

Sludge/Actinide Removal Followed by Cesium Disposal in Grout

In the proposed process, the salt solution is first treated to remove U, Pu, Sr, and sludge. The Cs-137 is not separated from the salt waste or concentrated supernate. All soluble waste is sent to the Saltstone facility. The saltstone waste form generated from dissolved saltcake solution will meet NRC Class C LLW disposal requirements for near-surface disposal. The vaults presently used in the Saltstone facility meet current regulations for NRC Class C disposal. The current permit, however recognizes a much lower average Ci content in a disposal unit (cell) (within NRC Class A limits) for disposed saltstone. Treatment of salt solution is required to remove entrained sludge and Hg so that soluble alpha activity is no greater than 100 nCi/g and Hg concentration is less than 260 mg/l in the final waste form. At the projected maximum concentration of Cs-137, a new grout production facility within a new shielded cell containing grout production equipment modified to enable remote maintenance capability would need to be constructed.

The proposed process would include these steps: (1) combine concentrated supernate and dissolved salt cake solution and transfer the salt solution to a tank for treatment to remove soluble alpha; (2) treat salt solution with MST to reduce Sr, Pu, and U; (3) filter to remove entrained sludge solids and MST; (4) transfer filtered salt solution to the new grout production facility.

Variation:

- 1) Use a temperature-tolerant ceramic waste form in place of grout

Merits:

- 1) Simplicity - no separation process
- 2) No hazardous materials added

3) Reduced volume of glass

