

May 17, 2016

Ms. Jean Ridley, Director
Waste Disposition Programs Division
U.S. Department of Energy
Savannah River Operations Office
P.O. Box A
Aiken, SC 29802

SUBJECT: THE U.S. NUCLEAR REGULATORY COMMISSION FEBRUARY 2-3 2016,
ONSITE OBSERVATION VISIT REPORT FOR THE SAVANNAH RIVER SITE
COMBINED F AND H TANK FARM CLOSURE (DOCKET NO. PROJ0734)

Dear Ms. Ridley:

The enclosed Onsite Observation Visit (OOV) report describes the U.S. Nuclear Regulatory Commission (NRC) OOV on February 2-3, 2016, of tank closure at the Savannah River Site (SRS) F and H Tank Farms. The OOV was conducted in accordance with Section 3116(b) of the Ronald W. Reagan National Defense Authorization Act for Fiscal Year 2005 (NDAA), which requires the NRC to monitor certain disposal actions taken by the U.S. Department of Energy (DOE) for the purpose of assessing compliance with the performance objectives set out in Title 10 of the *Code of Federal Regulations* (CFR) Part 61, Subpart C. The OOV was the seventh such monitoring site visit since the program began in 2012.

This is the second onsite observation visit covering both F and H Tank Farms. The first is summarized in the Report for Combined FTF and HTF Observation 2015-01 (July 28-29, 2015), (Agencywide Documents Access and Management System (ADAMS) Accession No. ML15239A628) with Guidance issued on June 26, 2015, (ML15162B071). There were also five previous NRC FTF onsite observation visits (June 12, 2012) (ML12191A210); (September 26-27, 2012), (ML12299A190); (March 27-28, 2013), (ML13113A322); (August 27-28, 2013), (ML13267A452); and (March 26-27, 2014), (ML14106A573). The NRC has also completed eleven Technical Review Reports.

The main activities conducted during the February 2016 tank farm closure OOV were technical discussions of topics identified herein and a tour of field activities associated with on-going grouting of Tank 12H.

The OOV activities were consistent with those described in the NRC Observation Guidance Memorandum dated December 30, 2015, (ML15356A590). That Guidance Memorandum was developed using the "*U.S. Nuclear Regulatory Commission Plan for Monitoring Disposal Actions Taken by the U.S. Department of Energy at the Savannah River Site F-Area and H-Area Tank Farm Facilities in Accordance with the National Defense Authorization Act for Fiscal Year 2005,*" October 6, 2015, (referred to as the Combined Tank Farm Monitoring Plan) (ML15238A761). The Combined Tank Farm Monitoring Plan contains the monitoring areas and monitoring factors, which describe how the NRC will monitor the DOE tank farm actions to assess

compliance with the Part 61 performance objectives. The OOV included detailed discussions of the following topics:

1. Status of the high-level waste tank residual solids sample leaching experiments and the NRC comments on SRNL-STI-2015-00446 (Monitoring Factor's (MF's) 2.1, "Solubility-Limiting Phases/Limits and Validation", and 2.2, "Chemical Transitions Times").
2. On-going DOE research or analyses relevant to MFs listed in the NRC staff's combined monitoring plan.
3. Technical Reviews of Tank 16 Final Inventory Documentation (ML15301A830), Tank 16 Special Analysis (SA) (ML15301A710), and Tank 12 Closure Module and SA (MFs 1.1, "Final Inventory and Risk Estimates"; 1.2, "Residual Waste Sampling"; 1.3, "Residual Waste Volume"; 3.1, "Hydraulic Performance of Concrete Vault and Annulus (As It Relates to Steel Liner Corrosion and Waste Release)", 3.5 "Vault and Annulus Sorption"; and 4.1, "Natural Attenuation of Key Radionuclides").
4. Tank 16H and Tank 12H Grouting Operations (MF 3.2 "Groundwater Conditioning", MF 3.3 "Shrinkage and Cracking," MF 3.4 "Grout Performance", and MF 3.6, "Use of Stabilizing Grout (As It Pertains to ALARA)").
5. DOE response to follow-up action 12 from July 2015 OOV (SRR-CWDA-2015- 00117), related to assignment of pore water chemistry in the CZ (MF 6.2 "Model and Parameter Support").
6. Other follow-on activities from previous OOV's and clarifying technical teleconference Calls.

The NRC will not close any of the tank farm closure monitoring factors (specific to a specific performance objective) or change the NRC Technical Evaluation Report (TER) overall conclusions as a result of the February OOV. There were no tank farm closure Open Issues identified during the February OOV.

Follow-Up Action Items identified during the OOV are specific short-term actions to be performed by the NRC or the DOE. It is anticipated that most, if not all, of those Follow-Up Action Items will be closed before the next OOV.

A main focus of the NRC staff performing an OOV under the NDAA monitoring regarding tank closure are recommendations contained in the NRC TER for F Tank Farm, October 2011 (ML112371751) and the NRC TER for H Tank Farm, June 2014. (ML14094A496).

In accordance with the requirements of NDAA Section 3116(b), the NRC will continue to monitor the DOE tank farm closure activities for SRS. The next tank farm OOV has not yet been scheduled.

In accordance with 10 CFR 2.390 of the NRC's "Agency Rules of Practice and Procedure," a copy of this letter will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>.

J. Ridley

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If you have any questions or need additional information regarding this OOV report, then please contact James Shaffner at James.Shaffner@nrc.gov or 301-415-5496.

Sincerely,

/RA/

Andrea Kock, Deputy Director
Division of Decommissioning, Uranium Recovery,
and Waste Programs
Office of Nuclear Material Safety
and Safeguards

Enclosures:

1. NRC OOV Report
2. Technical Project Manager
Detailed Field Notes
3. SRR-CWDA-2016-00009, Rev. 1

cc w/Enclosures: WIR Service List
WIR E-mail Contacts List

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U.S. NUCLEAR REGULATORY COMMISSION
February 2-3, 2016, ONSITE OBSERVATION VISIT REPORT FOR
THE SAVANNAH RIVER SITE FOR TANK FARM CLOSURE

EXECUTIVE SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) staff conducted its seventh Onsite Observation Visit (OOV) related to tank closure at the Savannah River Site (SRS) on February 2-3, 2016. This was the second OOV that included both F and H tank farms. On every OOV to the SRS, the NRC is focused on assessing compliance with four performance objectives in Title 10 of the *Code of Federal Regulations* (CFR) Part 61, Subpart C: (1) protection of the general population from releases of radioactivity (§61.41); (2) protection of individuals from inadvertent intrusion (§61.42); (3) protection of individuals during operations (§61.43); and (4) stability of the disposal site after closure (§61.44). Please see the attachment to this OOV report for the detailed technical information from this OOV.

For this OOV, the NRC focused on the monitoring areas and monitoring factors derived from the *“U.S. Nuclear Regulatory Commission Plan for Monitoring Disposal Actions Taken by the U.S. Department of Energy at the Savannah River Site F-Area and H-Area Tank Farm Facilities in Accordance with the National Defense Authorization Act for Fiscal Year 2005,”* October 6, 2015 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML15238A761) (Combined Tank Farm Monitoring Plan). The NRC performs monitoring activities in coordination with South Carolina, therefore the South Carolina Department of Health and Environmental Control (SCDHEC) staff also participated in the OOV and received the same information from the U.S. Department of Energy (DOE) as the NRC during the OOV.

As described in the Observation Guidance Memorandum for the OOV, the main activities conducted were technical discussions between the DOE (i.e., includes DOE contractors throughout this OOV report), the NRC, and the SCDHEC, plus a field observation of Tanks 12H and 16H. The technical discussions focused on: (i) Tank 16H and 12H grouting operations; (ii) NRC Technical Review Report (TRR): Tank 16 Inventory Documentation; (iii) status of real waste testing and NRC comments on FY2015 Test Report (SRNL-STI-2015-00446); (iv) Status of other DOE research, analysis, and update on the NRC research/analysis relevant to monitoring factors; (v) follow-up on Action Item 12 from the July 2015 OOV; (vi) NRC TRR: Tank 16H Special Analysis (SA); and (vii) Tank 12H Closure Module and SA. This OOV report provides a description of the activities during the OOV, including observations made by the NRC.

1.0 BACKGROUND

Section 3116(a) of the National Defense Authorization Act for Fiscal Year 2005 (NDAA) authorizes the DOE, in consultation with the NRC, to determine that certain radioactive waste related to the reprocessing of spent nuclear fuel is not high-level waste, provided certain criteria are met. NDAA Section 3116(b) requires the NRC to monitor the DOE disposal actions to assess compliance with the performance objectives in 10 CFR Part 61, Subpart C.

On September 30, 2010, the DOE submitted to the NRC a draft waste determination titled, "Draft Basis for 3116 Determination for Closure of F Tank Farm at the Savannah River Site," DOE/SRS-WD-2010-001 (ML102790078). The purpose of the draft waste determination was to demonstrate compliance with the criteria in Section 3116(a) of the NDAA, including compliance with the performance objectives in 10 CFR Part 61, Subpart C. In its consultation role, the NRC staff reviewed the draft waste determination and supporting performance assessment. In October 2011, the NRC staff documented the results of its review in a Technical Evaluation Report (TER) (ADAMS Accession no. ML112371751). In the TER, the NRC staff listed a number of recommendations for the DOE to provide information the NRC staff needs to assess compliance with the performance objectives. The DOE considered the NRC staff TER observations and recommendations in finalizing its FTF waste determination (WD-2012-001) and basis document (DOE/SRS-WD-2012-001, Rev. 0) in March 2012. (ML121140043 and ML121140051).

On February 6, 2013, the DOE submitted to the NRC a draft waste determination titled, "Draft Basis for Section 3116 Determination for Closure of H-Tank Farm at the Savannah River Site," DOE/SRS-WD-2013-001, Rev. 0 (ML13045A504). The purpose of the draft waste determination was to demonstrate compliance with the criteria in Section 3116(a) of the NDAA, including compliance with the performance objectives in 10 CFR Part 61, Subpart C. In its consultation role, the NRC staff reviewed the draft waste determination and supporting performance assessment. In June 2014, the NRC staff documented the results of its review in a TER (ML14094A496). Similar to the process for FTF, the NRC staff listed a number of recommendations in its HTF TER for the DOE to provide information that the NRC staff needs to assess compliance with the performance objectives. Many of the recommendations listed in the HTF TER are similar to those made in the FTF TER. The DOE considered the NRC staff TER observations and recommendations in finalizing its HTF waste determination (DOE-WD-2014-001) and basis document (DOE/SRS-WD-2014-001, Rev. 0) in December 2014 (ML15051A352 and ML15051A353).

To carry out its monitoring responsibility under NDAA Section 3116(b), the NRC, in coordination with the SCDHEC, performs three activities: (1) technical reviews; (2) OOVs; and (3) data reviews. Those activities focus on both: (1) key modeling assumptions identified in the F- and H-Area Monitoring Plan (ML15238A761); and (2) the DOE disposal actions. Specifically, technical reviews generally focus on reviewing information generated to provide support for key assumptions that the DOE made in the tank farm Performance Assessment (PA) or SA documents. The OOVs generally focus on either: (1) observing the collection of data and reviewing the data to assess consistency with assumptions made in the tank farm final Waste Determination; or (2) observing key disposal or closure activities related to technical review areas. Data reviews generally focus on supplementing technical reviews by focusing on monitoring data that may indicate future system performance or reviewing records or reports that can be used to directly assess compliance with the performance objectives.

2.0 NRC ONSITE OBSERVATION VISIT ACTIVITIES

On December 30, 2015, the NRC issued the Observation Guidance (ML15356A590) for the February 2-3, 2016, OOV. Observation Guidance is a plan for what the NRC expects to cover during an OOV. There may be some variation based on what happens during the OOV.

The OOV began with a short briefing on the agenda presented by the DOE contractor, Savannah River Remediation (SRR) that was attended by representatives from the DOE, the NRC, and the SCDHEC. The main activities conducted were technical discussions between the DOE, the NRC, and the SCDHEC. The OOV also included a brief tour focused on grouting of Tank 12H and the closure status of Tank 16H. The focus of technical discussions are summarized in section 1.0. This OOV report provides a description of the activities during the OOV, including observations made by the NRC

2.1 Technical Discussion – Follow-up from July 28-29 OOV re: Handling of Tank 6 Grout truck with out-of-specification grout

2.1.1 Observation Scope

Discuss and analyze circumstances surrounding discovery and follow-up regarding the introduction of too lean grout (because of aggregate deficiency) to Tank 6 from a single truck.

2.1.2 Observation Results

The DOE stated this was an isolated incident. There were no problems with their Quality Control check and none found with batch plant process. (See Enclosure 2 for details).

2.1.3 Conclusions and Follow-up Action Items

The DOE will provide the date of rejected load so a subject-matter expert can watch the related video. NRC will review the video per SCHEC request.

2.2 Technical Discussion – Tank 16H Grouting Operations (update since July OOV and Tank 12H Grouting Operations)

2.2.1 Observation Scope

The technical discussion supported the NRC monitoring of the DOE disposal actions to assess compliance with 10 CFR 61.41 and 61.42, apparent anomalies and questions arising from video and field operations.

2.2.2 Observation Result

Tank 16H:

- All participants discussed the rationale and schedule for introduction of clean cap grout which is a more flowable grout used in the Saltstone disposal facility and which was introduced to the top of Tank 16 due to significant mounding below grout delivery points that would make it difficult to fill remaining voids.
- Observation of the grout video yielded noticeable changes in grout flowability on August 31, 2015, during the use of clean cap grout. The grout was extremely flowable, with no mounding and behaved much more like a Newtonian fluid. This could result in higher K_h and lower compressive strength grout at the top of the tank.

- The NRC was concerned about interruptions or stoppage of grout flow. The NRC indicated, based on observation of the grout video it seemed that more than 30 truckloads (per day) were discharged into the tank. Stoppages and non-continuous flow made counting difficult. The DOE said that it normally takes about 7 minutes to discharge a grout load. There were discussions as to how to evenly distribute grout to prevent mounding and the relationship between sporadic stoppage and grout mounding.
- The DOE is performing tank grout shrinkage testing per ASTM C-157.

Tank 12H:

- The SRR provided details of Tank 12 specific grout operations and schedule. It will take approximately 565, eight cubic yard truck loads to grout Tank 12H (25-30 trucks per day).
- The same (as Tank 16H) spread of 26-30 inches will be used. The grout formulation will use 120 grade ground blast furnace slag instead of 100 grade, because there is no longer a vendor of the latter.
- The NRC noted that the DOE planned to use the same approach to ventilation duct filling (from the inside) as was used in Tanks 5 and 6, but which was different from the approach used to grout the annular duct inventory in Tank 16 (i.e., grout from outside the duct). This is important to verify the degree to which duct voids are filled and stabilized
- It was noted that the DOE skipped Lifts 2 and 3. The DOE explained the delay was due to accumulation of water in the annulus from groundwater in-leakage. The DOE is waiting for the water to evaporate before grouting. This is also a potential concern in the main tank. A drop test report indicates that segregation can occur if grout is dropped in standing water.
- Additional details can be found in Enclosure 2.

2.2.3 Conclusions and Follow-up Action Items

The NRC staff will continue to monitor the DOE Tank Farm activities.

- Re: Tank 16H – The DOE to provide the NRC with Tank 16 Final Configuration Report when available;
- Re: Tank 12H – The DOE to provide three documents re: grouting (grout strategy, closure assurance plan, and subcontractor surveillance plan); and
- Re: Tank 16H and 12H – The NRC will provide additional questions and request a teleconference to discuss observation of Tank 16H grouting video and follow-up questions on Tank 16H and 12H grouting/documentation.

2.3 NRC TRR: Tank 16 Inventory Documentation

2.3.1 Observation Scope

The discussion supported the NRC monitoring of the DOE disposal actions to assess compliance with 10 CFR 61.41 and 10 CFR 61.42. The TRR focused on waste sampling and analysis and in particular the risk significant inventory in the annulus.

2.3.2 Observation Results

- The NRC discussed that the focus of its review was on waste sampling and volume estimates, and in particular what was thought to be a risk significant inventory in the annulus.
- The NRC questioned whether the analysis of composite samples in triplicate allowed for the samples to be considered as nine independent samples. The DOE stated that the triplicate samples are independent because, although the samples came from the same composite, they were different samples.
- The NRC questioned whether samples were obtained outside of the ventilation duct between the primary liner and the ventilation duct or between the secondary liner and the duct.
- The NRC expressed concern regarding the waste height differential on either side of the ventilation duct and the DOE's rationale for assigning heights.
- In its TRR, the NRC indicated that it was not clear when visual evidence would be compelling enough to override the measured values or interpolated values between measured values.

A more detailed discussion of observation results are included in Enclosure 2.

2.3.3 Conclusions and Follow-up Action Items

The NRC staff concluded that the DOE had done a generally good job in developing the inventory and had appropriately executed the sampling analysis program and Quality Assurance program plans. The NRC staff will continue to monitor the DOE tank farm closure activities. The following Follow-Up Action Items resulted from the discussion:

- The DOE agreed to provide a video of annulus sampling.
- The NRC requested that the DOE clarify how triplicate samples are processed and the basis for treating the triplicate samples as independent in certain circumstance (based on analysis of variance F test) when they came from the same composite sample.

2.4 On-going (DOE) Research or Analyses

2.4.1 Observation Scope

The technical discussion supported the NRC monitoring of the DOE research and analysis relevant to MFs listed in NRC staff's combined monitoring plan to assess compliance with 10 CFR 61.41 and 10 CFR 61.42. The discussion focused on DOE Waste Release (WR) testing reports (SRNL-STI-2015-00446, Rev. 3 and related DOE research (O)).

2.4.2 Observation Results

- (WR) – The DOE indicated that the WR testing report was updated in Rev. 3 (SRNL-STI-2015-00446, Rev. 3).
- (WR) – The NRC expressed concern with the lack of collection of mechanistic information and the difficulty in extrapolating results to other conditions. There was discussion regarding the DOE analysis of residual waste following leaching experiments to identify potential mechanisms for Pu retention.
- (WR) – The DOE indicated that after doing Tank 18F real waste testing they plan to perform additional work on Tank 12H waste samples, because the tank has had oxalic acid treatment and is one of the more risk significant tanks in HTF.
- (WR) – The NRC noted that Tank 12H had also undergone Low Temperature Aluminum Dissolution (LTAD) and, therefore, might not be representative of tank waste that may not undergo LTAD.
- (WR) – The NRC inquired about CO₂ scrubbing to control pH and its effect on carbonate concentrations.
- (WR) – The DOE noted that the shielded cell has Pu contamination that may potentially impact the current experiment.
- (WR) – The DOE indicated that they plan to test a single sample, FTF-1, that has the highest actinide concentrations. The NRC questioned the switch from compositing samples to use of a single discrete sample.
- (O) – The DOE is in the process of updating the geochemical data package-SRNL-STI-2009-00473.
- (O) – A Belgium report on K₂S in cementitious material is being issued.
- (O) – The DOE is in the process of performing tank grout shrinkage testing per ASTM C-157. Testing so far indicates a shrinkage rate of 0.023 percent on a 30” specimen. Test protocol includes fully submerged samples. The NRC noted that shrinkage can increase significantly in less than 100 percent humidity. The NRC noted that American Concrete Institute documents exist for modeling and calculating shrinkage.

A more detailed discussion of observation results are included in Enclosure 2.

2.4.3 Conclusions, Follow-up Action Items, and Other Related Activities¹

The NRC staff will continue to monitor the DOE tank closure activities. The following Follow-Up Action Items resulted from the tour and technical discussion:

- (WR) – The DOE will provide the NRC with SRNL-RP-2013-00203, Rev. 3 for review.
- (WR) – Regarding effect of silica concentrations on experimental results, the DOE agreed to perform chemical analysis on silica concentrations.
- (WR) – The DOE agreed to attempt to identify mechanisms for key radionuclide retention following leaching experiments through solid phase analysis.
- (WR) – The NRC will arrange for follow-up discussion regarding representativeness of Tank 12H for other tank waste where LTAD is not performed.
- (WR) – The DOE would analyze samples for major anions using ICP-MS or ion chromatography.
- (WR) – The DOE will analyze blank samples to evaluate the contamination issue.
- (WR) – The DOE will perform a mass balance to ensure that significant quantities of key radionuclides are not lost from the sample.
- (WR) – The NRC will review the Tank 18F characterization report within a week and notify the DOE if the NRC has concerns with the use of a single sample versus a composite sample.
- (O) – The DOE will provide the NRC the updated geochemical data package when available.
- (O) – The DOE to provide NRC the report number of the Belgian K_d report.

2.4a. Technical Discussion – NRC Contractor Experiments

2.4a.1 Observation Scope

The Center for Nuclear Waste Regulatory Analysis (CNWRA) experiments regarding groundwater conditioning by tank grouts and viability of acoustic detection to discern grout cracking characteristics.

¹ NRC has characterized certain activities and informal agreements as “Other Related Activities.” There are no deliverables associated with Other Related Activities as there are with the mutually agreed upon Action Items captured during the OOV close out.

2.4a.2 Observation Results

- The CNWRA discussed groundwater conditioning tests and the use of synthetic SRS groundwater around a grout core. The CNWRA measured Dissolved Oxygen, pH and Eh to determine the extent of interaction between the grout and infiltrating groundwater.
- The NRC summarized the acoustic emission work including ultrasonic property testing and an acoustic emission monitoring system to detect the location and distribution of cracks in a cementitious waste form.

A more detailed discussion of observation results are included in Enclosure 2.

2.4a.3 Conclusions, Follow-up Actions, and Other Related Activities

The DOE agreed to provide vendor information on grade 120 slag to be used in future tank grouting operations

2.5 Technical Discussion – Action Item 12 Follow-Up NRC TRR Tank 16 SA

2.5.1 Observation Scope

The technical discussion supported the NRC monitoring of the DOE disposal actions to assess compliance with 10 CFR 61.41 and 10 CFR 61.42. The discussion focused on rationale for assignment of chemical transition times and grout degradation in deterministic and probabilistic models.

2.5.2 Observation Results

The major points of the technical discussion were:

- The NRC stated that in certain deterministic FTF and HTF PORFLOW cases, the DOE assumed that tank grout did not degrade rapidly compared to other cases, thereby facilitating fast flow through the fast pathway (flow through cracks and around monolith as opposed to flow through grout monolith). In these cases the fast flow pathway controlled the chemistry in the contaminated zone. In the probabilistic HTF GoldSim model, the matrix is assumed to degrade at different rates making it difficult to determine if the fast flow pathway or the matrix would control the chemistry in the contaminated zone (CZ).

A more detailed discussion of observation results are included in Enclosure 2.

2.5.3 Conclusions, Follow-Up Action Items, and Other Related Activities

The DOE indicated that its response to Action Item 12 from the July 2015 OOV was not intended to suggest that the contaminated zone was its own segment controlling its own chemistry. The DOE will further clarify its response regarding chemistry in the CZ.

Although not a formal Action Item, the DOE agreed to provide additional information regarding the assignment of chemical transition times in GoldSim.

2.5a Technical Discussion – NRC TRR: Tank 16 SA

2.5a.1 Observation Scope

The technical discussion supported the NRC monitoring of the DOE disposal actions to assess compliance with 10 CFR 61.41 and 10 CFR 61.42. Discussions included the presence and chemical state of various radionuclides as well as inventories in the tank, annulus and primary and secondary sand pads.

2.5a.2 Observation Results

- Regarding an evaluation of an alternative fast flow case for release of waste from the Tank 16H annulus in the Tank 16H SA, the NRC indicated that Tank 12H groundwater in leakage data could be used to assess conductivity of tank vaults. Wang et al. (1997) provides information on hydraulic conductivity as a function of aperture due to shrinkage. Shrinkage gaps greater than 50² microns are expected to allow increased flow through the gap.
- With regard to DOE iodine K_d reports, NRC indicated that the stability of more sorptive species such as iodate was unclear and that experimental results did not always seem to be consistent with field results.
- The NRC pointed out that the chemical form of iodine in the tank waste is important. The DOE indicated iodine might be present as mercury or silver iodide. The DOE stated that when they finish the solubility testing on Tank 18F, they would like to test Tank 12H samples and also focus on Sr-90 and I-129 instead of Tc-99.

A more detailed discussion of observation results are included in Enclosure 2.

2.5a.3 Conclusions, Follow-Up Action Items, and Other Related Activities

There are no formal action items. However, DOE indicated that they were preparing a new SA to look at both groundwater in-leakage and subsequent drainage, as well as release of long-lived radionuclides. NRC will review the SA when it is available.

2.6 Technical Discussion- Tank 12H Closure Module Addendum and SA

² Apertures of 50 microns would permit some water flow; apertures of 500 microns would permit significant flow.

2.6.1 Observation Scope

Discussions focused on modeling, cleaning and sampling strategies for Tank 12H

2.6.2 Observation Results

- The NRC staff questioned the use of Goldsim only for the Tank 12H SA. The DOE indicated that they did not have many changes in the Tank 12H SA besides inventory, so they thought using only GoldSim was appropriate.
- The NRC inquired about the peak dose in the Tank 12H Closure Module Addendum that had not previously been presented.
- The NRC inquired about the statement in the Tank 12H SA that indicated that the tank was not driving the intruder dose in light of figure 6.5-6 in the HTF PA that shows that the highest well dose was associated with T12H. The DOE indicated that T12 H might not be the driver at the 1-m boundary.

2.6.3 Conclusions and Follow-Up Action Items

- The NRC requested further clarification regarding the 20,000 years peak dose presented in the Tank 12H closure module addendum.
- The NRC requested clarification regarding the contributions of Tank 12H on intruder dose for the groundwater pathway.

Table 1
List of Remaining Follow-up Action Items
from Previous Onsite Observation Visits and Teleconference Calls

7/2015 OOV	The DOE to provide information on lessons learned/procedure changes relative to the rejected Tank 6 grout truck.	Not yet received
7/2015 OOV	The NRC to set up a teleconference call to discuss on-going NRC grout testing relative to Tank Farm grout.	Discussed at 2/2-3/16 OOV
5/2013 Teleconference	The DOE to provide response in writing or another teleconference call to the NRC main points about water segregation and previously provided observations.	Not yet received

3.0 OVERALL CONCLUSIONS, STATUS OF MONITORING FACTORS, OPEN ISSUES, OPEN FOLLOW-UP ACTION ITEMS; AND ISSUANCE OF NRC TECHNICAL REVIEW REPORTS

3.1 Overall Conclusions

The information gathered during tank farm closure Observation 2015-01 will be used for multiple NRC TRR via memoranda, review of the DOE tank closure SA documentation, and future OOVs, based on the topics discussed. There is no change to the NRC staff overall conclusions from the F- and H-Tank Farm TERs regarding compliance of DOE disposal actions with the 10 CFR Part 61 performance objectives.

3.2 Status of Monitoring Factors

The NRC staff did not close any monitoring factors during the OOV. Therefore, all monitoring factors remain open.

3.3 Status of Open Issues for F- and H-Tank Farm Monitoring

There are currently no open issues.

3.4 Status of Open Follow-up Action Items from Previous F- and H-Tank Farm OOV Reports

All Action Items complete.

3.5 Status of Open Follow-up Action Items from Clarifying Teleconference Calls

None.

3.6 Summary of Follow-Up Action Items

The table below contains the sixteen Follow-Up Action Items that were open during the Tank Farm Observation 2016-01, including a unique NRC identifier for each Follow-Up Action Item:

Unique Identifier	Follow-Up Action Item
TF CY16-01-001	The DOE to provide the NRC an Electronic copy of presentation material including action items and attendance rosters. [SRR-CWDA-2016-00009, Rev. 1] <i>(complete)</i>
TF CY16-01-002	The DOE to provide the NRC a copy of Rev. 1 to Action Item Follow-up in support of the NRC OOV on July 28-29, 2015, [SRR-CWDA-2015-00170], when issued. <i>(complete)</i>
TF CY16-01-003	The DOE to provide the NRC a copy of the Tank 16 Final Configuration Report when issued.
TF CY16-01-005	The DOE to provide the NRC date/information for the rejected Tank 6 grout truck. (ref. Action Item No. 5 from 7/2015 OOV) <i>(complete)</i>
TF CY16-01-004	The DOE to provide the NRC an electronic copy of Release of Radionuclides from Tank Waste Residual Solids: Actual Waste Testing with Tank 18 Residuals. [SRNL-MS-2016-00012] <i>(complete)</i>
TF CY16-01-006	The DOE to provide the NRC five accepted and five rejected batch tickets from Tank 16 grouting. Batch ticket from 8/31/2015 to be included. <i>(complete)</i>
TF CY16-01-007	The DOE to provide the NRC documentation of the grade 120 blast furnace slag evaluation. <i>(complete)</i>

TF CY16-01-008	The DOE to provide the NRC a copy of the Tank 12 Grouting Strategy, Closure Assurance Plan, and Subcontractor Surveillance Plan. <i>(complete)</i>
TF CY16-01-009	The DOE to provide the NRC video of auger contact with waste during annulus sampling (including a location where ventilation duct was cut). <i>(complete)</i>

Unique Identifier	Follow-Up Action Item
TF CY16-01-010	The DOE to provide the NRC a copy of the Task Technical and Quality Assurance Plan for Determining the Radionuclide Release from Tank Waste Residual Solids. [SRNL-RP-2013-00203, Rev. 3] <i>(complete)</i>
TF CY16-01-011	The NRC to provide the DOE feedback on Tank 18 residual solids testing parameters (Sample FTF-1 vs. composite sample, Co2 Scrubbing, Silica). <i>(complete)</i>
TF CY16-01-012	The DOE to provide FY2016 PA Maintenance Plan to SCDHEC.
TF CY16-01-013	The DOE to provide the NRC a copy of the reference for Tank 16 SA use of a 1 percent gradient. <i>(complete)</i>
TF CY16-01-014	The DOE to provide the NRC additional information on triplicate sample analysis process. <i>(general)</i>
TF CY16-01-015	The DOE to provide the NRC additional information relative to the Tank 16 SA GoldSim model benchmarking. <i>(17,000 year peak)</i>
TF CY 16-01-016	The DOE to provide the NRC a copy of the Un-reviewed Waste Management question covering the use of clean cap grout in Tank 16. <i>(complete)</i>

3.7 Issuance of NRC TRR's

Between the previous OOV and tank farm Observation 2016-01, the NRC issued two Tank Farm TRR's via memorandum:

- (ML15301A830). *Technical Review of Final Inventory Documentation for Tank 16H at Savannah River Site*. Memorandum to Douglas Mandeville. ADAMS Accession No. ML15301A830. Rockville, Maryland: U.S. Nuclear Regulatory Commission. October 30, 2015.
- (ML15301A710). *Technical Review of Tank 16H Special Analysis for the Performance Assessment for the H-Tank Farm at the Savannah River Site*. Memorandum to Douglas Mandeville. ADAMS Accession No. ML15301A710. Rockville, Maryland: U.S. Nuclear Regulatory Commission. November 10, 2015.

4.0 PARTICIPANTS

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5.0 REFERENCES

(ML112371751). “Technical Evaluation Report for F-Area Tank Farm Facility, Savannah River Site, South Carolina – Final Report.” Washington, DC: U.S. Nuclear Regulatory Commission. 2011.

(ML121140043 and ML121140051) F Tank Farm waste determination (WD-2012-001) and basis document (DOE/SRS-WD-2012-001, Rev. 0) in March 2012.

(ML12212A192). “U.S. Nuclear Regulatory Commission Plan for Monitoring Disposal Actions Taken by the U.S. Department of Energy at the Savannah River Site F-Area Tank Farm Facility in Accordance With the National Defense Authorization Act for Fiscal Year 2005.” Washington DC: U.S. Nuclear Regulatory Commission. 2013.

(ML14094A496). “Technical Evaluation Report for H-Area Tank Farm Facility, Savannah River Site, South Carolina—Final Report.” Washington, DC: U.S. Nuclear Regulatory Commission. 2014.

(ML15051A352 and ML15051A353) H Tank Farm Waste Determination (DOE-WD-2014-001) and basis document (DOE/SRS-WD-2014-001, Rev. 0) in December 2014.

(ML14342A784). “Technical Review: U.S. Department of Energy Documentation Related to Tanks 5F and 6F Final Configurations with an Emphasis on Grouting from Recommendations and Testing to Final Specifications and Procedures (Project No. PROJ0734).” Memorandum from L. Parks (NRC) to G. Suber (NRC) thru C. McKenney (NRC). Washington, DC: U.S. Nuclear Regulatory Commission. December 2014.

(ML12272A124). “Technical Review of Environmental Monitoring and Site-Specific Distribution Coefficient Reports.” Memorandum from C. Barr (NRC) to G. Suber (NRC) thru C. McKenney (NRC). Washington, DC: U.S. Nuclear Regulatory Commission. March 2015.

(ML15162B071). Shaffner, J. "Onsite Observation Guidance for July 28-29, 2015, Monitoring Visit to the Savannah River Site F- and H-Area Tank Farms (Docket No. PROJ0734)." Memorandum to A. Persinko. Rockville, MD: U.S. Nuclear Regulatory Commission. June 26, 2015.

(ML12191A210). Persinko, A. "The U.S. Nuclear Regulatory Commission June 12, 2012, Onsite Observation Visit Report for the Savannah River Site F-Tank Farm Facility (Docket No. PROJ0734)." Memorandum to James Folk. Rockville, Maryland: U.S. Nuclear Regulatory Commission. September 5, 2012.

(ML12299A190). Mohseny, A. "The U.S. Nuclear Regulatory Commission September 26-27, 2012. Onsite Observation Visit Report for the Savannah River Site F-Tank Farm Facility (Docket No. PROJ0734)." Memorandum to James Folk. Rockville, Maryland: U.S. Nuclear Regulatory Commission. December 5, 2012.

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(ML15244A839). NRC Staff Comments on "Industrial Wastewater Closure Module for Liquid Tank 12 H-Area Tank Farm, Savannah River Site," SRR-CWDA-2014-00086, Rev. 0, May 2015.

(ML15244A905). NRC Comments on Long-Term Structural Assessment for F-Tank Farm Facility, T-CLC-F-00421, Structural Assessment of F-Area Tank Farm After Final Closure.

(ML15239A622). SRR-CWDA-2015-00095, Rev. 1, Savannah River Site F- and H-Area Tank Farms, NRC Onsite Observation Visit, July 28-29, 2015.

(ML15239A628). The U.S. Nuclear Regulatory Commission July 28-29, 2015, Onsite Observation Visit Report for the Savannah River Site Combined F- and H-Tank Closure, October 5, 2015.

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(ML15356A590). Onsite Observation Guidance for February 2-3, 2016, Monitoring Visit to the Savannah River Site, F- and H-Area Tank Farms, December 30, 2015.

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