

April 30, 2012

Mr. Mark Gilbertson
Deputy Assistant Secretary for Site Restoration
Office of Environmental Management
U.S. Department of Energy
1000 Independence Avenue, S.W.
Washington, DC 20585

SUBJECT: TECHNICAL EVALUATION REPORT FOR THE 2009 PERFORMANCE
ASSESSMENT FOR THE SALTSTONE FACILITY AT THE SAVANNAH RIVER
SITE

Dear Mr. Gilbertson:

Under Section 3116(b) of the Ronald W. Reagan National Defense Authorization Act for Fiscal Year 2005 (NDAA), the U.S. Nuclear Regulatory Commission (NRC) is required to monitor certainⁱ disposal actions taken by the U.S. Department of Energy (DOE) to assess compliance with the performance objectives set out in 10 CFR 61, Subpart C. In accordance with these responsibilities, the NRC staff has performed a technical review to determine whether there is reasonable assurance that the 10 CFR 61 performance objectives are met by the waste management approach proposed in DOE's *Performance Assessment for the Saltstone Disposal Facility at the Savannah River Site, SRR-CWDA-2009-00017* (2009 PA) and associated documentation. The NRC's assumptions, analysis, and conclusions are presented in the attached Technical Evaluation Report (TER).

The 2009 PA is an update to DOE's February 2005 Performance Assessment (2005 PA) performed in support of the *Draft Section 3116 Determination, Salt Waste Disposal, Savannah River Site*. In its December 2005 TER (available via the NRC's Agencywide Documents Access and Management System (ADAMS) at Accession Number ML053010225) documenting the NRC's review of DOE's 2005 PA for the Saltstone Disposal Facility (SDF), the NRC staff concluded that it had reasonable assurance that salt waste disposal at the SDF would meet the performance objectives of 10 CFR Part 61 provided certain assumptions in DOE's analyses were verified during monitoring. During the current review, the NRC staff carefully evaluated new information related to the assumptions identified in the previous review, as well as new factors of importance to the modified disposal plans and revised conceptual model.

Based on the information provided by DOE to the NRC in letters dated November 23, 2009, July 23, 2010 (ML102090661), April 21, 2011 (ML111180128), May 20, 2011 (ML111400298), and August 26, 2011 (ML113320297), the NRC staff has concluded that the performance objective in §61.41 for protection of the general population from releasesⁱⁱ may be exceeded by DOE's current proposed disposal activities for salt waste. Specifically, the NRC staff does not have reasonable assurance, in accordance with §61.40, that the annual dose limit for a member of the general population as specified in §61.41 will be met. This conclusion is based on the NRC staff's review of the 2009 PA, Request for Additional Information (RAI) responses, and supporting references, as well as the NRC's own independent calculations and analyses, as

documented in the attached TER. Although the NRC staff cannot conclude that the performance objective in §61.41 is met, the potential dose to an off-site member of the public from DOE's disposal actions is still expected to be relatively low (i.e., approximately 1 mSv/yr [100 mrem/yr], the public dose limit in §20.1301). The NRC staff does have reasonable assurance that waste disposal at the SDF meets the 10 CFR 61 performance objectives for protection of individuals against intrusion (§61.42), protection of individuals during operations (§61.43), and site stability (§61.44).

As stated in NUREG-1854, *NRC Staff Guidance for Activities Related to U.S. Department of Energy Waste Determinations*, there are three primary reasons that DOE disposal actions could be found noncompliant: (1) if there are sufficient indications that the requirements of the performance objectives are currently not being met, (2) if there are sufficient indications that there is no longer reasonable assurance that the dose limits specified in the performance objectives will be met in the future, or (3) if key aspects relied upon to demonstrate compliance with one or more performance objectives are no longer supported due to the lack of supporting information obtained during the monitoring period. As documented and explained in the TER, the NRC is not stating that releases have occurred from the disposal facility that could lead to annual doses that exceed the limits established in §61.41 (item 1 listed above). The NRC staff is, however, concerned that (i) information collected during the monitoring period (e.g., hydraulic conductivity assessments, technetium sorption measurements) does not support DOE's compliance demonstration and (ii) sufficient information has not been provided to support many key modeling assumptions relied on for performance (items 2 and 3 above).

Concurrent to publishing its TER, the NRC is sending a letter of concern (ML120650576), per Section 10.4.3 of NUREG-1854, to DOE and the State's regulatory body, the South Carolina Department of Health and Environmental Control (SC DHEC) so that SC DHEC is kept informed and has an opportunity to provide input and comments and to provide DOE with an opportunity to furnish information that demonstrates its disposal actions are in compliance with the performance objectives. For example, DOE may present new or additional information or make design changes that would enable the NRC to conclude with reasonable assurance that salt waste disposal at the SDF meets the 10 CFR 61 performance objectives. NRC staff will review any additional information provided by DOE and SC DHEC.

In accordance with §2.390 of the NRC's "*Rules of Practice for Domestic Licensing Proceedings and Issuance of Orders*," 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 (ML121020140). ADAMS is accessible from the NRC Website at <http://www.nrc.gov/reading-rm/adams.html>.

The NRC, like DOE, considers it to be in the public interest and important to dispose of the salt waste in a safe and timely fashion. We welcome the opportunity to meet with your staff to resolve concerns identified in the TER. If you have any questions or need additional information please call me at (301) 415-6673, or call Nishka Devaser, the Saltstone project manager, at (301) 415-5196.

Sincerely,

/RA/

Larry W. Camper, Director
Division of Waste Management
and Environmental Protection
Office of Federal and State Materials
and Environmental Management Programs

cc w /enclosure:
S. Wilson
Federal Facilities Liaison
Environmental Quality Control Administration
South Carolina Department of Health
and Environmental Control
2600 Bull Street
Columbia, SC 29201-1708

WIR Service list

ⁱ Section 3116(b) of the NDAA requires NRC to monitor DOE's disposal actions concerning certain wastes associated with spent fuel reprocessing that DOE has determined to be non-High Level Waste (HLW). Although radioactive material resulting from the reprocessing of spent nuclear fuel typically is defined as HLW, DOE may determine certain reprocessing waste is non-HLW, or Waste Incidental Reprocessing, if it does not need to be disposed of as HLW to manage the risks it poses.

ⁱⁱ §61.41 states "Concentrations of radioactive material which may be released to the general environment in ground water, surface water, air, soil, plants, or animals must not result in an annual dose exceeding an equivalent of 25 millirems to the whole body, 75 millirems to the thyroid, and 25 millirems to any other organ of any member of the public." NRC has evaluated compliance using a dose limit of 0.25 mSv/yr (25 mrem/yr) Total Effective Dose Equivalent (TEDE) consistent with the approach discussed in final rule (66 FR 55752) "Because each of the organs had the same limit under the older system even though each had a different level of radiosensitivity, it is very difficult to directly compare the old standards with the new standards. As noted in the proposed rule, the Commission considers 0.25 mSv/yr (25 mrem/yr) TEDE as the appropriate dose limit to compare with the range of potential doses represented by the older limits that had whole body dose limits of 0.25 mSv/yr (25 mrem/yr)." The DOE performance assessment and NRC's review have used the most updated dose factors consistent with Commission direction in SRM-SECY-01-0148 to calculate the potential dose.

The NRC, like DOE, considers it to be in the public interest and important to dispose of the salt waste in a safe and timely fashion. We welcome the opportunity to meet with your staff to resolve concerns identified in the TER. If you have any questions or need additional information please call me at (301) 415-6673, or call Nishka Devaser, the Saltstone project manager, at (301) 415-5196.

Sincerely,

Larry W. Camper, Director
Division of Waste Management
and Environmental Protection
Office of Federal and State Materials
and Environmental Management Programs

cc w /enclosure:

S. Wilson
Federal Facilities Liaison
Environmental Quality Control Administration
South Carolina Department of Health
and Environmental Control
2600 Bull Street
Columbia, SC 29201-1708

WIR Service List

DISTRIBUTION: GAlexander ARidge KPinkston CBarr

ML121020140

OFC	DWMEP:PM	DWMEP:LA	DWMEP:TR	DWMEP:BC
NAME	NDevaser	AWalkerSmith	ARidge	GSuber
DATE	04/30/12	04/30/12	04/30/12	04/30/12
OFC	DWMEP:BC	OGC	DWMEP	DWMEP:DD
NAME	CMcKenney	BJones	APersinko	LCamper
DATE	04/30/12	04/30/12	04/30/12	04/30/12

OFFICIAL RECORD COPY

¹ Section 3116(b) of the NDAA requires NRC to monitor DOE's disposal actions concerning certain wastes associated with spent fuel reprocessing that DOE has determined to be non-High Level Waste (HLW). Although radioactive material resulting from the reprocessing of spent nuclear fuel typically is defined as HLW, DOE may determine certain reprocessing waste is non-HLW, or Waste Incidental Reprocessing, if it does not need to be disposed of as HLW to manage the risks it poses.

¹¹ §61.41 states "Concentrations of radioactive material which may be released to the general environment in ground water, surface water, air, soil, plants, or animals must not result in an annual dose exceeding an equivalent of 25 millirems to the whole body, 75 millirems to the thyroid, and 25 millirems to any other organ of any member of the public." NRC has evaluated compliance using a dose limit of 0.25 mSv/yr (25 mrem/yr) Total Effective Dose Equivalent (TEDE) consistent with the approach discussed in final rule (66 FR 55752) "Because each of the organs had the same limit under the older system even though each had a different level of radiosensitivity, it is very difficult to directly compare the old standards with the new standards. As noted in the proposed rule, the Commission considers 0.25 mSv/yr (25 mrem/yr) TEDE as the appropriate dose limit to compare with the range of potential doses represented by the older limits that had whole body dose limits of 0.25 mSv/yr (25 mrem/yr)." The DOE performance assessment and NRC's review have used the most updated dose factors consistent with Commission direction in SRM-SECY-01-0148 to calculate the potential dose.