

# Savannah River Site



The Salt Waste Processing Facility will significantly enhance DOE's ability to treat tank waste at the site.

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## Overview

The Savannah River Site (SRS), an approximately 310-square-mile-site located in South Carolina, focused on the production of plutonium and tritium for use in the manufacture of nuclear weapons from its inception in the early 1950s until the end of the Cold War. In 1992, the focus at SRS turned to environmental cleanup, nuclear materials management and research and development (R&D) activities.

Today, SRS is a complex site run by EM and host to NNSA. DOE works in partnership with multiple contractors in technically sophisticated nuclear and non-nuclear facilities. Cleanup activities at SRS include addressing 35 million gallons of radioactive liquid processing waste stored in 43 underground tanks; surplus plutonium downblending and disposition as TRU waste to WIPP; disposition of highly enriched uranium and processing of foreign and domestic research reactor receipts; facility decommissioning and demolition and soil and groundwater remediation.

To date, 293 facilities out of 1,127 have been deactivated and decommissioned, and 410 out of 515 areas have been remediated. Notably, collaboration among SRS entities and state and federal regulators resulted in the in-situ decommissioning of P and R Area Reactors in 2011 – the first in the DOE complex. Finally, the operational footprint of SRS has been reduced by 85 percent.

For NNSA, SRS processes and stores nuclear materials in support of national defense and U.S. nuclear nonproliferation efforts. EM is also responsible for the SRNL, located at the site. SRNL assists EM in achieving the nation's legacy nuclear

waste cleanup objectives and plays an equally important role supporting NNSA through its work in tritium R&D, operations support, stockpile stewardship, nuclear non-proliferation, and other critical national security programs.

### **Cleanup accomplishments include:**

- **Emptied and closed eight underground waste tanks.**
- **Produced more than 4,200 canisters of radioactive vitrified waste.**
- **Completed construction and cold commissioning of the Salt Waste Processing Facility, a key component in the site liquid waste program.**
- **Completed Saltstone Disposal Unit 6 ahead of schedule and under budget.**
- **Removed one metric ton of plutonium.**
- **Processed Canadian liquid Highly Enriched Uranium target material shipments, High Flux Isotope Reactor cores and four batches of Material Test Reactor Fuel.**
- **Completed material-at-risk removal activities from Building 235-F, a former plutonium fabrication facility.**
- **Completed D-Area Ash Project ahead of schedule and under budget, which resulted in the removal and consolidation of ash into an on-site landfill, remediating 60 acres.**
- **Completed the removal and disposition of coal ash at Dunbarton Bay Coal Ash Basin Phase 1, resulting in 29,600 tons of ash dispositioned.**

## **Cleanup Highlights 2020-2030**

Over the coming decade, DOE will significantly enhance its ability to tackle the largest remaining environmental risk at SRS – radioactive tank waste – with the startup of new waste treatment facilities. DOE will also make continued progress in addressing nuclear materials stored at SRS, and complete disposition of remaining TRU waste.

### **LIQUID WASTE PROGRAM**

The Liquid Waste Program will achieve significant risk reduction through continued stabilization and immobilization of the high activity fraction of the waste in a glass waste form and immobilization of the low-level fraction of the waste as a saltstone waste form. The SWPF will begin hot commissioning in 2020 and will process up to 9 million gallons of waste per year after the initial year of operation, enhanced through implementation of the Next Generation Solvent. By 2030, it is expected that nearly all of the salt waste inventory will be processed.

DOE will continue to perform environmental analyses in an effort toward the use of the Department's interpretation of the term "high-level waste" for a waste stream at SRS. This waste stream, recycle wastewater from the Defense Waste Processing Facility (DWPF), is undergoing analyses to determine if it could be solidified and disposed of at an off-site commercial disposal facility.

Substantial progress toward tank closure will continue with 22 of the 51 underground tanks being closed. By 2030, the DWPF will have produced more than 7,100 canisters of vitrified radioactive waste (more 85 percent of the anticipated total). The Liquid Waste Program will continue to support receipt of waste from H-Canyon.

### **NUCLEAR MATERIALS DISPOSITION PROGRAM**

The near-term Nuclear Materials Disposition Program strategic objectives are to continue disposition of legacy material stored in L- and K-Area, as well as continued surveillance and maintenance (S&M) of excess, non-operating nuclear facilities awaiting D&D. Over the next 10

years, the K-Area facilities will continue to down-blend and disposition both EM and NNSA surplus plutonium through capital upgrades and eventual shipment to WIPP. Shipment of down-blended material to WIPP is expected to begin in 2021.

The L-Area facilities will continue to provide wet storage of spent nuclear fuel received as part of the domestic and foreign research reactor fuel receipt programs. The H-Canyon chemical separations facility will continue to process nuclear materials and spent nuclear fuel (including Test Reactor Material and High Flux Isotope Reactor fuel) to support disposition of these materials. The K-Area facilities will continue to provide long-term storage of special nuclear material owned by both EM and NNSA.

### **SOLID WASTE PROGRAM**

The Solid Waste Program will continue to safely characterize, store and disposition site-generated wastes in compliance with applicable regulations and requirements. All remaining SRS legacy TRU waste (approximately 500 cubic meters) will be disposed of at WIPP.

### **ENVIRONMENTAL REMEDIATION, DEACTIVATION AND DECOMMISSIONING**

Environmental Remediation will continue to clean up contaminated soils, groundwater, streams (and associated wetlands) and legacy waste sites. EM is committed to reducing risk and protecting groundwater aquifers and surface waters from the spread of contamination by addressing sources of contamination using an area completion approach. Examples include installation of a Reactive Barrier Wall in P Area to treat solvent-contaminated groundwater; and the remediation of a former Oil Seepage Basin in G Area.

In addition, an integral part of the cleanup mission is the D&D of legacy facilities constructed in support of past nuclear materials production, such as the Process Heat Exchanger Repair Facility (also known as the Ford Building) and the Cask Car Repair Facility. SRS will continue to operate and maintain soil and groundwater remedial systems; and conduct post-closure and post-Record of Decision (ROD) care, surveillance, and maintenance of 73 closed areas (approximately 1,000 acres).

## SRNL

Construction of the Advanced Manufacturing Collaborative (AMC) facility will allow the Department to focus on developing and adapting safer and more cost-effective technology, facilities, and expertise for nuclear chemical and materials manufacturing to tackle the remaining challenges in the cleanup of radioactive and chemical waste resulting from Cold War activities and nuclear research. The DOE Laboratory Operations Board review of SRNL infrastructure concluded that two-thirds of the SRNL facilities are substandard or inadequate for modern technology development. The AMC facility strengthens current efforts to consolidate and modernize Laboratory facilities to address these inadequacies.

The AMC facility will provide accessible, modern, commercially viable and flexible laboratory space for SRNL to collaborate with industry and academia to translate a range of proven and potential advanced manufacturing technologies from the commercial chemical and manufacturing sectors into DOE processes, plans and missions to significantly improve risk management, enhance worker and public safety, reduce costs and shave years off the legacy waste cleanup schedule.

## Remaining Cleanup Scope Post-2030

The Liquid Waste program will start closing its operations after SWPF completes treatment operations for the remaining salt waste and operational closure of the tank farms is completed. The Liquid Waste Program cleanup mission is planned for completion in 2037, and the S&M of the vitrification canisters in storage will be transferred to the Solid Waste Program.

The remaining Nuclear Material clean-up scope will be to complete deactivation and turn over for decommissioning all facilities other than K-Area facilities. Operations in K-Area will continue, particularly with the surplus plutonium disposition mission and all facilities will be deactivated at the conclusion of the disposition of special nuclear material.

Newly generated wastes resulting from the EM cleanup program will continue to be disposed as the waste is generated through the EM mission. As the Nuclear Materials and Liquid Waste Programs complete their missions, the Environmental Remediation, D&D Program will ramp up its program to provide for remediation of approximately 100 legacy waste units and D&D of over 800 industrial, nuclear and radioactive facilities.



Operators move fuel along in L Area Disassembly Basin after completing spent nuclear fuel travel modifications. The modifications allow movement of spent nuclear fuel vertically, instead of horizontally, and will realize a 25 percent efficiency gain for cask processing.