July 25, 2011

ORGANIZATION: U.S. Department Of Energy

PROJECT MANAGER: Nishka Devaser **/RA/**
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

PROJECT: Savannah River Site, Saltstone Facility

SUBJECT: MAY 5, 2011 SUMMARY OF TELEPHONE CONFERENCE CALL TO DISCUSS SECOND REQUEST FOR ADDITIONAL INFORMATION FOR REVIEW OF THE UPDATED PERFORMANCE ASSESSMENT FOR THE SALTSTONE DISPOSAL FACILITY, DOCKET NUMBER PROJ0734

On May 5, 2011, the U.S. Nuclear Regulatory Commission (NRC) participated in a working-level phone call with the U.S. Department of Energy (DOE) to discuss DOE's proposed approach for responses to the NRC staff's second request for additional information (RAI). The purpose of the call was to ensure the comments are fully understood by DOE such that DOE may adequately respond to the NRC's second RAI made during review of the Performance Assessment for the Saltstone Facility at the Savannah River Site. NRC is reviewing the Saltstone Performance Assessment in accordance with its monitoring responsibilities under Section 3116 of the National Defense Authorization Act for Fiscal Year 2005. No formal decisions were made or intended to be made at this meeting. The purpose was for information exchange at the technical staff level and no management was present at the meeting.

Enclosure 1 provides a listing of the telephone conference participants. Enclosure 2 contains a listing of the RAI's discussed and a brief description of the status of each item. A copy of this summary was provided to the DOE for comment.

Docket No.: PROJ0734

Enclosure: Meeting Summary

CC w/enclosures: WIR Service List

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OFC	DWMEP	DWMEP	DWMEP	DWMEP	DWMEP	DWMEP
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List of Participants
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Regarding the Savannah River Site, Saltstone Facility

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Patricia Suggs	U.S. Department of Energy
Linda Suttora	U.S. Department of Energy
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Greg Flach	Savannah River National Laboratory

Request for Additional Information Discussion and Status with Regard to the U.S. Nuclear Regulatory Commission Monitoring Activities at the Saltstone Disposal Facility at the Savannah River Site
May 5, 2011

The U.S. Nuclear Regulatory Commission (NRC) sent its second Request for Additional Information (RAI) on December 15, 2010 (ML103400571). Due to the complexity of performance assessments and associated RAIs, extensive clarification of RAI comments is sometimes necessary. Additionally, the NRC staff provided some indication of the risk significance of the basis for various RAI comments to the U.S. Department of Energy (DOE).

PA-13: ***Comment***: The dose consequence from early releases from the vaults prior to completion of the closure cap is not considered.

Discussion: Regarding the effects of the environmental exposure of vaults prior to cap completion, DOE indicated that (1) the cells have walls and a roof to prevent water intrusion; (2) many of the cells have (or will have) sheet drain systems to remove water from inside the cells; (3) the emplacement of a clean grout cap will essentially seal the disposal unit penetrations hydraulically and pneumatically; (4) the vault roofs are sloped to preclude ponding; and (5) freeze-thaw cycle impacts are not anticipated due to the temperate climate of South Carolina.

DOE indicated it expects prompt removal of water via the sheet drain system would minimize the effects of any infiltration that may migrate through the vault roofs. NRC staff discussed cells C, G, and I within Vault 4, which do not have sheet drain systems, and requested additional information regarding the potential for cells to collect and release water derived from (1) condensation inside the vaults, (2) infiltration through the vault roofs, and (3) bleed water. DOE discussed that although there is communication between the cells in Vault 4, the volume of condensate is minimal due to atmospheric venting. NRC staff suggested data collected on the volume of water that is retrieved from the cells with the sheet drain system after the initial curing period may provide useful information on the volume of water that may be condensing and infiltrating through the roof.

NRC staff noted that meteorological reports have indicated approximately 30-40 days/yr near the Savannah River Site (SRS) reach temperatures that are below freezing. DOE stated that the magnitude and duration of freezing temperatures at the site would not be sufficient to adversely affect the integrity of the cementitious materials. NRC staff requested a technical basis for this conclusion.

NRC staff also hypothesized that the effect of current oxygen exposure may be significant to the chemical stability of the grout and is not represented in the PA. Recent research by DOE (Kaplan et al., 2011) indicated that trace concentrations of oxygen led to the oxidation of technetium in saltstone. NRC staff suggested that current oxygen exposure should be evaluated in the base case model or a calculation should be provided demonstrating that the dose consequences are insignificant.

Cozzi, A. and Duncan, A., 2009. *Characterization of Core Sample Collected from the Saltstone Disposal Facility*. SRNL-STI-2009-00804 Rev. 0.

Kaplan, D., Lilley, M., Almond, P., and Powell, B., 2011. *Long-term Technetium Interactions with Reducing Cementitious Materials*. SRNL-STI-2010-00668 Rev. 0.

Status: Question required clarification, NRC staff discussed the RAI with DOE staff; additional technical discussion is required.

IN-5: ***Comment***: Additional information is needed about the Th-230 inventory assumed for Vault 4 and the process used to confirm that all risk-significant radionuclides have been identified as key radionuclides as waste is disposed and final inventory information becomes available.

Discussion: DOE indicated Ra-226 and Th-230 are below detection limits in Tank 50 samples and stated that they would check the sample results to assess the detection limits and results for Th-230. DOE indicated that U-234 is measured.

Status: Question required clarification, NRC staff clarified the RAI to DOE staff; no additional technical discussion is required. NRC looks forward to reviewing the response.

SP-10: ***Comment***: There are indications that some measured plutonium and neptunium sorption coefficients in cementitious materials could reflect solubility rather than sorption, which could lead to a significant overestimate of plutonium and neptunium sorption.

Discussion: DOE indicated it plans to model the solubility limit for plutonium and neptunium with a K_d approach. NRC staff indicated that it understands that although linear sorption is conceptually different from solubility, the approach can work if (1) the source is not significantly depleted during the period of interest, and (2) the solid concentration in the field is greater than the solid concentration used in the laboratory experiments. NRC staff indicated it has encountered this generic issue before and can send a short write up on this issue; however, subsequent to this meeting, NRC and DOE staff determined that such a write-up is unnecessary, thus the NRC staff did not provide this write-up to DOE. DOE then stated that, regarding (2) above, they believe that the concentrations in their lab samples are kept below solubility limits.

Status: Question required clarification, NRC staff clarified the RAI to DOE staff; no additional technical discussion is required. NRC looks forward to reviewing the response.

SP-14: ***Comment***: Additional information is needed about the basis for the K_d values used for iodine and radium in cementitious materials.

Discussion: NRC requested clarification on the role of the DOE report SRNL-STI-2009-00636. DOE indicated that the K_d values in this report are the most recent information but that they are considered in the context of previous

values and do not necessarily supersede previous values. NRC staff requested more information about which data were used to support the best estimate of the iodine K_d used in the PA. NRC staff also suggested that DOE should consider the large uncertainty in the iodine no-solids control sample and show the effect of this uncertainty on the K_d values reported as best estimates for an iodine K_d in cementitious materials in SRNL-STI-2009-00636.

Status: Question required clarification, NRC staff clarified the RAI to DOE staff; no additional technical discussion is required. NRC looks forward to reviewing the response.

FFT-1: ***Comment***: Additional justification is required for the uncertainty ranges used for K_d values in site soils.

Discussion: NRC indicated that if DOE has more information about the uncertainty in K_d values for risk-significant radionuclides, it would be preferable to refine the uncertainty ranges based on this information than to use the generic uncertainty ranges.

Status: Question required clarification, NRC staff clarified the RAI to DOE staff; no additional technical discussion is required. NRC looks forward to reviewing the response.

Biosphere: ***Comment***: Generalized discussion regarding DOE's approach to modeling the local biosphere.

Discussion: DOE has not determined whether it will change the K_d for iodine in Case K. NRC indicated it would coordinate its comments on DOE's proposed resolution to the biosphere comments with the NRC F-Tank Farm review team. NRC also indicated that they would provide the DOE information about their approach to analyzing the ingestion of soil by chickens.

Status: Question required clarification, NRC staff clarified the RAI to DOE staff; no additional technical discussion is required. NRC looks forward to reviewing the response.