

Radioactive Liquid Waste— Operational Closure of Tanks

The Savannah River Site (SRS) is home to the first two liquid radioactive waste tank operational closures in the nation. These two closures marked a major milestone in stabilizing another portion of the Cold War legacy materials for the Site and the country.

Tank 20, the first closed, was certified closed by the South Carolina Department of Health and Environmental Control (SCDHEC) and applicable U.S. Department of Energy (DOE) Orders in July 1997. SCDHEC certified closure of Tank 17 in December 1997. Both tanks were constructed in 1958 and first used in 1960.

The DOE, SCDHEC, the U.S. Environmental Protection Agency, SRS workers and the public worked closely together to establish strict closure requirements that supported all state and Federal regulations.

Closure activities for Tanks 17 and 20 began years before the actual closing of the tanks. Initially, radioactive waste was removed from each tank to the extent practical once agreements and closure plans with state and federal regulators were finalized. The final closure activities began with workers pouring specially formulated grout (a cement-like substance) into the 1.3 million-gallon tanks. A special grout was added during the process to retard the leaching and migration of the waste. Over the course of several weeks, the tanks were filled with controlled low-strength material (a cement-like backfill) to within a few feet of the top. The balance of the tanks was filled with very high-strength cement.



This waste tank closure process reduces risks to human health and the environment by securing residual waste in the tanks, which minimizes the potential for groundwater contamination.

To reach the tank closure goals, workers had to build, test and deploy new technology and tools to remove waste from the tanks. In addition, special grout testing helped determine how to best pour the grout into the tanks to secure the remaining waste and the tank structure.

The two closed tanks are part of the 51 underground tanks used in the Site's F and H Area Tank Farms to store liquid radioactive waste generated from weapons material production during the Cold War. This radioactive waste from the tank farms has been concentrated over the years to reduce its volume and currently is stored as 38 million gallons in 49 underground carbon-steel waste tanks. The high-level radioactive waste is being sent to the Site's Defense Waste Processing Facility, where it is being immobilized in glass for safe storage.

Most of the waste in the tanks is salt waste, which will also be removed as part of the closure process during the waste removal phase.

An interim salt waste processing program, the Actinide Removal Process (ARP) and Modular Caustic Side Solvent Extraction Unit (MCU), has been developed that integrates a set of salt-decontamination processes

designed to eliminate most 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 2014-2015.

ARP/MCU work together as an integrated system to remove nearly all of the radioactive isotopes from salt wastes solutions prior to transfer to the Saltstone facilities for stabilization.

SRS waste tanks have provided over 50 years of safe storage for nuclear waste. These tanks include four designs, all consisting of a steel tank within a concrete vault. The Site's goal is to eventually close all waste tanks.

Savannah River Remediation (SRR), SRS's liquid waste contractor, is closing some of the old-style waste tanks per Federal Facility Agreement milestones. During its six-year, plus two-year option, contract, which concludes in 2017. Fifteen waste tanks are in various stages of the waste removal process pending closure, with two tanks presently being prepared for scheduled operational closure in 2012.

SRS is owned by DOE. 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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TANK 20F
1960 - 1997
THIS TANK HAS SUPPORTED THE
NATIONAL DEFENSE PROGRAM
AND IS CLOSED BY THE
DEPARTMENT OF ENERGY
WITH THE PERMISSION OF THE
STATE OF SOUTH CAROLINA