

Technical Review Inquiry: *TECHNICAL REVIEW: SALTSTONE INVENTORY*

Review Completed: Not Completed, Attached Inquiry/Comments

Reviewer(s): K. Pinkston, D. Pickett

Document(s): Rosenberger, K.H., *Unreviewed Disposal Question Evaluation: Evaluation of Updated Radionuclide Inventory in Saltstone Disposal Facility*, SRNS-J2100-2009-00014. June 2009.

Staub, A.V., *Inventory Determination of PODD Radionuclides in Saltstone Vaults 1 and 4*, X-CLC-Z-00027. June 2009.

Le, T.A., *Alternative Determination of Saltstone Disposal Facility (SDF) Radionuclides Inventory as of March 31, 2009*, X-ESR-H-00188. June 2009.

Romanowski, L.B., *Evaluation of Saltstone Disposal Facility Radiological Inventory*, LWO-RIP-2009-00025. June 2009.

Tisler, A.J., *Best Estimate of the Concentration of Radionuclides in a Tank 50 Influent Stream Aggregate*, LWO-LWE-2009-00159. June 2009.

NRC staff would like to discuss the following topics for discussion on the subject of inventory disposed of at the Saltstone Disposal Facility with appropriate site personnel.

Please note that these topics are only intended to be a guide for discussion and are not a formal request for any documentation or any follow up actions.

Topics for Discussion

1. In the past, the concentrations and inventory provided in the permit reports were based on the materials balance calculations for radionuclides identified as having limits in the Saltstone WAC and were based just on sample results for radionuclides identified as having targets in the Saltstone WAC. Is this method going to continue to be used to track the inventory of radionuclides disposed of at the Saltstone Disposal Facility?
2. How is decay and ingrowth going to be accounted for when tracking the inventory that has been disposed?
3. What caused the change in reported inventory between the permit reports and X-CLC-Z-00027?
4. The fourth quarter 2007 permit report had concentrations of radionuclides (e.g., Se-79, Pu-238, Pu-239, Am-241, and Cm-244) that were much higher than those reported for the same time period in X-CLC-Z-00027. What is the reason for this?
5. In Tables 1 to 3 in X-CLC-Z-00027 many of the radionuclides had less than values reported for their concentrations. What was the reason for this? Were these radionuclides present below the limit of quantification or the detection limit?

6. How is the total inventory of radionuclides that are not present at detectable levels going to be tracked? Will the methodology of X-ESH-H-00188 continue to be used for this?
7. In X-ESR-H-00188 assumption 7 states that non-salt processing influents were low in activity and were not included. How are radionuclide inputs from these waste streams going to be tracked in the future?
8. When are samples going to be taken each quarter?
9. Is the prediction of the Tank 50 concentration calculated in LWO-LWE-2009-00159 ("Best Estimate of the Concentration of Radionuclides in a Tank 50 Influent Stream Aggregate") going to be used in the tracking of inventory?
10. In X-ESR-H-00188, an alternative inventory calculation is performed for a) radionuclides that are based on sample results that are less than the detection limit and are near the projected inventory in the PODD, b) radionuclides for which no analyses were performed, and c) Am-243. Which of the radionuclides evaluated fall into category b (i.e., no analyses were performed)?
11. Other than the radionuclides in the above list, are there any others that are not measured directly in the samples and are instead quantified based on process knowledge or the concentration of surrogates?
12. In X-ESR-H-00188, it is stated that the tank concentrations used in this calculation were taken from Tran 2005. Were any samples taken of these tanks between 2005 and the present? If so, were the measured concentrations in the samples comparable to what was reported in Tran 2005?
13. In X-ESR-H-00188, assumption 10 states that Na-22, Al-26, Ac-227, and Pa-231 are assumed to be 100% soluble in the salt solution. What is assumed for the solubility of the other radionuclides?
14. In the example calculation for Nb in X-ESR-H-00188, it seems to be assumed that the inventory of Nb in the salt cake is zero. What is the basis for this assumption and how is it known that there is no entrained sludge in the salt cake?
15. The volumes used for material in tank 50 in X-ESR-H-00188 seem to be inconsistent. For example, at the top of page 7 the initial volume in tank 50 is given as 4.24e5 gallons. A transfer of 1.5e5 gallons was made from tank 50 during DDA batch 0, and, based on Table 1; it does not seem that any transfers were made into tank 50 during this time. However, the initial volume for tank 50 for DDA batch 1 seems to be 7.06e5 gallons.
16. Have any of the documents related to the tank sampling or tracking of inventory been updated? Is revision 8 the most recent version of the Saltstone WAC (X-SD-Z-00001)?
17. A follow-up action from a previous meeting was for SRS to provide an evaluation of Tank 50 material balance; from third quarter 2007 to present (item ML091320439-004). What is the status of this action?