

July 3, 2012

MEMORANDUM TO: Gregory Suber, Chief
Low-Level Waste Branch
Environmental Protection
and Performance Assessment Directorate
Division of Waste Management
and Environmental Protection
Office of Federal and State Materials
and Environmental Management Programs

FROM: Nishka Devaser, Project Manager */RA/*
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SUBJECT: ONSITE OBSERVATION GUIDANCE FOR AUGUST 6-7, 2012,
MONITORING VISIT TO THE SAVANNAH RIVER SITE, SALTSTONE
FACILITY

The U.S. Nuclear Regulatory Commission (NRC) staff is planning an onsite observation visit on August 6-7, 2012, to the U.S. Department of Energy's Savannah River Site, Saltstone Facility to monitor activities related to the disposal of non-high-level-waste, per NRC's responsibilities under Section 3116 of the Ronald W. Reagan National Defense Authorization Act for Fiscal Year 2005.

Enclosure:
Onsite Observation Guidance

CONTACT: Nishka Devaser, FSME/DWMEP
(301) 415-5196

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NAME	NDevaser	ARidge	TMoon	CMcKenney	NDevaser for GSuber	NDevaser
DATE	06/28/12	06/28/12	07/02/12	06/28/12	07/02/12	07/03/12

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ONSITE OBSERVATION GUIDANCE FOR AUGUST 6-7, 2012, MONITORING VISIT AT THE SAVANNAH RIVER SITE SALTSTONE FACILITY

PURPOSE:

To provide onsite observation guidance for a planned visit on August 6-7, 2012, to the U.S. Department of Energy's (DOE) Savannah River Site (SRS) Saltstone Facility to monitor activities related to the disposal of non-high-level waste, per the U.S. Nuclear Regulatory Commission's (NRC) responsibilities under Section 3116(b) of the Ronald W. Reagan National Defense Authorization Act for Fiscal Year 2005 (NDAA).

OBJECTIVES:

- Tour Saltstone Disposal Facility
- Discuss saltstone processing and quality assurance
- Discuss Technetium inventory in Vault 4
- Observe and discuss details of lysimeter testing
- Discuss path forward in NRC NDAA monitoring program

BACKGROUND:

Section 3116(a) of the NDAA authorizes DOE, in consultation with the NRC, to determine whether certain radioactive waste related to the reprocessing of spent nuclear fuel is not high-level waste, provided certain criteria are met. Section 3116(b) of the NDAA requires NRC to monitor DOE disposal actions to assess compliance with Title 10 of the Code of Federal Regulations (10 CFR), Part 61, Subpart C, performance objectives for low-level waste. On March 31, 2005, DOE submitted to the NRC a draft waste determination titled, *Draft Section 3116 Determination, Salt Waste Disposal, Savannah River Site*. 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 concluded that there was reasonable assurance that the applicable criteria of the NDAA could be met, provided certain assumptions made in DOE's analyses were verified via monitoring. In December 2005, NRC staff documented the results of its review in a Technical Evaluation Report (TER). DOE issued a final waste determination in January 2006 taking into consideration the assumptions, conclusions, and recommendations documented in NRC's TER. On May 3, 2007, NRC staff, pursuant to its monitoring responsibility under the NDAA, completed a monitoring plan for the SRS Saltstone Facility. This onsite observation guidance has been developed in accordance with the May 2007 monitoring plan to ensure consistency in NRC staff's monitoring activities. The May 2007 monitoring plan is available in NRC's Agency-wide Document Access and Management System (ADAMS) at accession number ML070730363.

Enclosure

On November 23, 2009, DOE submitted its updated Performance Assessment (PA), the *2009 Performance Assessment for the Saltstone Disposal Facility at the Savannah River Site* (2009 PA) for NRC review in accordance with NRC's monitoring responsibilities under Section 3116(b). Following extensive discussions with DOE, the NRC completed its review in a TER on April 30, 2012 (ML121020140). In this TER, the staff concluded that it did not have reasonable assurance that the performance objective in §61.41 would be met. The staff concluded, however, that the rest of the performance objectives are met. At the current time NRC is working on a revised monitoring plan based on the results of 2012 TER. NRC staff expects the revised plan to be complete within the 2012 calendar year. The NRC will continue to use the 2007 monitoring plan until the 2012 monitoring plan is complete.

OBSERVATION DETAILS:

NRC's onsite observation of the disposal actions taken by DOE focuses on the performance objectives set out in 10 CFR Part 61, Subpart C. These performance objectives are (i) protection of the general population from releases of radioactivity (§61.41), (ii) protection of individuals against inadvertent intrusion (§61.42), (iii) protection of individuals during operations (§61.43), and (iv) stability of the disposal site after closure (§61.44).

Ensuring protection of the general population, protection of an inadvertent intruder, and disposal site stability predicates heavily on the performance of the disposal cell and saltstone waste form within the period of compliance. Protection of individuals during operations depends, in part, on the containment of salt waste in the waste form and disposal cells during and immediately following grout emplacement. The staff will observe features important to waste form and disposal cell performance and will use the following guidance to direct the observation while visiting the SRS facility.

Facilities Tour

The NRC staff has requested a tour of operating Vault 4, the new disposal cells (built or under construction) and the Saltstone Production Facility (SPF). NRC staff also requests an update on the status of construction activities associated with the new cells.

Saltstone Processing Discussion

The NRC staff would like an update on SPF operations. The SPF is the facility responsible for production of the grouted waste form during normal operation. Some details of the staff's request are listed below:

- General information on operations in 2011 (e.g., number of operating days, aggregate disposed inventory [volume, concentrations, and activity]),
- Unusual facility behavior in 2011, if any (e.g., unusual work stoppages, their respective causes, and length, abnormal worker exposure),
- Planned disposal actions for 2012 (e.g., quarterly run-rate, intended feed volume), and
- Capacity constraint schedule (i.e., when new cells will be put into operation).

In addition, the NRC staff is interested in discussing Saltstone quality assurance. Verifying the quality of the saltstone waste form is important to assessing grout formulation and placement which relates directly to ensuring compliance with §61.41, “*protection of the general population from releases of radioactivity*” and §61.42, “*protection of individuals against inadvertent intrusion.*” Specifically, the staff would like to discuss conditions and controls that DOE has defined to ensure future saltstone quality.

Technetium Inventory in Vault 4

NRC staff would like to discuss topics related to the inventory of Tc in Vault 4 with SRS site staff. NRC staff monitors inventory of radionuclides disposed of in Z-Area in order to verify compliance with the performance objectives identified in §61.41, protection of the general population from releases of radioactivity and §61.42, protection of individuals from inadvertent intrusion. In particular, the NRC staff would like to discuss how the current inventory in Vault 4 compares to the assumed inventory in the 2009 PA (e.g., based on X-CLC-Z-00027 and the quarterly monitoring reports, it appears that the Tc disposed of in Vault 4 to date exceeds the inventory assumed in the revised PA). Additionally, the NRC staff would like to discuss the expected inventory in the waste that DOE intends to dispose in Cells 2A/2B.

Details of Lysimeter Testing

NRC staff would like to observe and discuss the new radionuclide lysimeter field experiments. The lysimeter testing is a 10-year study which will provide information on the leaching of radionuclides from the saltstone waste form. Specifically, NRC staff would like to discuss the following topics:

- Overview of the experimental design of the lysimeter study,
- Analytical approach for effluent and soil samples, and
- Anticipated results from the lysimeter study and potential application of results in future PAs.

Path Forward for NRC NDAA Monitoring Program

NRC staff would like to discuss two aspects of the path forward to its NDAA monitoring program at the SDF.

1. The NRC staff would like to explain how Open Issues identified under NDAA monitoring prior to publication of the 2012 TER will be incorporated into the revised monitoring plan.
2. The NRC staff would like to discuss two sections it plans to incorporate into the revised monitoring plan: (i) a list of documents (Document List) composed of a standing set of documents the NRC would be interested in receiving when published or revised by DOE, and (ii) a list of processes or activities (Disposal Activities List), exclusively related to NDAA disposal activities, about which the NRC staff plans to routinely request updates.