Area Completion Projects

Program Overview

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U. S. Department of Energy – Savannah River
SRS Citizens Advisory Board
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WHAT WE DO?

• Objectives
  – RemEDIATE contaminated soil, surface water, and groundwater
  – Decommission inactive facilities after they have been deactivated by the operating organization
  – Prevent offsite migration of contamination in groundwater and surface water/sediments

• To Date
  – 411 of 515 waste units completed
    • Remedy selected, including No Action, and systems operating as required
    • 18 groundwater plumes being evaluated and/or remediated
    • 5 major Savannah River Site (SRS) streams and the Savannah River
    • 73 waste units required post-closure care
  – 296 of 1127 facilities decommissioned
  – 38 remediation systems operational (3 active, 14 low energy, 21 passive)
  – 5 of 14 Areas Closed
    • T Area, M Area, R Area, P Area, and B Area
  – As of August 31, 2020, Area Completion Projects has achieved all 3,924 Federal Facility Agreement (FFA) milestones and Resource Conservation and Recovery Act (RCRA) Permit commitments on or ahead of schedule
WHAT WE DO? (CONTINUED)

- 85% of the Site’s area is cleaned to industrial standards (Green)
- Remaining contamination areas primarily within the core of the Site
WHAT WE DO? (CONTINUED)
WHAT WE DO? (CONTINUED)

- SRS streams were added to the FFA in Fiscal Year 1997

- “Integrator Operable Units” (IOUs) include surface water, sediment, floodplain soils, and biota (plants and animals)
  - Include large reservoirs L-Lake and PAR Pond
WHY DO WE DO IT?

RCRA

Permit

Resource Conservation and Recovery Act

CERCLA

Compliance Agreement

Comprehensive Environmental Response, Compensation, and Liability Act

FFA

Integrates requirements of RCRA and CERCLA

SAVANNAH RIVER SITE • AIKEN • SC • WWW.SRS.GOV 6
• RCRA (Resource Conservation and Recovery Act of 1976)
  – Regulates the management of both hazardous and non-hazardous solid waste (including the treatment, storage, and disposal of hazardous waste)
  – Requires corrective action for releases of hazardous waste or hazardous constituents (chemicals, not radionuclides)
  – Cleanup of abandoned waste sites / solid waste management units (SWMUs)

• Authority to administer RCRA is delegated to South Carolina Department of Health and Environmental Control (SCDHEC) by U.S. Environmental Protection Agency (EPA)

• SCDHEC issues SRS RCRA Permit Renewal and addresses:
  – Post closure care and maintenance of closed RCRA hazardous waste management facilities (HWMFs) (e.g., M-Area and Metallurgical Laboratory HWMFs, F-Area HWMF, H-Area HWMF, Mixed Waste Management Facility, and Sanitary Landfill)
  – RCRA SWMUs (e.g., waste units)
    • Addressed through the FFA process
    • RCRA permit renewal inclusive of all remedial decisions reached for SWMUs

WHY DO WE DO IT? (CONTINUED)
CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act of 1980)

- Protects human health and the environment from releases or threatened releases of hazardous substances (radionuclides and chemicals)
- Provides for the cleanup of abandoned and uncontrolled waste sites, as well as responsibilities for addressing the release of hazardous substances to the environment
- Requires the owner of any federal facility placed on the EPA National Priority List (NPL) to negotiate an FFA to integrate RCRA and CERCLA requirements to govern the cleanup process
- Cleanup remedies and end states are contained within CERCLA Records of Decision
  - Documents signed by EPA, DOE, and SCDHEC declaring cleanup decisions after public review and comment on proposed remedy
  - Legally-binding documents
- Some early cleanup actions are taken before a Record of Decision is issued
  - Removal actions under DOE’s Lead Agency authority
Federal Facility Agreement

- Established August 1993
  - A legally binding agreement among DOE, EPA, and SCDHEC
  - Includes administrative requirements, enforceable schedules, and milestones for actions and documents
  - Lists the RCRA/CERCLA waste units and other potential releases that must be addressed, and describes a process for any additional ones
  - Includes requirements for Removal from Service of 24 of the SRS Liquid Waste tanks
  - Spells out authorities and responsibilities of the three agencies and procedures for resolving disputes

- Appendices (these require annual updates)
  - C: RCRA/CERCLA Units List
  - D & E: Current year milestones and Long-term projections (out-year milestones)
  - G: Site Evaluation List
  - H: RCRA Permitted Facilities and SWMUs
  - K: D&D Facilities
The Federal Facility Agreement and Supporting Documentation, including Federal Facility Annual Process Report for Fiscal Year 2019, Land Use Control Assurance Plan, Savannah River Site Community Involvement Plan, etc. is available online at:

http://www.srs.gov/general/programs/soil/ffa/ffa.html

The Federal Facility Agreement for the Savannah River Site is available at:

WHY DO WE DO IT? (CONTINUED)
Area Completion Projects
Federal Facility Agreement and Supporting Documentation

- Federal Facility Agreement: The document that directs the comprehensive remediation of the Savannah River Site
- Appendices affected by Modification E
  - Date 10/24/2019
  - Modification E: Issuance of the updated Revised E Appendices E for Fiscal Year 2015 (Fiscal Date: 10/24/2015). Updated 10/24/2019:
- Land Use Control Assurance Plan
- Regulatory Document Handbook
- SRS Community Involvement Plan

These documents are in portable document format (PDF) which requires Adobe Acrobat Reader software to be installed on your computer.

Area Completion Projects
General Information & Technologies

- SRS Fact Sheets
- Fact Sheet: Eating Fish from the Savannah River
- Groundwater Management Strategic and Implementation Plan
- Groundwater Protection Program
- Memorandum of Agreement for Achieving an Accelerated Cleanup Vision
- Records of Decision

ACP Technology Descriptions
ACP Modeling Applications
- NAPL Calculator Model Abstract
- NAPL Calculation Note
- VCPWQ Calculation Note and Documentation
- Fate Transport through Contaminant Mass
- NAPL
- DOB/SPA: Principles of Environmental Restoration

SRS Operator: 803-755-4211
SRS Status & Emergency Information: Savannah River Site
Contact SRS: Ask Today! Savannah River Site

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SRS has begun the process of posting the Administrative Record File/Information Repository File (ARF/IRF) on the SRS external web page. The ARF/IRF web page contains an Index of Documents and the initial group of portable document format (PDF) records that are dated between October 1, 2017 and July 31, 2020. More records will be added during quarterly updates.

The ARF/IRF is available online at:

http://www.srs.gov/general/programs/soil/arf/arfirf.html
Area Completion Projects
Administrative Record File/Information Repository File (ARFIRF)

Index of documents contained in the ARFIRF, which are available at the University of South Carolina Libraries - Aiken and Columbia on CD. This index is in PDF (portable document format) which requires Adobe Acrobat Reader software to be installed on your computer.

PDFs of documents contained in the ARFIRF from 10/1/03 through 7/1/2003 are located here. The PDFs will be updated approximately twice per quarter. Historical PDFs will be added at a later date.

Introduction

The Administrative Record File contains the documents and information considered or relied on in the selection of a response action and in overseeing hazardous waste management activities. The Savannah River Site, the Administrative Record File will fulfill the requirements of Section 3009K, Administrative Record of the Federal Facility Agreement (FFA).

An Administrative Record File for an individual waste site is created upon the approval by the EPA-AR and the SCDEH of an RI/FS or an RVRM Work Plan. The File is compiled until the decision of the response action is chosen (the signing of the Record of Decision). At that time the Administrative Record File is finalized and is called the Administrative Record for that waste site.

An Administrative Record serves two primary purposes: First, it is a vehicle for public participation in the selection of the response action. Section 11303(b) of CERCLA provides the public with an opportunity to participate in a response decision. The Administrative Record makes available the information considered or relied on in the selection and provides the opportunity for public involvement. Without opportunity for this involvement of interested persons, the initiation of court review solely to the Administrative Record can be challenged. Therefore, the Administrative Record will also record the public participation in the decision process and reflect the views of members of the public.

The second purpose of the Administrative Record is concerned with the presentation of evidence in the event of litigation. Judicial review of any issue concerning the adequacy of a response selection is limited to the Administrative Record. Under section 11303(b) of CERCLA, the trial court reviewing the selected response decision is limited to the facts as set out in the Administrative Record. The Courts will not allow the use of discovery, hearings or additional fact finding unless the Administrative Record is found to be insufficient or poorly prepared. Provided the Administrative Record is adequate, the court will limit its review of the response decision made to the standard of arbitrary and capricious or otherwise not in accordance with the law. The Administrative Record should therefore chronicle the response decision process, whereby a judge could easily follow the record and either a decision was made.

An Information Repository File contains information and documents that do not meet the definition of Administrative Record Files but that contain site and well information, documents on site and well activities, and general information.
HOW DO WE DO IT AND HOW ARE WE DOING?

RCRA/CERCLA Integration Process

**RCRA Corrective Action Requirements**

1. **RCRA Facility Investigation** → **RFI/RI Report** → **Corrective Measures Study** → **Statement of Basis** → **Public Notice for SB/PP & Proposed RCRA Permit Mod.** → **Record of Decision** → **Perform Action**
2. **CERCLA Remediation Requirements**
   - **NOTE:** SCDHEC has reserved its authority to require corrective action in accordance with the South Carolina Hazardous Waste Management Act (RCRA)

**= FFA Milestone**
Core Team Process

- SRS is held up as the model in the DOE Complex for implementing a cleanup program with decisions that are technically risk-driven, cost effective and achieve incremental progress.
- DOE, EPA, and SCDHEC work collaboratively to develop and implement sound remediation approaches, avoid disputes.
- Open communication produces common understanding of data (site conditions), and generally leads to consensus on needed actions.

After decisions are made, these decisions are documented and parties work diligently to uphold.
Types of remedies as selected by DOE, EPA, and SCDHEC

- No Action
- Land Use Controls (LUCs)
  - Institutional controls (i.e., administrative controls) and engineering controls
  - Can include monitoring, maintenance, reporting, access restrictions, signage, fencing, and land use restrictions
- Soil
  - Removal and Disposal
  - Covers to prevent exposure
  - Caps to prevent exposure AND infiltration
  - Heating (electrical and steam) to vaporize volatile organic compounds (VOCs) for extraction
  - Soil vapor extraction (high energy active systems to low-energy systems such as BaroBalls™ and MicroBlowers™)
- Groundwater
  - Barrier walls with treatment zones
  - Monitored natural attenuation or mixing zones
  - Permeable treatment barriers
  - Pump-and-treat (i.e., air stripping to remove VOCs)
  - Passive (enhanced) – Bioremediation of VOCs
BaroBalls™
- When the subsurface pressure is higher than at ground surface, contaminants naturally more upward through venting well.
- When the above ground pressure is greater, air is prevented from traveling down by a simple plastic sphere.

Photovoltaic Powered MicroBlower™ Configuration
P-Area Groundwater Permeable Reactive Barrier (PRB)

- Design Attributes
  - 264 ft long
  - 22 injection wells
  - 760 tons of zero-valent iron emplaced
  - Depth from 45 ft to 135 ft
System Plan

– Fiscal Years 2020 to 2030
– Thirteen major projects are expected to require funding during the planning period
  • Stormwater Outfall A-013
  • A-Area Ash Pile & Coal Pile Runoff Basin
  • C-Area Groundwater
  • Central Shops Early Construction and Operational Disposal Site (ECODs) N-1, Central Shops Scrap Lumber Pile, Building 690-N, Process Heat Exchanger Repair Facility (Ford Building)
  • D-Area Groundwater
  • D-Area Coal Storage Area (484-17D)
  • D-Area Groundwater Treatability Study
  • Wetland Area at Dunbarton Bay – Phase II
  • F-Area Operable Unit (14 building remnants)
  • G-Area Oil Seepage Basin
  • Lower Three Runs Integrator Operable Unit
  • L-Area ECODs
  • P-Area Groundwater
## CURRENT AND NEAR-TERM CLEANUP WORK (CONTINUED)

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### Acronyms
- AAO/DRIS: A-Area Above Ash Pad (788-A) / A-Area Coal Pile Runoff Basin (788-3A)
- DAOU: D-Area Operable Unit
- GOSB: G-Area O2 Seepage Basin
- ROD: Record of Decision
- GSA: - Groundwater Source Area
- DACSA: D-Area Coal Storage Area (484-176)
- FYs: Fiscal Years
- EC: Early Conclusions
- FAOU: F-Area Operable Unit
- FG: Final Guidance
- FS: Fiscal Year
- FYs: Fiscal Years
CURRENT AND NEAR-TERM CLEANUP WORK (CONTINUED)

G-Area Oil Seepage Basin (GOSB) Operable Unit

- Basin was approximately 0.4 acres and up to 10 ft. deep
- Basin was constructed for liquid waste disposal during SRS plant construction (1951 to 1956) and later received sanitary wastewater from treatment plants in Central Shops in the early 1990s.
- Investigation of the GOSB found low levels of pesticides and herbicides in the soils at the bottom of the basin.
- Remediation of the basin began in September 2019 and was completed in December 2019.
- Basin was filled with 1,400 tons of stone, followed by 7,000 cubic yards of dirt, and then capped with grass sod.

GOSB - Before

GOSB - After
CURRENT AND NEAR-TERM CLEANUP WORK (CONTINUED)

Mixed Waste Management Facility Phytoremediation – Collection Pond with Irrigation

- RCRA Permitted Corrective Action
- Simple “green” solution
- Irrigation started in October 2000 as an interim corrective measure
- Reduced tritium entering Savannah River by 65% or better to date, near remedial goal of 70% reduction of tritium influx to Fourmile Branch
CURRENT AND NEAR-TERM CLEANUP WORK (CONTINUED)

Lower Three Runs IOU – R-Area Discharge Canal
CURRENT AND NEAR-TERM CLEANUP WORK (CONTINUED)

Building 690-N, Process Heat Exchanger Repair Facility

Building 690-N (Pre-D&D)

Deactivation Photos

- Preparation for deactivation of the airlock – checking material to determine removal and disposition; foreground shows floor covering material to protect the slab from equipment (photo on the left)

- Grapple is removing doors to provide equipment access to the building interior and the laydown and waste container staging areas outside the building (photo on the right)
CURRENT AND NEAR-TERM CLEANUP WORK (CONTINUED)

D-Area Coal Storage Area (484-17D)

Field Activities – Mid-May 2020

- Very low-pH soil has been acidified by coal storage (~65 years), causing shallow groundwater acidification and contamination with metals from coal and native soil.
- Removal action start for 484-17D was achieved on May 5, 2020, with the installation of the stormwater pollution prevention controls along the perimeter of the excavation area.
- Excavation and addition of soil amendment began May 12, 2020. As of August 2020, nine of twelve acres are completed. Soil amendment is ongoing in the tenth acre.
- ACP has taken several soil pH samples and verified the effectiveness of the amendment.
- Construction activities will be ongoing until November 2020.
Ash Disposition Evaluation

– DOE is developing a comprehensive evaluation for the disposition of the remaining coal ash at SRS in A-, D-, F-, H-, K-, L-, and P-Areas
– Potential Options on-site (in-place or consolidated) and off-site (landfill disposal or beneficial re-use)
– DOE, EPA, and SCDHEC will be discussing these options during calendar year 2020
  • First meeting was held on August 12, 2020
    – Purpose of the meeting was to discuss and agree upon the preliminary range of alternatives
  • Second meeting is tentatively planned for October 2020 to December 2020 timeframe
    – Purpose is to present the preliminary results of the evaluation with the objective of reaching agreement on the path forward for ash disposition