



# Radioactive Liquid Waste: Operational Closure of Tanks

*The Savannah River Site (SRS) is home to the first two radioactive liquid waste tank closures in the nation, a major milestone toward stabilizing Cold War legacy materials. These two tank operational closures were followed with two more in 2012, two in 2013, one in 2015, and one in 2016.*

Tank 20, the first closed, was certified closed by the South Carolina Department of Health and Environmental Control (SCDHEC) on July 31, 1997. SCDHEC certified closure of Tank 17 in December 1997. Both tanks, located in the Site's F Area, were constructed in 1958 and placed into service in 1960. These closed tanks are part of the 51 total underground tanks located in the Site's F and H Area Tank Farms to store radioactive liquid waste generated from nuclear material production during the Cold War.

The U.S. Department of Energy, SCDHEC, U.S. Environmental Protection Agency (EPA), Nuclear Regulatory Commission, SRS workers, and the public work closely together to implement strict closure requirements that support all state and federal regulations for tank closure.

Years before the actual closing of the tanks can begin, the bulk of the radioactive waste must be removed for treatment and stabilization using SRS processing facilities. Following completion of bulk waste removal in a tank, the complex closure activities begin with removal of the remaining heel waste material using either mechanical or chemical cleaning methods to the extent practical in accordance with federal requirements and closure plans established with SCDHEC. The final closure activity begins with workers pouring specially formulated grout (a cement-like substance) into the approximately one million-gallon tanks. This special grout stabilizes the tank and is used to impede the leaching and migration of any residual waste. Over the course of several weeks, the tanks are filled with grout and tank top penetrations are sealed. This final waste tank closure process reduces risks to people and the environment by securing any residual waste in the tanks, which minimizes the potential for groundwater contamination in the future.



Radioactive liquid waste from the SRS tank farms has been concentrated over the years to reduce its volume. Currently, about 35 million gallons of waste is stored in the remaining 43 underground carbon-steel waste tanks.

To reach tank closure goals, new technology and tools had to be built, tested, and deployed to remove waste from the tanks. In addition, special grout testing has helped determine how to best add the grout into the tanks to secure the remaining waste and protect the tank structure.

Radioactive sludge waste removed from tanks is sent to the Site's Defense Waste Processing Facility (DWPF), where it is immobilized in a glass form for safe storage and eventual long term disposal in a federal repository. About 90% of the waste in the tanks is salt waste, which is also removed as part of the closure process. 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 remove 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. These removed radioactive isotopes are then transferred to DWPF for immobilization into glass.

In addition to those facilities, salt processing has been achieved through Tank Closure Cesium Removal (TCCR), a demonstration of innovative technology to assist in the acceleration of tank closure at SRS and is a supplemental at-tank process that is removing radioactive cesium from the waste.

ARP/MCU and TCCR remove nearly all of the radioactive isotopes from salt waste prior to transfer to the Saltstone Production Facility for treatment by mixing with dry materials, forming a cementitious grout that is placed into Saltstone Disposal Units.

Savannah River Remediation (SRR), SRS's liquid waste contractor, is continuing a broad range of efforts to close the old-style waste tanks per agreements with SCDHEC and EPA. Currently, five additional waste tanks are in various stages of preparations for the bulk waste removal process.

SRS waste tanks have provided over 60 years of safe storage for radioactive liquid waste. The Site's mission is to eventually close all waste tanks.

For more information about tank closure at SRS, please visit:  
[https://www.youtube.com/watch?v=tfqYtIKX\\_o](https://www.youtube.com/watch?v=tfqYtIKX_o)  
<https://www.youtube.com/watch?v=vHoOu8MLsCc>



SRR is the Liquid Waste contractor at SRS, which is owned by the U.S. Department of Energy. SRR is composed of a team of companies led by AECOM with partners Bechtel National, Jacobs, and BWX Technologies, Inc.