

Interim Salt Waste Processing: Actinide Removal Process and Modular Caustic Side Solvent Extraction Unit

The Savannah River Site's liquid radioactive waste operations involve the management of space in the Site's 49 underground waste tanks, including the removal of waste materials. Once water is removed from the waste tanks, two materials remain: salt and sludge waste.



Actinide Removal Process (ARP)



Modular Caustic Side Solvent Extraction Unit (MCU)

Removing salt waste, which fills approximately 90 percent of the tank space in the SRS tank farms, is a major step toward closing the Site's waste tanks that currently contain approximately 38 million gallons of waste.

Due to the limited amount of tank space available in new-style tanks, some salt waste must be dispositioned in the interim to ensure sufficient tank space for continued sludge washing and to support the initial start-up and salt processing operations at the Salt Waste Processing Facility (SWPF).

Interim Salt Processing

Until the SWPF begins operations, several interim processes will be used to accomplish the separations activity for salt waste.

An interim salt waste processing program has been developed that integrates a set of salt-decontamination processes designed to eliminate nearly all of the radioactive isotopes from about one million gallons of salt solution per year until the high-capacity Salt Waste Processing Facility (SWPF) becomes operational, which is targeted for 2014.

The Actinide Removal process (ARP) and Modular Caustic Side Solvent Extraction Unit (MCU) work together as an integrated system to remove nearly all of the radioactive isotopes from salt wastes solutions prior to its transfer to the Saltstone facilities.



The goal is to immobilize all of the waste into one of two final forms for safe, long-term storage: glass, which will contain 99 percent of the radioactivity, most of which is contained in the sludge, and cement-like grout, is how the low-activity salt waste is disposed.

Actinide Removal Process (ARP)

ARP removes long-lived radioactive contaminants, such as plutonium and strontium, by adding monosodium titanate (MST) to radioactive salt solutions stored at SRS and then filtering out the MST that has absorbed the radioactive contaminants.

The MST-radionuclide particles are transferred to the Site's Defense Waste Processing Facility (DWPF) where it is mixed with molten glass and poured into 10-foot tall stainless steel canisters and welded shut and temporarily stored onsite awaiting final disposition at an off-site federal repository. The remaining filtered salt solution is then sent to the MCU for further processing.

Modular Caustic Side Solvent Extraction Unit (MCU)

Using principles involving centrifugal force and a special engineered solvent, MCU equipment takes the high-activity salt solution and divides it into two waste streams. The cesium is removed and sent to the DWPF. The remaining decontaminated salt waste solution is transferred to the Saltstone Production Facility to be mixed with dry cement-like materials to form a grout for safe, permanent on-site disposal in engineered vaults.

SRS is owned by the U.S. Department of Energy. The SRS Liquid Waste contract is managed by SRR, a team of companies led by URS Corp. with partners Bechtel National, CH2M Hill and Babcock & Wilcox. Critical subcontractors for the contract are AREVA, Energy Solutions and URS Safety Management Solutions.

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