

The Savannah River Site Environmental Bulletin

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Notice of Public Availability Fifth Phase: Fifth Five-Year Remedy Review Report for Savannah River Site Operable Units with Operating Equipment

The Fifth Five-Year Remedy Review is being conducted in five phases for operable units (OUs) with similar remedies. The OUs are grouped by the following remedy types: (1) native soil covers and/or land use controls, (2) groundwater, (3) engineered cover systems, (4) geosynthetic or stabilization/solidification cover systems, and (5) operating equipment. The public is notified when each phase of the remedy review is conducted and when the phase is complete. The review for the fifth phase for OUs with operating equipment is complete and is being made available to the public.

The Comprehensive Environmental Response, Compensation, and Liability Act requires that remedial actions that result in hazardous substances, pollutants, or contaminants remaining at an OU at levels unsuitable for unrestricted land use be subject to a five-year remedy review. The Fifth Five-Year Remedy Review Report for Savannah River Site Operable Units with Operating Equipment evaluated the remedial actions for operating equipment selected through issued Records of Decision (RODs), Interim RODs, ROD Amendments, or Explanations of Significant Differences to determine whether the selected remedies remain protective of human health and the environment. The Fifth Five-Year Remedy Review Report for Savannah River Site Operable Units with Operating Equipment is complete and is being issued by the U. S. Department of Energy (DOE), the lead agency for the Savannah River Site (SRS), with concurrence by the U. S. Environmental Protection Agency – Region 4 (EPA), and South Carolina Department of Health and Environmental Control (SCDHEC).

The five-year remedy review addressed three major questions:

- Are the remedies functioning as intended by the decision document?
- Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of remedy selection still valid?
- Has any other information emerged that could call into question the protectiveness of the remedy?

The report reviews eleven (11) remedy decisions for SRS OUs that selected operating equipment (i.e., ongoing active remediation) as part of the final remedy. A range of active remediation systems are used at SRS to address contaminants in soil and groundwater. Soil vapor extraction (SVE) systems are used to remove volatile organic compounds (VOCs) from vadose zone source areas before the contaminants can migrate to the water table. Air strippers are employed to remove VOCs from groundwater in the source zone while active recirculation well systems remove VOCs from groundwater plumes. Pump and treat systems are used to remove contaminant mass and exert hydraulic control over contaminated groundwater plumes. Thermal technologies (e.g., dynamic underground stripping and electrical resistance heating) have been employed in several areas to mobilize dense non-aqueous phase liquid VOCs in the vadose zone and groundwater.

Many existing SVE systems have been converted from active vacuum extraction powered by fossil fuel to enhanced-passive systems powered by natural non-fossil-fuel energy sources. BaroBall™ and MicroBlower™ systems are two types of low-energy-consumption, low-carbon-emission SVE systems currently used at SRS to remove VOC contaminants from the subsurface.

The Fifth Five-Year Remedy Review Report for SRS Operable Units with Operating Equipment includes a review of the following OUs and their respective remedies:

- A-Area Burning/Rubble Pits (731-A/1A) and Rubble Pit (731-2A), Miscellaneous Chemical Basin (731-4A) and Metals Burning Pit (731-5A) – Active and Passive SVE, Air Sparging, Soil Cover, land use controls (LUCs)
- A/M Area Groundwater – Active and Passive SVE, Pump-and-Treat with Air Stripping, Humate Amendment, Recirculation Wells (dynamic underground stripping previously implemented), LUCs
- A-Area Miscellaneous Rubble Pile (731-6A) – Excavation, SVE, Soil Cover, LUCs

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- C-Area Burning/Rubble Pit (131-C) and Old C-Area Burning/Rubble Pit (NBN) – SVE, Air Sparging, Soil Cover, and Monitored Natural Attenuation
- D-Area Operable Unit – Removal Action (Excavation, Thermal Treatment, SVE), and LUCs
- F-Area Groundwater – Barrier Wall Funnel and Gate System with Base Injection (Pump-and-Treat Groundwater previously implemented), LUCs
- H-Area Groundwater - Barrier Wall Funnel and Gate System with Base Injection (Pump-and-Treat Groundwater previously implemented), LUCs
- M-Area Inactive Process Sewer Line (081-M) – SVE, Soil Fracturing, LUCs
- M-Area Operable Unit – Removal Actions (Excavation, Backfill), Passive SVE, LUCs
- P-Area Burning/Rubble Pit (131-P) – Soil Cover, Passive SVE, Groundwater Monitoring
- TNX Area – Excavation, In Situ Solidification / Stabilization, SVE (Pump-and-Treat with Air Stripping, Recirculation Wells, Air Sparging previously implemented), Treatability Study (Enhanced Bioremediation with Edible Oil), Cover, Groundwater Monitoring, LUCs

The exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of remedy selection are still valid for all the remedial actions evaluated. All eleven (11) remedies were determined to be protective of human health and the environment. The remedy for the A/M-Area Groundwater OU has been determined to be protective in the short-term. To establish long-term protectiveness for the A/M-Area Groundwater OU, optimization of the M-1 Air Stripper and recovery system and/or other remediation technologies must be implemented to treat the high concentration portion of the plume located outside of the recovery well zone of capture.

In the Fifth Five-Year Remedy Review Report for Savannah River Site Operable Units with Operating Equipment, the DOE, EPA, and SCDHEC determined the following:

- The passive system at A-Area Miscellaneous Rubble Pile (731-6A) OU has been successful in treating VOC contamination and the soil remedial goals have likely been achieved. SRS recommends additional characterization of the ash layer and vadose zone soils to determine if the soil remedial goals have been met to support shutdown of the passive SVE system.
- The D-Area OU MicroBlower™ SVE system at the Bubble Tower subunit has been successful in treating VOC contamination and the soil remedial goals have likely been achieved. SRS recommends confirmation sampling of the soil to determine if the soil remedial goals have been met to support shutdown of the MicroBlower™ SVE system.

To aid in the review of the report, a Savannah River Site Fact Sheet for the Fifth Five-Year Remedy Review Report for SRS Operable Units with Operating Equipment was also developed.

Copies of the Fifth Five-Year Remedy Review Report for Savannah River Site Operable Units with Operating Equipment and the Fact Sheet are available in the Administrative Record. The Administrative Record is available in the information repositories listed below:

- DOE Public Reading Room at the Gregg-Graniteville Library at the University of South Carolina (USC)-Aiken campus in Aiken, SC; and
- Thomas Cooper Library Government Documents Department at USC in Columbia, SC

Hard copies of the Fifth Five-Year Remedy Review Report for Savannah River Site Operable Units with Operating Equipment and the Fact Sheet are available at the following locations:

- Reese Library Government Information Section at Augusta University in Augusta, GA; and
- Asa H. Gordon Library at Savannah State University in Savannah, GA

An electronic copy of the Fifth Five-Year Remedy Review Report for Savannah River Site Operable Units with Operating Equipment can be found at the following website:

- <http://www.srs.gov/general/programs/soil/rod/rod.html>

An electronic copy of the Fact Sheet can be found at the following website:

- <http://www.srs.gov/general/programs/soil/pub/pubinv.html>

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