ENTERED

Allen, Pam, NMENV

From: Maestas, Ricardo, NMENV
Sent: Thursday, December 18, 2014 9:30 AM
To: Allen, Pam, NMENV
Subject: FW: Sealed Sources for SRS RH - Approval
Attachments: Sealed sources approval letter May 22 2014.pdf; SRS RH T1 Sealed Sources 5-22 14.pdf

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From: Kliphuis, Trais, NMENV
Sent: Thursday, May 22, 2014 5:59 AM
To: Allen, Pam, NMENV
Cc: Maestas, Ricardo, NMENV; Smith, Coleman, NMENV; Holmes, Steve, NMENV
Subject: FW: Sealed Sources for SRS RH - Approval

Hi Pam,

Please add this to the record.

From: Feltcorn, Ed [mailto:Feltcorn.Ed@epa.gov]
Sent: Thursday, May 22, 2014 5:57 AM
To: J. R. Stroble (j.r.stroble@cbfo.doe.gov)
Cc: Franco, Jose - DOE; Marcus Pinzel; Norma Castaneda (norma.castaneda@cbfo.doe.gov); Thomas Morgan; Brown, Mike - DOE; 'Site Documents - DOE (SiteD@wipp.ws)'; Patrick Kelly; Kira Darlow (kdarlow@scainc.com); Kliphuis, Trais, NMENV; Peake, Tom; Joglekar, Rajani; Bender, Lindsey; Irene Joo; Alton Harris
Subject: Sealed Sources for SRS RH - Approval

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MAY 22 2014

NMED
Hazardous Waste Bureau

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
AIR AND RADIATION

MAY 22 2014

Mr. J. R. Stroble
Manager, National TRU Program
U.S. Department of Energy
P.O. Box 3090
Carlsbad, NM 88221-3090

Dear Mr. Stroble:

On September 30, 2013 the U.S. Department of Energy (DOE), Carlsbad Field Office (CBFO), requested the U.S. Environmental Protection Agency's approval of remote-handled (RH) sealed sources (Waste Stream SR-RH-SDD.01) managed and characterized by the Central Characterization Project (CCP) at the Savannah River Site (SRS). With this letter EPA approves the requested Tier 1 (T1) change consisting of three sealed sources initially packaged into special form capsules by personnel at the Offsite Source Recovery Program of the Los Alamos National Laboratory. This approval is limited to the three sealed sources included in Waste Stream SR-RH-SDD.01 as of the date of this evaluation. This approval does not reflect approval of VE for RH TRU waste at SRS-CCP. Any use of VE by SRS-CCP for any RH waste is a T1 change requiring EPA approval as described in the enclosed report (EPA Air Docket # A-98-49; II-A4-184).

If you have any questions regarding this approval, please contact Rajani Joglekar at (202) 343-9462 or Ed Feltcorn at (202) 343-9422.

Sincerely,

Tom Peake

Tom Peake, Director
Center for Waste Management and Regulations

Enclosure

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NMED
Hazardous Waste Bureau

cc: Electronic Distribution
Joe Franco, CBFO
Marcus Pinzel, CBFO
Norma Castaneda, CBFO
Tom Morgan, CBFO
Mike Brown, CBFO QA
Bert Crapse, DOE-SRS
Site Documents

DOCKET NO: A-98-49; II-A4-184

WASTE CHARACTERIZATION TIER 1 CHANGE REPORT

EPA TIER 1 EVALUATION OF THE CENTRAL CHARACTERIZATION PROGRAM REMOTE-HANDLED TRANSURANIC WASTE CHARACTERIZATION PROGRAM FOR THE SAVANNAH RIVER SITE: ADDITION OF WASTE STREAM SR-RH-SDD.01 (SEALED SOURCES)

U.S. Environmental Protection Agency
Office of Radiation and Indoor Air
Center for Waste Management and Regulations
1200 Pennsylvania Avenue, NW
Washington, DC 20460

May 2014

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ATTACHMENTS

Attachment A: Approval Summary for Savannah River Site Remote-Handled Waste Characterization Program

Attachment B: List of Documents Reviewed by EPA during T1 Evaluation

Attachment C: List of DOE Personnel Present at Evaluation

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ACRONYMS AND INITIALIZATIONS

AK	acceptable knowledge
AKE	AK Expert
AKSR	acceptable knowledge summary report
Am	americium
BDR	batch data report
Be	beryllium
CBFO	Carlsbad Field Office
CCP	Central Characterization Program
CFR	Code of Federal Regulations
CH	contact-handled
Ci	curie
CIS	Characterization Information Summary
CRR	Characterization Reconciliation Report
Cs	cesium
CSSF	Correlation and Surrogate Summary Form
DOE	U.S. Department of Energy
DQO	data quality objective
DTC	dose-to-curie
EPA	U.S. Environmental Protection Agency
HLW	high-level waste
ISOCS	In Situ Object Counting System
LANL	Los Alamos National Laboratory
LWA	Land Withdrawal Act
MCS	Mobile Characterization Services
MRC	Monsanto Research Corporation
mrem/hr	millirem per hour
nCi	nanocuries
NDA	nondestructive assay
NWPA	Nuclear Waste Policy Act
ORTEC	Oak Ridge Technical Enterprise Corporation
OSRP	Offsite Source Recovery Program

Pu	plutonium
QA	quality assurance
RH	remote-handled
RTR	real-time radiography
SCG	summary category group
SFC	Special Form Capsules
SNF	spent nuclear fuel
SPM	site project manager
Sr	strontium
SRS	Savannah River Site
SWB	standard waste box
T1	Tier 1
T2	Tier 2
TMU	total measurement uncertainty
TRU	transuranic
U	uranium
VE	visual examination
WCPIP	Waste Characterization Program Implementation Plan
WIPP	Waste Isolation Pilot Plant
WSPF	Waste Stream Profile Form

1.0 INTRODUCTION

This report supports the U.S. Environmental Protection Agency's (EPA's) approval of a Tier 1 (T1) change to add Waste Stream SR-RH-SDD.01 (sealed sources) to the approved transuranic (TRU) waste characterization program for remote-handled (RH) waste at the U.S. Department of Energy's (DOE's) Savannah River Site (SRS). In April 2012, EPA approved the Central Characterization Program (CCP)[1] to characterize RH TRU waste at SRS. On September 30, 2013, the Carlsbad Field Office (CBFO) requested EPA's approval of a T1 change to add Waste Stream SR-RH-SDD.01 consisting of three sealed sources previously packaged in special form capsules (SFC) by the Los Alamos National Laboratory (LANL) Offsite Source Recovery Program (OSRP). EPA concludes that SRS-CCP can characterize the subject waste for disposal at the Waste Isolation Pilot Plant (WIPP) using the EPA-approved waste characterization processes discussed in this report.

In accordance with Title 40 of the Code of Federal Regulations [40 CFR 194.8(b)], EPA conducted Baseline Inspection No. EPA-SRS-CCP-RH-08.11-8. The April 2012 SRS-CCP RH baseline final inspection report (see EPA Docket No. A-98-49; II-A4-161) documents EPA's approval of:

- The acceptable knowledge (AK) process for RH TRU debris waste streams that have companion[2] contact-handled (CH) debris waste streams.
- The radiological characterization process that uses dose-to-curie (DTC) with scaling factors generated through use of the Mobile Characterization Services (MCS)/In Situ Object Counting System (ISOCS[3]) and historical assays of companion CH debris waste streams for assigning radionuclide values for RH waste.
- The real-time radiography (RTR) process specific to SRS-CCP's RH waste characterization program.

Table 1 of that report defined addition to the EPA-approved waste characterization program of any new waste streams that do not have companion CH debris waste streams or are characterized using a different process as a T1 change that requires EPA approval before implementation. EPA did not approve SRS-CCP for visual examination (VE) of RH waste containers during the Baseline Inspection or subsequent T1 evaluations. Since the baseline approval, EPA approved SRS-CCP's two T1 change requests to add additional RH debris waste streams to the approved waste characterization program as shown in Attachment A.

---

[1] The Central Characterization Program was formerly known as the Central Characterization Project, and both names are used in the documentation reviewed for this evaluation.

[2] A companion CH waste stream has the same summary category group, same waste stream definition and same radiological and physical properties as the subject RH waste stream. In this case, the only difference between containers in the companion CH waste stream and those in the subject RH waste stream is the waste's external dose rate, i.e., less than or greater than 200 millirem per hour (mrem/hr), which makes the waste CH or RH, respectively.

[3] Unlike other nondestructive assay (NDA) instruments in CH programs, EPA has not approved use of the ISOCS to quantify radionuclides directly; its use is limited to obtaining the relative ratios of radionuclides, i.e., scaling factors.

The scope of this T1 change evaluation consists of (1) the AK process, (2) the radiological characterization process developed by LANL's OSRP for assigning radionuclide values and (3) physical characterization[4] of the three SRS-CCP containers that are the subject of this T1 evaluation.

EPA conducted a desktop review of this change during a meeting with SRS-CCP personnel in Denver, Colorado, on December 3–5, 2013. This discussion resulted in SRS-CCP revising several waste characterization documents concerning the subject waste stream. Upon evaluation of revised information and specific clarifications EPA concludes that SRS-CCP can use the EPA-approved system of controls to adequately characterize Waste Stream SR-RH-SDD.01. Inclusion of any additional SFCs of sealed sources to Waste Stream SR-RH-SDD.01 in the future will require a T1 evaluation to approve the physical characterization of those containers.

Waste Stream SR-RH-SDD.01 currently consists of three sealed sources packaged in two 15-gallon containers and one 16-gallon container, specifically source Nos. M-029, M-044 and M-045. SRS-CCP compiled AK documents and characterized this waste stream by deriving simple mass-based isotopic relationships and then applying the OSRP CharacterizationDatabase.mdb process for non-plutonium radionuclides. EPA approved this LANL OSRP process in June 2005 (see EPA Docket No. A-98-49; II-A4-55). SRS-CCP provided the sealed source packaging records prepared by the OSRP and container packaging records and photographs prepared by SRS-CCP to document the sources' physical characterization. Any use of VE by SRS-CCP for any RH waste remains a T1 change. EPA modified the SRS-CCP RH T1 designations that were established during the baseline approval and subsequent T1 evaluations to state this requirement explicitly (see Table 1).

EPA did not identify any findings or concerns during this evaluation. SRS-CCP revised several documents during the evaluation and provided them to EPA. Attachment B is a list of all documentation reviewed, including batch data reports (BDRs) and calculation packages.

This report serves as EPA's public notification of the results of the proposed T1 change and its evaluation. This information will be provided through the EPA website and by emails to the WIPPNEWS list, in accordance with 40 CFR 194.8(b)(3).

[4] As stated previously, SRS-CCP is not approved to perform VE for RH wastes. EPA is approving SRS-CCP's determination of the physical contents of the three drums based on EPA's evaluation of packaging records, including photographic evidence.

Table 1. Tiering of Remote-Handled Transuranic Waste Characterization Processes Implemented by SRS-CCP (Based on August 20–September 1, 2011, and December 6–7, 2011, Baseline Inspection, Updated March 2014)

Process Elements	SRS-CCP RH Waste Characterization Process – T1 Changes	SRS-CCP RH Waste Characterization Process – T2 Changes*
Acceptable Knowledge	Any new SCG S3000 or S4000 RH waste stream Any new SCG S5000 RH waste stream that <u>does not</u> have a companion CH waste stream Substantive modification** to EPA-approved AKSRs and certification confirmation test plans (e.g., CCP-AK-SRS-580, CCP-AK-SRS-582, CCP-CP-SRS-562)	Notification to EPA upon characterization of any new SCG S5000 RH waste stream that <u>does</u> have a companion CH waste stream Notification to EPA upon availability or nonsubstantive modification** of AKSRs and certification confirmation test plans (e.g., CCP-AK-SRS-580, CCP-AK-SRS-582, CCP-CP-SRS-562) Notification to EPA upon availability or modification of: • CCP-TP-005 or nonconformance and corrective action procedures requiring CBFO approval • CCP-TP-005 attachments, including when Attachment 4 is generated to reflect the updated AKSR Source Document Reference List • WSPF, CIS, CRR and related attachments, and any subsequent revisions to these documents • AK accuracy reports (annually, at a minimum) • Add Container Memoranda • Additional discrepancy resolution reports and nonconformance reports
Radiological Characterization, including Dose-to-Curie	Use of the MCS/ISOCS to provide any information other than the relative determinations of gamma-emitting radionuclides for use as scaling factors Future use of the ORTEC/ISOCS for any RH TRU waste Application of new (i.e., not EPA-approved) scaling factor processes for isotopic determination (applies to new RH waste streams and to the addition of containers to an approved waste stream) Substantive modification** to EPA-approved procedures or radiological characterization technical reports (e.g., CCP-TP-504, CCP-AK-SRS-581, CCP-RC-SRS-561)	Notification to EPA upon: • Characterization of any new RH waste stream using an approved scaling factor process for isotopic determination • Modification of the procedures or radiological characterization technical reports (e.g., CCP-TP-504, CCP-AK-SRS-581, CCP-RC-SRS-561) requiring CBFO approval • Availability of calculation package CCP-SRS-44 or equivalent records
Visual Examination	**Any use of visual examination**	**N/A**
Real-Time Radiography	Real-time radiography by any new process	Notification to EPA upon: • Substantive modification** to site procedures requiring CBFO approval • Characterization of SCG S3000 or S4000 RH waste by an approved process

New T1s, T2s and significant modifications to existing T1s or T2s are in **bold** text; T1s or T2s that were only revised for style are not shown in bold.

* SRS-CCP will report all T2 changes to EPA every three months.

** "Substantive modification" refers to a change with the potential to affect SRS-CCP's RH waste characterization processes or documentation of them, excluding changes that are solely related to the environment, safety and health; nuclear safety; or the Resource Conservation and Recovery Act, or that are editorial in nature or are required to address administrative concerns. EPA may request copies of new references that DOE adds during a document revision.

2.0 PURPOSE OF TIER 1 EVALUATIONS

Certain changes to the waste characterization activities after the date of the site's baseline inspection must be reported to and, if applicable, approved by EPA according to the tiering requirements set forth in 40 CFR 194.8 and incorporated into the SRS-CCP RH baseline final report (see EPA Docket No. A-98-49; II-A4-161).

Under the changes to 40 CFR 194.8 promulgated in the July 16, 2004, Federal Register notice (Vol. 69, No. 136, pages 42571–42583), EPA must perform a single baseline inspection of a TRU waste generator site's waste characterization program. The purpose of EPA's baseline inspection is to approve the site's waste characterization program, based on the demonstration that the program's components, with applicable conditions and limitations, can adequately characterize TRU wastes and comply with the regulatory requirements imposed on TRU wastes destined for disposal at the WIPP.

Following EPA's baseline approval, EPA is authorized to evaluate and approve changes, if necessary, to the site's approved waste characterization program by conducting additional inspections under the authority of 40 CFR 194.24(h). Changes requiring EPA notification and approval prior to implementation (T1) and those requiring post-implementation notification [Tier 2 (T2)] are identified in the site-specific baseline inspection reports. When evaluating proposed T1 changes for approval, EPA may conduct a site inspection to observe at first hand the implementation of the change or can decide to conduct a desktop review of information provided specific to a change. DOE may choose to characterize and dispose of any previously approved TRU waste using processes, procedures or equipment implemented as T2 changes at risk of subsequent EPA disapproval. EPA reviews T2 changes on a quarterly basis and may conduct continued compliance inspections to evaluate implemented T2 changes to verify adequacy.

3.0 PURPOSE OF THIS REPORT

This report presents the results of EPA's evaluation of a T1 change to add SRS sealed sources (Waste Stream SR-RH-SDD.01) to SRS-CCP's approved waste characterization program. This report presents the technical basis for and results of EPA's approval decision. EPA's approval decision regarding the addition of Waste Stream SR-RH-SDD.01 has been conveyed to DOE separately by letter. EPA will also announce the decision on its website at www.epa.gov/radiation/wipp, in accordance with 40 CFR 194.8(b)(3).

The DOE documents that EPA reviewed for this evaluation are cited in different sections throughout the report and are listed in Attachment B. Any of these documents can be requested from the following address:

Manager, National TRU Program
Carlsbad Field Office
U.S. Department of Energy
P O Box 3090
Carlsbad, NM 88221-3090

4.0 SCOPE OF THE TIER 1 EVALUATION

The scope of EPA's T1 evaluation is:

- The AK process.
- The radiological characterization processes of applying the techniques approved by EPA for CH sealed source waste under the OSRP to the three containers described in this report.
- The physical characterization of the three sealed sources in Waste Stream SR-RH-SDD.01 at the time of this T1 evaluation.

Sections 6.1–6.3 of this report detail the technical elements assessed during this evaluation.

5.0 EVALUATION PERSONNEL

5.1 EPA Evaluation Personnel

The EPA evaluation team members consisted of the personnel listed in Table 2 with their technical areas of expertise.

Table 2. EPA Tier 1 Evaluation Team Members

Name	Affiliation & Function
Ed Feltcorn	Lead Inspector, U.S. EPA
Kira Darlow	Technical Evaluator – Acceptable Knowledge, SC&A
Rose Gogliotti	Technical Evaluator – Radiological Characterization, SC&A
Patrick Kelly	Technical Evaluator – Radiological Characterization, SC&A
Amir Mobasheran*	Technical Evaluator – Radiological Characterization, SC&A
Dorothy Gill*	Technical Evaluator – Physical Characterization, SC&A

*Participated remotely

5.2 DOE Evaluation Personnel

EPA and its support personnel conducted interviews with SRS-CCP waste characterization personnel in radiological characterization and AK. The SRS-CCP personnel contacted during the T1 evaluation in Denver, Colorado, are listed in Table 3 with their affiliations and areas of expertise or function. Following the Denver meeting, members of the EPA Evaluation Team had discussions with DOE personnel via email regarding document revisions and other technical details. All DOE personnel present at the evaluation are listed in Attachment C.

Table 3. DOE Tier 1 Evaluation Personnel

Name	Affiliation & Function
Kevin Peters	SRS-CCP, AK Expert
Derek Ott	URS, Radiological Characterization Technical Expert
Steve Schafer	CCP, AK Expert

6.0 TECHNICAL EVALUATION

Waste-Generating Activities

Waste Stream SR-RH-SDD.01 (SRS sealed sources) consists of two 15-gallon containers and one 16-gallon container, each holding a single sealed plutonium (Pu)-beryllium (Be) source. SRS purchased these sources from the Monsanto Research Corporation (MRC) to support research of production reactors in the Physics Laboratory at SRS from 1965–1978. In 2002, OSRP personnel encapsulated the sealed sources into SFCs and collected the AK necessary to identify and characterize the sources. LANL OSRP could not accept three of these sources because they were too long for the pipe overpack containers for shipping encapsulated sources. In 2007, SRS packaged the remaining SFCs individually into three standard waste boxes (SWBs) filled with polyethylene beads and moved them to the SRS Decontamination and Decommissioning Facility in the P-Area. In 2013, SRS-CCP repackaged the three SFCs into 15- or 16-gallon steel containers equipped with wooden bracing and no internal neutron shielding. All three containers had surface dose rates greater than 200 mrem/hr and were classified as RH TRU.

Documents, Waste Containers, and Batch Data Reports and Calculation Packages

EPA evaluated the SRS-CCP documentation that supported the addition of Waste Stream SR-RH-SDD.01 to the EPA-approved RH waste characterization program at SRS. SRS-CCP provided CCP-AK-SRS-630, Revision 1; CCP-RC-SRS-631, Revision 0 and Revision 1; and CCP-CP-INL-632, Revision 0, to EPA for review. Attachment B is a list of all documentation reviewed, including BDRs and calculation packages.

6.1 Acceptable Knowledge

EPA examined the programmatic requirements and AK process and associated information to assess the technical adequacy of the information to support the addition of Waste Stream SR-RH-SDD.01.

Waste Characterization Element Description

EPA evaluated the technical elements listed below.

- Evaluation scope and waste stream identification.
- Identification of the Waste Characterization Program Implementation Plan (WCPIP)[5] waste characterization process.
- Adequacy of the certification plan and other WCPIP documentation.
- Waste stream definition, including radiological and physical characteristics.

[5] All references to the WCPIP in this report refer to Revision 3, unless specified otherwise. U.S. Department of Energy, Carlsbad Field Office, "Remote Handled TRU Waste Characterization Program Implementation Plan," Revision 3, Carlsbad, New Mexico, September 19, 2012.

- Verification that the subject waste is of defense origin and is not high-level waste (HLW) or spent nuclear fuel (SNF).
- Role of AK in the characterization methodology, including radionuclide mass fractions.
- Adequacy of AK procedure implementation, including attachments and AK accuracy reports.
- Adequacy of the AKSR and associated source documents.
- AK data traceability.
- Personnel training.
- Attainment of data quality objectives (DQOs).

Technical Evaluation

EPA evaluated the adequacy of AK information specific to the addition of Waste Stream SR-RH-SDD.01, as described in the AKSR (CCP-AK-SRS-630, Revision 1); CCP-RC-SRS-631, Revision 1; and certification plan (CCP-CP-SRS-632, Revision 0).

(1) EPA examined the waste stream determination for Waste Stream SR-RH-SDD.01 and found it to be adequate.

The WCPIP defines the waste stream as waste material that is (1) generated from a single process/activity and (2) similar in material, physical form, and radiological properties. EPA examined the containers that were characterized according to the methods described in CCP-CP-SRS-582, Revision 0, and described in the AKSR, to determine whether the waste stream was adequately defined.

As described in section 6.0 above, the waste stream consists of three Pu-Be sealed sources that the SRS Physics Laboratory used to support reactor research. Reactor-specific AK does not identify the three remaining Pu-Be sources; however, the neutron output of these sources is sufficiently similar to those identified in the AK to indicate that SRS used these Pu-Be sources for the same purpose (References C001 and P001). As described in Item (6), the three containers are similar in material, physical form, and radiological properties. Based on this information, EPA determined that the waste stream is adequately defined.

(2) EPA examined the certification plan, including a description of the waste characterization process, and found it to be complete and technically adequate.

The certification plan is presented in CCP-CP-SRS-632, Revision 0. The WCPIP states that the certification plan must describe the process for certification of the waste stream, including a description of the characterization methods selected and AK qualification method(s). The WCPIP requires that the certification plan include, at a minimum, the following:

- Description of AK qualification and/or characterization methods selected to meet the DQOs, including the justification for the selection of the methods.
- Description of the quality assurance objectives for the selected methods.

- Detailed description of any characterization and testing method not included in the WCPIP; the description of the method must be sufficient to allow for CBFO approval prior to implementation of the method.
- Summary of the program documents to be prepared during the characterization and/or qualification methods selected for the waste stream.

EPA reviewed the certification plan to evaluate compliance with these document requirements, as well as the waste characterization requirements consolidated in the WCPIP from 40 CFR Parts 191 (Subparts B and C) and 194 and the *WIPP Land Withdrawal Act* (LWA) (Public Law 102-579). EPA found that the plan included the necessary components.

(3) EPA determined that SRS-CCP identified the waste qualification pathway, and that the selected approach and documentation were adequate.

40 CFR 194.24(c)(3)–(5) states that a system of controls must be implemented to characterize waste components, and that this system must comply with quality assurance (QA) requirements found at 40 CFR 194.22. If AK is used to quantify components, its use must also comply with §194.22, which states that data collected prior to implementation of the WIPP-specific QA program must be qualified by peer review, corroborating data, confirmatory testing, or demonstration that a QA program equivalent to American Society of Mechanical Engineers NQA-1 requirements was in place at the time of characterization.

The system of controls used to characterize Waste Stream SR-RH-SDD.01 includes:

- AK for waste stream determination, defense determination, absence of SNF and HLW and radiological characterization.
- Radiological characterization based on historical records, including LANL's OSRP database.
- Physical characterization of the sources based on packaging records.

SRS-CCP used the Microsoft Access-based OSRP CharacterizationDatabase.mdb to execute the calculations for characterizing the three Pu-Be sources in Waste Stream SR-RH-SDD.01. EPA previously approved this approach for characterization of CH sealed sources under the LANL OSRP. SRS-CCP used AK as input for each identified sealed source. Per 40 CFR 194.22, this use of AK requires qualification by one of the four approved methods listed above. In 2003, a Peer Review panel evaluated the AK used as input to the characterization process for sealed sources and identified a list of specific types of documents that can be used in the radiological characterization calculations. As discussed in section 6.2, Item, EPA evaluated the characterization approach for applicability to RH containers and found it to be acceptable.

EPA evaluated the physical characterization of Waste Stream SD-RH-SDD.01 and found it to be acceptable only for the three containers currently in this waste stream. EPA's evaluation and approval limitations are discussed in section 6.3.

The characterization and qualification pathways used by CCP are adequately defined.

(4) EPA examined the acceptable knowledge procedure and found it to be adequate and appropriately implemented.

CCP-TP-005, Revision 26, is the current version of the AK procedure. CCP-TP-005, Revision 25, was also in place during the course of SRS-CCP's characterization of Waste Stream SR-RH-SDD.01. EPA's review of the RH component of the current AK procedure (CCP-TP-005, Revision 26) is included in the report documenting EPA's approval of Waste Stream ID-EBR-S5000 (see EPA Docket No. A-98-49; II-A4-183).

SRS-CCP provided the AKSR and attachments indicated in Table 4 as objective evidence of implementation of procedure CCP-TP-005. EPA evaluated the AKSR [see Item (5)] and relevant attachments and found that SRS-CCP adequately implemented procedure CCP-TP-005 for compilation and evaluation of the AK for Waste Stream SR-RH-SDD.01.

Table 4. CCP-TP-005 Attachments as Applicable to Waste Stream SR-RH-SDD.01

No.	Title	Revision Provided	Adequate	Notes
1	Acceptable Knowledge Documentation Checklist – Example Form	26	Y	
2	Record of Communication – Example Form	None	Y	SRS-CCP did not conduct any interviews for this waste stream.
3	Acceptable Knowledge Source Document Summary – Example Form	25, 26	Y	
4	Acceptable Knowledge Information List – Example Form	26	Y	
5	Hazardous Constituents – Example Form	N/A	N/A	Not in EPA's purview.
6	Waste Form, Waste Material Parameters, Prohibited Items, and Packaging – Example Form	26	Y	
7	Radionuclides – Example Form	N/A	N/A	CH only.
8	Waste Containers List – Example Form	25	Y	
9	Attachment 9 is no longer required and Attachment number is reserved for future use	N/A	N/A	
10	Acceptable Knowledge Re-evaluation Checklist – Example Form	None	Y	SRS-CCP has not re-evaluated the AK for this waste stream.
11	Acceptable Knowledge Source Document Discrepancy Resolution – Example Form	None	Y	SRS-CCP has not prepared any Discrepancy Resolutions for this waste stream.
12	Example Form and Content Guide for AK Summary Reports	N/A	N/A	See AKSR review in Item (5).
13	CCP Waste Stream Characterization Checklist – Example Form	26 (sample)	Y	Sample provided. SRS-CCP will complete and sign checklist when a lot is created after the waste stream is approved.
14	CCP Acceptable Knowledge Accuracy Report – Example Form	26 (draft)	Y	Initial draft report inadequate. SRS-CCP provided adequately revised report.
15	CCP TRU Waste Correlation and Surrogate Summary Form – Example Form	25	Y	See Item (10)

(5) EPA examined the acceptable knowledge summary report, along with the reference list and associated source documents, and found them to be adequate.

The LANL OSRP initially compiled all of the AK information for the SRS sources in 2002. SRS-CCP AK Experts (AKEs) evaluated the information compiled by OSRP and incorporated the source documents into the AKSR (CCP-AK-SRS-630) as appropriate. SRS-CCP also relied on the OSRP AKSR (CCP-AK-LANL-008, currently Revision 9) for specific pieces of information, including the description of typical source materials for construction of sealed sources and SPCs; the OSRP determination for absence of liquids, reactive, ignitable and corrosive materials; and the description of the radiological characterization process from the AK perspective.

SRS-CCP had not incorporated the current revision of the OSRP AKSR into the SRS-CCP AK record prior to the meeting in Denver. EPA's waste characterization program approvals are on a site-by-site basis. To EPA, SRS-CCP is a completely separate entity from LANL-CCP and all applicable source documents must be incorporated into the SRS-CCP AK record. SRS-CCP appended CCP-AK-LANL-008, Revision 9, to the Correlation and Surrogate Summary Form (CSSF) for Waste Stream SR-RH-SDD.01. EPA determined that this revision to the CSSF adequately resolved this issue for this waste stream because the information supported by the OSRP AKSR addressed sealed sources in general and any statements specific to the subject waste were also supported by source documents in the SRS-CCP AK record [see Item (10) below for additional required CSSF revisions].

The AKE indicated that recently developed AKSRs at other DOE sites also reference offsite AKSRs. EPA will evaluate each situation individually and may require that offsite AKSRs are assigned source document tracking numbers and/or that individual source documents from the offsite AKSRs are included in the subject waste's site-specific AK record.

EPA reviewed the sealed sources AKSR and found its contents to be adequate. Notification to EPA when revisions of the AKSR are available remains a T2 change. Substantive modifications that have the potential to affect the characterization process remain a T1 change. (See Table 1.)

(6) EPA examined descriptions of the radiological and physical properties of the waste stream and found them to be adequate.

Waste Stream SR-RH-SDD.01 consists of three sealed sources in SFCs packaged with wooden bracing in two 15-gallon containers and one 16-gallon container. There is no additional waste in the containers (References BDR No. SRSRHVE13001 and U004). SRS-CCP assigned waste matrix code S5400, Heterogeneous Debris, to Waste Stream SR-RH-SDD.01. By weight, the containers are 51% organic material (wooden bracing) and 49% inorganic material (metal sealed sources packaged in metal SFCs) (References C003, U002, U004 and CCP-TP-005 Attachment 6). Applicable waste material parameters are iron-based metals/alloys, aluminum-based metals/alloys, other metals and cellulosics.

The AKSR documents the initial estimate of radionuclide content based on an MRC drawing that provided the serial numbers, the physical dimensions, and grams of Pu oxide and Be used in each identified source, as well as the isotopic distribution (mass fractions) of the Pu oxide used for

source construction. SRS-CCP determined the initial radionuclide content of the sources and then decay corrected the initial content to estimate the content at the time of packaging in 2007 (Reference C001). Per this analysis, the two predominate radionuclides by mass are ^{239}Pu and ^{238}Pu, and 95% of the activity is due to ^{238}Pu, ^{241}Pu and americium-241 (^{241}Am) (References C001 and U003).

The physical and radiological properties of Waste Stream SR-RH-SDD.01 are adequately documented.

(7) EPA evaluated documentation regarding the status of spent nuclear fuel and high-level waste, and found this waste stream to be in compliance with the Waste Isolation Pilot Plant Land Withdrawal Act.

The LWA prohibits the disposal at WIPP of SNF and HLW as defined by the *Nuclear Waste Policy Act* (NWPA). The NWPA and DOE M435.1-1[6] state that SNF is "fuel that has been withdrawn from a nuclear reactor following irradiation, the constituent elements of which have not been separated by reprocessing.... [However,] test specimens of fissionable material irradiated for research and development only, and not production of power or plutonium, may be classified as waste, and managed in accordance with the requirements of this Order when it is technically infeasible, cost prohibitive, or would increase worker exposure to separate the remaining test specimens from other contaminated material." The NWPA defines HLW as "the highly radioactive material resulting from the reprocessing of spent nuclear fuel, including liquid waste produced directly in reprocessing and any solid material derived from such liquid waste that contains fission products in sufficient concentrations, and other highly radioactive material that the commission, consistent with existing law, determines by rule requires permanent isolation."

The AKSR states that Waste Stream SR-RH-SDD.01 consists of three sealed sources in SFCs packaged with wooden bracing in two 15-gallon containers and one 16-gallon container. By definition, the sealed sources are neither SNF nor HLW. Physical characterization records indicate that there is no additional waste in the containers (Reference BDR No. SRSRHVE13001). Therefore, Waste Stream SR-RH-SDD.01 does not contain SNF or HLW.

(8) EPA examined the defense origin of transuranic wastes and found it to be adequate.

TRU waste must be defense-related in order to qualify for disposal at WIPP. The SRS Physics Laboratory used neutron sources such as the three Pu-Be sources in Waste Stream SR-RH-SDD.01 in production reactor research. From 1953 to the 1970s, the experimental reactors in the Physics Laboratory were used to study production reactor design and operation and to calibrate various standards and monitoring devices they required (References C002, P001, P002, U002 and CCP-AK-LANL-008, Revision 9). The production reactors themselves were instrumental to the production of materials for nuclear weapons during the Cold War (Reference C002). Therefore, the sealed sources in Waste Stream SR-RH-SDD.01 directly supported defense

[6] DOE M435.1-1 is DOE's Radioactive Waste Management Manual.

nuclear materials production and defense research and development and are eligible for disposal at WIPP.

(9) EPA examined the Waste Stream Profile Form and attached Characterization Reconciliation Reports and found them to be adequate.

SRS-CCP provided EPA with the draft waste stream profile form (WSPF), characterization reconciliation report (CRR), Characterization Information Summary (CIS) and Summation of Aspects on October 30, 2013. The WCPIP explicitly lists the required contents of the WSPF and the CRR. The WCPIP does not require the CIS; however, SRS-CCP has elected to combine the once-separate EPA and New Mexico Environmental Department WSPFs. Therefore, a CIS must be prepared and may be used in conjunction with the WSPF to meet all of the EPA requirements as documented in WCPIP.

EPA examined the draft documents and found that some revisions were necessary. The draft WSPF, CRR and CIS initially provided to EPA had been adapted from documents for a different waste stream and all three required revision to correct waste stream references and characterization details. Additionally, the WSPF required revision to update the defense determination so that it would match the AKSR. The WSPF also did not list the BDRs supporting waste stream characterization (as required by the WCPIP), instead referencing the CIS. The draft CIS, however, did not include a calculation reference for radiological characterization. Therefore, SRS-CCP also revised the draft CIS to reference CCP-RC-SRS-531. The WSPF, CIS and CRR are draft documents and, therefore, do not include the Site Project Manager (SPM) signature and date. The revised draft WSPF, CIS and CRR are complete and adequate.

Notification to EPA of the availability of the final WSPF, CIS, CRR and any revisions to these documents and their attachments (e.g., Summation of Aspects) are T2 changes. (See Table 1.)

(10) EPA examined the acceptable knowledge accuracy report and Correlation and Surrogate Summary Form and found them to be adequate.

EPA examined the draft AK accuracy report and found it to be complete. The radiological characterization for Waste Stream SR-RH-SDD.01 is based on AK; therefore, there is not a measured value to compare to an expected value. SRS-CCP appropriately explained the inability to calculate AK accuracy for radionuclide composition in CCP-CP-SRS-632, Revision 0, and referenced this explanation in the draft AK accuracy report. SRS-CCP uses CCP-TP-005, Attachment 14, to compile and calculate AK accuracy. The draft Attachment 14 initially provided to EPA included "N/A" in several fields that SRS-CCP should have answered with "Y" or "N." SRS-CCP adequately revised the Attachment 14 and provided the revision to EPA.

Waste Stream SR-RH-SDD.01 consists of three Pu-Be sealed sources that were intended to be part of OSRP Waste Stream LA-OS-00-01.001. Characterization information, including the radiological characterization method, source construction and prohibited items, are applicable to both waste streams. Therefore, a correlation and surrogate summary form (CSSF) was required. EPA reviewed the CSSF and found it to require revision to cite the correct radiological

characterization technical report and certification plan. SRS-CCP provided a revised draft AK accuracy report that reflects those changes and is adequate.

Notification to EPA when AK accuracy reports are completed, and prepared annually at a minimum, is a T2 change. Notification to EPA of revision to the CSSF (CCP-TP-005, Attachment 15) or preparation of an additional CSSF is also a T2 change. (See Table 1.)

(11) Drum data are adequately traceable and are in the AK record.

As discussed in Item (1), Waste Stream SR-RH-SDD.01 was produced and packaged by OSRP during a campaign to remove sealed neutron sources from SRS. The sealed sources were produced by MRC and used in the Physics Laboratory at SRS to research production reactor designs from 1965–1978 (References C001 and C002). In 2002, OSRP packaged the sealed sources in SFCs and removed most of the sources from SRS. However, the three Pu-Be sources that are in Waste Stream SR-RH-SDD.01 were too large for LANL OSRP to package and ship to LANL (References C002 and U002). In 2007, SRS packaged the three remaining sources in SWBs with polyethylene beads (Reference U001). In 2013, SRS removed the sources from the SWBs and packaged them in two 15-gallon containers and one 16-gallon container with wooden bracing. These are the characterization containers for the three sources (References U004, CCP-RC-SRS-631, Revision 1, and BDR No. SRSRHVE13001).

EPA reviewed the records and determined that the drums proposed for emplacement in the WIPP facility as Waste Stream SR-RH-SDD.01 are traceable from the Physics Laboratory at SRS to the 15- and 16-gallon containers and SRS-CCP characterization.

(12) EPA examined acceptable knowledge training and found it to be adequate.

The WCPIP requires that characterization personnel responsible for compiling AK, characterizing RH TRU waste streams using the AK process, and assessing the AK characterization shall be qualified and trained to:

- The WCPIP.
- The characterization program nonconformance and corrective action process.

Kevin Peters is the primary AK Expert (AKE) responsible for Waste Stream SR-RH-SDD.01. Trey Greenwood signed one of the AK documents for Mr. Peters. Through interviews and discussions, EPA was able to conclude that Mr. Peters is current with respect to the training requirements listed above. EPA reviewed Mr. Peter's and Mr. Greenwood's AKE qualification cards that document their training to the elements listed above and found them to be adequate. EPA also reviewed evidence of their training to Revision 3 of the WCPIP.

EPA also reviewed the RH SPM qualification card for Laura Nelson and found it to be adequate.

(13) Data quality objectives were evaluated and EPA found they were adequately met.

The WCPIP identifies the following DQOs that must be addressed:

Defense Waste, HLW and SNF Determination (Regulatory Basis: LWA): This is required to ensure that the waste stream was generated by atomic energy defense activities, is not HLW, and is not SNF. These are addressed in CCP-AK-SRS-630, Revision 1, as discussed in Items (8) and (7) above.

Radioactive Properties (Regulatory Basis: LWA, EPA Certification of the WIPP):

- *TRU Waste Determination:* Waste must contain more than 100 nanocuries (nCi) of TRU isotopes per gram of waste.
- *RH Waste Determination:* Surface dose rate must be equal to or greater than 200 mrem/hr and less than 1,000 rem/hr.
- *Activity Determination:* The total waste inventory can be no more than 5.1 million curies (Ci) of RH TRU; activity limit per canister is 23 Ci per liter; and all radionuclides important to release calculations must be tracked.

These three DQOs are addressed in CCP-RC-SRS-631, Revision 0, and CCP-CP-SRS-632, Revision 0, as discussed in section 6.2 below.

Physical Properties (Regulatory Basis: EPA Certification of the WIPP):

- *Liquids:* The absence of liquids in excess of 1% must be confirmed.
- *Physical Form:* The physical form of the waste to delineate the waste stream as required by the final certification rule must be determined.

These two DQOs concerning the waste's physical form and the presence of liquids are discussed in Item (8) above, section 6.3 below and documented in BDR No. SRSRHVE13001. EPA determined that the documents cited above supported that all DQOs were achieved.

Summary of Acceptable Knowledge Findings and Concerns

EPA did not identify any AK-related findings or concerns relative to the addition of Waste Stream SR-RH-SDD.01 during this T1 change evaluation.

Changes to Tiering

Based on the results of this evaluation, there are no changes to the AK T1 or T2 designations as identified during the baseline inspection and subsequent T1 evaluations.

Acceptable Knowledge Approval

Based on the results of this evaluation, EPA approves the addition of Waste Stream SR-RH-SDD.01 and finds that all requirements have been met. Based on this evaluation, there are no changes to the AK T1 or T2 designations. Characterization of any new RH debris waste stream without a companion CH debris waste stream remains a T1 change. T1 and T2 changes that were initiated during the baseline approval remain in effect.

6.2 Radiological Characterization

EPA examined the radiological characterization process and associated information to support the inclusion of Waste Stream SR-RH-SDD.01 in the SRS-CCP approval.

Waste Characterization Element Description

The approach to characterizing Waste Stream SR-RH-SDD.01 is based on historical records found in AK. The radiological properties of each source were determined with characterization methods developed by LANL-OSRP for CH sealed sources that EPA approved in June 2005 (see EPA Docket No. A-98-49; II-A4-55).

Technical Evaluation

(1) EPA evaluated the overall radiological characterization process and its documentation and found them to be adequate.

The radiological characterization process for Waste Stream SR-RH-SDD.01 is based on developing mass fractions (discussed below) from AK, which were used with OSRP isotopic distributions to derive mass values for non-plutonium radionuclides in ^{238}Pu sources. The mass values were converted to activities in curies (Ci) for each source. EPA prepared a flow diagram to reflect this process, shown in Figure 1 below. There are no concerns related to the technical adequacy or documentation of the radiological characterization process for Waste Stream SR-RH-SDD.01.

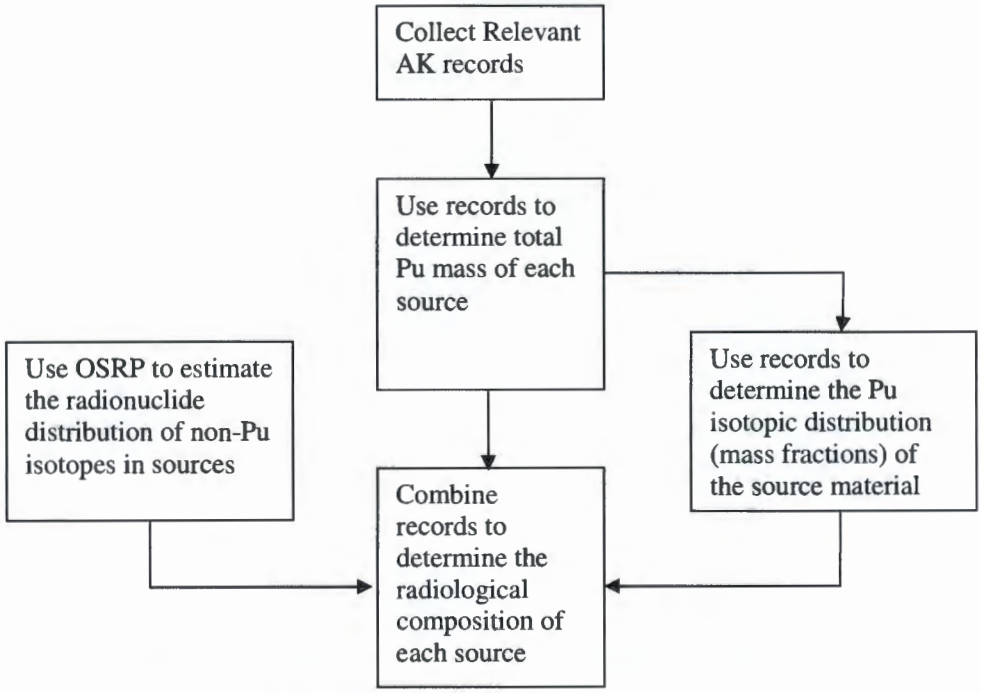

Figure 1. Radiological Characterization Flow Diagram

(2) EPA evaluated the correlation of waste records to the values used in the characterization and the determination of mass fractions and found the correlation to be adequate.

The characterization of Waste Stream SR-RH-SDD.01 is based solely on AK records, i.e., no new measurements were performed to characterize these containers. Instead, SRS-CCP used an approach that has previously been applied under the LANL OSRP for CH TRU waste that EPA approved in June 2005 (see EPA Docket No. A-98-49; II-A4-55). SRS-CCP obtained records for the three sources from AK that had somewhat discrepant values, i.e., they listed different quantities of radionuclides for the same sources. SRS-CCP chose to use the MRC design drawing (Reference C001) as the basis for the total Pu content in each source because these appeared to be the oldest records available and they were deemed the most reliable.

Mass fractions represent the mass relationship between a specific radionuclide and the total plutonium in the waste, e.g., ^{238}Pu, ^{239}Pu or ^{240}Pu to total PuO_2. Calculation of the radionuclide-specific mass fractions developed for the three individual drums is documented in SRS-RH-88, Revision 0 and Revision 1, and CCP-RC-SRS-631, Revision 0 and Revision 1. EPA evaluated the technical basis for the following aspects:

- MRC source design drawing, specifying the Pu isotopic distribution (mass fractions) and masses of the sources.
- Use of OSRP estimated mass fractions from a Microsoft Access database for the non-plutonium isotopics specific to the three sealed sources.
- The appropriateness of the choice of physical constants and radionuclide-specific attributes (specific activity, physical half-life, decay heat, etc.) and the technical correctness of the values assigned to each attribute.
- Appropriate decay correction; EPA identified calculation errors related to decay correction during the Denver meeting; these errors were corrected in Revision 1 of CCP-RC-SRS-631 and SRS-RH-88, Revision 1.
- Activity and uncertainty values determined for the 10 WIPP-tracked radionuclides: ^{241}Am, cesium-137 (^{137}Cs), ^{238}Pu, ^{239}Pu, ^{240}Pu, ^{242}Pu, strontium-90 (^{90}Sr), uranium-233 (^{233}U), ^{234}U, and ^{238}U.

SRS-CCP used the mass of plutonium oxide in source No. M-029, and mass of ^{238}Pu in source Nos. M-044 and M-045 to calculate the sources' mass fractions as of December 31, 1966. Due to the 87.7-year half-life of ^{238}Pu, it was important to calculate the mass fractions as close to the creation of the material as possible. SRS-CCP also chose this date because it had been used by LANL OSRP and provided some degree of corroboration. SRS-CCP decay corrected radionuclides with short half-lives (^{137}Cs, ^{90}Sr, and ^{241}Am) from this date.

There are no concerns related to the technical adequacy or documentation of the correlation of waste records to the values used in the characterization and the determination of mass fractions for Waste Stream SR-RH-SDD.01.

(3) EPA evaluated the technical aspects and documentation of the radiological characterization process and found them to be adequate.

SRS-CCP described the radiological characterization process for Waste Stream SR-RH-SDD.01 in Revision 0 of both CCP-RC-SRS-631 and SRS-RH-88, which had been prepared and reviewed by D. Ott and J. Vance, respectively. EPA reviewed these documents in advance of the meeting in Colorado. During the Denver meeting, EPA raised specific technical concerns regarding apparent discrepancies in Revision 1 of both CCP-RC-SRS-631 and SRS-RH-88. As a result of these discussions, SRS-CCP made revisions to SRS-RH-88 and CCP-RC-SRS-631, both of which EPA reviewed. The revised information SRS-CCP provided adequately supports the radiological characterization process. There are no concerns related to the technical adequacy or documentation of the radiological characterization process for Waste Stream SR-RH-SDD.01.

(4) EPA evaluated the technical basis and derivation of total measurement uncertainty and found them to be adequate.

The development of total measurement uncertainty (TMU) for Waste Stream SR-RH-SDD.01 is based on the propagation of uncertainties in all aspects of the radiological characterization process. These aspects are assumed to be independent, which allows them to be added in quadrature.[7] The TMU determination included the uncertainty contributions of the following:

- Manufacturing Uncertainties.
- Plutonium Measurement Uncertainties.
- Isotopic Distribution Measurement.
- Data Variability.
- Impurity Measurement.

A general treatment of TMU for this waste stream is presented in CCP-RC-SRS-631, Revision 0 and SRS-RH-88, Revision 1. There are no concerns regarding the technical derivation and documentation of TMU for Waste Stream SR-RH-SDD.01.

(5) EPA assessed the remote-handled and transuranic determinations and found them to be adequate.

SRS-CCP performed RH determinations on the 15- and 16-gallon containers. All three containers significantly exceeded the 200 mrem/hr RH criterion. Additionally, SWB measurements for gamma and neutron all exceeded 200 mrem/hr as shown in survey record SWIN-M-20120806-11.

Attachment 1 of CCP-RC-SRS-631, Revision 1, contains a Waste Container Characterization Record for each of the three containers. Records for all three containers indicate that they are TRU waste, i.e., they have TRU Alpha Activity Concentrations in excess of 100 nCi per gram.

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[7] Adding in quadrature is a standard statistical technique that allows one to combine the square root of the sum of each contributor to uncertainty squared, resulting in a lower value than what would be obtained if the values were simply added.

There were no concerns regarding the determination and documentation of the three containers of Waste Stream SR-RH-SDD.01 as RH TRU wastes.

Summary of Radiological Characterization Findings and Concerns

EPA did not identify any findings or concerns related to the radiological characterization of Waste Stream SR-RH-SDD.01 during this T1 change evaluation.

Changes to Tiering

Based on the results of this evaluation, there are no changes to the radiological characterization T1 or T2 designations as identified during the baseline inspection and subsequent T1 evaluations.

Radiological Characterization Approval

Based on the results of this evaluation, EPA approves the addition of Waste Stream SR-RH-SDD.01. Characterization of any new RH debris waste stream using a new scaling factor development process remains a T1 change. T1 and T2 changes that were initiated during the baseline approval remain in effect.

6.3 Physical Characterization

Overview

SRS-CCP stated that the three containers of Waste Stream SR-RH-SDD.01 consist solely of sealed sources that were packaged into SFCs under the LANL OSRP for CH TRU waste and were subsequently packaged into 15- and 16-gallon containers by SRS-CCP. EPA evaluated the documentation that SRS-CCP provided to support an approval of the physical characterization of these three containers.

As stated in section 6.0, OSRP packaged the sealed sources that make up Waste Stream SR-RH-SDD.01 in SFCs in the course of removing sealed neutron sources from SRS in 2002. In 2007, SRS packaged these SFCs in SWBs with shielding, and in 2013 SRS-CCP removed the SFCs from the SWBs and packaged them in two 15-gallon containers and one 16-gallon container with wooden bracing [see Item (4), below, and Attachment D]. SRS-CCP's 2013 packaging of the sources in 15- and 16-gallon containers was performed in accordance with CCP-TP-500, Revision 12,[8] as documented in BDR No. SRSRHVE13001. Because the SFCs are sealed containers that cannot be opened for direct inspection, SRS-CCP verified the SFC contents using CCP-TP-163, Revision 4,[9] and records from the LANL OSRP.

[8] CCP-TP-500, CCP Remote-Handled Waste Visual Examination, Revision 12, September 23, 2013.

[9] CCP-TP-163, CCP Evaluation of Waste Packaging Records for Visual Examination of Records, Revision 4, June 18, 2013.

Technical Evaluation

(1) EPA reviewed the physical characterization procedures and found them to be adequate.

The procedures used to generate the data reported in BDR No. SRSRHVE13001 were well established and adequate. SRS-CCP used procedure CCP-TP-500, Revision 12, to perform physical characterization of sealed sources in two 15-gallon and one 16-gallon containers. SRS-CCP also used CCP-TP-163, Revision 4, to review the OSRP SFC packaging records because the SFCs are sealed containers and direct examination of the sources would involve breaching the SFCs' integrity. There are no concerns regarding the technical adequacy of the procedures used for physical characterization of the sealed sources in Waste Stream SR-RH-SDD.01.

(2) EPA reviewed the physical characterization records and found them to be adequate.

EPA reviewed BDR No. SRSRHVE13001 and determined that the records supporting physical characterization of the sealed sources were complete. SRS-CCP personnel performed data generation and SPM level reviews and recorded them on the appropriate forms from the applicable SRS-CCP procedures. SRS-CCP has not issued any nonconformance reports for the containers reported in this BDR. There are no concerns regarding the adequacy of the physical characterization records for Waste Stream SR-RH-SDD.01.

(3) EPA reviewed the physical characterization training records and found them to be adequate.

EPA reviewed training records (i.e., qualification cards and List of Qualified Individuals) for selected operators and determined that the operators were trained in accordance with SRS-CCP procedures and that their training records were complete and available for review. There are no concerns regarding the training records for personnel relative to the physical characterization of sealed sources in Waste Stream SR-RH-SDD.01.

(4) EPA reviewed additional objective evidence to support the physical characterization of Waste Stream SR-RH-SDD.01 and found it to be adequate.

SRS-CCP provided photographic images of the items/aspects of the 2013 packaging of the sealed sources into 15- and 16-gallon containers. The images are included in Reference U004 and as Attachment D of this report, and consist of the following:

- The interior of an empty 15- or 16-gallon container with wooden bracing to hold an SFC (Figure D-1).
- An SFC showing the serial number of the source contained within (Figure D-2).
- A close up of the interior of a 15- or 16-gallon container with an SFC held in place by the wooden bracing (Figure D-3).
- The interior of a 15- or 16-gallon container with an SFC held in place by the wooden bracing from a distance of approximately three feet (Figure D-4).
- The exterior of a 15- or 16-gallon container containing an SFC, showing the container's external markings (Figure D-5).

EPA found these images to be adequate in supporting the 2013 physical characterization of the three sealed sources by SRS-CCP. There are no concerns regarding the documentation of the physical characterization of sealed sources in Waste Stream SR-RH-SDD.01.

Summary of Physical Characterization Findings and Concerns

EPA did not identify any findings or concerns related to the physical characterization of sealed sources in Waste Stream SR-RH-SDD.01 during this T1 change evaluation.

Changes to Tiering

Based on the results of this evaluation, there are no changes to the VE T1 or T2 designations as identified during the baseline inspection and subsequent T1 evaluations. This EPA evaluation consisted of an examination of objective evidence from SRS-CCP's physical characterization of sealed sources previously managed by LANL OSRP, including waste packaging and historical record review. As stated previously, EPA has not evaluated the VE process for RH waste at SRS-CCP. Therefore, EPA modified the tiering table language (i.e. placed the VE T1 requirement in bold text) to emphasize that any use of VE for RH TRU waste remains a T1 change (see Table 1).

Physical Characterization Approval

Based on the results of this evaluation, EPA approves the physical characterization of the three sealed sources that are the subject of this T1 evaluation.

7.0 FINDINGS AND CONCERNS

The EPA inspection team did not identify any findings or concerns relative to the addition of Waste Stream SR-RH-SDD.01 during this T1 change evaluation. There are no open issues relative to this T1 evaluation.

8.0 CONCLUSIONS

Changes to Tiering

As a result of this evaluation, EPA modified the tiering table language (i.e. placed the VE T1 requirement in bold text) to emphasize that any use of VE for RH TRU waste remains a T1 change (see Table 1). Table 1 reflects this change. T1 and T2 change designations from the baseline approval remain in effect.

Approval

EPA concluded that the AK, radiological characterization processes, and physical characterization used to characterize RH TRU Waste Stream SR-RH-SDD.01 are adequate, as evidenced by the records evaluated. There are no open issues relative to this T1 evaluation.

Based on this evaluation, EPA approves this T1 change to add Waste Stream SR-RH-SDD.01 consistent with the limitations specified in this report. The physical characterization portion of

EPA's approval is limited to the three sealed sources included in Waste Stream SR-RH-SDD.01 as of the date of this T1 evaluation. This approval does not reflect an approval of VE for RH TRU waste at SRS-CCP. As stated above, any use of VE by SRS-CCP for any RH waste is a T1 change requiring EPA approval.

ATTACHMENT A

APPROVAL SUMMARY FOR SAVANNAH RIVER SITE REMOTE-HANDLED WASTE CHARACTERIZATION PROGRAM

Approved Activity	EPA Inspection Number, Approval Dates	EPA Docket Number
SRS RH Baseline Approval	EPA-SRS-CCP-RH-08.11-8, April 2012	A-98-49; II-A4-161
T1 Change – Addition of Waste Stream SR-RH-235F.01	February 11, 2013	A-98-49; II-A4-170
T1 Change – Addition of Waste Stream SR-RH-221H.01	August 20, 2013	A-98-49; II-A4-177

ATTACHMENT B

LIST OF DOCUMENTS REVIEWED BY EPA DURING THE T1 EVALUATION

Acknowledgment for WCPIP Revision 3 Briefing for Trey Greenwood and Kevin Peters, October 1, 2012, provided December 4, 2013

AKE Qualification Card for Kevin Peters, June 16, 2011

AKE Qualification Card for Trey Greenwood, June 16, 2011

BDR No. SRSRHVE13001, August 22, 2013

C001, Characterization of Sources from Savannah River Plant, M.W. Pearson, September 26, 2002

C002, Memo to J. McAlpin from T.J. Feske re: Pu-Be Sources - 777-10A, T. J. Feske, September 12, 2002

C003, Waste Stream SR-RH-SDD.01 Physical Parameter Evaluation, Kevin Peters, June 28, 2013

CCP-AK-SRS-630, Central Characterization Program Acceptable Knowledge Summary Report for Savannah River Site Physics Laboratory Sealed Sources, Waste Stream: SR-RH-SDD.01, Revision 1, September 26, 2013

CCP-CP-SRS-632, Central Characterization Program RH TRU Waste Certification Plan for 40 CFR Part 194 Compliance for Savannah River Site Waste Stream: SR-RH-SDD.01, Revision 0, June 5, 2013

CCP-RC-SRS-631, Central Characterization Program Remote-Handled Transuranic Radiological Characterization Technical Report for Savannah River Site Physics Laboratory Sealed Sources, Waste Stream: SR-RH-SDD.01, Revision 0, September 27, 2013, and Revision 1, January 22, 2014

CCP-TP-002, Revision 26, CCP Reconciliation of DQOs and Reporting Characterization Data, Attachment 2 – CCP Waste Stream Profile Form (Example), Waste Stream SR-RH-SDD.01, Revision 0, draft provided October 30, 2013

CCP-TP-005, CCP Acceptable Knowledge Documentation, Revision 26, August 12, 2013

CCP-TP-005, Revision 25, CCP Acceptable Knowledge Documentation, Attachment 15 – CCP TRU Waste Correlation and Surrogate Form, SR-RH-SDD.01, July 1, 2013

CCP-TP-005, Revision 25, CCP Acceptable Knowledge Documentation, Attachment 8 – Waste Containers List-Example Form, SR-RH-SDD.01, June 28, 2013

CCP-TP-005, Revision 26, CCP Acceptable Knowledge Documentation, Attachment 4 – Acceptable Knowledge Information List, SR-RH-SDD.01, September 17, 2013

CCP-TP-005, Revision 26, CCP Acceptable Knowledge Documentation, Attachment 1 – Acceptable Knowledge Documentation Checklist, SR-RH-SDD.01, September 17, 2013

CCP-TP-005, Revision 26, CCP Acceptable Knowledge Documentation, Attachment 6 – Waste Form, Waste Material Parameters, Prohibited Items, and Packaging, SR-RH-SDD.01, September 17, 2013, with Waste Stream SR-RH-SDD.0l Physical Parameter Evaluation

CCP-TP-005, Revision 26, CCP Acceptable Knowledge Documentation, Attachment 13 – CCP Waste Stream Characterization Checklist – Example Form, SR-RH-SDD.01, Lot 1, drafts provided October 30, 2013, and December 11, 2013

CCP-TP-005, Revision 26, CCP Acceptable Knowledge Documentation, Attachment 14 – CCP Acceptable Knowledge Accuracy Report – Example Form, SR-RH-SDD.01, draft provided October 30, 2013

Characterization Information Summary, WSPF No. SR-RH-SDD.01, Lot 1, drafts provided October 30, 2013, and December 11, 2013

Characterization Reconciliation Report, Waste Stream SR-RH-SDD.01, drafts provided October 30, 2013, and December 11, 2013

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List of Qualified Individuals, June 8, 2013

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U001, Container Paperwork for Waste Stream SR-RH-SDD.01, OSR 29-90, various dates

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U003, Reported Radionuclide Evaluation Tables for Waste Stream SR-RH-SDD.01, Steve Schafer, June 27, 2013

U004, Miscellaneous Neutron Source Repackaging Photographs, not dated

VE Operator/Independent Technical Reviewer for RH Waste Qualification Card for Anthony Harley, April 29, 2011, and June 5, 2013

VE Operator/Independent Technical Reviewer for RH Waste Qualification Card for Spencer Pattee, June 16, 2009, July 22, 2011, and June 17, 2013

VE Operator/Independent Technical Reviewer for RH Waste Qualification Card for Wes Root, October 1, 2009

ATTACHMENT C

LIST OF DOE PERSONNEL PRESENT AT EVALUATION

Name	Affiliation	Audit Function/Expertise
Marcus A. Pinzel	U.S. DOE	DOE Observer
Derek Ott	URS	Radiological Characterization Technical Expert
Ed Gulbransen	NWP-Areva	TRU Project Manager
Thomas L. Clements, Jr.	CWI-INL	DOE Observer
Douglas M. Pruitt	DOE-ID	DOE Observer
Jason Montoya	LANL-CO	AK Expert
David Ams	LANL-CO	AK Expert
Patsy Gilbert	LANL-CO	Site Docs
Scott Smith	INL-CCP	AK Expert
Lisa Watson	INL-CCP	AK Expert
Irene Joo	CCP	RH Support
Steve Schafer	CCP	AK Expert
Kevin Peters	SRS-CCP	AK Expert
Tom Morgan	CBFO	DOE Observer

ATTACHMENT D

PHOTOGRAPHS OF PACKAGING OF SEALED SOURCES FOR DISPOSAL AT WIPP

Figure D-1. Interior of a 15- or 16-Gallon Container with Wooden Bracing

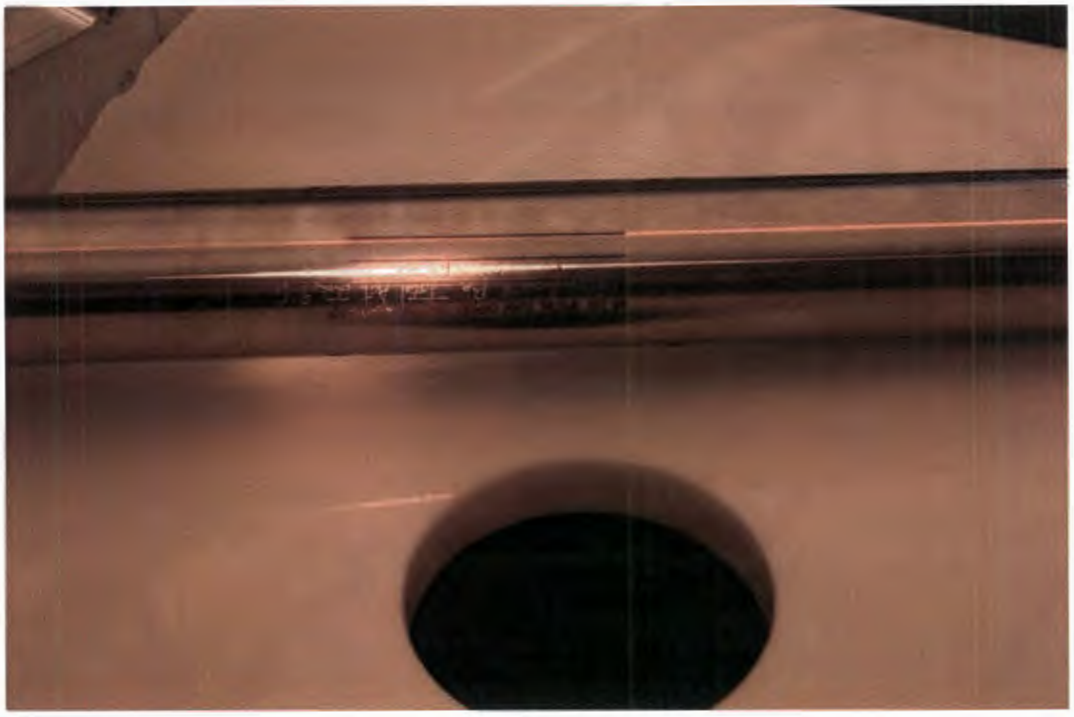

Figure D-2. SFC with Sealed Source Serial Number

Figure D-3. Interior of a 15- or 16-Gallon Container with Wooden Bracing and SFC (Near)

Figure D-4. Interior of a 15- or 16-Gallon Container with Wooden Bracing and SFC (Far)

Figure D-5. Exterior of a 15- or 16-Gallon Container Showing Markings and Labels