LA00000061411, LA00000062709, LA00000064553, LA00000064592
M201	AK Documentation for Characterization of the LA11-OSR-CH-003 drums: LA00000062710, 64554, 64582, 65404, and 65409
M202	AK Documentation for Characterization BDR LA11-OSR-CH-005 drums: LA00000065405, 65406, 65407, 65408, 65410, 65411.
M210	Catalog and Price List Alpha, Heat, and Neutron Sources from Plutonium-239 & Threshold Detectors from Plutonium-239, Neptunium-237, Uranium-238

Source Document Number	Document Title
M211	Monsanto Research Corporation Shipping Data Form
M222	Mound Laboratory Shipping Data
M223	NRC Materials License 19-00294-19 and SNM-1649
M224	AK Documentation for Characterization BDR LA11-OSR-CH-004 drums: LA00000058754, 58757, 58763, 58767, 58768, 60208, 60210, 60211, 60212
M226	Sources of Alpha-, Beta-, Gamma-, and Neutron Radiation Catalog
M229	AEC/DOE Isotope Sales 1964-1987
M234	AK Documentation for Characterization BDR LA11-OSR-CH-008, drums: LA00000064081, LA00000064545, LA00000064546, LA00000064547, LA00000064556, LA00000064559, LA00000064560, LA00000064561, LA00000064562, LA00000064585, LA00000065413, LA00000065460
M235	AK Documentation for Characterization BDR LA11-OSR-CH-009 drums: LA0000005443, LA00000065417
M236	AK Documentation for Characterization BDR LA11-OSR-CH-006, drums: LA00000064540 and LA00000064595
M237	AK Documentation for Characterization BDR LA11-OSR-CH-010 drum: LA00000065416.
P001	<i>CCP-TP-069 CCP Sealed Source Visual Examination and Packaging</i>
P002	<i>CCP-TP-101, CCP Off-Site Source Recovery Project Sealed Source Radiological Characterization</i>
P003	Off-Site Source Recovery Transuranic Waste Interface Document (TWID)
P004	Recovery, Transport, and Storage of Off-Site Source Recovery Project Material
P005	OSRP - VOC Evolutions from Packaging Materials
P007	NRD Shipping File