

Summary Notes from 17-19 April 2007 Savannah River Site F-Area Tank Farm
Performance Assessment Input Meeting

Attendees: Representatives from Department of Energy-Savannah River (DOE-SR), DOE-Headquarters (DOE-HQ), the U.S. Nuclear Regulatory Commission (NRC), the South Carolina Department of Health and Environmental Control (SCDHEC) and the U.S. Environmental Protection Agency, Region IV (EPA-IV) met at the SCDHEC offices in Columbia, South Carolina from 17-19 April 2007.

Discussion: DOE is pursuing final closure on the F-Area Tank Farm (FTF) located at Savannah River Site (SRS). At some point in the future, DOE and NRC will consult on waste determinations for these tank closures; additionally these tanks will be closed in coordination with EPA and SCDHEC in accordance with the Federal Facility Agreement for the Savannah River Site and the State-approved closure plans pursuant to the State Industrial Wastewater permit. The DOE, NRC, EPA, and SCDHEC met for the third in a series of technical exchanges on the proposed inputs for a revision to the FTF Performance Assessment (PA). The technical exchanges are intended to capitalize on early interactions between the agencies with a goal of improving DOE's FTF PA. Technical discussion allowed for the clarification of general modeling parameter values and identifying other specific questions. Future meetings for additional input parameter topics were discussed with the next meeting planned for 8-9 May 2007 to discuss the overall integrated conceptual model.

Topics: The following four specific topical areas were discussed during the meeting:

1. Waste Release Approach – DOE's proposed approach for calculating the modeled release of radionuclides from the residual waste, with the parameters for uranium and technetium presented as examples.
2. Vadose Zone and Backfill Parameters – DOE's proposed approach to developing input parameters for the vadose zone soil and backfill soils around the tanks for use in the PA modeling.
3. Modeling Code Integration – DOE's proposed modeling codes for the PA and their integration, including the hierarchy of the codes.
4. Ancillary Equipment Design – DOE's proposed initial conceptual models for the FTF ancillary equipment including evaporators, pump tanks, diversion boxes,

valve boxes and transfer lines.

Summary: The following summarizes the discussion during the meeting, by topical area.

Waste Release Approach

- DOE plans to provide clarification in the background section of the inputs package for the FTF PA regarding how the residual material on the tank walls will be considered in the model for the FTF PA.
- DOE plans to conduct a literature review and determine if lab testing with grout can limit uncertainties for the FTF PA.
- If solubility limits in grouted waste are based on solubilities in dip samples, then DOE should provide an explanation of why the chemistry of the dip sample is similar to grouted pore fluid.
- DOE plans to conduct simulations of waste form release under both oxidizing and reducing conditions, with and without cracks for the FTF PA. DOE will identify its assumptions and explain their reasonableness and relevance in the input packages for the FTF PA.
- NRC staff acknowledged improvements in the overall conceptual approach for the FTF PA over previous SRS PA work.
- DOE plans to consider the input from this meeting prior to calculating parameters for other radionuclides in the input packages for the FTF PA.
- NRC staff indicated it would need to understand the uncertainty in solubility limits and sorption coefficients used in a radionuclide release model. As an example, NRC staff indicated that the choice of a solubility-limiting phase would be expected to have a significant effect on the results.

Vadose Zone and Backfill Parameters

- DOE plans to review site reports for any data on contaminant transport in the vadose zone and add a reference for information on tritium migration in the input packages for the FTF PA.
- DOE plans to ensure appropriate justification for modeling assumptions in the FTF PA such as the effect of using a single average moisture retention curve to represent a range of material properties.

- DOE plans to evaluate the effect of degrading cement on pH, solubility, and sorption for the FTF PA.
- DOE plans to code the data in its data tables (e.g., Table 1.7) for the FTF PA to include whether the data is from testing or literature.
- DOE plans to use Kd values and ranges for the FTF PA that utilize the best estimate values and reflect the statistical distribution of the values.
- NRC staff discussed the types of information it would expect to evaluate when reviewing Kd values, including the applicability of experiments or field observations to the physical and chemical conditions modeled in the tank farm PA.
- DOE plans to consider the effect of fluctuations in the water table on contaminant transport and material degradation of engineered barriers to validate assumptions regarding ponding of water above working slabs for the FTF PA.
- DOE plans to consider the applicability of the simpler GoldSim model to perform sensitivity or uncertainty analysis on engineered or natural system attributes considered in more complex modeling for the FTF PA.

Modeling Code Integration

- NRC staff believes the models being selected by DOE appear to be reasonable as they are the same as used for the Saltstone PA, with the addition of GoldSim. SCDHEC is still reviewing the software.
- DOE plans to include three separate zones in its integrated model for the FTF PA for transport and fate of radionuclides from tank residuals: the closure cap, vadose zone and the saturated zone.
- DOE's proposed model approach for the FTF PA does not preclude consideration of lateral migration from the tanks.
- DOE plans to develop a process to assure consistency of data from one analysis package to another for the FTF PA using a single point of control for datasets.

Ancillary Equipment Design

- DOE plans to include abandoned waste transfer lines in the FTF PA as potential lines to be drilled through by a hypothetical intruder. The

abandoned waste transfer lines will be excluded from the basement excavation scenarios in the FTF PA due to their depth after placement of the assumed closure cap.

- DOE plans to assume uniform distribution of the radionuclide inventory in the transfer lines throughout the FTF modeling grid system initially to determine if there is a need to address any concentration of lines. DOE plans to address, based on investigation of the sensitivity of the results of this assumption, whether analysis of a more concentrated, nonhomogeneously distributed source is needed for the FTF PA.
- DOE plans to not include diversion boxes and valve boxes in the conceptual model for the FTF PA because they have secondary containments that will be cleaned at closure, are easily accessible, and will be grouted.
- For modeling purposes, DOE plans to assume for the FTF PA that transfer lines will not be grouted, although for structural purposes they may be grouted in locations where they are concentrated.
- DOE plans to flush, clean, and grout pump pits; however, a residual heel may remain in pump tanks, which would be addressed in the FTF PA.

DOE acknowledged that there may be remaining uncertainties for each of the above topics that DOE plans to address as appropriate in preparing the FTF PA.