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

FEB 23 2015

OFFICE OF
AIR AND RADIATION

Mr. J. R. Stroble, Manager
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Carlsbad Field Office
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Dear Mr. Stroble:

This letter provides the results of the U.S. Environmental Protection Agency's (EPA) continued compliance (CC) inspection of the Central Characterization Program (CCP) at the Savannah River Site (SRS) near Aiken, South Carolina. CCP is responsible for implementing the transuranic (TRU) waste characterization (WC) program for contact-handled (CH) and remote-handled (RH) transuranic (TRU) waste at SRS. In July 2006 and in April 2012, respectively, EPA first approved SRS-CCP's CH (A-98-49; II-A4-65) and RH (A-98-49: II-A4-161) TRU waste characterization programs. Since then, SRS-CCP has continued to characterize CH and RH waste containers for disposal at the Waste Isolation Pilot Plant (WIPP). On August 19-21 and on October 15, 2014, EPA conducted a Continued Compliance inspection in accordance with Title 40 of the Code of Federal Regulations (CFR) 194.24(h). The enclosed report presents the results of the inspection (EPA Air Docket No. A-98-49; II-A4-195; EPA eDocket No. EPA-HQ-OAR-2001-0012-0449).

As a result of this inspection, EPA confirms that the TRU waste characterization activities and processes listed below are, as implemented by SRS-CCP, technically adequate and compliant with 40 CFR 194.24 requirements:

- Acceptable knowledge (AK) for CH and RH TRU waste streams;
- One nondestructive assay (NDA) system for characterizing CH TRU waste: the Nondestructive Assay Box Counter (NABC);
- Dose-to-curie (DTC) and the In Situ Object Counting System (ISOCS) for RH TRU waste;
- Real-time radiography (RTR) for CH and RH TRU waste.

During the inspection, EPA did not identify any findings. EPA, however, identified one AK Summary Report-related concern requiring a response. To address this concern, SRS-CCP revised several documents during the inspection. However, EPA has not yet received the revised



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AK Summary Report (AKSR), therefore this concern remains open. The final revised AKSR is due prior to the resumption of characterization activities at SRS.

Since the initial CH and RH baseline approvals, EPA has approved seven CH Tier 1 (T1) changes and four RH T1 changes at SRS-CCP and concurred on all quarterly Tier 2 (T2) changes to the approved CH and RH programs. EPA, however, did not conduct any continued compliance inspection of SRS-CCP's CH and RH waste characterization programs. As a result, this first continued compliance inspection of SRS-CCP's WC program provided an opportunity for EPA to make substantive T1 and T2 adjustments to the CH and RH Tiering requirements which require DOE action. These changes harmonize the SRS-CCP program-assigned tiering designations and make them consistent with the tieirngs given to changes identified for waste characterization programs at other CH and RH TRU sites. The harmonization of the site-specific tiering tables serves the following objectives:

- Allow DOE to gain efficiencies when demonstrating regulatory compliance and when providing documentation to EPA;
- Enable EPA-approved TRU Sites to maintain waste characterization proficiency at all active sites such that there would not be any lapses in EPA approvals; and
- Facilitate EPA's need to inspect the previously-approved site-based waste characterization activities to verify continued compliance as TRU Sites resume waste characterization at pre-February 2014 level.

To achieve the last objective, EPA must be notified approximately 3 months prior to the resumption of waste characterization effort to the pre-2014 throughput level as WIPP waste emplacement becomes fully operational.

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

Sincerely,

Tom Peake

Tom Peake, Director
Center for Waste Management and Regulations

Enclosure

cc: electronic distribution
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Joe Franco, CBFO
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Marcus Pinzel, CBFO
Ricardo Maestas, NMED
Site Documents, CBFO/LANL
Jon Edwards, EPA

**EPA DOCKET NO. A-98-49, II-A4-195**
**EPA E-DOCKET NO. EPA-HQ-OAR-2001-0012-0449**

# WASTE CHARACTERIZATION INSPECTION CONTINUED COMPLIANCE REPORT

## EPA INSPECTION OF THE CENTRAL CHARACTERIZATION PROGRAM WASTE CHARACTERIZATION PROGRAM AT THE SAVANNAH RIVER SITE

**August 19–21, 2014**
**October 15, 2014**

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

**February 2015**

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| Attachment A.2 | Approval Summary for SRS-CCP Remote-Handled Waste Characterization Program |
| Attachment B | Inspection Personnel |
| Attachment C | EPA Inspection Issue Tracking Form, Issue No. SRS-CCP-CH-CC-2014-01CR, Final |
| Attachment D.1 | Acceptable Knowledge Continued Compliance Inspection Checklist: Contact-Handled Waste |
| Attachment D.2 | Acceptable Knowledge Continued Compliance Inspection Checklist: Remote-Handled Waste |
| Attachment E | Nondestructive Assay Box Counter Continued Compliance Inspection Checklist |
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| Attachment I | List of Documents Reviewed for this Inspection |

## ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| μR/hr | microroentgen per hour |
| $\chi^2$ | chi-squared |
| AAS | Add-a-Source |
| AGNS | Allied-General Nuclear Services |
| AK | acceptable knowledge |
| AKE | Acceptable Knowledge Expert |
| AKSR | acceptable knowledge summary report |
| Am | americium |
| Att. | Attachment |
| A/V | audio/visual |
| BDR | batch data report |
| BEGe | broad energy germanium |
| BGR | burial ground record |
| BNAS | Box Neutron Assay System |
| BNFP | Barnwell Nuclear Fuel Plant |
| BKG | background count rate |
| BSGS | Box Segmented Gamma System |
| CAR | corrective action report |
| CBFO | Carlsbad Field Office |
| CCP | Central Characterization Program |
| Cd | cadmium |
| Cf | californium |
| CFR | Code of Federal Regulations |
| CH | contact-handled |
| Ci | Curie |
| CIS | characterization information summary |
| Cm | curium |
| CRR | characterization reconciliation report |
| Cs | cesium |
| CSSF | correlation and surrogate summary form |

| | |
|---|---|
| CTAC | Carlsbad Technical Assistance Contractor |
| Cu | copper |
| CWI | CH2M-WG Idaho, LLC |
| D&R | decontamination and removal |
| DOE | U.S. Department of Energy |
| DPS | drum packaging stations |
| DQO | data quality objective |
| DR | discrepancy resolution |
| DSA | digital spectrum analyzer |
| DTC | dose-to-curie |
| DVD | digital video disk |
| EA | Expert Analyst |
| EPA | U.S. Environmental Protection Agency |
| Eu | europium |
| EU | enriched uranium |
| FAMS | F-Area Materials Storage Facility |
| FFG | far-field geometry |
| FRAM | Fixed energy Response function analysis with Multiple Efficiency |
| FY | fiscal year |
| g | gram |
| HBL | HB-Line |
| HCLA | Hot and Cold Laboratory Area |
| He | helium |
| HEU | highly enriched uranium |
| HLW | high-level waste |
| HS Pu | heat-source plutonium |
| ISOCS | In Situ Object Counting System |
| ITR | Independent Technical Reviewer |
| kg | kilogram |
| LANL | Los Alamos National Laboratory |
| LLD | lower limit of detection |

| | |
|---|---|
| LLW | low-level waste |
| LOQI | list of qualified individuals |
| mCi | millicuries |
| MCS | Mobile Characterization Services |
| MGA | multi-group analysis |
| MGA-U | multi-group analysis-uranium |
| mm | millimeter |
| mR/hr | milliroentgen per hour |
| mrem/hr | millirem per hour |
| NABC | Nondestructive Assay Box Counter |
| NaI | sodium iodide |
| nCi/g | nanocuries per gram |
| NCR | nonconformance report |
| NDA | nondestructive assay |
| NDE | nondestructive evaluation |
| NFG | near-field geometry |
| Np | neptunium |
| NTP | National TRU Program |
| NU | natural uranium |
| NWP | Nuclear Waste Partnership, LLC |
| OJT | on-the-job training |
| ORIA | Office of Radiation and Indoor Air |
| ORTEC | Oak Ridge Technical Enterprises, Corp. |
| PDP | Performance Demonstration Program |
| POC | pipe overpack containers |
| Pu | plutonium |
| QC | quality control |
| R | roentgen |
| R/hr | roentgen per hour |
| R&D | research and development |
| Rev. | revision |

| | |
|---|---|
| RH | remote-handled |
| RTG | Radioisotope Thermoelectric Generator |
| RTR | real-time radiography |
| SC&A | S. Cohen and Associates (SC&A, Inc.) |
| SCG | summary category group |
| SD | source document |
| SLBs | standard large boxes |
| SLI | special legacy items |
| SME | Subject-Matter Expert |
| SNF | spent nuclear fuel |
| SPM | Site Project Manager |
| Sr | strontium |
| SRNS | Savannah River Nuclear Solutions, LLC |
| SRP | Sludge Repackage Project |
| SRS | Savannah River Site |
| SWBs | standard waste boxes |
| T1 | Tier 1 |
| T2 | Tier 2 |
| TAAC | TRU Alpha Activity Concentration |
| Th | thorium |
| TMU | total measurement uncertainty |
| TRU | transuranic |
| U | uranium |
| UREX | Uranium Recovery by Extraction |
| VE | visual examination |
| VEE | Visual Examination Expert |
| WAC | waste acceptance criteria |
| WCPIP | Waste Characterization Program Implementation Plan |
| WG Pu | weapons-grade plutonium |
| WIPP | Waste Isolation Pilot Plant |
| WMC | waste matrix code |

| | |
|---|---|
| WMO | Waste Management Operations Department |
| WMP | waste material parameter |
| WSPF | waste stream profile form |
| wt% | weight percent |
| WWIS | WIPP Waste Information System |

## 1.0 EXECUTIVE SUMMARY

This report supports the U.S. Environmental Protection Agency's (EPA's) determination that the waste characterization program at the U.S. Department of Energy's (DOE's) Savannah River Site (SRS) continues to be in compliance with federal regulations. In accordance with Title 40 of the Code of Federal Regulations (40 CFR) 194.24(h), EPA can conduct a continued compliance inspection of the EPA-approved transuranic (TRU) waste characterization systems used at the TRU waste sites operated by DOE. Since 2006, the Central Characterization Program (CCP),[1] a mobile waste characterization systems provider, has operated a waste characterization program for contact-handled (CH) and remote-handled (RH) TRU wastes at SRS in Aiken, South Carolina.

EPA conducted a continued compliance inspection of the site's program to characterize CH and RH TRU wastes proposed for disposal at the Waste Isolation Pilot Plant (WIPP). During this inspection, EPA evaluated samples of the following waste characterization activities:

- Acceptable knowledge (AK) for CH and RH TRU waste streams;
- One nondestructive assay (NDA) system for characterizing CH TRU waste: the Nondestructive Assay Box Counter (NABC);
- Dose-to-curie (DTC) and the In Situ Object Counting System (ISOCS) for RH TRU waste;
- Real-time radiography (RTR) for CH and RH TRU waste.

For logistical reasons, the inspection took place in three segments: AK was evaluated in Denver, Colorado on August 19–21, 2014; NDA, DTC and ISOCS were evaluated at SRS on August 20–21, 2014; and RTR was evaluated at SRS on October 15, 2014.[2] Based on the results of this continued compliance inspection, EPA confirms that the SRS-CCP CH and RH TRU waste characterization programs in the configuration observed during this inspection are consistent with the limitations described in the baseline inspection reports (see EPA Docket Nos. A-98-49; II-A4-65, dated July 10, 2006, and A-98-49; II-A4-161, dated April 18, 2012) and subsequent EPA Tier 1 (T1) approvals. Attachments A.1 and A.2 summarize all of EPA's approvals of the SRS-CCP CH and RH TRU waste characterization programs.

Based on this inspection, EPA made several changes to the CH and RH tiering designations, as shown in Tables 1 and 2. Any use of VE to characterize CH waste is a new T1 change. During the 2006 baseline inspection, EPA approved SRS-CCP to use VE to characterize CH waste; however, EPA did not include this process in the continued compliance inspection scope because SRS-CCP is not currently prepared to use or demonstrate the CH VE process. Since EPA did not observe and review the CH VE process during the continued compliance inspection, the CH VE process must be approved in the future as a separate T1 evaluation.

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[1] The Central Characterization Program was formerly known as the Central Characterization Project.

[2] It was EPA's intention to evaluate RTR at SRS on August 19–21, 2014. However, SRS-CCP did not have an operable RTR unit for EPA to evaluate, which required EPA NDE personnel to make an additional trip to SRS to complete the RTR evaluation on October 15, 2014.

EPA also made substantive changes to the AK, NDA, radiological characterization and RTR Tier 2 (T2) designations. These changes require DOE action:

1. Submission to EPA of a list of all SRS-CCP AK Experts (AKEs) and Site Project Mangers (SPMs) who performed work in these roles during the previous quarter is a new CH and RH AK T2 change (see Tables 1 and 2).
2. Submission to EPA of a list of all SRS-CCP NDA personnel who performed work during the previous quarter is a new NDA T2 change (see Table 1). Specifically, the list must include all operators, Expert Analysts (EAs) and Independent Technical Reviewers (ITRs).
3. Submission to EPA of a list of all SRS-CCP DTC and ISOCS personnel who performed work during the previous quarter is a new radiological characterization T2 change (see Table 2). Specifically, the list must include all operators, EAs and ITRs.
4. Submission to EPA of a list of all RTR personnel who performed work during the previous quarter is a new CH and RH RTR T2 change (see Tables 1 and 2). Specifically, the list must include all RTR operators and ITRs.

These changes to the T2 requirements are necessary to harmonize the SRS-CCP tiering designations consistent with the requirements identified during the baseline inspections and revised as needed as part of Tier 1 approvals and continued compliance inspections at other CH and RH TRU sites. EPA also revised the tiering tables to remove duplicate entries and ensure completeness. As part of the harmonization and completeness edits, EPA (1) added an RH AK T1 requirement to explicitly state that addition of load management to any RH waste stream is a T1 change, and (2) revised the RH AK T2 requirements to clarify the specific CCP-TP-005 Attachments for which EPA expects to receive T2 notification. Tables 1 and 2 show the substantive T1 and T2 changes for CH and RH in bold text. T1 and T2 changes that were initiated during the CH and RH baseline and subsequent T1 approvals remain in effect. The language in Tables 1 and 2 regarding AK documentation applies to all SRS-CCP waste streams.

EPA began harmonizing the tiering designations during continued compliance inspections in 2013; with these revisions to the SRS-CCP tiering tables, all of the active CCP waste characterization programs' tiering tables have been modified. Harmonization of the site-specific tiering tables is intended to facilitate CBFO's T1 and T2 reporting and EPA's site-based continued compliance inspections and T1 evaluations. EPA will continue to make clarifying and editorial changes to the tiering tables as necessary.

EPA did not identify any findings during this inspection. EPA identified one concern requiring a response regarding necessary revisions to AK summary report (AKSR) CCP-AK-SRS-022. This concern is documented on the EPA Inspection Issue Tracking Form, Issue No. SRS-CCP-CH-CC-2014-01CR, which is included in Attachment C. The concern remains open until EPA receives the revised AKSR. SRS-CCP may continue to characterize other waste streams consistent with existing EPA approvals. SRS-CCP revised several documents during the inspection and provided them to EPA. Attachment I is a list of all documentation reviewed, including batch data reports (BDRs).

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

**Table 1. Tiering of Contact-Handled Transuranic Waste Characterization Processes Implemented by SRS-CCP (Based on October 31–November 3, 2005, Baseline Inspection and Subsequent Tier 1 Evaluations, Updated February 2015)**

| Process Elements | SRS-CCP CH Waste Characterization Processes – T1 Changes | SRS-CCP CH Waste Characterization Processes – T2 Changes* |
|---|---|---|
| Acceptable Knowledge, including Load Management | Load management for the S3000 summary category group | **Submission of a list of SRS-CCP CH AKEs and SPMs that performed work during the previous quarter**<br>Notification to EPA upon completion of or substantive modification** to:<br>• AK accuracy reports (annually, at a minimum)<br>• AK-AK and AK-NDA/NDE Discrepancy Resolution Reports<br>• WSPFs and AKSRs and related attachments (e.g., CIS) for all new or modified waste streams, including change notices<br>• CCP-TP-005, Attachments 4, 6 and 7 and associated memoranda<br>• Add Container Memoranda<br>• The load management status of approved waste streams<br>• Site procedures requiring CBFO approval<br>• Any waste identified outside of the waste profiles included in the 2002 Transuranic Waste Baseline Inventory Report<br>• Creation of newly generated soil or debris waste streams through remediation or decontamination and decommissioning activities |
| Nondestructive Assay | New equipment or substantive physical modifications** to approved equipment<br>Extension of or changes to the approved calibration range for approved equipment | **Submission of a list of SRS-CCP NDA operators, EAs and ITRs that performed work during the previous quarter**<br>Notification to EPA upon substantive modification** to:<br>• Site procedures requiring CBFO approval<br>• Software for approved equipment<br>• Operating ranges upon CBFO approval |
| Real-Time Radiography | None | **Submission of a list of SRS-CCP CH RTR operators and ITRs that performed work during the previous quarter**<br>Notification to EPA upon:<br>• New equipment or substantive physical modifications** to approved equipment<br>• Substantive modification** to site procedures requiring CBFO approval |
| Visual Examination and Visual Examination Technique | **Any use of visual examination** | Notification to EPA upon substantive modification** to site procedures requiring CBFO approval |

| Process Elements | SRS-CCP CH Waste Characterization Processes – T1 Changes | SRS-CCP CH Waste Characterization Processes – T2 Changes* |
|---|---|---|
| WIPP Waste Data System | Changes to Waste Data System algorithms specific to load management. | Notification to EPA upon substantive modification** to:<br>• Site procedures requiring CBFO approval<br>• The load management status of approved waste streams |

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 CH 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.

**Table 2. 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 February 2015)**

| 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<br>Any new SCG S5000 RH waste stream that does not have a companion CH waste stream<br>**Load management for any RH waste stream**<br>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) | **Submission of a list of SRS-CCP RH AKEs and SPMs that performed work during the previous quarter**<br>Notification to EPA upon characterization of any new SCG S5000 RH waste stream that does have a companion CH waste stream<br>Notification to EPA upon availability of or nonsubstantive modification** to AKSRs and certification confirmation test plans (e.g., CCP-AK-SRS-580, CCP-AK-SRS-582, CCP-CP-SRS-562)<br>Notification to EPA upon availability of or modification to:<br>• Site procedures requiring CBFO approval<br>• **CCP-TP-005 Attachments 4, 6, 8 and 15**, including when Attachment 4 is generated to reflect the updated AKSR Source Document Reference List<br>• WSPF, CIS, CRR and related attachments, and any subsequent revisions to these documents<br>• AK accuracy reports (annually, at a minimum)<br>• Add container memoranda<br>• 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<br>Future use of the ORTEC/ISOCS for any RH TRU waste<br>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)<br>Substantive modification** to EPA-approved procedures or radiological characterization technical reports (e.g., CCP-TP-504, CCP-AK-SRS-581, CCP-RC-SRS-561) | **Submission of a list of SRS-CCP DTC and ISOCS operators, EAs and ITRs that performed work during the previous quarter**<br>Notification to EPA upon:<br>• Characterization of any new RH waste stream using an approved scaling factor process for isotopic determination<br>• 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<br>• Availability of calculation package CCP-SRS-44 or equivalent records |
| Visual Examination | Any use of visual examination | N/A |

| Process Elements | SRS-CCP RH Waste Characterization Process – T1 Changes | SRS-CCP RH Waste Characterization Process – T2 Changes* |
|---|---|---|
| Real-Time Radiography | Real-time radiography by any new process | **Submission of a list of SRS-CCP RH RTR operators and ITRs that performed work during the previous quarter**<br>Notification to EPA upon:<br>• Substantive modification** to site procedures requiring CBFO approval<br>• 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 unmarked 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 CONTINUED COMPLIANCE INSPECTIONS

Under the changes to 40 CFR 194.8 promulgated in the July 16, 2004, Federal Register notice, EPA must perform a single baseline inspection of a TRU waste generator site's waste characterization program (Vol. 69, No. 136, pages 42571–42583, July 16, 2004). The purpose of EPA's baseline inspection is to approve the site's waste characterization program, based on a 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 has the authority to conduct continued compliance inspections to verify that the site (1) continues to use only the approved waste characterization processes to characterize the waste, and (2) remains in compliance with all the regulatory requirements in 40 CFR 194. EPA is also authorized to evaluate and approve changes (i.e., tiering changes), if necessary, to the site's approved waste characterization program by conducting additional inspections under the authority of 40 CFR 194.24(h).

EPA performs annual continued compliance inspections of each TRU waste characterization program, covering all elements of the programs, including the common elements of waste characterization processes that are not expected to significantly vary by waste stream. Examples of the common characterization elements are personnel training, procedures and equipment capabilities. EPA will consider the results of continued compliance inspections when setting the scope and evaluating site-specific T1 changes.

The results of this continued compliance inspection and the review of quarterly T2 changes submitted since the August 2014 inspection will be the basis for EPA's evaluation of any SRS-CCP T1 change requests submitted before the next EPA continued compliance inspection. Thus, EPA can focus on those waste characterization components that are critical to the specific T1 change request, evaluation and approval (e.g., waste-stream-specific AK records).

## 3.0 INSPECTION PERSONNEL

EPA and its support personnel conducted interviews with SRS-CCP waste characterization personnel in several disciplines. The personnel contacted represented a sample of the CH and RH TRU waste characterization staff. The EPA inspection team and SRS-CCP personnel contacted are listed in Attachment B, with their affiliations and areas of expertise or function.

## 4.0 PURPOSE OF THIS REPORT

This report documents the basis for EPA's decision to maintain the approval of the SRS-CCP waste characterization program for CH and RH TRU wastes. Specifically, this report:

- Describes the sample of the SRS-CCP waste characterization systems evaluated during this inspection.
- Identifies all areas where waste characterization systems have changed relative to what was approved during the baseline inspection and subsequent EPA T1 evaluations and assesses the impact, if any, of those changes.

- Provides objective evidence to support the basis for EPA's continued approval of all waste characterization systems.
- Describes any tests or demonstrations completed during the course of the inspection and their relevance to EPA's approval decision.

## 5.0 SCOPE OF THIS CONTINUED COMPLIANCE INSPECTION

The scope of this continued compliance inspection included the evaluation of selected elements of the waste characterization systems in use at SRS-CCP to characterize CH and RH TRU wastes that were approved during the baseline inspection and subsequent T1 evaluations. The waste characterization activities evaluated included AK for a subset of the CH and RH waste streams characterized in the year preceding this continued compliance inspection, the NABC NDA system for CH waste characterization, the DTC and ISOCS systems for RH waste characterization and RTR operations for CH and RH TRU waste.

## 6.0 TECHNICAL EVALUATION

EPA's technical evaluation is summarized in sections 6.1–6.4 of this report. The details of EPA's technical evaluation are located in the completed inspection checklists, which are included in this report as Attachments D.1–E and G–H.2. When evaluating future T1 change requests and concurring with quarterly T2 change submissions, EPA may use these checklists to supplement their review. Attachments F.1–F.2 contain the results of SRS-CCP's NDA replicate scanning as discussed in section 6.2.1, Item (8), of this report. The DOE documents that EPA reviewed for this evaluation are cited throughout the report and are listed in Attachment I. Any of these documents can be requested from the following address:

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

### 6.1 Acceptable Knowledge for Contact-Handled and Remote-Handled Waste Characterization

#### 6.1.1 Technical Evaluation: Contact-Handled Waste

EPA evaluated SRS-CCP's continued compliance with EPA-approved AK procedures for CH waste characterization. EPA has approved SRS-CCP's CH AK characterization program for Summary Category Group (SCG) S3000 (homogeneous solids), SCG S4000 (soils) and SCG S5000 (heterogeneous debris) waste. SRS-CCP personnel stated that SRS-CCP performed waste characterization activities for 26 CH Waste Streams in the year prior to this continued compliance inspection. EPA reviewed documents from 15 of these waste streams as representative samples of the SRS-CCP CH AK waste characterization program. The AK checklist used for this inspection is included in Attachment D.1. The 15 waste streams reviewed during this inspection are listed below in Table 3.

**Table 3. Contact-Handled SRS-CCP Waste Streams Sampled for Review**

| Waste Stream | AKSR* |
|---|---|
| SR-W027-FB-Pre86-C | 002 |
| SR-W026-221F-HET-A | 003 |
| SR-W027-221H-HET | 004 |
| SR-W026-772F-HET | 005 |
| SR-W027-235F-HET | 006 |
| SR-W027-773A-HOM | 007 |
| SR-MD-SOIL | 008 |
| SR-MD-PAD1 | 009 |

| Waste Stream | AKSR* |
|---|---|
| SR-AGNS-HOM | 011 |
| SR-SDD-HET-A | 013 |
| SR-DWPF-HET | 015 |
| SR-KAC-HET-A | 018 |
| SR-HBL-235F-HET | 020 |
| SR-221H-EUOx | 022 |
| SR-BCLDP.004.004 | 540 |

*The full AKSR citation for each waste stream is CCP-AK-SRS-XXX, where XXX represents the numbers indicated in the AKSR column. For example, the full citation for AKSR-002 is CCP-AK-SRS-002.

(1) EPA examined select Central Characterization Program procedures and found them to be adequate.

EPA reviewed select CCP procedures for AK documentation, training of AKEs and disposition of nonconformances for technical sufficiency and scope. Specifically, EPA reviewed:

- CCP-QP-002, Revisions 37 and 38, "Training and Qualification Plan," August 7, 2014
- CCP-QP-005, Revision 24, "Nonconforming Item Reporting and Control," June 25, 2013.
- CCP-TP-002, Revision 26, "Reconciliation of DQOs and Reporting Characterization Data," June 19, 2013.
- CCP-TP-005, Revision 26, "CCP Acceptable Knowledge Documentation," August 12, 2013.

CCP revised CCP-QP-002 in June 2014 (Revision 37) and August 2014 (Revision 38) to address a Carlsbad Field Office (CBFO) corrective action report (CAR). These changes are discussed in section 6.4. The reviewed procedures adequately reflect the requirements of 40 CFR 194. Procedure implementation is evidenced by adequate preparation and maintenance of the required documentation, as reviewed below.

Notification to EPA upon completion of or substantive modification to site procedures requiring CBFO approval remains a T2 change (see Table 1).

(2) EPA verified that SRS-CCP adequately implemented the acceptable knowledge characterization process for containers, including acceptable knowledge assembly, compilation and verification.

EPA evaluated SRS-CCP's completion of each of the 15 attachments associated with CCP procedure CCP-TP-005 (AK documentation) by reviewing samples of each attachment for Waste Streams SR-W027-773A-HOM, SR-MD-PAD1, SR-KAC-HET-A and SR-HBL-235F-HET.

The examined CCP-TP-005 attachments indicate that SRS-CCP is adequately implementing the AK characterization process. EPA identified a few inconsistencies between CCP-TP-005, Attachment 6s, and the associated waste material parameter (WMP) calculation memoranda. During the inspection, SRS-CCP AKEs did pen-and-ink revisions of the two WMP calculation memoranda to correct rounding errors.

Notification to EPA upon completion of or substantive modification to CCP-TP-005, Attachments 4, 6 and 7 and associated memoranda remains a T2 change (see Table 1).

(3) EPA verified that waste traceability was adequately demonstrated.

EPA randomly selected containers from four of the active waste streams to assess traceability. Selected waste streams and drums are presented in Table 4. Drums selected could be traced from original SRS packaging documentation including Burial Ground Records, TWCFF, Drum repackaging forms, and site-specific data bases.

**Table 4. Contact-Handled Containers Evaluated for Traceability**

| Drum No. | Waste Stream |
|---|---|
| SR503072VB | SR-W027-221H-HET |
| 772F000027 | SR-W026-772F-HET |
| SR520533 | SR-AGNS-HOM |
| HBL130022 | SR-221H-EUOx |

The four Waste Streams containers selected were traceable through original waste generation paperwork through SRS-CCP characterization.

(4) EPA assessed the acceptable knowledge summary reports and found them to be adequate.

EPA evaluated five of the AKSRs listed in Table 3 for inclusion of sufficient information, supported by appropriate source documents, to support the following statements:

- All waste within the waste stream was generated from a single process/activity.
- All waste within the waste stream is similar in material and physical form.
- All waste within the waste stream has similar radiological properties.
- All of the waste in the waste stream is defense in origin.[3]
- None of the waste in the waste stream is high-level waste (HLW).[3]
- None of the waste in the waste stream is spent nuclear fuel (SNF).[3]

EPA found that the AKSRs for Waste Streams SR-W027-221H-HET, SR-W026-772F-HET, SR-W027-235F-HET, SR-AGNS-HOM are adequate. EPA found that the AKSR CCP-AK-SRS-22, Waste Stream SR-221H-EUOx, does not adequately address elements of the waste origin, waste generation processes, and the defense determination. EPA issued a concern requiring a response pertinent to these issues, see Attachment C. SRS-CCP provided the freeze file for this revision to

[3]As defined by U.S. Code, Title 42, "The Public Health and Welfare," Chapter 108, "Nuclear Waste Policy Act of 1982."

EPA during the inspection. The final revised AKSR must be provided to EPA for review prior to resumption of characterization activities for Waste Stream SR-221H-EUOx.

Explanations and source documents supporting each of the above statements are included in the checklist in Attachment D.1.

Notification to EPA upon completion of or revisions to all AKSRs remains a T2 change (see Table 1).

(5) EPA evaluated waste stream profile form preparation and completeness and found them to be adequate.

EPA reviewed the waste stream profile forms (WSPFs), including the characterization information summaries (CISs) and summations of aspects, and related change notices for Waste Streams SR-MD-SOIL, SR-SDD-HET-A and SR-BCLDP.004.004 and found them to be complete and adequate.

EPA examined the WSPFs and found there were no major inconsistencies between the WSPF and AKSRs primarily because the WSPFs were relatively recent. However, AKSRs are modified frequently and may contain significant changes to waste volume and composition that CCP's internal procedure does not require to be reflected in the WSPF. As a result, older WSPFs and recent AKSRs may be inconsistent. CCP previously had used Change Notices to document these inconsistencies so that anyone using the WSPFs could, in conjunction with the Change Notices, understand the current waste stream. CCP abandoned using the Change Notices a few years ago, but is considering reinstating the notices, particularly since the February 2014 radiological release in the WIPP, to ensure that up-to-date information is available with the WSPF. EPA requests that CCP re-initiate the change notices and/or increase the incidents requiring WSPF revision to ensure that WSPFs are current.

Notification to EPA upon completion of or revisions to all WSPFs and related attachments, including generation of any Change Notices, remains a T2 change (see Table 1).

(6) EPA assessed acceptable knowledge personnel training and found it to be adequate.

SRS-CCP provided an extensive list of AKEs and SPMs that previously worked or continue to work in the SRS-CCP CH program. EPA reviewed training records for all of these individuals, including the three who were present or available by telephone during EPA's inspection: Jeff Harrison (AKE), Lisa Watson (AKE) and Beverly Schrock (SPM). SRS-CCP provided completed qualification cards and documentation showing familiarity of the AKEs and SPMs with the current revisions of AK procedures, except in the case of CCP-QP-002, Revision 38, "Training and Qualification Plan," August 7, 2014. For this procedure, SRS-CCP provided documented training to Revision 37.

Training records for the personnel listed above and in Attachment D.1 (checklist item AK-2) are complete and adequate with three exceptions:

- Barbara Broomfield's SPM qualification card indicated that her qualification is valid for sites with attached site-specific addenda. CCP no longer requires site-specific addenda

for SPMs; however, the documentation provided to EPA for Barbara Broomfield does not show this change in policy.

- David Ams (AKE) and Sherry Auckland (AKE) are not listed on the SRS-CCP CH AKE and SPM Acknowledgement of CCP-TP-005, Revision 26.

EPA will review training records for Ms. Broomfield, Mr. Ams and Ms. Auckland, as well as any additional personnel, if they are indicated as actively supporting CH waste characterization in a future T2 change report.

Submission to EPA of a list of AKEs and SPMs who performed work in these roles for the SRS-CCP CH waste characterization program in the previous quarter is a new T2 change (see Table 1).

(7) EPA assessed nonconformance and discrepancy resolution documentation and found it to be adequate.

EPA evaluated sample nonconformance and discrepancy resolution (DR) documentation from Waste Streams SR-W027-FB-Pre86-C, SR-W026-221F-HET-A, SR-W027-235F-HET, SR-MD-PAD1, SR-DWPF-HET, SR-HBL-235F-HET and SR-221H-EUOx. EPA evaluated sample NCRs, sample CCP-TP-005, Attachment 10s (AK re-evaluation checklists), and sample CCP-TP-005, Attachment 11s (DR reports) and found that SRS-CCP adequately prepared these documents, as necessary.

Notification to EPA upon completion of or substantive modification to AK-AK and AK-NDA/NDE DR reports remains a T2 change (see Table 1).

(8) EPA assessed acceptable knowledge accuracy and found it to be adequate.

EPA reviewed recent AK accuracy reports for Waste Streams SR-W027-773A-HOM, SR-MD-PAD1 and SR-HBL-235F-HET and found them to be adequate. However, AK accuracy is calculated by comparing AK against measurement data after troublesome containers identified by fast scan and other pre-screening methods have been removed from the waste stream. Containers that were initially included in a waste stream but were removed prior to the WIPP-certifiable characterization do not count against AK accuracy. The AK accuracy report cannot be used to evaluate the accuracy of the original AK or the decision to include or exclude certain containers in the waste stream based on AK alone.

Notification to EPA upon completion of or substantive modification to AK accuracy reports (annually, at a minimum) remains a T2 change (see Table 1).

(9) EPA assessed communication between acceptable knowledge and nondestructive assay personnel and found it to be adequate.

EPA reviewed the current AK-NDA memoranda for Waste Streams SR-W027-773A-HOM, SR-MD-PAD1, SR-KAC-HET-A and SR-HBL-235F-HET. EPA evaluated the memoranda for completeness, technical adequacy and compared the memoranda with the AKSRs and determined that the reviewed AK-NDA memoranda are adequate.

EPA noted that the expected radionuclides in CCP-TP-005, Attachment 7, for Waste Stream SR-W027-773A-HOM do not match the expected radionuclides in the associated AK-NDA memorandum. The SRS-CCP AKEs explained that they revised the AKSR and Attachment 7 for Waste Stream SR-W027-773A-HOM to replace the AK-expected radionuclides with expected radionuclides based on actual waste stream NDA data. SRS-CCP did not revise the AK-NDA memorandum in this case because there are no additional drums to characterize and therefore no need for the memorandum to be up to date. EPA expects if SRS identifies any additional containers for inclusion in Waste Stream SR-W027-773A-HOM, SRS-CCP will revise the AK-NDA memorandum prior to characterizing the additional containers.

Notification to EPA upon completion of or substantive modification to AK-NDA memoranda remains a T2 change (see Table 1).

(10) EPA found load management to be adequately implemented.

The WIPP waste acceptance criteria allow that a payload container may include drums that measure less than 100 nanocuries per gram (nCi/g) of TRU radionuclides so long as the TRU Alpha Activity Concentration (TAAC) of the payload in total is greater than 100 nCi/g. The AKSR for each waste stream selected for payload management must include an estimate of the total waste volume and percentage of the waste volume that is above and below100 nCi/g TAAC. Each container selected for payload management must contain at least one TRU radionuclide whose activity exceeds the lower limit of detection (LLD) of the radioassay system used to characterize the waste (i.e., is measureable), and each container may only be overpacked into a payload container with other containers from the same TRU waste stream.

EPA examined the AKSRs for waste streams SR-W027-221H-HET, SR-W026-772F-HET, SR-AGNS-HOM and SR-221H-EUOx and found that three of the AKSRs stated that all payload containers will contain >100 nCi/g TRU isotopes (i.e., load management will not take place). SRS-CCP representatives stated that payload management of the fourth waste stream (Waste Stream SR-221H-EUOx) will not be performed.

Implementation of load management for the S3000 SCG remains a T1 change. Notification to EPA upon modification to the load management status of approved S5000 waste streams remains a T2 change (see Table 1).

(11) EPA evaluated compliance with tiering requirements and found it to be adequate.

T2 notification to EPA upon completion of or substantive modification to the waste-stream-specific documents listed in Table 1 is required on a quarterly basis. EPA compared the revision dates of documents provided during this continued compliance inspection with the T2 notification reports provided to EPA by CBFO.

In general, EPA found that SRS-CCP is providing T2 notification as required. However, the 1st quarter report for fiscal year (FY) 2014 was incomplete and SRS-CCP has inconsistently notified EPA regarding the availability of CCP-TP-005 attachments (specifically Attachments 4 and 6) and add-container memoranda. EPA discussed these deficiencies with SRS-CCP and determined that the issues with the 1st quarter FY 2014 report were a one-time event. SRS-CCP agreed that the CCP-TP-005 attachments and add-container memoranda are being inconsistently included in

the T2 notifications and are committed to improving their performance. EPA restated that all CH T2 requirements apply to all SRS-CCP CH waste streams, unless specifically stated otherwise.

The tiering changes identified during the SRS-CCP CH baseline inspection and subsequent T1 inspections remain in effect and are included as Table 1 of this document.

**Summary of Acceptable Knowledge for Contact-Handled Waste**

EPA did not identify any findings related to AK for CH waste as a result of this continued compliance inspection. EPA identified one concern requiring a response regarding the adequacy of AKSR CCP-AK-SRS-22 (see Concern No. SRS-CCP-CH-CC-2014-01CR in Attachment C). SRS-CCP provided the freeze file for this revision to EPA during the inspection. The final revised AKSR must be provided to EPA for review prior to resumption of characterization activities for Waste Stream SR-221H-EUOx. The concern remains open until EPA receives the revised AKSR. SRS-CCP may continue to characterize other waste streams consistent with existing EPA approvals.

There are no changes to the T1 designations for CH AK as a result of this continued compliance inspection. Submission to EPA of a list of AKEs and SPMs who performed work in these roles for the SRS-CCP CH waste characterization program in the previous quarter is a new T2 change (see Table 1). The language in Table 1 regarding AK documentation applies to all SRS-CCP CH waste streams, unless specifically stated otherwise.

Based on the results of this evaluation and the data examined, EPA determines that SRS-CCP demonstrated continued AK characterization compliance for CH waste streams.

### 6.1.2 Technical Evaluation: Remote-Handled Waste

EPA evaluated SRS-CCP's continued compliance with EPA-approved AK procedures for RH waste characterization for SCG S5000 (heterogeneous debris) waste. SRS-CCP management stated that SRS-CCP performed waste characterization activities on four waste streams since EPA's 2012 RH baseline approval. SRS-CCP completely characterized Waste Stream SR-RH-SDD.01 prior to EPA's T1 approval; therefore, EPA did not include this waste stream in the scope of this continued compliance inspection. EPA reviewed documents associated with Waste Streams SR-RH-235F.01, SR-RH-FBL.01 and SR-RH-221H.01 as a representative sample of the SRS-CCP RH AK waste characterization program, all of which have companion CH waste streams. EPA reviewed the initial population of Waste Stream SR-RH-FBL.01 during the SRS-CCP RH baseline inspection. EPA has not previously reviewed AK documentation for Waste Streams SR-RH-235F.01 and SR-RH-221H.01. The AK checklist used for this inspection is included in Attachment D.2.

(1) EPA examined select Central Characterization Program procedures and found them to be adequate.

EPA reviewed several CCP procedures for AK documentation, training of AKEs and disposition of nonconformances for technical sufficiency and scope. In addition to the procedures listed and

discussed in section 6.1.1, Item (1), EPA reviewed CCP-TP-506, Revision 5.[4] CCP modified CCP-TP-506, Revision 5, significantly with respect to Revision 4, including changes to attachment format and content, removal of AKE signatory requirements, and other modifications. These are significant procedural changes and EPA has determined that the changes to CCP-TP-506, Revision 5, will be examined as part of the T2 change review process because these changes apply to all CCP sites. The other procedures adequately reflect the requirements of 40 CFR 194. Procedure implementation is evidenced by adequate preparation and maintenance of the required documentation, as reviewed below.

Notification to EPA upon completion of or modification to site procedures requiring CBFO approval remains a T2 change (see Table 2).

(2) EPA verified that SRS-CCP adequately implemented the acceptable knowledge characterization process for containers, including information assembly, compilation and verification.

EPA evaluated SRS-CCP's completion of the attachments associated with procedure CCP-TP-005 for AK documentation for Waste Streams SR-RH-235F.01, SR-RH-FBL.01, and SR-RH-221H.01. EPA evaluated whether SRS-CCP revised the attachments as necessary to incorporate the ongoing waste characterization and whether SRS-CCP prepared the attachments using forms from the appropriate revisions of CCP-TP-005. EPA found that SRS-CCP should have generated a revised Attachment 4 for Waste Stream SR-RH-FBL.01 at the same time that SRS-CCP revised the AKSR, or at least prior to the EPA continued compliance inspection. Also, the Correlation and Surrogate Summary Form (CSSF), Attachment 15, did not reflect that there are two CH companion streams for Waste Stream SR-RH-FBL.01. SRS-CCP provided revised versions of both the Attachments 4 and 15 in question during the inspection. EPA found that the rest of the attachments had been appropriately revised, as necessary.

Notification to EPA upon availability or modification of CCP-TP-005 attachments remains a T2 change. EPA revised the language in the tiering table to clarify that EPA expects to receive notification upon availability or modification of CCP-TP-005 Attachments 4, 6, 8 and 15, including when Attachment 4 is generated to reflect the updated AKSR Source Document Reference List (see Table 2).

(3) EPA verified that SRS-CCP adequately demonstrated waste traceability.

EPA examined traceability from waste generation through characterization for newly characterized drums from all three waste streams, as shown in Table 5. EPA examined documentation for initial packaging and final drum identification and characterization. These data show that the final drums can be traced to the original sources.

**Table 5. Remote-Handled Containers Evaluated for Traceability**

| Drum No. | Waste Stream |
|---|---|
| SR504231 | SR-RH-235F.01 |

[4] CCP-TP-506, CCP Preparation of the Remote-Handled Transuranic Waste Acceptable Knowledge Characterization Reconciliation Report, Revision 5, July 10, 2014.

| | |
|---|---|
| SR611464 | SR-RH-FBL.01 |
| SR545535 | SR-RH-221H.01 |
| SR522596A | SR-RH-221H.01 |

Traceability for Waste Streams SR-RH-235F.01, SR-RH-FBL.01 and SR-RH-221H.01 was adequately demonstrated.

(4) EPA assessed the acceptable knowledge summary report and found it to be adequate.

EPA evaluated the AKSR for each sample waste stream to determine whether SRS-CCP appropriately developed or revised the document to account for all waste currently being characterized. EPA reviewed process information, radiological characterization, characterization progression, and other aspects of each waste stream to verify accuracy of the AKSR and adequacy of the waste stream determination. EPA found that SRS-CCP developed and subsequently revised each of the sample AKSRs to adequately document the subject waste.

Notification to EPA upon completion of or non-substantive modification to all AKSRs remains a T2 change; substantive modification to EPA-approved AKSRs remains a T1 change (see Table 2).

(5) EPA evaluated waste stream profile form preparation and completeness and found them to be adequate.

EPA had not previously reviewed the final WSPF for any of these waste streams. EPA found all three WSPFs to be adequate, but also identified room for improvement in all three. The WSPF procedure requires revision of the WSPF only if there are changes to the EPA hazardous waste numbers, content codes, or waste material parameter (WMP) weight estimates per unit of waste. Any other changes in the waste stream (i.e., projected volume of waste, generation dates, generating processes) are not currently reflected in the WSPF. EPA requests that CCP institute a process by which important waste stream changes can be documented as part of the WSPF record, even if the changes do not trigger full WSPF revision. EPA will continue to monitor the WSPF revision process to ensure that key information is available in the waste stream profile.

Notification to EPA upon availability of or modification to WSPFs, CIS, CRR and related attachments remains a T2 change (see Table 2).

(6) EPA assessed acceptable knowledge personnel training and found it to be adequate.

SRS-CCP provided an extensive list of AKEs and SPMs that previously worked or continue to work in the SRS-CCP RH program. EPA reviewed training records for all of these individuals, including the four who were present during EPA's inspection: Kevin Peters (AKE), Steve Schafer (AKE), Laura Turner (SPM) and Charlie Turner (SPM). SRS-CCP provided completed qualification cards and documentation showing familiarity of the AKEs and SPMs with the current revisions of AK procedures, except in the case of CCP-QP-002, Revision 38, "Training and Qualification Plan," August 7, 2014. For this procedure, SRS-CCP provided documented training to Revision 37.

Training records for the personnel listed above and in Attachment D.2 (checklist item AK-2) are complete and adequate with one exception: Irene Joo's SPM qualification card indicated that her qualification is valid for sites with attached site-specific addenda. CCP no longer requires site-specific addenda for SPMs; however, the documentation provided to EPA for Ms. Joo does not show this change in policy.

EPA will review training records for Ms. Joo, as well as any additional personnel, if they are indicated as actively supporting RH waste characterization in a future T2 change report.

Submission to EPA of a list of AKEs and SPMs who performed work in these roles for the SRS-CCP RH waste characterization program in the previous quarter is a new T2 change (see Table 2).

(7) EPA assessed nonconformance and discrepancy resolution documentation and found it to be adequate.

SRS-CCP has not generated any AK-related NCRs or any AK re-evaluation checklists (CCP-TP-005, Attachment 10s) for any of the subject RH waste streams; EPA reviewed DR reports for Waste Streams SR-RH-235F.01 and SR-RH-221H.01. EPA determined that SRS-CCP is adequately preparing the DR reports and that the lack of Attachment 10s is also appropriate.

Notification to EPA upon completion of or modification to DR reports and NCRs for AK nonconformances remains a T2 change (see Table 2).

(8) EPA assessed acceptable knowledge accuracy and found it to be adequate.

EPA evaluated the most recent AK accuracy reports for Waste Streams SR-RH-235F.01, SR-RH-FBL.01 and SR-RH-221H.01 and found that the reports did not adequately address requirements for comparison of AK and measurement results in the case of significant discrepancies. SRS-CCP provided revised versions of all three AK accuracy reports to EPA during the inspection. The revised AK accuracy reports are technically adequate.

Notification to EPA upon availability of or modification to AK accuracy reports (annually, at a minimum) remains a T2 change (see Table 1).

(9) EPA evaluated the certification plans and identification of data quality objectives in the certification plan, and found them to be adequate.

EPA reviewed the certification plans for Waste Streams SR-RH-235F.01, SR-RH-FBL.01 and SR-RH-221H.01 and found them to adequately describe the role of AK in waste characterization. Further, the certification plans also adequately described the data quality objectives related to defense, HLW and SNF determination, as well as those related to radioactive properties and physical properties.

Notification to EPA upon availability of or nonsubstantive modifications to certification plans remains a T2 change; substantive modification to certification plans remains a T1 change (see Table 2).

(10) EPA found load management to not be applicable.

The WIPP waste acceptance criteria allow payload management such that a payload container may include drums that measure less than 100 nCi/g so long as the TAAC of the payload in total is greater than 100 nCi/g. SRS-CCP does not intend to load manage any RH waste streams.

EPA modified the RH tiering table to explicitly state that addition of load management to any RH waste stream is a T1 change (see Table 2). This language is consistent with EPA tiering requirements at other waste characterization sites.

(11) EPA evaluated compliance with tiering requirements and found it to be adequate.

T2 notification to EPA upon completion of or substantive modification to the waste-stream-specific documents listed in Table 2 is required on a quarterly basis. EPA compared the revision dates of documents provided during this continued compliance inspection with the T2 notification reports provided to EPA by CBFO.

In general, EPA found that SRS-CCP is providing T2 notification, as required. However, SRS-CCP has not notified EPA regarding the availability of any CCP-TP-005 attachments and inconsistently provides notification of add-container memoranda. SRS-CCP also did not notify EPA regarding the availability of the AK accuracy reports, which were completed during the 3rd quarter of FY 2014. EPA discussed these deficiencies with SRS-CCP and determined that the RH T2 requirements need to be clarified to identify the specific CCP-TP-005 attachments for which EPA expects to receive notification [see Item (2) of this section]. EPA also restated that all RH T2 requirements apply to all SRS-CCP RH waste streams, unless specifically stated otherwise.

The tiering changes identified during the SRS-CCP RH baseline inspection and subsequent T1 inspections remain in effect and are included as Table 2 of this document.

**Summary of Acceptable Knowledge for Remote-Handled Waste**

EPA did not identify any findings or concerns related to AK for RH SCG S5000 waste as a result of this continued compliance inspection.

There are no changes to the T1 designations for RH AK as a result of this continued compliance inspection. Submission to EPA of a list of AKEs and SPMs who performed work in these roles for the SRS-CCP RH waste characterization program in the previous quarter is a new T2 change. EPA also revised an existing T2 change to clarify that EPA expects to receive notification upon availability or modification of CCP-TP-005 Attachments 4, 6, 8 and 15, including when Attachment 4 is generated to reflect the updated AKSR Source Document Reference List. The changes are indicated in bold in Table 2. The language in Table 2 regarding AK documentation applies to all SRS-CCP RH waste streams, unless specifically stated otherwise.

Based on the results of this evaluation and the data examined, EPA determines that SRS-CCP demonstrated continued AK characterization compliance for RH SCG S5000 waste streams.

### 6.1.3 Acceptable Knowledge Findings and Approval

**Summary of Acceptable Knowledge Findings and Concerns**

EPA did not identify any findings related to AK as a result of this continued compliance inspection. EPA identified one concern requiring a response regarding the adequacy of AKSR CCP-AK-SRS-22 (see Concern No. SRS-CCP-CH-CC-2014-01CR in Attachment C). SRS-CCP provided the freeze file for this revision to EPA during the inspection. The final revised AKSR must be provided to EPA for review prior to resumption of characterization activities for Waste Stream SR-221H-EUOx. The concern remains open until EPA receives the revised AKSR. SRS-CCP may continue to characterize other waste streams consistent with existing EPA approvals.

**Acceptable Knowledge Approval**

There are no changes to the T1 designations for CH AK as a result of this continued compliance inspection. EPA modified the RH AK T1 designations to explicitly state that addition of load management to any RH waste stream is a T1 change (see Table 2).

Submission to EPA of a list of AKEs and SPMs who performed work in these roles for the SRS-CCP CH and RH waste characterization programs in the previous quarter is a new T2 change (see Tables 1 and 2). EPA also revised an existing T2 change to clarify that EPA expects to receive notification upon availability or modification of CCP-TP-005 Attachments 4, 6, 8 and 15, including when Attachment 4 is generated to reflect the updated AKSR Source Document Reference List (see Table 2). Tables 1 and 2 show the substantive T1 and T2 changes for CH and RH in bold text. T1 and T2 changes that were initiated during the CH and RH baseline and subsequent T1 approvals remain in effect. The language in Tables 1 and 2 regarding AK documentation applies to all SRS-CCP waste streams.

Based on the results of this evaluation and the data examined, EPA determines that SRS-CCP demonstrated continued AK characterization compliance.

## 6.2 Nondestructive Assay for Contact-Handled Waste Characterization

SRS-CCP currently has one NDA system approved for WIPP assays of CH TRU wastes: the NABC. EPA approved the NABC initially during a T1 evaluation in August 2009 (EPA Docket No. A-98-49; II-A4-114) and has evaluated its operation in five subsequent T1s, as shown in Attachment A.1. SRS-CCP demonstrated the system's ability to perform the required analyses during the baseline inspection and confirmed it during subsequent T1 evaluations. Accordingly, this inspection focused on the following:

- Confirmation that the design and technical capabilities of the NABC's hardware and software had not changed since EPA's last inspection.
- Adequacy of the current revisions of the SRS-CCP NABC procedures and documents.
- Operational and maintenance history of the NABC since the last EPA inspection.
- Knowledge, understanding and training status of SRS-CCP NDA personnel.
- Replicate testing of the NABC as outlined in the EPA Replicate Testing Protocol.

### 6.2.1 Technical Evaluation: Nondestructive Assay Box Counter

EPA evaluated SRS-CCP's continued compliance with the EPA-approved waste characterization program for CH waste using the NABC NDA system. The checklist used for this inspection is included in Attachment E. EPA evaluated the following aspects of the NABC during this inspection.

(1) The Nondestructive Assay Box Counter nondestructive assay system is the same system that EPA approved previously, has not been moved or relocated and has essentially the same functions as when first approved.

The NABC is located at SRS, E Area, Building 643-43E, and is operated by SRS-CCP. It is a bimodal system consisting of a Box Segmented Gamma System (BSGS) and a Box Neutron Assay System (BNAS). The NABC is configured for CH TRU wastes in three container types (geometries): 55-gallon (208-liter) drums, standard waste boxes (SWBs) and standard large boxes (SLB-2s). It has two configurations: the near-field and far-field. SRS-CCP documents refer to the far-field configuration as the "stand off geometry" or the "five-foot setback."

This is the same system as EPA inspected and approved previously. The NABC has not been moved since EPA approved it initially in 2009. During this inspection, EPA verified that there have been no substantive changes to this system since EPA's last inspection. There were no concerns regarding these aspects of the NABC at SRS-CCP.

(2) EPA assessed the design and operational range of the Nondestructive Assay Box Counter and found them to be unchanged from the last inspection and adequate for the radionuclide content and physical composition of the wastes currently being assayed.

Subsequent to EPA's baseline approval of the NABC in 2009, EPA has approved the NABC for assaying 55-gallon drums, SWBs and SLB-2s in both the near-field and far-field geometries. As detailed in EPA's previous T1 reports, all measurement configurations, container sizes and assay modes (filtered or non-filtered) for the NABC were unchanged. The operational ranges for all assay configurations with respect to radionuclide composition (Weapons Grade Pu or $^{239}$Pu and Heat Source Pu or $^{238}$Pu) and concentration, and physical form (matrix) were unchanged.

EPA observed SRS-CCP personnel perform the complete BSGS assay of container No. SR515955, and the startup and daily source checks for the BNAS. There were no concerns regarding the adequacy of the design and operational range of the NABC.

(3) SRS-CCP performed and documented system calibration and calibration confirmation of the Nondestructive Assay Box Counter as required.

The NABC BSGS calibrations were performed at Canberra's facility in Meriden, Connecticut, for all three geometries and were confirmed by SRS-CCP. The BSGS calibrations had been updated in conjunction with the T1 changes (see Attachment A) and EPA had approved all updated calibrations previously. Calibration of the BNAS was performed at the Canberra facility in Meriden, Connecticut, for all appropriate parameters for all three geometries and these had been verified and documented. EPA established this during the baseline inspection in 2009 and subsequent T1 evaluations, see Attachment A.1. The BNAS calibrations were essentially

unchanged for the T1 changes subsequent to the baseline approval. There were no concerns regarding the technical aspects of the NABC calibration or its documentation.

(4) Determination and documentation for the total measurement uncertainty for the Nondestructive Assay Box Counter are adequate.

The determination of total measurement uncertainty (TMU) for the NABC is addressed in "Savannah River Gamma Box Counter Calibration Report Alternatives for Non-Destructive Assay (NDA) of Large Containers to Allow Shipping in TRUPACT III without Resizing and/or Repackaging," Canberra Document No. 40945. EPA had evaluated this document previously and determined during this evaluation that it was unchanged. There were no concerns regarding the determination and documentation of TMU for the NABC.

(5) SRS-CCP determined and documented the lower limit of detection, including the minimum detectable concentration of the Nondestructive Assay Box Counter, as required.

The lower limits of detection (LLD) for the NABC had been determined and documented for all near-field assay configurations. The LLDs for far-field configurations are more complex. There are three configurations where SRS-CCP could not demonstrate the NABC's ability to discriminate TRU and non-TRU at 100 nanocurie per gram (nCi/g) in the far-field configuration, specifically:

- Assaying SLB2s.
- The attenuated-mode "summed spectrum" configuration for any container, where the actual LLD is on the order of 300 nCi/g.
- The BNAS component of the NABC for predominantly plutonium-238 ($^{238}$Pu)-bearing wastes.

All containers that the NABC assays in the five-foot setback configuration were previously assayed in the near-field configuration and exhibited high dead-times, often as a result of high concentrations of $^{238}$Pu. Accordingly, these containers are assumed to have TRU concentrations in excess of 100 nCi/g. SRS-CCP expects to use the far-field setback configuration to assay only containers with easily measureable concentrations of TRU radionuclides, making the inability to sort at the TRU/non-TRU criterion not applicable for the far-field configuration. There were no concerns regarding the determination and documentation of the LLD for the NABC.

(6) The Nondestructive Assay Box Counter had successfully participated in the performance demonstration program, as required.

The NABC successfully completed NDA performance demonstration program (PDP) Cycle B12A for SWBs, and was most recently approved by CBFO on November 1, 2012. The NABC successfully completed NDA PDP Cycle 20B for 55-gallon drums and was most recently approved by CBFO on September 17, 2013. There were no concerns regarding the NABC's participation in the CBFO-sponsored NDA PDP.

(7) EPA assessed personnel training and found it to be adequate.

The SRS-CCP list of qualified individuals (LOQI) dated June 27, 2014, showed four qualified NABC operators and two EAs. EPA verified the training of the NABC operator who performed the BSGS, Tim Carlton, and the BNAS operator, Tom Shepley, by reviewing their qualification cards. Both individuals were current on all applicable training. There were no concerns regarding training for SRS-CCP NABC personnel.

(8) SRS-CCP performed replicate testing of the Nondestructive Assay Box Counter unit. EPA evaluated the results and found the testing to comply with the criteria for the Environmental Protection Agency Replicate Testing Protocol.

The purpose of the replicate testing performed as part of this inspection is to provide EPA with an independent means to verify that the NABC can provide reproducible results for the determination of the quantity of 10 WIPP-tracked radionuclides [americium-241 ($^{241}$Am), cesium-137 ($^{137}$Cs), $^{238}$Pu, $^{239}$Pu, $^{240}$Pu, $^{242}$Pu, strontium ($^{90}$Sr), uranium-233 ($^{233}$U), $^{234}$U and $^{238}$U] and the TRU alpha activity concentration.[5] This is accomplished by re-assaying containers previously measured on the same system, in order to demonstrate the system's ability to do the following:

- Produce results consistent with the reported TMU by comparing the sample standard deviation for a number of replicate measurements taken over several hours or days to the reported TMU.
- Provide reproducible results over longer periods of time, such as weeks or months, by comparing the results of the replicate measurements to the original reported values.

As part of EPA's evaluation of the NABC, EPA requested that the NABC re-assay two containers that EPA randomly selected from a list of previously assayed containers: Nos. SR515955 and SR21524421. Both containers were re-assayed on the NABC unit five times, and the data for the five replicates and the original assay were analyzed using two statistical tests, a chi-squared ($\chi^2$) test, and a t-test. The EPA inspection team observed operation of the NABC as it performed the assay of SLB-2 No. SR515955. Attachments F.1 and F.2 include data and results of the statistical analyses for all assays.

The t-test for both containers assayed on the NABC did not show any statistically significant differences between the original measurement assay values and the average of the five replicate measurements for the activities of any of the target radionuclides or the TRU alpha activity concentration. The $\chi^2$ test for both containers assayed on the NABC showed that the observed variances in the replicate measurements are less than or equal to the reported uncertainties within the statistical limits of the test. There are no technical issues associated with replicate testing of the NABC.

[5] Revision 2 of the EPA Replicate Testing Protocol provides the details of the replicate testing assay protocol and data evaluation.

### 6.2.2 Nondestructive Assay Findings and Approval

**Summary of Nondestructive Assay Findings and Concerns**

EPA did not identify any findings or concerns for the NABC NDA system at SRS-CCP.

**Nondestructive Assay Approval**

There are no changes to the T1 designations for NDA as a result of this continued compliance inspection. Submission to EPA of a list of all NDA personnel who performed work during the previous quarter is a new NDA T2 change (see Table 1). Specifically, the list must include all operators, EAs and ITRs.

Based on the results of this evaluation and the data examined, EPA determines that SRS-CCP demonstrated continued compliance with the EPA-approved waste characterization program for the NABC NDA system.

## 6.3 Radiological Characterization for Remote-Handled Waste

EPA approved the DTC and ISOCS processes at SRS-CCP initially during the RH baseline inspection in April 2012 (EPA Docket No. A-98-49; II-A4-161).

### 6.3.1 Technical Evaluation: Dose-to-Curie

EPA evaluated SRS-CCP's continued compliance with EPA-approved DTC procedures for RH waste characterization. The checklist used for this inspection is included in Attachment G. EPA evaluated the following aspects of DTC during this inspection.

(1) EPA observed the dose-to-curie technique, including source checks, and confirmed it was consistent with the EPA-approved process.

EPA initially observed the DTC technique at SRS-CCP in the DTC alcove located in Area E, Pad 4, as part of the RH baseline inspection and subsequently for a T1 evaluation (see Attachment A.2). During this inspection, SRS-CCP performed a DTC demonstration on August 21, 2014, using a previously-characterized RH TRU waste drum (No. SR522331), and the EPA-approved equipment and procedures. SRS-CCP personnel performed all appropriate source checks, number of measurements, etc., as if the assay was the measurement of record for the container, as detailed in the DTC checklist (see Attachment G). The process was unchanged from the configuration that EPA approved previously. There were no concerns regarding the execution and documentation of the DTC event at SRS-CCP.

(2) EPA assessed personnel training and found it to be adequate.

The SRS-CCP LOQI dated June 27, 2014, showed three qualified operators and two EAs. EPA verified the training of the DTC operator, Tim Carlton, by reviewing his qualification card, which showed him to be current on all applicable training. There were no concerns regarding training for SRS-CCP DTC personnel.

**Summary of Dose-to-Curie for Remote-Handled Waste**

EPA did not identify any findings or concerns related to DTC for RH waste as a result of this continued compliance inspection. There are no changes to the T1 designations for radiological characterization as a result of this continued compliance inspection. Submission to EPA of a list of all DTC personnel who performed work during the previous quarter is a new radiological characterization T2 change (see Table 2). Specifically, the list must include all operators, EAs and ITRs. Based on the results of this evaluation and the data examined, EPA determines that SRS-CCP demonstrated continued DTC compliance for RH waste.

### 6.3.2 Technical Evaluation: In Situ Object Counting System

EPA evaluated SRS-CCP's continued compliance with EPA-approved ISOCS procedures for RH waste characterization. EPA evaluated the following aspects of the ISOCS during this inspection.

(1) EPA observed operation of the In Situ Object Counting System for a TRU waste container.

The ISOCS is a portable system by design and can easily be relocated to a new area, as needed. EPA observed its operation at SRS in E Area, Building 643-43E, at the other end of the structure housing the NABC, the same location as was observed previously.

The ISOCS provides relative determinations, i.e., ratios of two measured radionuclides, as opposed to absolute determinations. Accordingly, EPA limited its evaluation to observing the ISOCS operation on a RH TRU waste container that was available. Since SRS-CCP was not actively using the ISOCS for routine assays, EPA observed its operation on a previously-assayed waste container drum that SRS had available. SRS-CCP personnel made entries in the appropriate ISOCS logbook, successfully performed required source checks and initiated measurement of container No. SR52231. EPA observed the spectrum that ISOCS generated for the RH waste drum, and confirmed that several peaks relating to specific, relevant gamma-emitting radionuclides were visible. There were no concerns regarding SRS-CCP's use of the ISOCS.

(2) EPA assessed the training of In Situ Object Counting System personnel and found it to be adequate.

The SRS-CCP LOQI dated June 27, 2014, showed three qualified operators, two qualified SMEs and two EAs. EPA verified the training of the ISOCS operator, Tim Carlton, by reviewing his qualification card, which showed him to be current on all applicable ISOCS training. There were no concerns regarding training for SRS-CCP ISOCS personnel.

**Summary of In Situ Object Counting System for Remote-Handled Waste**

EPA did not identify any findings or concerns related to ISOCS for RH waste as a result of this continued compliance inspection. There are no changes to the T1 designations for radiological characterization as a result of this continued compliance inspection. Submission to EPA of a list of all ISOCS personnel who performed work during the previous quarter is a new radiological characterization T2 change (see Table 2). Specifically, the list must include all operators, EAs

and ITRs. Based on the results of this evaluation and the data examined, EPA determines that SRS-CCP demonstrated continued ISOCS compliance for RH waste.

### 6.3.3 Radiological Characterization Findings and Approval

**Summary of Radiological Characterization Findings and Concerns**

EPA did not identify any findings or concerns for radiological characterization at SRS-CCP.

**Radiological Characterization Approval**

There are no changes to the T1 designations for radiological characterization as a result of this continued compliance inspection. Submission to EPA of a list of all DTC and ISOCS personnel who performed work during the previous quarter is a new radiological characterization T2 change (see Table 2). Specifically, the list must include all operators, EAs and ITRs.

Based on the results of this evaluation and the data examined, EPA determines that SRS-CCP demonstrated continued compliance with the EPA-approved waste characterization program for radiological characterization.

## 6.4 Nondestructive Examination for Contact-Handled and Remote-Handled Waste Characterization

EPA evaluated SRS-CCP's continued compliance with EPA-approved RTR procedures for RH and CH waste and found compliance to be adequate. The RTR checklist used for this inspection is included in Attachment H.

As mentioned in section 6.1.1, Item (1), CCP revised CCP-QP-002 in June 2014 (Revision 37) and August 2014 (Revision 38) to address a CBFO CAR, the resolution of which was to state that the preferred method of determining a subject matter expert's (SME's) on-the-job training (OJT) is to examine his or her resume. The changes also included addition of and subsequent revisions to a template SME appointment letter that documents the SPM's determination that an individual is suitable as an EA, RH technical staff member, SME for a given NDA unit, or Visual Examination Expert (VEE). Text was also revised with respect to the qualification process of the RTR Operator/Independent Technical Reviewer.

### 6.4.1 Technical Evaluation: Real-Time Radiography

(1) EPA observed real-time radiography examination of a drum and found it to be adequate.

On October 15, 2014, EPA observed the RTR evolution for container No. 773A120021 from BDR No. SR4RTR0365. This 55-gallon container was a debris drum from Waste Stream SR-W027-773A-HET (SCG S5400). The operator had successfully completed the image quality check prior to EPA's arrival and the demonstration commenced at the start of the examination of the above referenced drum. The operator properly examined the container's contents and entered characterization data into the electronic data sheet. The operator determined that the waste matched the waste stream description and verified the waste matrix code (WMC). The operator

used procedure CCP-TP-053, Revision 15, to guide the examination and did not identify any prohibited items in the container.

The EPA inspector determined the procedure and processes used continue to be adequate and effective for generation of compliant RTR data.

(2) EPA examined real-time radiography characterization records and found them to be adequate.

EPA reviewed the audio/visual (A/V) and written records for selected containers from CH BDR Nos. SRLBR0115 and SR4RTR0271 and from RH BDR Nos. SRLBR0098, SRLBR0120, SR4RTR0248, SR4RTR0363 and SR4RTR0364 and determined that the records were complete and generated in accordance with CCP procedures. An image quality check had been performed prior to each RTR event for the BDRs examined and the required quality control (QC) examinations had been performed. RTR operators had properly examined and identified each container's contents and entered characterization data into an electronic data sheet. The containers reviewed include SCG S5000 (debris) and S3000 (sludge) wastes. RTR operators determined if the waste matched the waste stream description and verified the WMC.

The operators had initiated NCRs as needed for multiple containers in some of the reviewed BDRs. NCR Nos. NCR-SRS-0623-13 and NCR-SRS-0624-13 were generated for containers in BDR No. SRLBR0115. NCR Nos. NCR-RHSRS-0687-13 and NCR-RHSRS-0689-13 were generated for containers in BDR No. SRLBR0098. All reviewed NCRs had been processed and dispositioned in accordance with SRS-CCP procedures.

The SRS-CCP RTR BDRs had been reviewed at the data generation and SPM levels; the reviews were recorded on the appropriate forms from CCP-TP-053 and CCP-TP-001.

(3) EPA examined real-time radiography training records and found them to be adequate.

The EPA inspectors reviewed training records, including Qualification Cards and Test and Training container examination records, for selected RTR operators. EPA determined that RTR operators continue to be trained in accordance with CCP procedures and that training records were readily available for review. EPA reviewed a list of qualified individuals and determined that the operator performing the on-site RTR demonstration was properly trained and qualified.

### 6.4.2 Real-Time Radiography Findings and Approval

**Summary of Real-Time Radiography Findings and Concerns**

EPA did not identify any findings or concerns related to RTR for CH and RH wastes as a result of this continued compliance inspection.

**Real-Time Radiography Approval**

Submission to EPA of a list of all RTR personnel who performed work during the previous quarter is a new RTR T2 change (see Tables 1 and 2). Specifically, the list must include all operators and ITRs.

Based on the results of this evaluation and the data examined, EPA determines that SRS-CCP demonstrated continued RTR compliance for CH and RH waste.

## 7.0 FINDINGS AND CONCERNS

EPA did not identify any findings during this continued compliance inspection. EPA identified one concern requiring a response regarding necessary revisions to AKSR CCP-AK-SRS-022. This concern is documented on the EPA Inspection Issue Tracking Form, Issue No. SRS-CCP-CH-CC-2014-01CR, which is included in Attachment C. The concern remains open until EPA receives the revised AKSR. SRS-CCP may continue to characterize other waste streams consistent with existing EPA approvals.

## 8.0 CONCLUSIONS

**Changes to Tiering**

EPA made several changes to the CH and RH tiering designations, as shown in Tables 1 and 2. Any use of VE to characterize CH waste is a new T1 change. During the 2006 baseline inspection, EPA approved SRS-CCP to use VE to characterize CH waste; however, EPA did not include this process in the continued compliance inspection scope, because SRS-CCP is not currently prepared to use or demonstrate the CH VE process. Since EPA did not observe and review the CH VE process during the continued compliance inspection, the CH VE process must be approved in the future as a separate T1 evaluation.

EPA also made substantive changes to the AK, NDA, radiological characterization and RTR T2 designations. These changes require DOE action:

1. Submission to EPA of a list of all SRS-CCP AKEs and SPMs who performed work in these roles during the previous quarter is a new CH and RH AK T2 change (see Tables 1 and 2).
2. Submission to EPA of a list of all SRS-CCP NDA personnel who performed work during the previous quarter is a new NDA T2 change (see Table 1). Specifically, the list must include all operators, EAs and ITRs.
3. Submission to EPA of a list of all SRS-CCP DTC and ISOCS personnel who performed work during the previous quarter is a new radiological characterization T2 change (see Table 2). Specifically, the list must include all operators, EAs and ITRs.
4. Submission to EPA of a list of all RTR personnel who performed work during the previous quarter is a new CH and RH RTR T2 change (see Tables 1 and 2). Specifically, the list must include all RTR operators and ITRs.

These changes to the T2 requirements are necessary to harmonize the SRS-CCP tiering designations consistent with the requirements identified during the baseline inspections and revised as needed as part of Tier 1 approvals and continued compliance inspections at other CH and RH TRU sites. EPA also revised the tiering tables to remove duplicate entries and ensure completeness. As part of the harmonization and completeness edits, EPA (1) added an RH AK T1 requirement to explicitly state that addition of load management to any RH waste stream is a

T1 change, and (2) revised the RH AK T2 requirements to clarify the specific CCP-TP-005 Attachments for which EPA expects to receive T2 notification. Tables 1 and 2 show the substantive T1 and T2 changes for CH and RH in bold text. T1 and T2 changes that were initiated during the CH and RH baseline and subsequent T1 approvals remain in effect. The language in Tables 1 and 2 regarding AK documentation applies to all SRS-CCP waste streams.

**Approval**

EPA determined that the SRS-CCP waste characterization program activities continue to be technically adequate. The scope of the compliance decision is based on EPA's inspection completed August 19–21 and October 15, 2014.

# ATTACHMENT A.1: APPROVAL SUMMARY FOR SRS-CCP CONTACT-HANDLED WASTE CHARACTERIZATION PROGRAM

| Approved Activity | EPA Inspection Number, Approval Dates | EPA Docket Number |
|---|---|---|
| SRS-CCP CH Baseline Approval | EPA-SRS-10.05-8<br>July 10, 2006 | A-98-49; II-A4-65 |
| T1 Change – Approval of Segmented Gamma Scanner, Nondestructive Assay System | August 29, 2007 | A-98-49; II-A4-90 |
| T1 Change – Approval of Nondestructive Assay Box Counter, Nondestructive Assay System | August 4, 2009 | A-98-49; II-A4-114 |
| T1 Change – Addition of S3000 Solids | March 23, 2010 | A-98-49; II-A4-123 |
| T1 Change – Extension of the Calibrated Range of the NABC BSGS to 7.18 g $^{238}$Pu Using a 20-Minute Counting Time | September 14, 2010 | A-98-49; II-A4-133 |
| T1 Change – Changing to an Efficiency-based Calibration for NABC BSGS | May 31, 2011 | A-98-49; II-A4-148 |
| T1 Change – NABC BSGS 5-ft Setback for 55-gallon drums | September 11, 2012 | A-98-49; II-A4-166 |
| T1 Change – NABC BSGS 5-ft Setback for SWBs | February 21, 2013 | A-98-49; II-A4-171 |
| T1 Change – NABC BSGS 5-ft Setback for SLB-2s | March 24, 2014 | A-98-49; II-A4-182 |

## ATTACHMENT A.2: APPROVAL SUMMARY FOR SRS-CCP 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 18, 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 |
| T1 Change – Addition of Waste Stream SR-RH-SDD.01 | May 22, 2014 | A-98-49; II-A4-184 |

# ATTACHMENT B: INSPECTION PERSONNEL

| Personnel | Affiliation | Area of Expertise/Function | Entrance Meeting | Interviewed | Exit Meeting |
|---|---|---|---|---|---|
| Rajani Joglekar | U.S. EPA ORIA | EPA Inspector–Team Leader | ✓ | | ✓ |
| Ed Feltcorn | U.S. EPA ORIA | EPA Inspector | ✓ | | ✓ |
| Dorothy Gill | SC&A, Inc. | RTR/VE Inspector | ✓ | | ✓ |
| Connie Walker | SC&A, Inc. | AK Inspector | ✓ | | ✓ |
| Kira Darlow | SC&A, Inc. | AK Inspector | ✓ | | ✓ |
| Patrick Kelly | SC&A, Inc. | NDA/Radiological Characterization Inspector | ✓ | | ✓ |
| Beverly Schrock | CCP | CH SPM | | ✓ | |
| Byron Gelderman | SRS-CCP | RTR Operator | ✓ | ✓ | |
| Charles Turner | CCP | RH SPM | ✓ | ✓ | ✓ |
| Dale Bignell | CBFO/CTAC | Observer | ✓ | | ✓ |
| Dan Remington | MCS/NDA | NDA Senior Scientist | | ✓ | ✓ |
| Ed Gulbransen | NWP/CCP | CCP Manager | ✓ | | ✓ |
| Erin Pennala | MCS | General manager | ✓ | | ✓ |
| Georgia Kareis | SRS-CCP | RTR Lead Operator, SME | ✓ | ✓ | |
| Irene Joo | NWP/CCP | RH Manager | ✓ | ✓ | ✓ |
| Jake Knox | NWP/CCP | Site Project Manager | | | ✓ |
| Jeff Harrison | SRS-CCP | AKE | ✓ | ✓ | ✓ |
| Joe Harvill | NWP/CCP | NDA Support | ✓ | | ✓ |
| Kevin Peters | SRS-CCP | AKE | ✓ | ✓ | ✓ |
| Laura Turner | CCP | RH SPM | | ✓ | |
| Lee Fox | SRNS | Site Technical Representative | ✓ | ✓ | ✓ |
| Lisa Watson | SRS-CCP | AKE | ✓ | ✓ | ✓ |
| Pat Tilman | CCP/NWP | SRS Characterization Manager | ✓ | | ✓ |
| Ronnie Lee | CCP | SRS Project Manager | ✓ | | |
| Steve Schafer | SRS-CCP | AKE | ✓ | ✓ | ✓ |
| Tim Carlton | MCS/NDA | NABC & DTC Operator | | ✓ | |
| Todd Shepley | MCS/NDA | NDA Lead Operator | ✓ | ✓ | ✓ |
| Tom Morgan | CBFO | NTP | ✓ | | |

**ATTACHMENT C: EPA INSPECTION ISSUE TRACKING FORM,**

**ISSUE NO. SRS-CCP-CH-CC-2014-01CR**

| | |
|---|---|
| **Inspection No.** SRS-CC-2014 | **Issue Number:** SRS-CCP-CH-CC-2014-01CR<br>**Date:** August 21, 2014, Draft |
| **Inspector:** C. Walker<br>**Attachments?** ☒ YES ☐ NO | **Sample Size:** 1 AKSR<br>**Population size (if known):** |

**Description of Issue:** The AK Summary Report (AKSR) CCP-AK-SRS-22, Waste Stream SR-221H-EUOx, does not adequately address elements of the waste origin, waste generation processes, and the defense determination. To address these issues, AKSR CCP-AK-SRS-22 will be revised to address the following:

a. Indicate that the entire waste stream will be blended or remove reference to only 30 containers being blended.
b. Better address the general process origin of the uranium oxides for each of the three oxide sources to indicate material origin, general (few sentences or small paragraph) process information, material management/transfer information, etc. This discussion does not need to detail accountable material generation but should provide enough information to define this component of the waste. Include citations to additional source documents (e.g., LANL), as necessary.
c. Better describe the blending material with respect to how addition of this material does not modify the debris status of the waste stream.
d. Revise the AKSR to more completely address the defense determination.

SRS-CCP provided the freeze file for this revision to EPA during the inspection. The final revised AKSR must be provided to EPA for review prior to start of the characterization program, expected in the Spring of 2015.

**B. Regulatory Reference:** 40 CFR 194.24(c)

**C. Site requirement(s):** Not applicable

**D. Discussed with:** Jeff Harrison, Steve Shafer

**E. Additional Comments:** None

**F. Site Response Information:**

**Site Response Required?** ☒ YES ☐ NO
**Site Response Due Date:** Final Revised AKSR CCP-AK-SRS-22, prior to resumption of characterization activities at SRS, expected to be Spring of 2015

**Attachment 1 of 2 to Concern No. SRS-CCP-CH-CC-2014-01CR**

FREEZE FILE
CCP-AK-SRS-22

**Freeze File for CCP-AK-SRS-22**

Section 4.4, 2nd paragraph: Change first sentence to say "As described in Section 4.3, the EU oxides in this waste stream…"

Section 4.4, 2nd paragraph: Change the end of the second sentence to say "…nonhazardous inert particulate blending material."

Section 4.4, 2nd paragraph: Delete third sentence. The Termination of Safeguards (TOS) (Reference C003) has expired. Before this AK report can be revised, a new TOS letter will need to be obtained.

Section 4.6: We need to better describe the specific origin of the oxide material (i.e., where specifically at LANL and Y-12 did the oxide originate and what process did it originate from/what was the oxide's intended use before it was decided to dispose of it as waste).

Section 5.4.1.1, add the following after the first sentence: "In accordance with the WIPP-WAP, although the oxide material and the particulate blending product added to the oxide consists of particles smaller than 2.36 inches in size, it may be considered debris because it is a manufactured object and is not a particle of S3000 or S4000 material."

**Attachment 2 of 2 to Concern No. SRS-CCP-CH-CC-2014-01CR**

FREEZE FILE

CCP-AK-SRS-22

**Madrid, Jessica - Stoller**

**From:** Payanes, Jose
**Sent:** Wednesday, March 12, 2014 7:09 AM
**To:** Madrid, Jessica - Stoller
**Subject:** FW: SRS-22 Freeze File

Freeze File

Jose Payanes
CCP Document Services/Training Manager
The S.M. Stoller Corporation, a wholly-owned subsidiary of Huntington Ingalls Industries, Inc.
Contractor to Nuclear Waste Partnership LLC
(575) 234-7151

**From:** Jeff Harrison [mailto:Trash_Talk@msn.com]
**Sent:** Tuesday, March 11, 2014 3:05 PM
**To:** Payanes, Jose
**Cc:** Ramirez, Mike - NWP
**Subject:** SRS-22 Freeze File

Jose,

Please include this email in the freeze file for CCP-AK-SRS-22:

- Section 5.5, 2nd sentence: Change "plastic bag" to "filtered plastic bag"
- Section 5.5.2, 2nd sentence: Change "plastic bag" to "filtered plastic bag"

Jeff Harrison
Nuclear Waste Partership LLC
Contractor for the U.S. Department of Energy
Trash_Talk@msn.com (e-mail)
720.977.7042 (office)
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# ATTACHMENT D.1: ACCEPTABLE KNOWLEDGE CONTINUED COMPLIANCE INSPECTION CHECKLIST: CONTACT-HANDLED WASTE

**EPA Inspection No.: SRS-CC-2014** **Contact-Handled Waste** **Inspection Date: August 19–21, 2014**

| Technical Elements | Objective Evidence | Comments |
|---|---|---|
| **Training and Procedures** | | |
| AK-1: Confirm that AK, training and nonconformance procedures adequately reflect the requirements of 40 CFR 194. | **CCP-TP-002**, Revision 26, CCP Reconciliation of DQOs and Reporting Characterization Data.<br>**CCP-TP-005**, Revision 26, Acceptable Knowledge Documentation<br>**CCP QP-005**, Revision 24, CCP TRU Nonconforming Item Reporting and Control<br>**CCP-QP-002**, Revisions 37 and 38, CCP Training and Qualification Plan | AK, training and nonconformance procedures are the same as previously reviewed and adequately reflect the requirements of 40 CFR 194.<br>Revisions to CCP-QP-002 will be evaluated as a T2 change because the procedure applies to all CCP waste characterization programs. |
| AK-2: Confirm that AKE and SPM training records and qualification cards are complete and that each individual's training was conducted prior to them performing work on this waste stream. | **AKE Qualification Cards:**<br>David Ams (4/30/13), Sherry Auckland (9/28/11), C. Allen Dickerson (6/16/11), Jeff Harrison (6/22/11), Jason Montoya (6/16/11), Michael Papp (6/16/11), Christina Poulos (2/18/14), Jim Schoen (6/16/11), Travis Smith (6/16/11), Lisa Watson (6/16/11)<br>**SPM Qualification Cards:**<br>Barbara Broomfield (3/8/06), Jerry Fisher (10/31/13), Joshua Houghton (5/31/11), Rich Kantrowitz (5/6/06), Jake Knox (10/23/13), Dave Moody (6/24/05), Beverly Schrock (6/23/10), Carolina Soaterna (5/31/11), Charlie Turner (4/19/07), Laura Turner (6/21/10), Daniel Wade (10/23/13), Roger Whiteaker (5/3/12), Rick Whiteley (10/31/13)<br>**Current Revision Training Acknowledgement:**<br>• SRS-CCP CH SPM Acknowledgement for CCP-TP-002, Revision 26<br>• SRS-CCP CH AKE and SPM Acknowledgment of CCP-TP-005, Revision 26<br>• SRS-CCP CH and SPM Acknowledgment of CCP-QP-005, Revision 24<br>• SRS-CCP CH AKE and SPM Acknowledgment of CCP-QP-002, Revision 37 | Barbara Broomfield's SPM qualification card indicated that her qualification is valid for sites with attached site-specific addenda. CCP no longer requires site-specific addenda for SPMs; however, the documentation provided to EPA for Barbara Broomfield does not show this change in policy. EPA will request this additional information during a T2 change if Ms. Broomfield is actively doing CH SPM work for SRS-CCP.<br>David Ams (AKE) and Sherry Auckland (AKE) are not listed on the SRS-CCP CH AKE and SPM Acknowledgment of CCP-TP-005, Revision 26. EPA will request documentation that David Ams and Sherry Auckland are familiar with the current revision of CCP-TP-005 during a T2 change if they are actively doing work for SRS-CCP CH AK.<br>With the exception of the items mentioned above, the records EPA examined show that the personnel listed in this checklist are adequately trained. |

| Technical Elements | Objective Evidence | Comments |
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| **Nonconformances and AK Discrepancies** | | |
| AK-3: Confirm that nonconformances are documented appropriately. | **SR-W027-FB-PRE86-C:** NCR-SRS-0180-13; NCR-SRS-0656-13<br>**SR-W026-221F-HET-A:** NCR-SRS-0622-13; NCR-SRS-0624-13<br>**SR-W027-235F-HET:** NCR-SRS-0376-14<br>**SR-221H-EUOX:** NCR-SRS-0181-14 | Nonconformances are appropriately documented. |
| AK-4: Confirm that CCP-TP-005, Attachment 10, Acceptable Knowledge Re-evaluation Checklist, is completed as necessary. | **SR-MD-PAD1:** Att. 10, 10/19/13; Att. 10, 6/4/13<br>**SR-DWPF-HET:** Att 10, 4/3/13<br>**SR-HBL-235F-HET:** Att 10, 1/31/13 and 4/29/13 | AK re-evaluation checklists are completed when appropriate. EPA found two covering the same issue for the same waste stream. AKEs thought this was probably due to miscommunication between AKEs and misunderstanding about who would do what work. SRS-CCP superseded the older Att. 10 during the inspection. |
| AK-5: Confirm that CCP-TP-005, Attachment 11, Acceptable Knowledge Source Document Discrepancy Resolution, is completed as necessary. | **SR-W027-FB-PRE86-C:** DR011, DR012<br>**SR-W026-221F-HET-A:** DR016<br>**SR-MD-PAD1:** DR004<br>**SR-DWPF-HET:** DR009, DR014 | DRs are completed as appropriate. The most common DR was to replace the historical radionuclide data in the AKSR with the actual NDA results. The AKE explained that if SRS-CCP gets about halfway through the waste stream and radionuclides still don't match the expected, they accept the NDA results as more accurate, write up Att. 10s and 11s, and change the AKSR. This removes the bullet in AK accuracy about how predominate radionuclides were different. The AKSR cites the DR in the radionuclides section, so the change is trackable.<br>During the inspection, SRS-CCP superseded a DR for being a duplicate of another DR. See explanation in CH AK-4.<br>AKSR-530 did not generate any DRs in the last five years. |
| **CCP-TP-005 Implementation** | | |
| AK-6: Confirm that Attachment 1, Acceptable Knowledge Documentation Checklist, is complete. | **SR-W027-773A-HOM:** 7/28/14<br>**SR-MD-PAD1:** 7/30/14<br>**SR-KAC-HET-A:** 7/23/14<br>**SR-HBL-235F-HET:** 7/29/14 | Based on a spot check, Att. 1s contained all source documents identified in AKSR. |
| AK-7: Confirm that Attachment 2, Record of Communication, is completed as necessary. | **SR-W027-221H-HET:** C105, C164<br>**SR-W026-772F-HET:** C144, C145, C146, C147, C151, C152, | SRS-CCP uses Att. 2s appropriately. |
| AK-8: Confirm that an Attachment 3, Acceptable | See reference list in Attachment I of this report. | All examined source documents had associated Att. 3s. |

| Technical Elements | Objective Evidence | Comments |
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| Knowledge Source Document Summary, is complete for every source document. | | EPA found one Att. 3 that was the wrong revision (AKE used Revision 25 after Revision 26's effective date). AKEs corrected the document during the inspection. |
| AK-9: Confirm that Attachment 4, Acceptable Knowledge Information List, is complete and up to date. | **SR-W027-773A-HOM:** 7/29/14<br>**SR-MD-PAD1:** 7/30/14<br>**SR-KAC-HET-A:** 7/23/14<br>**SR-HBL-235F-HET:** 7/29/14 | Based on a spot check, Att. 4s contained all source documents identified in AKSR. |
| AK-10: Confirm that Attachment 6, Waste Form, Waste Material Parameters, Prohibited Items, and Packaging, is complete and up to date. | **SR-W027-773A-HOM:** 9/30/13, attached memorandum 12/10/12<br>**SR-MD-PAD1:** 8/20/14, attached memorandum 10/14/09<br>**SR-KAC-HET-A:** 7/21/14, attached memorandum 7/25/13<br>**SR-HBL-235F-HET:** 7/30/14, attached memorandum 4/20/12 | All examined Att. 6s and memoranda are complete and up to date.<br>**SR-KAC-HET-A and SR-HBL-235F-HET:** There were minor differences (rounding errors) between the WMP values in the memoranda and in the Att. 6 and AKSR. AKEs did pen-and-ink revisions to correct the memoranda.<br>AKEs explained that the WMP values calculated in the memoranda and presented in Att. 6 are used only to convey expectations for waste stream contents and do not directly impact waste characterization. |
| AK-11: Confirm that Attachment 7, Radionuclides, is complete and up to date and that AK-NDA communication is appropriately documented. | **SR-W027-773A-HOM:** 10/30/13, memorandum 9/30/13, signed 10/30/13<br>**SR-MD-PAD1:** 6/27/13, memorandum 6/12/13, signed 6/17/13<br>**SR-KAC-HET-A:** 8/27/13, memorandum 8/21/13, signed same week<br>**SR-HBL-235F-HET:** 4/25/13, memorandum 5/11/12, signed 6/13/12, DR6002 | SRS-CCPs revised most of these memoranda and Att. 7s after characterizing more than half the waste stream and determining that the NDA data are more accurate (see AK-5 of this checklist).<br>**SR-HBL-235F-HET:** SRS-CCP made the above described revision in the AKSR and Att. 7, but did not revise the memorandum because the waste stream was already completely characterized. |
| AK-12: Confirm that Attachment 14, CCP Acceptable Knowledge Accuracy Report, is completed annually and verify that the AK accuracy report memorandum is technically adequate. | **SR-W027-773A-HOM:**10/30/13, Lot 1<br>**SR-MD-PAD1:** 9/9/11, Lots 1–21; 11/1/12, Lots 1–57; 10/31/13, Lots 1–80<br>**SR-HBL-235F-HET:** 11/6/13, Lots 1–3 | Reviewed accuracy reports are adequate.<br>Waste containers that fall out of the TRU waste stream as LLW have no impact on AK accuracy.<br>**SR-HBL-235F-HET:** Due to shipping schedules, three of the 13 containers had not yet shipped to WIPP prior to the February 2014 shutdown. Waste containers that are completely characterized and certified are included in the AK accuracy calculations regardless of shipping status. |
| AK-13: Confirm that Attachment 15, CCP TRU Waste Correlation and Surrogate Summary Form, is | None | Att. 15 is not required for CH waste streams and SRS-CCP has not prepared any Att. 15s for CH waste streams. |

| Technical Elements | Objective Evidence | Comments |
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| completed as necessary. | | |
| **Waste Stream Definition and Waste Identification** | | |
| AK-14: Confirm that the AKSR is complete and accurately describes the subject waste. | **SR-W027-221H-HET:** AKSR, Revision 16; C038, C063, C066, C105, D004, D005, D034, D054, D099, D113, D116, M069; CCP-TP-005, Attachments 6, 7 and 8<br>**SR-W026-772F-HET:** AKSR, Revision 9; C145, C183, C184, C186, C187, D001, D003, D021, D042, DR003, DR005, M001, M002, M058, M062, M066, M067, M069, P004, P022, P035, P040, P054, P060, P161; CCP-TP-005, Attachments 6, 7 and 8<br>**SR-AGNS-HOM:** AKSR, Revision 3; D002, D019, D022, D024, D029, D030, M052; CCP-TP-005, Attachments 6, 7 and 8<br>**SR-221H-EUOx:** AKSR, Revision 0; C001, D004, M010; CCP-TP-005, Attachments 6, 7 and 8 | EPA reviewed process information, radiological characterization, characterization progression, and other aspects of each waste stream to verify accuracy of the AKSR and adequacy of the waste stream determination. See AK-15, -16 and -17 of this checklist for additional information.<br>**SR-221H-EUOx:** EPA found that the AKSR does not adequately address elements of the waste origin, waste generation processes, and the defense determination for Waste Stream SR-221H-EUOx. EPA issued a concern requiring a response pertinent to these issues, see Concern No. SRS-CCP-CH-CC-2014-01CR in Attachment C to this report. |
| AK-15: Verify that all waste within the waste stream was generated from a single process/activity and that the generating process/activity is adequately described. | **SR-W027-221H-HET:** AKSR, Revision 16; C038, D004, D015, D075, M014, M026, M041, P014, P024, P073<br>**SR-W026-772F-HET:** AKSR, Revision 9; C145, C183, C184, C186, C187, D001, D003, D021, D042, DR003, DR005, M001, M002, M058, M062, M066, M067, M069, P004, P022, P035, P040, P054, P060, P161<br>**SR-AGNS-HOM:** AKSR, Revision 3; D001, D002, D004, D019, D022, D024, D029, M005, M030<br>**SR-221H-EUOx:** AKSR, Revision 0; D002, D004, M006, M007, M008, P001, P002, P003, P004, P005, P006, P007, P008, P009 | **SR-W027-221H-HET:** SRS generated debris waste in Waste Stream SR-W027-221H-HET during the use of HBL gloveboxes, contamination control huts, replacement of equipment, maintenance, inspection, sampling, laboratory operations, and from decontamination. It is job control waste that was not effectively segregated based on physical or chemical form.<br>**SR-W026-772F-HET:** Routine processes in the F/H Area Laboratory that generate TRU waste include laboratory analyses and associated housekeeping and routine maintenance of containment units and equipment, including cleaning and glove change outs. Non-routine waste is generated by F/H Area laboratory from decontamination and characterization support.<br>**SR-AGNS-HOM:** BNFP conducted studies and research to support the nonproliferation objectives of the United States, including the investigation and evaluation of proliferation-resistant alternative fuel cycle technologies. BNFP generated TRU waste in the HCLA during test and R&D support activities which they conducted using simulated fuel and HLW, among other components. |

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| | | **SR-221H-EUOx:** The waste stream is blended uranium oxide, containing small amounts of TRU material. This is blended with an inert material, the composition of which is sensitive. The purpose of blending is to reduce the radionuclide concentrations sufficiently to allow the termination of safeguards. The cans of blended material are placed in POCs for safeguards termination and ultimate shipment to the WIPP.<br>The AKSRs for Waste Streams W027-221H-HET, SR-AGNS-HOM and SR-AGNS-HOM adequately describe the waste generating process. The AKSR for Waste Stream SR-221H-EUOx does not adequately describe the waste generating process. SRS-CCP generated a freeze file that, when implemented and included in the AKSR, should adequately describe the components of the waste generation process. See Concern No. SRS-CCP-CH-CC-2014-01CR in Attachment C to this report. |
| AK-16: Verify that all waste within the waste stream is similar in material and physical form and that the expected physical parameters are adequately described. | **SR-W027-221H-HET:** AKSR, Revision 16; C032, D015, D075, M014, M015, M026, M041, M066, M108, M109, M110, M111, M115, M126, M127, M160, P014, P024, P073; CCP-TP-005, Attachments 6 and 8<br>**SR-W026-772F-HET:** AKSR, Revision 9; C144, C146, C147, C151, C152, C181, D003, D008, D021, D023, D029, D048, D110, M001, M005, M006, M016, M050, M056, M058, M059, M060, M061, M062, M066, M067, M069, M071, P002, P004, P005, P006, P015, P022, P035, P157, P160; CCP-TP-005, Attachments 6 and 8<br>**SR-AGNS-HOM:** AKSR, Revision 3; M027, M052; CCP-TP-005, Attachments 6 and 8<br>**SR-221H-EUOx:** AKSR, Revision 0; C002, P003, P004; CCP-TP-005, Attachments 6 and 8 | **SR-W027-221H-HET:** Waste Stream SR-W027-221H-HET is primarily heterogeneous organic debris by volume, including some small HEPA and AEC filters and small quantities of inorganic absorbents and absorbed liquids. The physical composition of the waste stream is adequately described.<br>**SR-W026-772F-HET:** Waste Stream SR-W026-772F-HET is composed of job control waste generated in the F/H Area laboratory and includes organic and inorganic debris such as paper, wipes, cartons, gloves, lab ware, sponges, rubber, Plexiglas, pipe, tubing and fittings, instruments, and may include poly bottles containing liquids (e.g., nitric acid, ammonium hydroxide, rinse water) that have been immobilized using NOCHAR. The physical composition of the waste stream is adequately described.<br>**SR-AGNS-HOM:** Waste Stream SR-AGNS-HOM is composed of solidified aqueous liquids. The aqueous component may include nitric and hydrochloric acids, hydroxylamine nitrate, and sodium carbonate. BNFP solidified the waste with lime and cement. BNFP absorbed some of the aqueous waste using Florco-X (Fuller's Earth) prior to immobilizing in cement. The physical composition |

| Technical Elements | Objective Evidence | Comments |
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| | | of the waste stream is adequately described.<br>**SR-221H-EUOx:** Waste Stream SR-221H-EUOx is composed of EU oxide blended with a nonhazardous inorganic material (down blended) to facilitate termination of safeguards. The EU oxide materials from LANL and Y-12 are down blended in cans and packaged into POCs in the HB-Line for subsequent shipment to WIPP. SRS-CCP states that the oxide exhibits an S5100 (inorganic debris) WMC, even though it is composed of small or fine particles and the blending material described in SD C002 leads one to conclude that the waste will be SCG S3000, solidified homogenous solid, once blended. The AKSR does not adequately describe the physical composition of the waste to support the SCG S5000 designation. SRS-CCP generated a freeze file that, when implemented and included in the AKSR, should adequately describe the physical composition with respect to assignment of SCG S5000. See Concern No. SRS-CCP-CH-CC-2014-01CR in Attachment C to this report. |
| AK-17: Verify that the expected radiological characteristics are adequately described. | **SR-W027-221H-HET:** AKSR, Revision 16; C093, C164, C192, D004, D019, D052, D054, D062, D095, D098, M069, M011, M014, M015, M115, M125, M127, M133; CCP-TP-005, Attachments 7 and 8<br>**SR-W026-772F-HET:** AKSR, Revision 9; C184, C186, D103, DR007, DR012, M002, M005, M006, M050, M051, M052, M058, M062, M066, M067, M069; CCP-TP-005, Attachments 7 and 8<br>**SR-AGNS-HOM:** AKSR, Revision 3; C006, C017, C055, C078, D049, DR001, M027, M052, M057, P010, P056, P057, P059; CCP-TP-005, Attachments 6, 7 and 8<br>**SR-221H-EUOx:** AKSR, Revision 0; C001, D004, M010; CCP-TP-005, Attachments 6, 7 and 8 | **SR-W027-221H-HET:** Processing of $^{237}$Np, $^{238}$Pu, $^{239}$Pu, $^{233}$U and $^{235}$U contributed to Waste Stream SR-W027-221H-HET. Both $^{232}$Th and $^{233}$U are also expected in the waste generated from D&R. $^{238}$U is expected to be the most predominant radionuclide by mass and $^{238}$Pu is expected to be the second most predominant radionuclide by mass; over 95% of the activity is expected to be $^{238}$Pu. Radionuclide content and isotopic distribution may vary considerably on a container-by-container basis due to the isotopic variability of HBL operations. The radiological characteristics of the waste stream are adequately described.<br>**SR-W026-772F-HET**: Generator and packaging data for Waste Stream SR-W026-772F-HET indicate that $^{238}$U is the most prevalent radionuclide by mass, followed by $^{239}$Pu. Certified SRS-CCP assay data for approximately 3,900 containers showed $^{239}$Pu to be the most prevalent radionuclide by mass, followed by $^{232}$Th and $^{238}$U. As newly generated waste is added to the waste stream, it is possible $^{232}$Th and/or $^{238}$U could exceed the total $^{239}$Pu mass since these two radionuclides can be present in a few drums in |

| Technical Elements | Objective Evidence | Comments |
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| | | relatively large quantities. Because the waste may contain radionuclides from a variety of processes and activities, radiological content and isotopic distribution may vary greatly between containers, so use of AK default isotopics would have to be considered on a container-by-container basis. The radiological characteristics of the waste stream are adequately described.<br>**SR-AGNS-HOM:** Based on AK for Waste Stream SR-AGNS-HOM, $^{238}$U is the most predominant radionuclide by mass, followed by $^{239}$Pu. The $^{238}$U mass is dominated by NU in a single drum, and NU is expected in other drums. The presence of NU could result in $^{235}$U, and as such, $^{235}$U could ultimately be the second most predominant radionuclide by mass. Trace quantities of $^{137}$Cs, $^{90}$Sr, $^{241}$Am and $^{237}$Np may also be present. The radiological characteristics of the waste stream are adequately described.<br>**SR-221H-EUOx:** Waste Stream SR-221H-EUOx is mainly an EU oxide-blend mix wherein the two most prevalent radionuclides by mass are $^{235}$U and $^{238}$U, and the two most prevalent radionuclides by activity are $^{234}$U and $^{233}$U. There are three types of EU oxides:<br>1) HEU/Np: HEU oxide with Y-12 $^{237}$Np, approximately 93 wt% $^{235}$U; $^{237}$Np is nearly 90 percent of the TRU activity.<br>2) HEU/Pu: HEU oxide with LANL Pu, approximately 93 wt% $^{235}$U, with various quantities of $^{237}$Np, $^{238}$Pu, $^{239/240}$Pu, and $^{155}$Eu at around 90 nCi/g.<br>3) SLI: Approximately 50 wt% $^{235}$U, 50 wt% $^{238}$U, 0.5 wt% $^{233}$U, with minor amounts of $^{237}$Np, $^{241}$Am, $^{238}$Pu, $^{239/240}$Pu, $^{208}$TI, $^{155}$Eu, and $^{243/244}$Cm. The radiological characteristics of the waste stream are adequately described. |
| AK-18: Verify that waste containers are traceable from retrieval or generation through CCP's EPA-approved characterization process? | **SR-W027-221H-HET:** Drum No. SR503072VB<br>• NDA BDR: SRLBC0930<br>• RTR BDR: SRLBR0083<br>• Drum Repackaging Form: SRS03072VB<br>• Drum Repackaging Form: SRS03072<br>• BGR: SR503072<br>**SR-W026-772F-HET:** Drum No. 772F000027<br>• HSG BDR: 722FHET-.021204B1 | EPA assessed traceability of the following containers:<br>• SR503072VB<br>• 772F000027<br>• SR520533<br>• HBL130022<br>These drums are traceable from site documentation through |

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| | • NDA BDR: SRBC0892<br>• RTR BDR: SR4RTR0256<br>• Drum Repackaging Form: 772F000027<br>• Transuranic Waste Container Characterization Form: 772F-00-0027<br>**SR-AGNS-HOM:** Drum No. SR520533<br>• NDA BDR: SRLBC0585<br>• RTR BDR: SRSRTR0502<br>• BGR: 520523<br>• C017, M027<br>**SR-221H-EUOx:** Drum No. HBL130022<br>• NDA BDR: SRLBC1098<br>• RTR BDR: SR4RTR0361<br>• Transuranic Waste Container Characterization Form: HBL130022 | SRS-CCP characterization. |
| AK-19: Confirm that CCP-TP-005, Attachment 8, Waste Containers List, is complete and up to date. | **SR-W027-221H-HET:** 7/29/14; C192, C207, C209, C210, M108, M109, M110, M124, M125, M132, M135, M136, M138, M141, M159, M170<br>**SR-W026-772F-HET:** 7/30/14; M071<br>**SR-AGNS-HOM:** 11/3/11<br>**SR-221H-EUOx:** 6/16/14 | Att. 8 for Waste Streams SR-W027-221H-HET, SR-W026-772F-HET and SR-AGNS-HOM (including add-container memoranda) are up to date.<br>**SR-221H-EUOx:** Att. 8 includes 30 containers. SRS-CCP representatives indicated that the waste stream contains over 150 drums. The waste has been sent back to safeguards because of the inability to ship waste to WIPP. Therefore, addition of the remaining drums in the waste stream is expected when they are returned to SRS-CCP for treatment and characterization prior to shipment. |
| **Land Withdrawal Act Requirements** | | |
| AK-20: Verify that all of the waste in the waste stream is defense in origin. | **SR-W027-235F-HET:** AKSR, Revision 10; C006, C011, C021, C029, C043, D007, D008, D012, D025, D027, D028, D031, D034, D035, D036, D037, D038, D039, D040, D041, D042, D046, D047, D048, D049, D050, D051, D052, D053, D054, D067, U004<br>**SR-AGNS-HOM:** AKSR, Revision 3; C015, C016, C018, C019, C052, C063, C077, D004, D018, D030, D045, M003, M006, M007, M008, M046, M050, M057, M070<br>**SR-221H-EUOx:** AKSR, Revision 0; C002, C003, | The defense determinations for Waste Streams SR-W027-235F-HET and SR-AGNS-HOM are based on commingling of defense and non-defense waste. The AKSRs adequately support the defense determination.<br>**SR-221H-EUOx:** The defense determination did not adequately support or reference the defense origin of waste. SRS-CCP generated a freeze file that, when implemented and included in the AKSR, should adequately describe the defense origin. See Concern No. SRS-CCP-CH-CC-2014-01CR in Attachment C to this report. |

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| | M010 | |
| AK-21: Verify that none of the waste in the waste stream is HLW. | **SR-W027-235F-HET:** AKSR, Revision 10; D006, D067, D072<br>**SR-AGNS-HOM:** AKSR, Revision 3; C015, C016, D030, M007, M008<br>**SR-221H-EUOx:** AKSR, Revision 0; D004 | The AKSRs for Waste Streams SR-W027-235F-HET, SR-AGNS-HOM and SR-221H-EUOx adequately address the absence of HLW. |
| AK-22: Verify that none of the waste in the waste stream is SNF. | **SR-W027-235F-HET:** AKSR, Revision 10; D006, D067, D072<br>**SR-AGNS-HOM:** AKSR, Revision 3; C015, C016, D030, M007, M008<br>**SR-221H-EUOx:** AKSR, Revision 0; D004 | The AKSRs for Waste Streams SR-W027-235F-HET, SR-AGNS-HOM and SR-221H-EUOx adequately address the absence of SNF. |
| **Waste Stream Certification** | | |
| AK-23: Verify that the WSPF is complete and accurate. | **SR-MD-SOIL:** WSPF, Revision 1<br>**SR-SDD-HET-A:** WSPF, Revision 0<br>**SR-BCLDP.004.004:** WSPF, Revision 0 | The WSPFs for Waste Streams SR-MD-SOIL, SR-SDD-HET-A and SR-BCLDP.004.004 are adequate. |
| AK-24: Confirm that a characterization information summary and summation of aspects are included in the WSPF package and are complete and accurate. | **SR-MD-SOIL:** WSPF, Revision 1; CIS Lot 6; Summation of Aspects<br>**SR-SDD-HET-A:** WSPF, Revision 0; CIS Lot 1; Summation of Aspects<br>**SR-BCLDP.004.004:** WSPF, Revision 0; CIS Lot 1; Summation of Aspects | A summation of aspects and CIS are attached to each WSPF. Both are complete and adequate. |
| AK-25: Confirm that CCP-TP-005, Attachment 13, CCP Waste Stream Characterization Checklist, is completed for each characterization lot. | **SR-MD-SOIL:** Lot 9<br>**SR-SDD-HET-A:** Lot 1<br>**SR-BCLDP.004.004:** Lot 1 | EPA requested that SRS-CCP provide all Att. 13s available. SRS-CCP provided only one checklist for each waste stream. The Att. 13s provided are adequate. |
| AK-26: Confirm that a characterization information summary is adequately completed for each characterization lot. | **SR-MD-SOIL:** CIS Lot 6, CIS Lot 9<br>**SR-SDD-HET-A:** CIS Lot 1<br>**SR-BCLDP.004.004:** CIS Lot 1 | SRS-CCP adequately completed the CIS associated with WSPFs and example CIS for subsequent characterization activities. |
| **Tier 2 Reporting** | | |
| AK-27: Verify that SRS-CCP has reported to EPA completion or revision of the AK-NDA memoranda. | FY2013 3rd Quarter T2 report<br>FY2013 4th Quarter T2 report<br>FY2014 1st Quarter T2 report<br>FY2014 2nd Quarter T2 report<br>FY2014 3rd Quarter T2 report | In general, NDA memoranda are adequately reported.<br>During this inspection, EPA reviewed CCP-TP-005, Att.7s, and AK-NDA memoranda for Waste Streams SR-W027-773A-HOM, SR-MD-PAD1, SR-KAC-HET-A and SR-HBL-235F-HET. SRS-CCP reported all recent revisions except the October 2013 revision of the Waste Stream SR- |

| Technical Elements | Objective Evidence | Comments |
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| | | W027-773A-HOM Att. 7 and AK-NDA memorandum. |
| AK-28: Verify that SRS-CCP has reported to EPA completion or revision of AK accuracy reports annually, at a minimum. | FY2012 1st Quarter T2 report<br>FY2013 1st Quarter T2 report<br>FY2014 1st Quarter T2 report<br>FY2014 2nd Quarter T2 report<br>FY2014 3rd Quarter T2 report | In general, AK accuracy reports are adequately reported. SRS-CCP completed AK accuracy reports for all active waste streams in the 1st quarter of FY2014, but did not notify EPA of their availability. |
| AK-29: Verify that SRS-CCP has reported to EPA completion or revision of AK-AK and AK-NDA/NDE DR reports. | FY2011 4th Quarter T2 report<br>FY2012 3rd Quarter T2 report<br>FY2013 3rd Quarter T2 report<br>FY2014 1st Quarter T2 report | In general, DRs are adequately reported.<br>SRS-CCP appropriately notified EPA of the availability of the example DRs cited in this checklist. |
| AK-30: Verify that SRS-CCP has reported to EPA completion or revision of WSPFs, including related attachments (e.g., CIS) for all new or modified waste streams, including change notices. | FY2013 1st Quarter T2 report<br>FY2013 3rd Quarter T2 report<br>FY2013 4th Quarter T2 report<br>FY2014 1st Quarter T2 report<br>FY2014 2nd Quarter T2 report<br>FY2014 3rd Quarter T2 report | In general, WSPFs are adequately reported.<br>SRS-CCP appropriately notified EPA of the availability of the example WSPFs cited in this checklist. |
| AK-31: Verify that SRS-CCP has reported to EPA completion or revision of AKSRs. | FY2013 3rd Quarter T2 report<br>FY2013 4th Quarter T2 report<br>FY2014 1st Quarter T2 report<br>FY2014 2nd Quarter T2 report<br>FY2014 3rd Quarter T2 report | In general, AKSRs are adequately reported.<br>SRS-CCP appropriately notified EPA of the availability of the example AKSRs cited in this checklist. |
| AK-32: Verify that SRS-CCP has reported to EPA completion or revision of CCP-TP-005, Attachments 4 and 6, and associated memoranda. | FY2013 3rd Quarter T2 report<br>FY2013 4th Quarter T2 report<br>FY2014 1st Quarter T2 report<br>FY2014 2nd Quarter T2 report<br>FY2014 3rd Quarter T2 report | In general, Atts. 4 and 6 are adequately reported about half of the time.<br>During this inspection EPA reviewed CCP-TP-005, Atts.4 and 6, for Waste Streams SR-W027-773A-HOM, SR-MD-PAD1, SR-KAC-HET-A and SR-HBL-235F-HET. SRS-CCP did not notify EPA regarding the September 2013 revision of the Waste Stream SR-W027-773A-HOM, Att. 6 or the June 2013 revision of the Waste Stream SR-MD-PAD1Att. 6. |
| AK-33: Verify that SRS-CCP has reported to EPA completion or revision of add-container memoranda. | FY2013 4th Quarter T2 report<br>FY2014 1st Quarter T2 report<br>FY2014 2nd Quarter T2 report<br>FY2014 3rd Quarter T2 report | In general, SRS-CCP is notifying EPA of availability of new or revised CCP-TP-005, Att. 8s. However, the add-container memoranda are being included in an AK SD. SRS-CCP has not been notifying EPA of the availability of new add-container memoranda, which would manifest as notification of revision of an SD. |

| Technical Elements | Objective Evidence | Comments |
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| AK-34: Verify that SRS-CCP has reported to EPA changes in load management status of approved waste streams. | N/A | SRS-CCP did not make any changes to load management status for any waste streams. |
| AK-35: Verify that SRS-CCP has reported to EPA any waste identified outside of the waste profiles included in the 2002 Transuranic Waste Baseline Inventory Report. | N/A | This is covered by reporting new and revised AKSRs. |
| AK-36: Verify that SRS-CCP has reported to EPA creation of newly generated soil or debris waste streams through remediation or decontamination and decommissioning activities. | N/A | This is covered by reporting new and revised AKSRs. |

# ATTACHMENT D.2: ACCEPTABLE KNOWLEDGE CONTINUED COMPLIANCE INSPECTION CHECKLIST: REMOTE-HANDLED WASTE

**EPA Inspection No.: SRS-CC-2014** **Remote-Handled Waste** **Inspection Date: August 19–21, 2014**

| Technical Elements | Objective Evidence | Comments |
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| **Training and Procedures** | | |
| AK-1: Confirm that AK, training and nonconformance procedures adequately reflect the requirements of 40 CFR 194. | **CCP-TP-002**, Revision 26, CCP Reconciliation of DQOs and Reporting Characterization Data.<br>**CCP-TP-005**, Revision 26, Acceptable Knowledge Documentation<br>**CCP QP-005**, Revision 24, CCP TRU Nonconforming Item Reporting and Control<br>**CCP-QP-002**, Revision 38, CCP Training and Qualification Plan<br>**CCP-TP-506,** Revision 5, CCP Preparation of the Remote-Handled Transuranic Waste Acceptable Knowledge Characterization Reconciliation Report | AK, training and nonconformance procedures are the same as previously reviewed and adequately reflect the requirements of 40 CFR 194.<br>Revisions to CCP-QP-002 and CCP-TP-506 will be evaluated as T2 changes because the procedures apply to all CCP waste characterization programs. |
| AK-2: Confirm that AKE and SPM training records and qualification cards are complete and that each individual's training was conducted prior to them performing work on this waste stream. | **AKE Qualification Cards:**<br>Jeff Harrison (6/22/11), Carrie Johnson (6/16/11), John Kleckner (6/16/11), Sheri Nance (6/16/11), Michael Papp (6/16/11), Kevin Peters (6/16/11), Steve Schafer (6/16/11), Scott Smith (6/22/11)<br>**SPM Qualification Cards:**<br>Joshua Houghton (8/19/13), Irene Joo (9/17/09), Rich Kantrowitz (10/29/12), David Moody (8/28/13), Charlie Turner (8/15/13), Laura Turner (6/21/10)<br>**Current Revision Training Acknowledgement:**<br>• SRS-CCP RH SPM Acknowledgment for CCP-TP-002, Revision 26<br>• SRS-CCP RH AKE and SPM Acknowledgment of CCP-TP-005, Revision 26<br>• SRS-CCP RH AKE and SPM Acknowledgment of CCP-QP-005, Revision 24<br>• SRS-CCP RH AKE and SPM Acknowledgment of CCP-QP-002, Revision 37<br>• SRS-CCP RH AKE and SPM Acknowledgment of WIPP-02-3214, Revision 3<br>• SRS-CCP RH SPM Acknowledgment of CCP-TP-506, Revision 5 | Irene Joo's SPM qualification card indicated that her qualification is valid for sites with attached site-specific addenda. CCP no longer requires site-specific addenda for SPMs; however, the documentation provided to EPA for Irene Joo does not show this change in policy. EPA will request this additional information during a T2 change if Ms. Joo is actively doing RH SPM work for SRS-CCP.<br>The records EPA examined show that the personnel listed in this checklist are adequately trained. |

| Technical Elements | Objective Evidence | Comments |
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| **Nonconformances and AK Discrepancies** | | |
| AK-3: Confirm that nonconformances are documented appropriately. | None | SRS-CCP has not generated any AK-related NCRs. RTR NCRs are reviewed as part of the RTR inspection (see Attachment H). |
| AK-4: Confirm that CCP-TP-005, Attachment 10, Acceptable Knowledge Re-evaluation Checklist, is completed as necessary. | **SR-RH-235F.01:** None<br>**SR-RH-FBL.01:** None<br>**SR-RH-221H.01:** None | Based on review of DRs, EPA agrees that it is appropriate that there are not any AK re-evaluations. |
| AK-5: Confirm that CCP-TP-005, Attachment 11, Acceptable Knowledge Source Document Discrepancy Resolution, is completed as necessary. | **SR-RH-235F.01:** DR001, DR002, DR005<br>**SR-RH-FBL.01:** No new since baseline<br>**SR-RH-221H.01:** DR013 | SRS-CCP adequately completed DRs as necessary. |
| **CCP-TP-005 Implementation** | | |
| AK-6: Confirm that Attachment 1, Acceptable Knowledge Documentation Checklist, is complete. | **SR-RH-235F.01:** 10/23/12<br>**SR-RH-FBL.01:** 10/23/12<br>**SR-RH-221H.01:** 6/30/11 | EPA selected sample SDs on the Att. 1 listing and evaluated them against the AK category to determine whether the source documents supported the AK category. Selected SDs compared well and the Attachment 1s are complete. |
| AK-7: Confirm that Attachment 2, Record of Communication, is completed as necessary. | **SR-RH-235F.01:** C104, C004, C008<br>**SR-RH-FBL.01:** C021, C025, C032<br>**SR-RH-221H.01:** C015, C178, C197, C219 | SRS-CCP is not required to complete Att. 2 for records of communication and does not use this form for historic memoranda or emails. The records of communication examined included those that used Att. 2 to record the interviews. The Records of Communication examined are complete. |
| AK-8: Confirm that an Attachment 3, Acceptable Knowledge Source Document Summary, is complete for every source document. | **SR-RH-235F.01:** C001, C104, C063, D058, D070, M004, M027, P022, P131, P144, U002, U004<br>**SR-RH-FBL.01:** C012, C058, D011, D075, DR001, DR008, M034, M180, P036, P067<br>**SR-RH-221H.01:** C006, C054, C075, C197, D005A, D041, D099, DR013, M014, M082, M169, P001, P055, P112 | EPA spot-checked AKSR source documents provided to see whether each had an accompanying Attachment 3s. Source documents checked had accompanying Attachment 3s. |
| AK-9: Confirm that Attachment 4, Acceptable Knowledge Information List, is complete and up to date. | **SR-RH-235F.01:** 11/6/12<br>**SR-RH-FBL.01:** 8/21/14<br>**SR-RH-221H.01:** 10/28/13 | EPA found the examined Att.4s to be complete and up to date. The Att. 4 is not revised every time the AKSR is revised; it is only revised if the source documents cited in the AKSR change. |
| AK-10: Confirm that Attachment 6, Waste Form, Waste Material Parameters, Prohibited Items, and | **SR-RH-235F.01:** 10/23/12<br>**SR-RH-FBL.01:** 10/23/13 | All examined Att. 6s and memoranda are complete and up to date. |

| Technical Elements | Objective Evidence | Comments |
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| Packaging, is complete and up to date. | **SR-RH-221H.01:** 11/4/13 | |
| AK-11: Confirm that Attachment 14, CCP Acceptable Knowledge Accuracy Report, is completed annually and verify that the AK accuracy report memorandum is technically adequate. | **SR-RH-235F.01:** 8/21/14, Lot 1<br>**SR-RH-FBL.01:** 8/21/14, Lots 1–2<br>**SR-RH-221H.01:** 8/21/14, Lot 1 | The AK accuracy reports did not adequately identify the percentage of containers for which there are significant discrepancies in radionuclide information between the AK record and measured values. All three reviewed AK accuracy reports stated, "Because of the requirement to report radionuclides to the WIPP Waste Information System (WWIS) there will be no further impact of AK Accuracy once the TRU waste determination has been made." SRS-CCP revised each AK accuracy report to remove the above text and to state, "There are no significant discrepancies to report as the radionuclides and percentages found in the conversion record compare well with the radionuclides and percentages listed." In the future, AK accuracy reports should provide numeric values for what constitutes "compare well." The AK Accuracy Reports, as modified, are technically adequate. |
| AK-12: Confirm that Attachment 15, CCP TRU Waste Correlation and Surrogate Summary Form, is completed as necessary. | **SR-RH-235F.01:** 3/16/12, Waste Used to Correlate: SR-W027-235F-HET, Waste Used to Surrogate: SR-W027-235F-HET<br>**SR-RH-FBL.01:** 8/21/14, Waste Used to Correlate: SR-W027-FB-Pre86C and SR-W026-221F-HET, Waste Used to Surrogate: SR-W027-FB-Pre86C and SR-W026-221F-HET<br>**SR-RH-221H.01:** 11/5/12, Waste Used to Correlate: SR-W027-221H-HET, Waste Used to Surrogate: SR-W027-221H-HET | **SR-RH-FBL.01:** Att. 15 originally did not include Waste Stream SR-W026-221F-HET as a surrogate or correlative waste streams. This is required because Waste Stream SR-RH-FBL.01 includes one drum from the newer population (i.e., SR-W026-221F-HET) while the rest of the containers were associated with SR-W027-FB-Pre86C. SRS-CCP revised the Att. 15 to include both waste streams.<br>The other two reviewed Att. 15s and the revised Att. 15 for Waste Stream SR-RH-FBL.01 are complete and adequate. |
| **Waste Stream Definition and Waste Identification** | | |
| AK-13: Confirm that the AKSR is complete and accurately describes the subject waste. | **SR-RH-235F.01:** AKSR, Revision 2<br>**SR-RH-FBL.01:** AKSR, Revision 6<br>**SR-RH-221H.01:** AKSR, Revision 2 | EPA reviewed process information, radiological characterization, characterization progression, and other aspects of each waste stream to verify accuracy of the AKSR and adequacy of the waste stream determination. See AK-14, -15 and -16 of this checklist for additional information.<br>**SR-RH-235F.01 and SR-RH-221H.01:** AKSRs contains all required elements.<br>**SR-RH-FBL.01:** EPA reviewed AKSR, Revision 3, in |

| Technical Elements | Objective Evidence | Comments |
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| | | depth for the RH baseline in 2011. The only substantial changes are related to newly added drums. The AKSR continues to contain all required elements. |
| AK-14: Verify that all waste within the waste stream was generated from a single process/activity. | **SR-RH-235F.01:** AKSR, Revision 2; D002, D005, D006, D007, D015, M056<br>**SR-RH-FBL.01:** AKSR, Revision 6; CCP-AK-SRS-2; CCP-AK-SRS-3; C102 C027, D016, M1001<br>**SR-RH-221H.01:** AKSR, Revision 2; C066, C105, D004, D005, D034, D054, D099, D116, M069, M169 | **SR-RH-235F.01:** FAMS activities, all of which are related to fabrication of actinide oxides and fuel forms for RTGs, generated this waste stream. The most common actinide oxide was $^{238}$Pu oxide. The waste is from a single process/activity.<br>**SR-RH-FBL.01:** EPA verified generation by a single process during the baseline inspection. Addition of the three new drums required modification of the waste stream generation location to include "F-Canyon" as well as FB-line. This is consistent with the companion CH streams. The waste is from a single process/activity.<br>**SR-RH-221H.01:** SRS generated the waste stream primarily by general operational activities and routine maintenance (job control waste) of HBL. Some D&R of the old box line, and less routine maintenance activities also contributed waste. The waste is from a single process/activity. |
| AK-15: Verify that all waste within the waste stream is similar in material and physical form. | **SR-RH-235F.01:** AKSR, Revision 2; D017, M056, P016, P031, P047<br>**SR-RH-FBL.01:** AKSR, Revision 6; C102, M1001<br>**SR-RH-221H.01:** AKSR, Revision 2; M015, M026, M110, M115, P024 | **SR-RH-235F.01:** The waste is mostly job control waste, which is verified by RTR. The waste is similar in material and physical form.<br>**SR-RH-FBL.01:** EPA verified that the waste is of similar material and physical form during the baseline. The three new drums are similar to other waste drums; SRS-CCP revised the WMPs to more accurately bound one of the new drums with cemented $^{241}$Am.<br>**SR-RH-221H.01:** The waste is mostly job control waste and maintenance waste, some from D&R and some solidified liquids. The assigned SCG is S5000. The waste is similar in material and physical form. |
| AK-16: Verify that all waste within the waste stream has similar radiological properties. | **SR-RH-235F.01:** AKSR, Revision 2; D006, D017, D036, D047, D054. M053, M054, M056<br>**SR-RH-FBL.01:** AKSR, Revision 6; C102, M1001<br>**SR-RH-221H.01:** AKSR, Revision 2; C024, C098, C164, D019, D054, D098, M069 | **SR-RH-235F.01:** FAMS had the same primary mission for all operations; therefore, the primary radionuclides are the same for all packaged waste, including the companion CH waste stream. |

| Technical Elements | Objective Evidence | Comments |
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| | | **SR-RH-FBL.01:** EPA verified the radiological properties during the baseline. The three new drums have overall the same radionuclides, with one being high in $^{241}$Am and one high in $^{137}$Cs. SRS-CCP revised the AKSR to explicitly mention these.<br>**SR-RH-221H.01:** The HBL's primary function over the years was to process $^{237}$Np and $^{238}$Pu, but also processed other campaigns. A wide range of radionuclides are possible because the waste from D&R of the old box line contains all the old embedded radionuclides, including Th. |
| AK-17: Verify that waste containers are traceable from retrieval through CCP's EPA-approved characterization process. | IDC database dump 8/19/14<br>**SR-RH-235F.01:** Drum No. SR504231<br>• RTR BDR: SR4RTR0196; NCR-RHSRS-3533-11, Revision 1; SR4RTR0275<br>• DTC BDR: SRSRHDTC11003<br>• M056<br>**SR-RH-FBL.01:** Drum No. SR611464<br>• RTR BDR: SRLBR0120<br>• C102<br>**SR-RH-221H.01:** Drum No. SR545535<br>• RTR BDR: SR4RTR0220; NCR-SRS-0298-08; SRSRTR0226<br>• DTC BDR: SRSRHDTC12001; NCR-RHSRS-0596-13, Revision 1; NCR-RHSRS-0315-14, Revision 2; NCR-RHSRS-1974-12, Revision 1; NCR-RHSRS-0597-13, Revision 1; NCR-RHSRS-0314-14, Revision 1<br>**SR-RH-221H.01:** Drum No. SR522596A<br>• RTR BDR: SRLBR0110<br>• C197 | **SR-RH-235F.01:** The initial RTR of drum No. SR504231 identified the waste as greater than 50% homogenous solid and wrote NCR-RHSRS-3533-11. Upon investigation, SRS-CCP determined that the RTR operator did not have correct training and did not categorize the waste correctly. Therefore, the drum remained in the waste stream.<br>**SR-RH-221H.01:** Drum No. SR545535 had to be remediated for an impenetrable object. The additional NCRs are related to shipping requirements.<br>These drums are traceable from site documentation through SRS-CCP characterization. |
| AK-18: Confirm that CCP-TP-005, Attachment 8, Waste Containers List, is complete and up to date. | **SR-RH-235F.01:** 3/14/12; C104<br>**SR-RH-FBL.01:** 10/23/13; C102<br>**SR-RH-221H.01:** 11/5/12; C197, M169 | The Att. 8 plus the add-container memoranda SDs equal the full waste containers list for each waste stream.<br>**SR-RH-235F.01:** C104 does not contain any memoranda; it is set up in case SRS-CCP identifies any containers to add.<br>**SR-RH-FBL.01:** The add-container memoranda have sufficient information.<br>**SR-RH-221H.01:** M169 includes generator paperwork for |

| Technical Elements | Objective Evidence | Comments |
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| | | the initial 16 containers; C197 contains the add-container memoranda for the other three containers. The add-container memoranda have sufficient information. |
| **Land Withdrawal Act Requirements** | | |
| AK-19: Verify that all of the waste in the waste stream is defense in origin. | **SR-RH-235F.01:** AKSR, Revision 2; C021, D025, D027, D034, D036, D037, D038, D039, D040, D041, D042, U004<br>**SR-RH-FBL.01:** AKSR, Revision 6; C056, D013, D016, D020, D029, D033, D035, D037, D054, D059, D064, D065, D069, D072, D073, D074, D075<br>**SR-RH-221H.01:** AKSR, Revision 2; C091, M021 | The waste streams are defense in origin either by containment of defense-related radiological material or by commingling with this material.<br>**SR-RH-235F.01:** The waste stream includes radionuclides generated from defense nuclear materials production and defense research and development.<br>**SR-RH-FBL.01:** SRS generated the waste in the FB-Line and F-Canyon wherein weapons material production and research and development activities took place.<br>**SR-RH-221H.01:** HBL operations generated the waste stream, which was commingled defense and non-defense. |
| AK-20: Verify that none of the waste in the waste stream is SNF. | **SR-RH-235F.01:** AKSR, Revision 2; D006, D067, D072<br>**SR-RH-FBL.01:** AKSR, Revision 6; D064, D065, D069, M171, M174<br>**SR-RH-221H.01:** AKSR, Revision 2; D052 | **SR-RH-235F.01:** The waste is general laboratory and routine "job control" debris generated in the FAMS and related areas. The waste does not contain irradiated fuel elements, so it does not contain SNF.<br>**SR-RH-FBL.01:** The waste is composed of general debris waste. The waste stream does not contain irradiated fuel elements withdrawn from a reactor or pieces thereof. Therefore, the waste is not SNF.<br>**SR-RH-221H.01:** The waste stream is debris waste associated with HBL. The facility managed SNF, but the debris waste does not contain SNF. |
| AK-21: Verify that none of the waste in the waste stream is HLW. | **SR-RH-235F.01:** AKSR, Revision 2; D006, D067, D072<br>**SR-RH-FBL.01:** AKSR, Revision 6; D064, D065, D069, M171, M174<br>**SR-RH-221H.01:** AKSR, Revision 2; D052 | **SR-RH-235F.01:** The waste is general laboratory and routine "job control" debris generated in the FAMS and related areas. The waste does not contain irradiated fuel elements, and being debris, does not contain HLW.<br>**SR-RH-FBL.01:** The waste is composed of general debris waste. SRS generated these wastes upstream of separation activities; therefore, the waste does not contain HLW.<br>**SR-RH-221H.01:** HLW was generated in H-Canyon, but SRS generated the debris waste stream from activities |

| Technical Elements | Objective Evidence | Comments |
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| | | performed on materials that did not contain fission products (i.e., SRS separated the HLW prior to waste generation). EPA believes that while HLW contamination is possible, it is incidental and. if present, would be secondary contamination on debris. Therefore, the waste is not HLW. |
| **Waste Stream Certification** | | |
| AK-22: Confirm that the certification plan is complete and adequately describes the role of AK in the waste characterization methodology. | **SR-RH-235F.01:** CCP-CP-SRS-562, Revision 0<br>**SR-RH-FBL.01:** CCP-AK-SRS-582, Revision 2<br>**SR-RH-221H.01:** CCP-CP-SRS-602, Revision 0 | EPA reviewed the certification plans for Waste Streams SR-RH-235F.01, SR-RH-FBL.01 and SR-RH-221H.01 and found them to adequately describe the role of AK in waste characterization. See AK-19–AK-21 and AK-28–AK-31 in this checklist for additional information. |
| AK-23: Verify that the WSPF is complete and accurate. | **SR-RH-235F.01:** WSPF, Revision 0<br>**SR-RH-FBL.01:** WSPF, Revision 0<br>**SR-RH-221H.01:** WSPF, Revision 0 | The WSPFs are adequate. |
| AK-24: Confirm that a characterization information summary and summation of aspects are included in the WSPF package and are complete and accurate. | **SR-RH-235F.01:** WSPF, Revision 0; CIS Lot 1; Summation of Aspects<br>**SR-RH-FBL.01:** WSPF, Revision 0; CIS Lot 1; Summation of Aspects<br>**SR-RH-221H.01:** WSPF, Revision 0; CIS Lot 1; Summation of Aspects | A summation of aspects and CIS are attached to each WSPF. Both are complete and adequate. |
| AK-25: Confirm that CCP-TP-005, Attachment 13, CCP Waste Stream Characterization Checklist, is completed for each characterization lot. | **SR-RH-235F.01:** Lot 1<br>**SR-RH-FBL.01:** Lot 2<br>**SR-RH-221H.01:** Lot 1 | **SR-RH-FBL.01:** EPA reviewed the Lot 1 CIS during the baseline inspection.<br>**SR-RH-235F.01 and SR-RH-221H.01:** SRS-CCP SPM made pen-and-ink modifications to the CIS to indicate the use of DTC as a characterization method for determining radionuclides present and other radiological parameters. SRS-CCP said that they removed mention of DTC in an attempt to streamline the checklist; they replaced the DTC reference at EPA's request.<br>The Att. 13s are adequately prepared. |
| AK-26: Confirm that a characterization information summary is adequately completed for each characterization lot. | **SR-RH-235F.01:** CIS Lot 1<br>**SR-RH-FBL.01:** CIS Lot 1, CIS Lot 2<br>**SR-RH-221H.01:** CIS Lot 1 | **SR-RH-FBL.01:** SRS-CCP revised the Lot 2 CIS to correct the identification of NDE characterization method SRS-CCP used on the subject wastes and to add the DTC BDR references to the table correlating the container numbers with characterization BDRs. |

| Technical Elements | Objective Evidence | Comments |
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| | | CCP representatives confirmed that the current practice is to include DTC BDRs in the table correlating the container numbers with characterization BDRs. The version of this table in procedure CCP-TP-002, Revision 26, still indicates that only NDA BDRs are required. However, CCP representatives stated that the table in CCP-TP-002 is an example and they will be including DTC BDRs. |
| AK-27: Confirm that a characterization reconciliation report is adequately completed for each characterization lot. | **SR-RH-235F.01:** CRR Lot 1<br>**SR-RH-FBL.01:** CRR Lot 1, CRR Lot 2<br>**SR-RH-221H.01:** CRR Lot 1 | As part of the revision to CCP-TP-506 mentioned in AK-1 above, the CRR format is significantly revised and is now more streamlined and easier to read. The CRRs reviewed are adequate. |
| **Data Quality Objectives** | | |
| AK-28: Confirm that SRS-CCP has adequately met the DQO for defense waste, HLW and SNF determination. | **SR-RH-235F.01:** CCP-CP-SRS-562, Revision 0<br>**SR-RH-FBL.01:** CCP-AK-SRS-582, Revision 2<br>**SR-RH-221H.01:** CCP-CP-SRS-602, Revision 0 | See AK-19–AK-21. The DQOs for defense waste, HLW, and SNF are addressed through AK for each waste stream and are adequately met. |
| AK-29: Confirm that SRS-CCP has adequately met the DQOs for radioactive properties: TRU waste determination, RH waste determination and activity determination. | **SR-RH-235F.01:** CCP-RC-SRS-561, Revision 2; CCP-CP-SRS-562, Revision 0<br>**SR-RH-FBL.01:** CCP-AK-SRS-581, Revision 1; CCP-AK-SRS-582, Revision 2<br>**SR-RH-221H.01:** CCP-RC-SRS-601, Revision 1; CCP-CP-SRS-602, Revision 0 | SRS-CCP plans to meet the DQOs for TRU waste determination, RH waste determination, and activity determination as follows:<br>DQO for TRU Waste Determination: A DTC method using shielding calculations, coupled with isotopic ratios will be used to determine the nCi/g value for each container for all three waste streams.<br>DQO for RH Waste Determination: The DQO for RH Waste Determination will be met for all three waste streams by survey results which show that each of the containers are greater than 200 mrem/hr.<br>DQO for Activity Determination: DTC is used to calculate the individual radionuclide contribution and the scaling factors/ratios will be determined from ISOCS measurements of the RH drums and certified assay results from CH drums in the companion waste stream. SRS-CCP implemented this approach (or a variant thereof) for all three waste streams.<br>SRS-CCP adequately met the radiological DQOs for each waste stream. |

| Technical Elements | Objective Evidence | Comments |
|---|---|---|
| AK-30: Confirm that SRS-CCP has adequately met the DQOs for physical properties: liquids and physical form. | **SR-RH-235F.01:** CCP-CP-SRS-562, Revision 0; CCP-TP-005, Attachment 6, and associated memorandum dated 2/29/12<br>**SR-RH-FBL.01:** CCP-AK-SRS-582, Revision 2; CCP-TP-005, Attachment 6, and associated memorandum dated 9/13/13<br>**SR-RH-221H.01:** CCP-CP-SRS-602, Revision 0; CCP-TP-005, Attachment 6, and associated memorandum dated 6/30/11 | The Certification Plans for all three waste streams state that SRS-CCP plans to meet the DQOs for physical property determination (liquid occurrence and physical form) by examining the waste using radiography or VE. In practice, 100% of containers will likely undergo RTR. Prohibited items and excess liquids identified during radiography will be remediated.<br>SRS-CCP adequately met the physical property DQOs for each stream. |
| **Tier 2 Reporting** | | |
| AK-31: Verify that SRS-CCP has reported to EPA completion or revision of AKSRs and certification plans. | FY2013 1st Quarter T2 report<br>FY2013 3rd Quarter T2 report<br>FY2013 4th Quarter T2 report<br>FY2014 1st Quarter T2 report<br>FY2014 2nd Quarter T2 report<br>FY2014 3rd Quarter T2 report | SRS-CCP appropriately notified EPA of the availability of the example AKSRs and certification plans cited in this checklist. |
| AK-32: Verify that SRS-CCP has reported to EPA completion or revision of CCP-TP-005 Attachments, including Attachment 4s that reflect the updated AKSR Source Document Reference Lists. | FY2013 3rd Quarter T2 report<br>FY2013 4th Quarter T2 report<br>FY2014 1st Quarter T2 report<br>FY2014 2nd Quarter T2 report<br>FY2014 3rd Quarter T2 report | SRS-CCP generated all three reviewed Att. 4s since EPA's baseline approval of the SRS-CCP RH AK waste characterization program. SRS-CCP did not notify EPA regarding the availability of any CCP-TP-005 attachments, including Att. 4. |
| AK-33: Verify that SRS-CCP has reported to EPA completion or revision of the WSPF, CIS and CRR, including change notices, and the associated documentation. | FY2012 3rd Quarter T2 report<br>FY2013 4th Quarter T2 report<br>FY2014 1st Quarter T2 report<br>FY2014 2nd Quarter T2 report<br>FY2014 3rd Quarter T2 report | SRS-CCP appropriately notified EPA of the availability of the example WSPFs cited in this checklist. |
| AK-34: Verify that SRS-CCP has reported to EPA completion or revision of AK accuracy reports annually, at a minimum. | FY2012 3rd Quarter T2 report<br>FY2014 1st Quarter T2 report<br>FY2014 2nd Quarter T2 report<br>FY2014 3rd Quarter T2 report | SRS-CCP completed AK accuracy reports for all active waste streams in the 3rd quarter of FY2014, but did not notify EPA of their availability. |
| AK-35: Verify that SRS-CCP has reported to EPA completion or revision of DRs and nonconformance reports. | N/A | SRS-CCP has not generated any AK-related NCRs or DRs since EPA's baseline approval of the SRS-CCP RH AK waste characterization program. |
| AK-36: Verify that SRS-CCP has notified EPA upon characterization of any new SCG S5000 RH waste | T1 change requests for EPA approval of radiological characterization of Waste Stream SR- | SRS-CCP has notified EPA regarding characterization of any new SCG S5000 RH waste stream with a companion |

| Technical Elements | Objective Evidence | Comments |
|---|---|---|
| stream that does have a companion CH waste stream. | RH-235F.01 and Waste Stream SR-RH-221H.01 | CH waste stream as part of the T1 change request for the radiological characterization of said waste stream. |
| AK-37: Verify that SRS-CCP has reported to EPA completion or revision of add-container memoranda. | FY2013 4th Quarter T2 report<br>FY2014 1st Quarter T2 report<br>FY2014 2nd Quarter T2 report<br>FY2014 3rd Quarter T2 report | SRS-CCP notified EPA regarding the availability of an add-container memorandum for Waste Stream SR-RH-235F.01. However, the SD referred to in the notification does not include any memoranda and was set up in anticipation of future use. SRS-CCP did not notify EPA regarding availability of add-container memoranda for either of the other waste streams examined. |

## ATTACHMENT E: NONDESTRUCTIVE ASSAY BOX COUNTER CONTINUED COMPLIANCE INSPECTION CHECKLIST:

## BOX SEGMENTED GAMMA SCANNER (BSGS) AND BOX NEUTRON ASSAY SYSTEM (BNAS)

| Technical Elements | Objective Evidence |
|---|---|
| Confirm the NDA system is the NABC, its location and number. | This is the same NDA system as EPA had evaluated and approved previously, located in Building 643-43E in E Area of the Savannah River Site near Aiken, South Carolina; there have been no changes to the system or its location. |
| Confirm any changes to the NABC. | There were no changes to the gamma (BSGS) or neutron (BNAS) aspects of the NABC. |
| Describe the NABC. | The BSGS consists of four high purity Broad Energy Germanium (BEGe) germanium detectors mounted opposite each other; the detectors determine the Pu isotopic content of waste containers directly, or use MGA, MGAU, FRAM or AK for isotopic determination. The BSGS has two $^{60}$Co transmission sources and directly opposite the sources are two thallium-drifted sodium iodide [NaI(Tl)] gamma detectors. There are two BSGS assay positions: Near-Field Geometry (NFG) and Far-Field Geometry (FFG), also called the Five-Foot Setback or Standoff geometry. The BSGS is unchanged.<br><br>The BNAS consists of 320 $^{3}$He proportional tubes in a polyethylene liner of the assay enclosure to determine the $^{240}$Pu effective mass ($^{240}Pu_{EFF}$), incorporating a $^{252}$Cf standard to perform the Add-A-Source (AAS) correction and serve as the reference standard for the system's daily performance check. Passive neutron values are expressed in terms of $^{240}Pu_{EFF}$. There is no difference for the NFG and FFG for the BNAS. The BNAS is unchanged. |
| Identify the measurement conditions for the NABC:<br>Container(s) type:<br>Assay Mode (BNAS & BSGS):<br>BSGS Counting Mode: Attenuated or Sum-of-Segments:<br>WG and/or HS Pu:<br>Attenuators: Filter(s):<br>BSGS Dead Time Criterion: Assay Time<br>De-facto LLD of 300 nCi/g:<br>Sort TRU/Non TRU:<br>Isotopic Determination: | Container(s) type: 55-gallon drums, SWBs and SLB-2's<br>Assay Mode (Neutron and/or Gamma): Neutron data used with NFG or FFG gamma values or AK-derived isotopics (see Isotopics, below)<br>BSGS Counting Mode: Attenuated or Sum-of-Segments: Summed Spectrum Mode only<br>BNAS Counting Mode: $^{240}Pu_{EFF}$ with a $^{252}$Cf AAS correction<br>WG and/or HS Pu: Individual contributions from both as well as mixtures are routine<br>BSGS Attenuators: 20-minute counts with attenuators; 60-minute counts without attenuators<br>BSGS Filter(s): 0.14 mm Cd, 0.5mm Cu<br>BSGS Dead Time Criterion: No specific criterion, depends on spectral quality, generally ~60%; dead time is the limit but acceptability is determined by the EA on a case-by-case basis<br>Assay Time: 20-minute counts with attenuators, 60-minute counts without attenuators<br>De-facto LLD of 300 nCi/g: As described in CCP-SRS-SRBC003<br>Sort TRU/Non-TRU: Not always possible but these containers are typically well above 100 nCi/g<br>Isotopics: FRAM, MGA or Approved AK |

| Technical Elements | Objective Evidence |
|---|---|
| Identify the number of waste containers the NABC has assayed during the last year. | The last day of routine assays for the NABC was March 12, 2014, as documented in the BSGS Operational Logbook on that date. The NABC has not performed routine assays since then; the assays performed for this inspection were demonstration only and were not used for WIPP certification purposes. |
| Identify all operational modes of the NABC with respect to container type, count time, use of filters for BSGS and geometry. | **Container Type** / **Count Time** / **Filtered/Unfiltered** / **Near Field/Far Field**<br>55-gallon Drum / 60 / Unfiltered / NFG<br>55-gallon Drum, High $^{137}$Cs / 60 / Unfiltered / FFG<br>55-gallon Drum, High $^{238}$Pu / 20 / Filtered / FFG<br>SWB / 60 / Unfiltered / NFG<br>SWB, High $^{137}$Cs / 60 / Unfiltered / FFG<br>SWB, High $^{238}$Pu / 20 / Filtered / FFG<br>SLB-2 / 60 / Unfiltered / NFG<br>SLB-2 / 60 / Unfiltered / FFG |
| Confirm that the NABC is able to report quantitative values and uncertainties for $^{238}$Pu, $^{239}$Pu, $^{240}$Pu, $^{242}$Pu, $^{241}$Am, $^{233}$U, $^{234}$U, $^{238}$U, $^{90}$Sr and $^{137}$Cs. | The NABC is able to report quantitative values and uncertainties for $^{238}$Pu, $^{239}$Pu, $^{240}$Pu, $^{242}$Pu, $^{241}$Am, $^{233}$U, $^{234}$U, $^{238}$U, $^{90}$Sr and $^{137}$Cs. |
| Identify any sample conditions, interferences, radionuclides or other aspects that are potentially problematic or require specific corrections for the NABC. | There are many, e.g., presence of $^{244}$Cm, high concentrations of $^{237}$Np, $^{241}$Am, $^{137}$Cs or $^{238}$Pu. The SRS-CCP Expert Analyst (EA) reviews all NABC data. The EA (Dan Remington) demonstrated ability to evaluate complex spectra adequately. |
| Identify the numbers and names of specific SRS waste streams that the NABC has routinely assayed. | SRS-CCP provided a list of waste streams listed according to their AK designation: AK Nos. 2, 4, 6 and 7, containing WG Pu, HS Pu and WG/HS Pu mixtures. |
| Determine if the HPGe and NaI detectors used for the BSGS aspects of the NABC are the same for NFG and FFG assays. Where are the detectors' attributes described? | The HPGe detectors are unchanged; the only difference is their proximity to the sample, i.e., they are 5 feet further away in the FFG relative to the NFG. The detectors' attributes are described in CCP-SRS-SRBC003 and "Calibration of the Savannah River Box Counter for Far-Field 5-Foot Stand-Off Arrangement for 55-gallon (208 Liter) Drum Containers." Detectors are No. 1 (BE382011058149), No. 2 (BE382011058149), No. 3 (BE382011058149) and No. 4 (BE382011058152). The NaI detectors are also the same, Nos. 127B102/5M-EI-NEG, as are the $^{60}$Co transmission sources, ~250 mCi as of May 5, 2005. No changes. |
| Identify the method(s) used to derive the isotopic contribution for the unmeasured radionuclides, e.g., MGA, FRAM or other technique as a result of the NABC.<br><br>Identify any changes to the method or details of the TMU calculation of the NABC. | Due to the spectra complexities, MGA is typically not used but FRAM is often helpful. There is considerable spectral interpretation by the EA and this is the most important aspect of deriving isotopics for BSGS assays.<br><br>The TMU derivation is unchanged for the NFG and FFG. The input values vary with each assay, as does the specific TMU value, potentially. |

## ATTACHMENT F.1: REPLICATE TESTING DATA FOR DRUM SR515955 – NONDESTRUCTIVE ASSAY BOX COUNTER

Instrument: NABC
Drum: SR515955

| Quantity of Interest | Original Measurement | | | Replicate #1 | | | Replicate #2 | | |
|---|---|---|---|---|---|---|---|---|---|
| | Reported Value | Absolute Uncertainty | Relative Uncertainty | Reported Value | Absolute Uncertainty | Relative Uncertainty | Reported Value | Absolute Uncertainty | Relative Uncertainty |
| $^{233}$U Activity (Ci) | | N/A | | | N/A | | | N/A | |
| $^{234}$U Activity (Ci) | | N/A | | | N/A | | | N/A | |
| $^{238}$U Activity (Ci) | | N/A | | | N/A | | | N/A | |
| $^{238}$Pu Activity (Ci) | 1.18E-01 | 9.46E-03 | 8.02E-02 | 1.27E-01 | 1.10E-02 | 8.66E-02 | 1.36E-01 | 1.25E-02 | 9.19E-02 |
| $^{239}$Pu Activity (Ci) | 1.16E+00 | 6.74E-02 | 5.81E-02 | 1.16E+00 | 6.59E-02 | 5.68E-02 | 1.14E+00 | 6.51E-02 | 5.71E-02 |
| $^{240}$Pu Activity (Ci) | 4.51E-01 | 2.74E-02 | 6.08E-02 | 4.75E-01 | 2.87E-02 | 6.04E-02 | 4.99E-01 | 3.06E-02 | 6.13E-02 |
| $^{242}$Pu Activity (Ci) | 5.23E-05 | 6.05E-06 | 1.16E-01 | 6.91E-05 | 7.95E-06 | 1.15E-01 | 5.56E-05 | 8.70E-06 | 1.56E-01 |
| $^{241}$Am Activity (Ci) | 8.10E-01 | 4.76E-02 | 5.88E-02 | 8.18E-01 | 4.73E-02 | 5.78E-02 | 8.42E-01 | 4.89E-02 | 5.81E-02 |
| $^{90}$Sr Activity (Ci) | 2.09E-06 | 1.38E-07 | 6.60E-02 | 1.75E-06 | 1.26E-07 | 7.20E-02 | 1.93E-06 | 1.34E-07 | 6.94E-02 |
| $^{137}$Cs Activity (Ci) | 2.09E-06 | 1.38E-07 | 6.60E-02 | 1.75E-06 | 1.26E-07 | 7.20E-02 | 1.93E-06 | 1.34E-07 | 6.94E-02 |
| $^{237}$Np Activity (Ci) | 6.38E-06 | 3.53E-07 | 5.53E-02 | 6.52E-06 | 3.65E-07 | 5.60E-02 | 6.88E-06 | 3.81E-07 | 6.38E-06 |
| TAAC (nCi/g) | 3.85E+05 | 1.32E+04 | 3.43E-02 | 3.90E+05 | 1.31E+04 | 3.36E-02 | 3.97E+05 | 1.33E+04 | 3.35E-02 |

| Quantity of Interest | Replicate #3 | | | Replicate #4 | | | Replicate #5 | | |
|---|---|---|---|---|---|---|---|---|---|
| | Reported Value | Absolute Uncertainty | Relative Uncertainty | Reported Value | Absolute Uncertainty | Relative Uncertainty | Reported Value | Absolute Uncertainty | Relative Uncertainty |
| $^{233}$U Activity (Ci) | | N/A | | | N/A | | | N/A | |
| $^{234}$U Activity (Ci) | | N/A | | | N/A | | | N/A | |
| $^{238}$U Activity (Ci) | | N/A | | | N/A | | | N/A | |
| $^{238}$Pu Activity (Ci) | 1.13E-01 | 1.04E-02 | 9.20E-02 | 1.11E-01 | 1.07E-02 | 9.64E-02 | 1.13E-01 | 9.55E-03 | 8.45E-02 |
| $^{239}$Pu Activity (Ci) | 1.15E+00 | 6.52E-02 | 5.67E-02 | 1.16E+00 | 6.62E-02 | 5.71E-02 | 1.14E+00 | 6.50E-02 | 5.70E-02 |
| $^{240}$Pu Activity (Ci) | 4.61E-01 | 2.79E-02 | 6.05E-02 | 4.89E-01 | 2.96E-02 | 6.05E-02 | 4.74E-01 | 2.82E-02 | 5.95E-02 |
| $^{242}$Pu Activity (Ci) | 6.49E-05 | 7.47E-06 | 1.15E-01 | 6.72E-05 | 7.74E-06 | 1.15E-01 | 6.66E-05 | 7.66E-06 | 1.15E-01 |
| $^{241}$Am Activity (Ci) | 8.23E-01 | 4.75E-02 | 5.77E-02 | 8.45E-01 | 4.88E-02 | 5.78E-02 | 8.28E-01 | 4.77E-02 | 5.76E-02 |
| $^{90}$Sr Activity (Ci) | 1.87E-06 | 1.31E-07 | 7.01E-02 | 2.12E-06 | 1.40E-07 | 6.60E-02 | 2.15E-06 | 1.42E-07 | 6.60E-02 |
| $^{137}$Cs Activity (Ci) | 1.87E-06 | 1.31E-07 | 7.01E-02 | 2.12E-06 | 1.40E-07 | 6.60E-02 | 2.15E-06 | 1.42E-07 | 6.60E-02 |
| $^{237}$Np Activity (Ci) | 6.58E-06 | 3.67E-07 | 5.58E-02 | 7.52E-06 | 4.12E-07 | 5.48E-02 | 6.70E-06 | 3.72E-07 | 5.55E-02 |
| TAAC (nCi/g) | 3.85E+05 | 1.30E+04 | 3.38E-02 | 3.95E+05 | 1.33E+04 | 3.37E-02 | 3.87E+05 | 1.30E+04 | 3.36E-02 |

| Quantity of Interest | Original Measurement | | Sample Mean | Sample Standard Deviation | Relative Standard Deviation | $\chi^2$ | Pr($x$ <\|$\chi^2$\|) |
|---|---|---|---|---|---|---|---|
| | Reported Value | Absolute Uncertainty | | | | | |
| $^{233}$U Activity (Ci) | 0.00E+00 | N/A | N/A | N/A | N/A | N/A | N/A |
| $^{234}$U Activity (Ci) | 0.00E+00 | N/A | N/A | N/A | N/A | N/A | N/A |
| $^{238}$U Activity (Ci) | 0.00E+00 | N/A | N/A | N/A | N/A | N/A | N/A |
| $^{238}$Pu Activity (Ci) | 1.18E-01 | 9.46E-03 | 1.20E-01 | 1.10E-02 | 9.17E-02 | 5.41E+00 | 2.48E-01 |
| $^{239}$Pu Activity (Ci) | 1.16E+00 | 6.74E-02 | 1.15E+00 | 1.00E-02 | 8.70E-03 | 8.81E-02 | 9.99E-01 |
| $^{240}$Pu Activity (Ci) | 4.51E-01 | 2.74E-02 | 4.80E-01 | 1.47E-02 | 3.06E-02 | 1.15E+00 | 8.86E-01 |
| $^{242}$Pu Activity (Ci) | 5.23E-05 | 6.05E-06 | 6.47E-05 | 5.29E-06 | 8.18E-02 | 3.06E+00 | 5.48E-01 |
| $^{241}$Am Activity (Ci) | 8.10E-01 | 4.76E-02 | 8.31E-01 | 1.18E-02 | 1.42E-02 | 2.47E-01 | 9.93E-01 |
| $^{90}$Sr Activity (Ci) | 2.09E-06 | 1.38E-07 | 1.96E-06 | 1.69E-07 | 8.62E-02 | 6.02E+00 | 1.97E-01 |
| $^{137}$Cs Activity (Ci) | 2.09E-06 | 1.38E-07 | 1.96E-06 | 1.69E-07 | 8.62E-02 | 6.02E+00 | 1.97E-01 |
| $^{237}$Np Activity (Ci) | 6.38E-06 | 3.53E-07 | 6.84E-06 | 4.04E-07 | 5.91E-02 | 5.25E+00 | 2.63E-01 |
| TAAC (nCi/g) | 3.85E+05 | 1.32E+04 | 3.91E+05 | 5.12E+03 | 1.31E-02 | 6.01E-01 | 9.63E-01 |

| Quantity of Interest | $t$ | Pr($x$ <\|$t$\|) | $\chi^2$ Test | $t$ Test |
|---|---|---|---|---|
| $^{233}$U Activity (Ci) | N/A | N/A | Not Applicable | Not Applicable |
| $^{234}$U Activity (Ci) | N/A | N/A | Not Applicable | Not Applicable |
| $^{238}$U Activity (Ci) | N/A | N/A | Not Applicable | Not Applicable |
| $^{238}$Pu Activity (Ci) | -1.66E-01 | 8.76E-01 | Not Significant | Not Significant |
| $^{239}$Pu Activity (Ci) | 9.13E-01 | 4.13E-01 | Not Significant | Not Significant |
| $^{240}$Pu Activity (Ci) | -1.78E+00 | 1.50E-01 | Not Significant | Not Significant |
| $^{242}$Pu Activity (Ci) | -2.14E+00 | 9.96E-02 | Not Significant | Not Significant |
| $^{241}$Am Activity (Ci) | -1.64E+00 | 1.77E-01 | Not Significant | Not Significant |
| $^{90}$Sr Activity (Ci) | 6.79E-01 | 5.34E-01 | Not Significant | Not Significant |
| $^{137}$Cs Activity (Ci) | 6.79E-01 | 5.34E-01 | Not Significant | Not Significant |
| $^{237}$Np Activity (Ci) | -1.04E+00 | 3.58E-01 | Not Significant | Not Significant |
| TAAC (nCi/g) | -1.03E+00 | 3.59E-01 | Not Significant | Not Significant |

## ATTACHMENT F.2: REPLICATE TESTING DATA FOR DRUM SR21524421 – NONDESTRUCTIVE ASSAY BOX COUNTER

Instrument: NABC
Drum: SR21524421

| Quantity of Interest | Original Measurement | | | Replicate #1 | | | Replicate #2 | | |
|---|---|---|---|---|---|---|---|---|---|
| | Reported Value | Absolute Uncertainty | Relative Uncertainty | Reported Value | Absolute Uncertainty | Relative Uncertainty | Reported Value | Absolute Uncertainty | Relative Uncertainty |
| $^{233}$U Activity (Ci) | | N/A | | | N/A | | | N/A | |
| $^{234}$U Activity (Ci) | 1.75E-03 | 9.19E-05 | 5.25E-02 | 1.70E-03 | 8.95E-05 | 5.26E-02 | 1.66E-03 | 9.45E-05 | 5.69E-02 |
| $^{238}$U Activity (Ci) | | N/A | | | N/A | | | N/A | |
| $^{238}$Pu Activity (Ci) | 9.81E+00 | 1.14E+00 | 1.16E-01 | 9.51E+00 | 1.10E+00 | 1.16E-01 | 9.28E+00 | 1.10E+00 | 1.19E-01 |
| $^{239}$Pu Activity (Ci) | 7.16E-03 | 1.31E-03 | 1.83E-01 | 7.02E-03 | 1.28E-03 | 1.82E-01 | 6.85E-03 | 1.26E-03 | 1.84E-01 |
| $^{240}$Pu Activity (Ci) | 3.83E-03 | 7.01E-04 | 1.83E-01 | 3.76E-03 | 6.89E-04 | 1.83E-01 | 3.67E-03 | 6.77E-04 | 1.84E-01 |
| $^{242}$Pu Activity (Ci) | 5.75E-06 | 1.05E-06 | 1.83E-01 | 5.70E-06 | 1.04E-06 | 1.82E-01 | 5.56E-06 | 1.02E-06 | 1.83E-01 |
| $^{241}$Am Activity (Ci) | | N/A | | | N/A | | | N/A | |
| $^{90}$Sr Activity (Ci) | 5.05E-07 | 4.20E-08 | 8.32E-02 | 4.94E-07 | 4.36E-08 | 8.83E-02 | 5.18E-07 | 4.47E-08 | 8.63E-02 |
| $^{137}$Cs Activity (Ci) | 5.05E-07 | 4.20E-08 | 8.32E-02 | 4.94E-07 | 4.36E-08 | 8.83E-02 | 5.18E-07 | 4.47E-08 | 8.63E-02 |
| $^{232}$U Activity (Ci) | 8.32E-06 | 4.30E-07 | 5.17E-02 | 8.46E-06 | 4.70E-07 | 5.56E-02 | 8.39E-06 | 7.15E-07 | 8.52E-02 |
| $^{237}$Np Activity (Ci) | 1.29E-04 | 6.51E-06 | 5.05E-02 | 1.28E-04 | 6.46E-06 | 5.05E-02 | 1.29E-04 | 6.54E-06 | 5.07E-02 |
| TAAC (nCi/g) | 5.42E+04 | 6.29E+03 | 1.16E-01 | 5.26E+04 | 6.10E+03 | 1.16E-01 | 5.13E+04 | 6.06E+03 | 1.18E-01 |

| Quantity of Interest | Replicate #3 | | | Replicate #4 | | | Replicate #5 | | |
|---|---|---|---|---|---|---|---|---|---|
| | Reported Value | Absolute Uncertainty | Relative Uncertainty | Reported Value | Absolute Uncertainty | Relative Uncertainty | Reported Value | Absolute Uncertainty | Relative Uncertainty |
| $^{233}$U Activity (Ci) | | N/A | | | N/A | | | N/A | |
| $^{234}$U Activity (Ci) | 1.74E-03 | 1.01E-04 | 5.80E-02 | 1.67E-03 | 9.31E-05 | 5.57E-02 | 1.72E-03 | 1.01E-04 | 5.87E-02 |
| $^{238}$U Activity (Ci) | | N/A | | | N/A | | | N/A | |
| $^{238}$Pu Activity (Ci) | 9.70E+00 | 1.15E+00 | 1.19E-01 | 9.31E+00 | 1.09E+00 | 1.17E-01 | 9.62E+00 | 1.14E+00 | 1.19E-01 |
| $^{239}$Pu Activity (Ci) | 7.17E-03 | 1.32E-03 | 1.84E-01 | 6.87E-03 | 1.26E-03 | 1.83E-01 | 7.11E-03 | 1.31E-03 | 1.84E-01 |
| $^{240}$Pu Activity (Ci) | 3.84E-03 | 7.10E-04 | 1.85E-01 | 3.68E-03 | 6.78E-04 | 1.84E-01 | 3.81E-03 | 7.04E-04 | 1.85E-01 |
| $^{242}$Pu Activity (Ci) | 5.82E-06 | 1.07E-06 | 1.84E-01 | 5.58E-06 | 1.03E-06 | 1.85E-01 | 5.77E-06 | 1.07E-06 | 1.85E-01 |
| $^{241}$Am Activity (Ci) | | N/A | | | N/A | | | N/A | |
| $^{90}$Sr Activity (Ci) | 5.09E-07 | 4.56E-08 | 8.96E-02 | 5.25E-07 | 4.50E-08 | 8.57E-02 | 5.51E-07 | 4.69E-08 | 8.51E-02 |
| $^{137}$Cs Activity (Ci) | 5.09E-07 | 4.56E-08 | 8.96E-02 | 5.25E-07 | 4.50E-08 | 8.57E-02 | 5.51E-07 | 4.69E-08 | 8.51E-02 |
| $^{232}$U Activity (Ci) | 8.45E-06 | 7.54E-07 | 8.92E-02 | 7.64E-06 | 4.07E-07 | 5.33E-02 | 8.74E-06 | 1.11E-06 | 1.27E-01 |
| $^{237}$Np Activity (Ci) | 1.28E-04 | 6.46E-06 | 5.05E-02 | 1.26E-04 | 6.40E-06 | 5.08E-02 | 1.26E-04 | 6.40E-06 | 5.08E-02 |
| TAAC (nCi/g) | 5.37E+04 | 6.37E+03 | 1.19E-01 | 5.15E+04 | 6.05E+03 | 1.17E-01 | 5.32E+04 | 6.32E+03 | 1.19E-01 |

| Quantity of Interest | Original Measurement | | Sample Mean | Sample Standard Deviation | Relative Standard Deviation | $\chi^2$ | Pr($x$ <\|$\chi^2$\|) |
|---|---|---|---|---|---|---|---|
| | Reported Value | Absolute Uncertainty | | | | | |
| $^{233}$U Activity (Ci) | 0.00E+00 | N/A | N/A | N/A | N/A | N/A | N/A |
| $^{234}$U Activity (Ci) | 1.75E-03 | 9.19E-05 | 1.70E-03 | 3.35E-05 | 1.97E-02 | 5.30E-01 | 9.70E-01 |
| $^{238}$U Activity (Ci) | 0.00E+00 | N/A | N/A | N/A | N/A | N/A | N/A |
| $^{238}$Pu Activity (Ci) | 9.81E+00 | 1.14E+00 | 9.48E+00 | 1.86E-01 | 1.96E-02 | 1.06E-01 | 9.99E-01 |
| $^{239}$Pu Activity (Ci) | 7.16E-03 | 1.31E-03 | 7.00E-03 | 1.42E-04 | 2.03E-02 | 4.70E-02 | 1.00E+00 |
| $^{240}$Pu Activity (Ci) | 3.83E-03 | 7.01E-04 | 3.75E-03 | 7.60E-05 | 2.02E-02 | 4.70E-02 | 1.00E+00 |
| $^{242}$Pu Activity (Ci) | 5.75E-06 | 1.05E-06 | 5.69E-06 | 1.14E-07 | 2.01E-02 | 4.75E-02 | 1.00E+00 |
| $^{241}$Am Activity (Ci) | 0.00E+00 | N/A | N/A | N/A | N/A | N/A | N/A |
| $^{90}$Sr Activity (Ci) | 5.05E-07 | 4.20E-08 | 5.19E-07 | 2.11E-08 | 4.07E-02 | 1.01E+00 | 9.08E-01 |
| $^{137}$Cs Activity (Ci) | 5.05E-07 | 4.20E-08 | 5.19E-07 | 2.11E-08 | 4.07E-02 | 1.01E+00 | 9.08E-01 |
| $^{232}$U Activity (Ci) | 8.32E-06 | 4.30E-07 | 8.34E-06 | 4.12E-07 | 4.94E-02 | 3.67E+00 | 4.52E-01 |
| $^{237}$Np Activity (Ci) | 1.29E-04 | 6.51E-06 | 1.27E-04 | 1.34E-06 | 1.05E-02 | 1.70E-01 | 9.97E-01 |
| TAAC (nCi/g) | 5.42E+04 | 6.29E+03 | 5.25E+04 | 1.05E+03 | 1.99E-02 | 1.11E-01 | 9.99E-01 |

| Quantity of Interest | $t$ | Pr($x$ <\|$t$\|) | $\chi^2$Test | $t$ Test |
|---|---|---|---|---|
| $^{233}$U Activity (Ci) | N/A | N/A | Not Applicable | Not Applicable |
| $^{234}$U Activity (Ci) | 1.42E+00 | 2.29E-01 | Not Significant | Not Significant |
| $^{238}$U Activity (Ci) | N/A | N/A | Not Applicable | Not Applicable |
| $^{238}$Pu Activity (Ci) | 1.60E+00 | 1.84E-01 | Not Significant | Not Significant |
| $^{239}$Pu Activity (Ci) | 1.00E+00 | 3.73E-01 | Not Significant | Not Significant |
| $^{240}$Pu Activity (Ci) | 9.37E-01 | 4.02E-01 | Not Significant | Not Significant |
| $^{242}$Pu Activity (Ci) | 5.11E-01 | 6.36E-01 | Not Significant | Not Significant |
| $^{241}$Am Activity (Ci) | N/A | N/A | Not Applicable | Not Applicable |
| $^{90}$Sr Activity (Ci) | -6.22E-01 | 5.67E-01 | Not Significant | Not Significant |
| $^{137}$Cs Activity (Ci) | -6.22E-01 | 5.67E-01 | Not Significant | Not Significant |
| $^{232}$U Activity (Ci) | -3.55E-02 | 9.73E-01 | Not Significant | Not Significant |
| $^{237}$Np Activity (Ci) | 1.09E+00 | 3.38E-01 | Not Significant | Not Significant |
| TAAC (nCi/g) | 1.52E+00 | 2.03E-01 | Not Significant | Not Significant |

## ATTACHMENT G: DOSE-TO-CURIE CONTINUED COMPLIANCE INSPECTION CHECKLIST

**EPA Inspectors Present:** Patrick Kelly and Ed Feltcorn

**Location of DTC:** DTC Alcove, Pad 4 in E Area at SRS

**Location of Waste Storage:** Not Applicable

**CCP-TP-504 Revision:** Revision 16, April 16, 2014

**Operators and Training Renewal Due:**

| | | |
|---|---|---|
| Todd Shepley | DTC Operator/ITR | Due 4/2015 |
| Tim Carlton | DTC Operator/ITR | Due 4/2015 |
| Ron Whitson | DTC Operator/ITR | Due 5/2016 |
| Mike Schneider | DTC Operator/ITR | Due 4/2015 |

All DTC operators listed in the logbook have current training

**Scale No:** LFT-SCL-001, Weightronix W1127, SN 005197

**Scale Calibration Due Date:** August 6, 2015

**Instrument No:** 020552

**Instrument Calibration Due Date:** NA

**Probe No.:** XC0607

**Probe Calibration/Due Date:** October 28, 2014

**Probe Range:** Low Range: 10 µR/hr – 800 mR/h; High Range: 800 mR/hr – 1,000 R/hr

**DTC Source Range:** Low Range 7.56 – 9.44 mR/hr; High Range; 2250 – 3370 mR/hr

**Operator Aide(s) Used:** None observed

**BDR No:** None assigned, SRS-CCP performed DTC as a demonstration only

**Packaging Configuration:** 55-gallon drum

**Container No:** SR522331

**Container Gross Wt:** 67.0 kg

**BKG:** 0.037 mR/h

**Dose Rate @ 0º:** 0.32 mR/h

**Dose Rate @ 90º:** 0.31 mR/h

**Dose Rate @ 180º:** 0.68 mR/h

**Dose Rate @ 270º**: 0.66 mR/h

**Highest measured Dose Rate >3 x BKG:** Yes

**Dose Rate Average:** 0.49 mR/h

**Estimated Contact Dose Rate:** Assumed to be >200 mR/h

# ATTACHMENT H: REAL-TIME RADIOGRAPHY CONTINUED COMPLIANCE INSPECTION CHECKLIST

**EPA Inspection No.: SRS-CC-2014** **Inspection Date: August 20-21, 2014; October 15, 2014**

| Technical Elements | Objective Evidence | Comments |
|---|---|---|
| RTR-1: Site procedures identify required training and qualifications for RTR personnel. | Inventory sheets for RTR container Nos. NDE-TEST-17, NDE-TEST-19, NDE-TEST-23, NDE-TRAINING-28, NDE-TRAINING-06, and NDE-TRAINING-27<br>A/V recordings of selected operator TEST and TRAINING container examinations<br>Training Container Evaluation Data Sheets for various RTR operators<br>Qualification Cards for selected RTR personnel<br>LOQI for RTR operators dated 6/27/2014<br>SRS NDE Personnel Waste Streams Qualified List, dated 6/27/2014<br>CCP-TP-028, Revision 8<br>CCP-QP-002, Revision 36 | At the time of the inspection there were two trained and qualified RTR operator/SMEs at the site. EPA reviewed the Qualification Cards and other training records for these RTR personnel. The records reviewed included training/test container DVDs and evaluation sheets. EPA determined that the training records were complete and demonstrated that qualified operators were performing the RTR examinations. |
| RTR-2: Site procedures provide complete instructions for operators to perform the RTR examination and completion of the associated documentation. | CH RTR BDR Nos. SRLBR0115, SR4RTR0271, SR4RTR0363 and SR4RTR0364<br>A/V recordings for selected containers from the above CH BDRs<br>RH RTR BDR Nos. SRLBR0098, SRLBR0120 and SR4RTR0248<br>A/V recordings for selected containers from the above RH BDRs<br>CCP-TP-053 | EPA observed the RTR evolution for container No. 773A120021 from BDR No. SR4RTR0365. The operator properly examined the container's contents and entered characterization data into the electronic data sheet. |
| RTR-3: The RTR procedures require an image quality check to be performed. | CH RTR BDR Nos. SRLBR0115, SR4RTR0271, SR4RTR0363 and SR4RTR0364<br>A/V recordings for selected containers from the above CH BDRs<br>RH RTR BDR Nos. SRLBR0098, SRLBR0120 and SR4RTR0248<br>A/V recordings for selected containers from the above RH BDRs<br>CCP-TP-053, Revision 14 | The operator had successfully completed the image quality check prior to EPA's arrival and the demonstration provided commenced at the start of the examination. EPA verified performance of an image quality check by review of BDRs. |
| RTR-4: The procedure allows the operator to adjust the RTR to accommodate the physical properties of the waste and waste containers | CH RTR BDR Nos. SRLBR0115, SR4RTR0271, SR4RTR0363 and SR4RTR0364<br>A/V recordings for selected containers from the above CH BDRs<br>RH RTR BDR Nos. SRLBR0098, SRLBR0120 and | The operator verified the WMC and that the waste matched the waste stream description for container No. 773A120021 from BDR No. SR4RTR0365. |

| Technical Elements | Objective Evidence | Comments |
|---|---|---|
| likely to be encountered at the site. | SR4RTR0248<br>A/V recordings for selected containers from the above RH BDRs<br>CCP-TP-053, Revision 14<br>CCP-TP-508, Revision 9 | |
| RTR-5: Data records are of sufficiently high quality for complete review. | CH RTR BDR Nos. SRLBR0115, SR4RTR0271, SR4RTR0363 and SR4RTR0364<br>A/V recordings for selected containers from the above CH BDRs<br>RH RTR BDR Nos. SRLBR0098, SRLBR0120 and SR4RTR0248<br>A/V recordings for selected containers from the above RH BDRs<br>CCP-TP-053, Revision 14 | EPA reviewed selected BDRs to verify that A/V recordings were of sufficient quality to allow for a detailed identification of waste items. EPA also verified that the A/V and written records were consistent. |
| RTR-6: There is a procedure for determining whether the waste matches the waste stream description and WMC, and for determining WMPs and weights. | CH RTR BDR Nos. SRLBR0115, SR4RTR0271, SR4RTR0363 and SR4RTR0364<br>A/V recordings for selected containers from the above CH BDRs<br>RH RTR BDR Nos. SRLBR0098, SRLBR0120 and SR4RTR0248<br>A/V recordings for selected containers from the above RH BDRs<br>CCP-TP-053, Revision 14<br>CCP-TP-508, Revision 9 | EPA observed RTR operations at the SRS site on October 15, 2014.The operator performed the RTR process as written in CCP-TP-053 and the records generated were completed as required.<br>SRS-CCP also provided A/V and written records for EPA's review. The BDRs reviewed were complete and signed by the RTR operator. |
| RTR-7: The RTR procedure provides instructions for identifying prohibited items and for processing drums containing prohibited items. | CH RTR BDR Nos. SRLBR0115, SR4RTR0271, SR4RTR0363 and SR4RTR0364<br>A/V recordings for selected containers from the above CH BDRs<br>RH RTR BDR Nos. SRLBR0098, SRLBR0120 and SR4RTR0248<br>A/V recordings for selected containers from the above RH BDRs<br>CCP-TP-053, Revision 14 | The operator did not identify any prohibited items in the container during the RTR demonstration. The EPA inspectors also reviewed selected BDRs to ensure that operators verify the absence of liquids in the containers examined.<br>NCRs had been initiated as required by the RTR personnel. These NCRs were generated in response to waste not meeting the Waste Stream Description or WMC (NCR-RHSRS-0687-13) and the presence of a lead liner (NCR-SRS-0623-13. |
| RTR-8: RTR procedures include the required QC examinations, evaluation accuracy and reproducibility of the RTR process. | CH RTR BDR Nos. SRLBR0115, SR4RTR0271, SR4RTR0363 and SR4RTR0364<br>A/V recordings for selected containers from the above CH BDRs<br>RH RTR BDR Nos. SRLBR0098, SRLBR0120 and | EPA reviewed BDRs to verify that QC examinations were performed on a batch basis. Both BDRs included an Independent Observation and Replicate scan, which had been performed and recorded in the proper manner and in |

| Technical Elements | Objective Evidence | Comments |
|---|---|---|
| | SR4RTR0248<br>A/V recordings for selected containers from the above RH BDRs<br>CCP-TP-053, Revision 14 | accordance with procedure CCP-TP-053. |
| RTR-9: Procedures contain standardized forms for recording RTR data. | CH RTR BDR Nos. SRLBR0115, SR4RTR0271, SR4RTR0363 and SR4RTR0364<br>A/V recordings for selected containers from the above CH BDRs<br>RH RTR BDR Nos. SRLBR0098, SRLBR0120 and SR4RTR0248<br>A/V recordings for selected containers from the above RH BDRs<br>CCP-TP-053, Revision 14 | The CH and RH BDRs used Attachment 2 from CCP-TP-053 to record the RTR data generated. The Attachments were completed and signed by the operator as required.<br>A/V records reviewed by EPA were complete and agreed with the applicable written records. |
| RTR-10: Site procedures require review of BDRs at the data generation and project level. | CH RTR BDR Nos. SRLBR0115, SR4RTR0271, SR4RTR0363 and SR4RTR0364<br>A/V recordings for selected containers from the above CH BDRs<br>RH RTR BDR Nos. SRLBR0098, SRLBR0120 and SR4RTR0248<br>A/V recordings for selected containers from the above RH BDRs<br>CCP-TP-053, Revision 14<br>CCP-TP-001, Revision 21 | The BDRs reviewed had been reviewed by an ITR and an SPM as required by CCP procedures. |

## ATTACHMENT I: LIST OF DOCUMENTS REVIEWED FOR THIS INSPECTION

**AK**

AKE Qualification Card for C. Allen Dickerson, June 16, 2011

AKE Qualification Card for Carrie Johnson, June 16, 2011

AKE Qualification Card for Christina Poulos, February 18, 2014

AKE Qualification Card for David Ams, April 30, 2013

AKE Qualification Card for Jason Montoya, June 16, 2011

AKE Qualification Card for Jeff Harrison, June 22, 2011

AKE Qualification Card for Jim Schoen, June 16, 2011

AKE Qualification Card for John Kleckner, June 16, 2011

AKE Qualification Card for Kevin Peters, June 16, 2011

AKE Qualification Card for Lisa Watson, June 16, 2011

AKE Qualification Card for Michael Papp, June 16, 2011

AKE Qualification Card for Scott Smith, June 22, 2011

AKE Qualification Card for Sheri Nance, June 16, 2011

AKE Qualification Card for Sherry Auckland, September 28, 2011

AKE Qualification Card for Steve Schafer, June 16, 2011

AKE Qualification Card for Travis Smith, June 16, 2011

Assigned Reading Report, CCP-QP-002, Revision 37, provided July 24, 2014

Assigned Reading Report, CCP-QP-005, Revision 24, provided July 24, 2014

Assigned Reading Report, CCP-TP-002, Revision 26, provided July 24, 2014

Assigned Reading Report, CCP-TP-005, Revision 26, provided July 24, 2014

Assigned Reading Report, CCP-TP-506, Revision 5, provided July 24, 2014

Assigned Reading Report, DOE WIPP-02-3214 (WCPIP), Revision 3, provided July 24, 2014

CH SRS-CCP AK Tracking Spreadsheet, July 26, 2014

Fiscal Year 2013 3rd Quarter T2 report, provided July 22, 2013

Fiscal Year 2013 4th Quarter T2 report, provided November 19, 2013

Fiscal Year 2014 1st Quarter T2 report, provided January 22, 2014

Fiscal Year 2014 2nd Quarter T2 report, provided May 1, 2014

Fiscal Year 2014 3rd Quarter T2 report, provided August 11, 2014

Integrated Database Center Database Dump, August 19, 2014

RH SRS-CCP AK Tracking Spreadsheet, March 6, 2014

SPM CH Qualification Card for Barbara Broomfield, November 2, 2004

SPM CH Qualification Card for Beverly Schrock, June 23, 2010, Revised February 5, 2014

SPM CH Qualification Card for Carolina Soaterna, May 31, 2011

SPM CH Qualification Card for Charles Turner, April 19, 2007, Revised May 6, 2014

SPM CH Qualification Card for Daniel Wade, October 23, 2013

SPM CH Qualification Card for David Moody, June 24, 2005, Revised May 6, 2014

SPM CH Qualification Card for Jake Knox, October 23, 2013

SPM CH Qualification Card for Jerry Fisher, October 31, 2013

SPM CH Qualification Card for Joshua Houghton, May 31, 2011

SPM CH Qualification Card for Laura Turner (Nelson), June 21, 2010

SPM CH Qualification Card for Rich Kantrowitz, May 2, 2006, Revised May 6, 2014

SPM CH Qualification Card for Rick Whiteley, October 31, 2013

SPM CH Qualification Card for Roger Whiteaker, May 3, 2012

SPM RH Qualification Card for Charles Turner, August 15, 2013

SPM RH Qualification Card for David Moody, August 28, 2013

SPM RH Qualification Card for Irene Joo (Quintana), September 17, 2009

SPM RH Qualification Card for Joshua Houghton, August 19, 2013

SPM RH Qualification Card for Laura Turner (Nelson), June 21, 2010

SPM RH Qualification Card for Rich Kantrowitz, October 29, 2012

**CH AK**

***SR-W027-FB-PRE86-C***

DR011, Acceptable Knowledge Source Document Discrepancy Resolution for Generation Dates of 48 Containers in Waste Stream SR-WO27-FB-Pre86-C, Michael Papp, March 4, 2011

DR012, Acceptable Knowledge Source Document Discrepancy Resolution: drums SR514741, SR514741A, and SR123429B Inconsistency with assigned Waste Matrix Code, Jason P. Montoya, CCP, January 3, 2011

NCR-SRS-0180-13, Revision 0, September 4, 2013

NCR-SRS-0656-13, Revision 0, September 10, 2013

***SR-W026-221F-HET-A***

DR016, Acceptable Knowledge Source Document Discrepancy Resolution, F-Canyon Beryl Saddle Discrepancy Resolution, Jeff Harrison, November 21, 2013

NCR-SRS-0622-13, Revision 0, November 13, 2013

NCR-SRS-0624-13, Revision 0, November 18, 2013

***SR-W027-221H-HET***

Burial Ground Record No. SR503072

C032, Memo to M. O'Rear re: SR Information on TRU Waste Characterization in Support of the WIPP No-Migration Variance Petition, R. Garvin, January 4, 1990

C038, Memo to J.P. Duane re: 221-HB-Line History, B. "Blackie" Blackburn, November 17, 1977

C063, Operational Practices During Emplacement of Transuranic Waste on TRU Pads 1-6 in the SRS Burial Grounds, E.K. Barradale, Westinghouse Savannah River Company, EPD-TWF-93-0027, August 12, 1993

C066, Interview of C. McClard Regarding the HG-Line Process Timeline, M. Frazer, November 14, 2002

C093, Letter re: TRU Waste Packaging Requirements Polyethylene Boxes for HEPA Filters, J.H. Hershey, June 8, 1977

C105, Record of Communication for Interview of G. Roberts, B. Bush, and M. Minor; J. Whitworth, A. Hallman, W. Estill, S. Fevig, J. Lunsford, CCP-TP-005, Revision 10, November 20, 2002

C164, Interview with Ann Gibbs concerning Thorium-232 in the HB-Line Waste, Anne Hallman, August 12, 2003

C192, Evaluation of Volume, Period of Generation, and Calculation of Individual and Total Radionuclide Masses and Activities for Waste Stream SR-W027-221-HET, James M. Schoen, March 1, 2011

C207, Addition of 3 Containers to Waste Stream SR-W027-221H-HEPA, Addition of 2 Containers to Waste Stream SR-W027-221F-HET-A, Addition of 2 Containers to Waste Stream SR-SWMF-HET-A, Jim Schoen, April 17, 2012

C209, Addition of 8 Containers to Waste Stream SR-SWMF-HET-A, Addition of 3 Containers to Waste Stream SR-W027-221 H-HEPA, Addition of 5 Containers to Waste Stream SR-W027-HBL-BOX, Jim Schoen, May 4, 2012

C210, Addition of 1 Container to Waste Stream SR-W027-221 H-HOM, Jim Schoen, December 14, 2011

CCP-AK-SRS-4, Central Characterization Program Acceptable Knowledge Summary Report for Savannah River Site, Waste Streams: SR-W027-221H-HET, SR-W027-221H-HEPA, SR-W027-HBL-BOX, SR-W027-221H-HET-C, SR-W027-221H-HET-D, SR-W027-221H-HOM, Revision 16, February 6, 2014

CCP-TP-005 Revision 18, CCP Acceptable Knowledge Documentation, Attachment 6- Waste Form, Waste Material Parameters, Prohibited Items, and Packaging, Savannah River Site CCP-AK-SRS-004, Jeff Harrison, November 30, 2006

CCP-TP-005, Revision 24, CCP Acceptable Knowledge Documentation, Attachment 7-Radionuclides, CCP-AK-SRS-4, Waste Stream Number: SR-W027-221 H-HET, Michael Papp, May 29, 2013

CCP-TP-005, Revision 26, CCP Acceptable Knowledge Documentation, Attachment 8- Waste Containers List, SR-W027-221H-HET, July 29, 2014

D004, Dismantlement and Decontamination of a Plutonium-238 Facility at SRS, R. Smith and H. Hootman, Westinghouse Savannah River Company, WSRC-RP-93-1376, January 1994

D005, Characterization of HB-Line Transuranic Waste, B.P. Payne, NMS-EHB-990045, Revision 10, January 8, 2007

D015, Savannah River TRU Waste Inventory Workoff Plan, K.S. Wierzbicki, S.J. Mentrup, V.B. Wheeler, DPSP-86-1116, July 15, 1986

D019, History of Du Pont at the Savannah River Plant, William P. Bebbington, E.I. du Pont de Nemours and Company, 1990

D034, Transuranic Waste Baseline Inventory Report, Department of Energy, Carlsbad Area Office, DOE/CAO-95-1121, Revision 2, December 1995

D052, Systems Analysis- 200 Area Savannah River Plant HB-Line Operations, H.M. Kelley, R.V. Slates, E.W. Holtzscheiter, E.I. DuPont De Nemours and Company, DPSTSY-200-11, May 1978

D054, Thorium Processing in 221-H Technical Standards, E.I. Du Pont De Nemours & Company Savannah River Laboratory, DPSTS-221H- TH, May 1970

D062, Recovering U-235 and PU-238-Pu-239 in Building 221-H, E.I. Du Pont De Nemours & Co. Explosives Department, DPSTS-221H-P-U, December 31, 1968

D075, 1992 Renewal application for a RCRA Part S Permit, Savannah River Site Volume XIII - TRU Pads Facility and Waste Certification Facility, WSRC-IM-91- 53, Revision B, December 21,1993

D095, History of Du Pont at the Savannah River Plant, W.P. Bebbington, E.I. Du Pont De Nemours and Company

D098, SRP Thorium Processing Experience, D. A. Orth, Du Pont, DPSPU 78-30-3, June 1978

D099, Sample Schedule for HB Line and the Compact Billet Line in 235-F, J. A. Porter, DPSPU-77-272-93, April 4, 1977

D113, Washington Savannah River Company Setting the Stage for Tomorrow... 2006 Annual Report, Bob Pedde, Washington Savannah River Company, 2006

D116, HB-Line Safety Analysis Report (U), WSRC-SA-2001- 00009, Rev. 5, 6, 7, 8, 9

DR003, Discrepancy Resolution: Toxicity Characteristic Organic Solvent Hazardous Waste Codes, David B Becker, March 20, 2003

Drum Repackaging Form for Drum Nos. SR503072VB, SRS03072

M001, Requests for Equipment Retirement, B. Arnold, Atomic Energy Division, SRP, OSR 19-76, May 30, 1991-September 30, 1991

M011, Go West Database Query, S. Mentrup, December 13, 2002

M014, Burial Ground Records and TRU Waste Package Data Forms, SRS Waste Generators

M015, TRU Waste Container Characterization Forms (OSR 29-90), SRS Generators

M026, SR-W027 DOE Waste Stream Questionnaire from DOE National Core Mixed and TRU Waste Data Requirements (from MITI), Revision 0, December 7, 1996

M041, Savannah River Site Waste Characterization Plans, Steve Mentrup, Solid Waste Engineering, Savannah River Site, December 3, 1992

M066, HB-Line Inventory Tracking Spreadsheet, Revision 2a

M069, HB-Line Process History August 11, 1970 through October 25, 1974; Through December 6, 1976

M108, Evaluation of Additional Containers for SRS-4 Waste Stream SR-W027-221H-HET (HB-Line), David Becker

M109, Evaluation of 62 Additional Containers for SRS-4 Waste Stream SR-W027-221 H-HET (HB-Line), David Becker

M110, Evaluation of 32 Additional Containers for SRS-4 Waste Stream SR-W027--221H-HET (HB-Line), David Becker

M111, Excel spreadsheet: Volume percent organic analysis for SR-W027-221H-HET containers, David Becker, July 21, 2004

M115, TRU Waste Container Characterization Forms (OSR 29-90) for drum additions, SRS Generators

M124, Evaluation of 119 Additional Containers for SRS-4 Waste Stream SR-W027-221H-HET (HB- Line)

M125, TRU Waste Container Characterization Forms (OSR 29-90) for drum additions June 1, 2005, SRS, 2003-2005

M126, Evaluation of Additional Containers for SRS-4 Waste Stream SR-W027-221H-HET (HB-Line), J. Harrison, May 19, 2006

M127, 29-90 Forms for drums Added May 19, 2006

M132, Evaluation of Additional Containers for SRS-4 Waste Stream SR-W027-221-HET (HB-Line), April 3, 2007

M133, Support Data for The Addition of Containers for SRS-4 Waste Stream SR-W027-221 H-HET (HB-Line)

M135, Evaluation of Additional Containers for SRS-4 Waste Stream SR-W027-221 H-HET, James Luginbyhl, February 14, 2008

M136, Evaluation of Additional Containers for SRS-4 Waste Stream SR-W027-221H-HET, James Luginbyhl, August 19, 2008

M138, Evaluation of Additional Containers for SRS-4 Waste Stream SR-W027-221 H-HET, and RTR Quick Screen Data Sheets for 4 Drums - SR63400X; SR63400Y; SR63400z; and SR67051, September 26, 2008

M141, Evaluation of Additional Containers for SRS-4 Waste Stream SR-W027-221H-HET, J. Luginbyhl, L. Watson

M159, Evaluation of Additional Containers for SRS-4 Waste Stream SR-W027-221H-HET (HB-Line), Mark Doherty, August 6, 2009

M160, Memo to Bettie Bush from B.P. Payne re: Waste Characterization of FB-Line's Sweepings Campaign, B.P. Payne, Washington Savannah River Company, CBU-HCP-2005-00342, Revision 1, March 1, 2006

M170, Evaluation of Additional Containers for SRS-4 Waste Stream SR-W027-221H-HET

NDR BDR Nos. SRLBC0930

P014, Packaging and Sealing TRU Waste in Drums, NOP 221-HB-4720, Revisions 11-19, 23, 24, 29, January 1997 to October 2001

P024, Draining of Process Jacket Piping (U), NOP 221-HB- 4561, Revision 3, October 20, 1997

P073, Completing TRU Waste Burial Records and TRU Waste Data Package, Corbett, R.D., D-103, REF 221-HB-4725, Revisions 5, 6, 7, 8 and Special Procedure, March 6, 1991, March 17, 1993, June 20, 1996, May 29, 1998, January 12, 1999

RTR BDR Nos. SRLBR0083

***SR-W026-772F-HET***

C144, Interview with Mary Sample Management Specialist and Ann Special Projects Chemist, W. Estill, May 20, 2003, revised September 23, 2003

C145, Interview with Jim Chemist, W. Estill, May 28, 2003, revised June 10, 2003, revised July 29, 2003

C146, Interview with Caroline Holland and Tony Deal, A. Hallman, May 21, 2003

C147, Interview with Betty Baxley, Marcia Wicker, Mark Randall, Caesar Finch, and Jim Marsh; Anne Hallman, May 20, 2003

C151, Interview with Vito Casella, CTF for CLAB, W. Estill, A. Hallman, May 19, 2003

C152, Interview with CLAB Personnel- Rudiger, Gilliam, and Felder; J. Whitworth, A. Hallman, W. Estill, May 19, 2003

C181, E-mail correspondence from Melissa Clary re: Nochar of Liquids, Melissa Clary, December 14, 2005

C183, E-mail from Jeff Lunsford to Mike Papp re: Future Waste Projections for Waste Stream SR-W026-772F-HET, Jeff Lunsford, January 11, 2011

C184, Memorandum to CCP Records from Mike Papp re: Evaluation of Volume, Period of Generation, and Calculation of Individual and Total Radionuclide Masses and Activities for Waste Stream SR-W026-772-HET, Mike Papp, January 17, 2011

C186, Revision 8 Evaluation of Volume, Period of Generation, and Calculation of Individual and Total Radionuclide Masses and Activities for Waste Stream SR-W026-772-HET, Mike Papp, January 10, 2012

C187, Evaluation of Additional Containers for CCP-AK-SRS-5 Waste Stream SR- W026-772F-HET, Jason P. Montoya, May 14, 2012

CCP-AK-SRS-5, Central Characterization Program Acceptable Knowledge Summary Report for Savannah River Site, Waste Stream: SR-W026-772F-HET, Revision 9, May 6, 2013

CCP-TP-005, Revision 24, CCP Acceptable Knowledge Documentation, Attachment 6- Waste Form, Waste Material Parameters, Prohibited Items, and Packaging, Savannah River Site CCP-AK-SRS-005, Michael Papp, January 10, 2012

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CCP-TP-001, CCP Project Level Data Validation and Verification, Revision 21, June 6, 2013

CCP-TP-028, CCP Radiographic Test Drum and Training Container Construction, Revision 9, June 16, 2014

CCP-TP-053, CCP CH Standard Real-Time Radiography Inspection Procedure, Revision 14, September 25, 2013

CCP-TP-053, CCP CH Standard Real-Time Radiography Inspection Procedure, Revision 15, September 11, 2014

CH RTR BDR Nos. SRLBR0115, SR4RTR0271, SR4RTR0363 and SR4RTR0364

Inventory sheets for RTR container Nos. NDE-TEST-17, NDE-TEST-19, NDE-TEST-23, NDE-TRAINING-28, NDE-TRAINING-06 and NDE-TRAINING-27

LOQI for RTR operators dated June 27, 2014 and October 8, 2014

NCR Nos. NCR-SRS-0623-13, NCR-SRS-0624-13, NCR-SRS-0218-12 and NCR-SRS-1073-12

Qualification Cards for selected RTR personnel

RH RTR BDR Nos. SRLBR0098, SRLBR0120 and SR4RTR0248

SRS NDE Personnel Waste Streams Qualified List, dated June 27, 2014

Training Container Evaluation Data Sheets for various RTR operators