Savannah River Site
Citizens Advisory Board

Recommendation 339
Liquid Waste Revision 20

Background

Treatment and disposition of salt waste is the critical path to the fulfillment of the Savannah River Site (SRS) Liquid Waste (LW) Disposition Program[i]. The goal of the Liquid Waste Plan is to ensure "safe storage of the waste and minimize extension of the remaining time at risk associated with legacy high level waste storage in aging tanks."[ii] Key components of the program include removing as much cesium as practical from the salt waste as quickly and safely as possible. The revision of the Liquid Waste Plan outlines the current operating strategy of the LW System at SRS to receive, store, treat, and dispose of radioactive liquid waste and to close waste storage and processing facilities at the program's close. The liquid waste system is a highly integrated system involving safe storage of liquid waste in underground storage tanks; removing, treating, and dispositioning the low-level waste fraction in concrete salt-stone disposal units, vitrifying the higher activity waste at DWPF;
and storing the vitrified waste in stainless steel canisters pending permanent disposition. After waste removal and processing are complete, the facilities are cleaned and closed. Changes to the Liquid Waste Plan are driven in part by funding adjustments, opportunities to accelerate the speed of removal, reprioritizing sequencing, and advances in technology[iii]. The chart below is a break-down of the current Revision 19 plan and Case 1 and Case 3 scenarios for Revision 20. Case 2 of Revision 20 models the same funding profile of Case 1, however, it has the Salt-Waste Processing Facility starting-up in January 2021, rather than 2018. Revision 19 (May 2015) incorporated SWPF beginning in September 2018 and the last liquid waste facility being turned over to demolition and destruction in 2042.

Parameter	Revision 19	Rev 20, Case 1	Rev 20, Case 3
Date SWPF begins hot operations	Sep 2018	Dec 2018	Dec 2018
Date last LW facility turned over to D&D	2042	2041	2038
Final Type I, II, and IV tanks complete operational closure	2032	2036	2032
Complete bulk sludge treatment	2030	2031	2030
Complete bulk salt treatment	2033	2032	2030
Complete heel treatment	2039	2036	2036
TCCR for supplemental salt waste treatment	No	1 unit	2 units
Next generation extractant for increased SWPF throughput	FY22	FY22	FY21
Maximum canister weight percent (wt%) waste loading	40 wt%	40 wt%	40 wt%
Total number of canisters produced	8,582	8,170	8,210
Year supplemental canister storage required to be ready	2019	2029	2029
Radionuclides (curies) dispositioned in SDF within the amended *SRS LW Strategy*	Yes	Yes	Yes
Total number of SDUs	13	14	13

In addition to a 3-year advance start-up of SWPF, Case 3 provides for an acceleration of the F-Tank Farm isolation and clean-up, and provides for a second TCCR (Tank Closure

Cesium Removal) installation. TCCR, procured from a vendor, is an ion exchange process for the removal of cesium liquid salt waste to "provide a supplemental treatment capability and improved confidence in supporting the desired acceleration of waste retrieval and tank closure efforts. Building on the experience of modular commercial nuclear plant decontamination and following the disaster response associated with Fukushima, the technology exists in industry, and appears to have matured in capability and reliability, to accomplish larger scale, selective removal of the cesium component of the bulk salt waste effectively and efficiently[iv]."
In the opinion of South Carolina Department of Health and Environmental Control the tank material at the Savannah River Site is the greatest environmental threat to the state.

Recommendation

The Savannah River Site Citizens Advisory Board recommends that the Department of Energy:

1. Focus on Case Scenario 3, which provides an accelerated clean-up schedule for the material, and work within the prescribed methods to secure additional funding to accelerate the program.

Recommendation #339
Adopted September 27, 2016
Sponsored by the Waste Management Committee

[i] Liquid Waste System Plan. Retrieved on July 26, 2016. http://www.srs.gov/general/pubs/srr-lw-systemplan.pdf
[ii] Liquid Waste System Plan. Retrieved on July 26, 2016. http://www.srs.gov/general/pubs/srr-lw-systemplan.pdf
[iii] System Plan Revision 20 Presentation. Pete Hill, SRR System Planning Manager. Presented on July 26, 2016.
[iv] Liquid Waste System Plan. Retrieved on July 26, 2016. http://www.srs.gov/general/pubs/srr-lw-systemplan.pdf