

**UNITED STATES DEPARTMENT OF ENERGY**

**SAVANNAH RIVER SITE**

**FINAL RECORD OF DECISION  
REMEDIAL ALTERNATIVE SELECTION**

**for**

**Tank 105-C Hazardous Waste Management Facility (U)**

Prepared by  
Environmental Restoration Engineering  
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## **DECLARATION FOR THE FINAL RECORD OF DECISION**

### ***Site Name and Location***

Tank 105-C Hazardous Waste Management Facility (HWMF)

Savannah River Site

Aiken County, South Carolina

### ***Statement of Basis and Purpose***

This document presents the selected final action for the Tank 105-C HWMF Unit and the immediately adjacent soils at the Savannah River Site (SRS), which was developed in accordance with the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended, and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision is based on the Administrative Record for this unit.

### ***Description of the Selected Remedy***

Previous action taken was under a Resource Conservation and Recovery Act (RCRA) Closure Plan, per Settlement Agreement 90-64-SW (September 5, 1990) USDOE, Savannah River Site, approved by the State of South Carolina and is protective of human health and the environment. Therefore, no further action is necessary under CERCLA.

The selected final action remedy involved the neutralization of waste from a pH of 13.2 to a pH of less than 12.5, removal of as much waste as reasonably possible, and shipment of the waste to an onsite storage/disposal facility. All remaining waste and the tank void were stabilized in place with concrete. This remedy prevents physical exposure to contaminants (radionuclides) and

mitigates potential migration of contaminants to the groundwater by stabilizing the liquid medium and minimizing the pathway for transport.

The major components of the RCRA action already conducted include:

- 1) Waste (including organic, aqueous, and sludge phases) neutralization with the addition of a mixture of oxalic acid and water;
- 2) Removal of 37 gallons of oily substance using an oil skimmer,
- 3) Removal of 3,753 gallons of aqueous and sludge waste, including water added during neutralization and tank rinse activities; and shipment to an on-site storage/disposal facility;
- 4) Tank assessment, which included a tank tightness test using the Horner EZY Check II Method;
- 5) Removal of 8,000 gallons of secondary wastewater (generated during the tank tightness test) and shipment to an on-site storage/ disposal facility;
- 6) Soil assessment, which consisted of 2 background samples and 18 samples from soil borings around the ancillary piping (excluding inaccessible ancillary piping beyond an adjacent wall/foundation) and Tank 105-C, and included visual observation, pH testing and radiological screening of soils;
- 7) Removal of 400 cubic feet of radiologically contaminated soil adjacent to the ancillary piping;
- 8) Removal of ancillary piping (90 cubic feet) followed by capping of ancillary piping stubs into the reactor area, pH testing of pipe sections, and removal/placement in 90 cubic foot containers for disposal or capped in place;

- 9) In place filling of tank (and residual waste) including two risers with concrete;
- 10) Capping risers above the tank with metal caps and epoxy;
- 11) Surface restoration (backfilling of piping, tank excavations, and paving backfilled areas with asphalt); and
- 12) Restricting access to the Tank 105-C HWMF to authorized personnel with appropriate training on applicable requirements.

***Declaration Statement***

Previous action taken at the Tank 105-C HWMF was under a RCRA Closure Plan approved by the State of South Carolina and was protective of human health and the environment. Therefore, no further remedial action is necessary under CERCLA. To ensure continued protection of human health and the environment, this action will be reviewed every 5 years, consistent with the requirements of the NCP.

9/19/94

Date

Thomas F. Heenan

Thomas F. Heenan  
Assistant Manager for Environmental  
Restoration & Solid Waste  
U.S. Department of Energy

9-23-94

Date

John H. Hankinson, Jr.

John H. Hankinson, Jr.  
Regional Administrator  
U. S. Environmental Protection Agency  
Region IV

# **SUMMARY OF FINAL ACTION REMEDIAL ALTERNATIVE SELECTION**

**for**

**Tank 105-C Hazardous Waste Management Facility (U)**

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## **I. Site and Operable Unit Names, Locations, and Descriptions**

The Savannah River Site (SRS) occupies approximately 310 square miles adjacent to the Savannah River, principally in Aiken and Barnwell Counties of South Carolina. (Figure 1) SRS is a secured U.S. government facility with no permanent residents. The Site is located approximately 25 miles southeast of Augusta, Georgia, and 20 miles south of Aiken, South Carolina. According to 1990 census data, the average population densities (in people per square mile) for the counties surrounding SRS range from 21 to 524 with the largest concentration in the Augusta, Georgia, metropolitan area. The population within a 50-mile radius of SRS is 634,784.

SRS is owned by the United States Department of Energy (DOE). Westinghouse Savannah River Company (WSRC) is the managing and operating contractor for DOE. SRS produces tritium, plutonium, and other special nuclear materials for national defense. The site also provides nuclear materials for the space program, and conducts medical, industrial, and research efforts. The Tank 105-C HWMF is a source specific operable unit within the C-Area Fundamental Study Area. The Tank 105-C HWMF consists of one 8,400 gallon capacity underground storage tank and ancillary piping located in C-Area, east of C Reactor 105-C and approximately 6 miles from the nearest site boundary (Figure 2). This tank and ancillary piping are the only aspects being addressed in this Record of Decision (ROD).

## **II. Operable Unit History and Compliance History**

### ***Operable Unit History***

The Tank 105-C HWMF was installed in 1961 as part of an off-line heat exchanger repair program and was used as a temporary holding tank for liquid

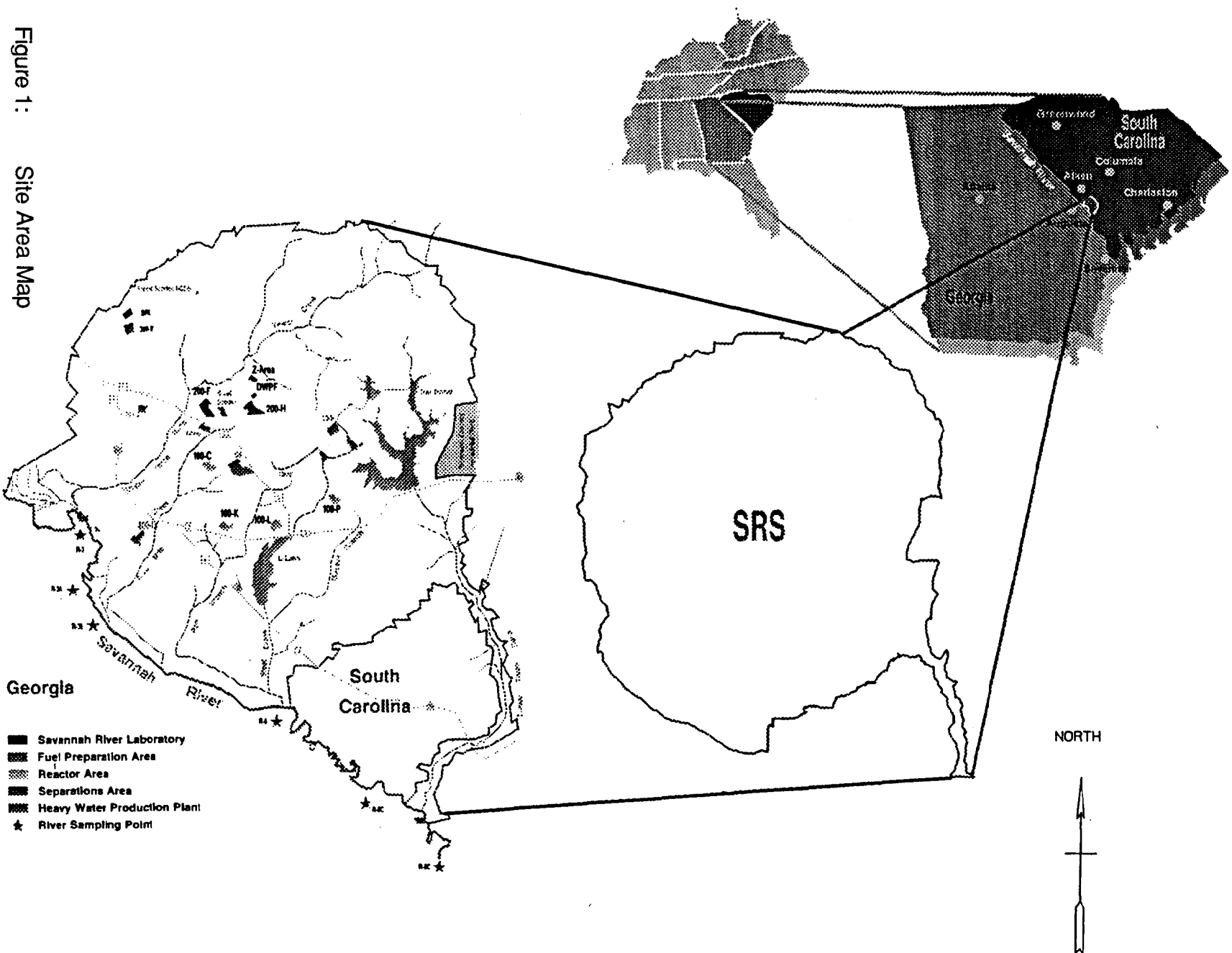


Figure 1: Site Area Map



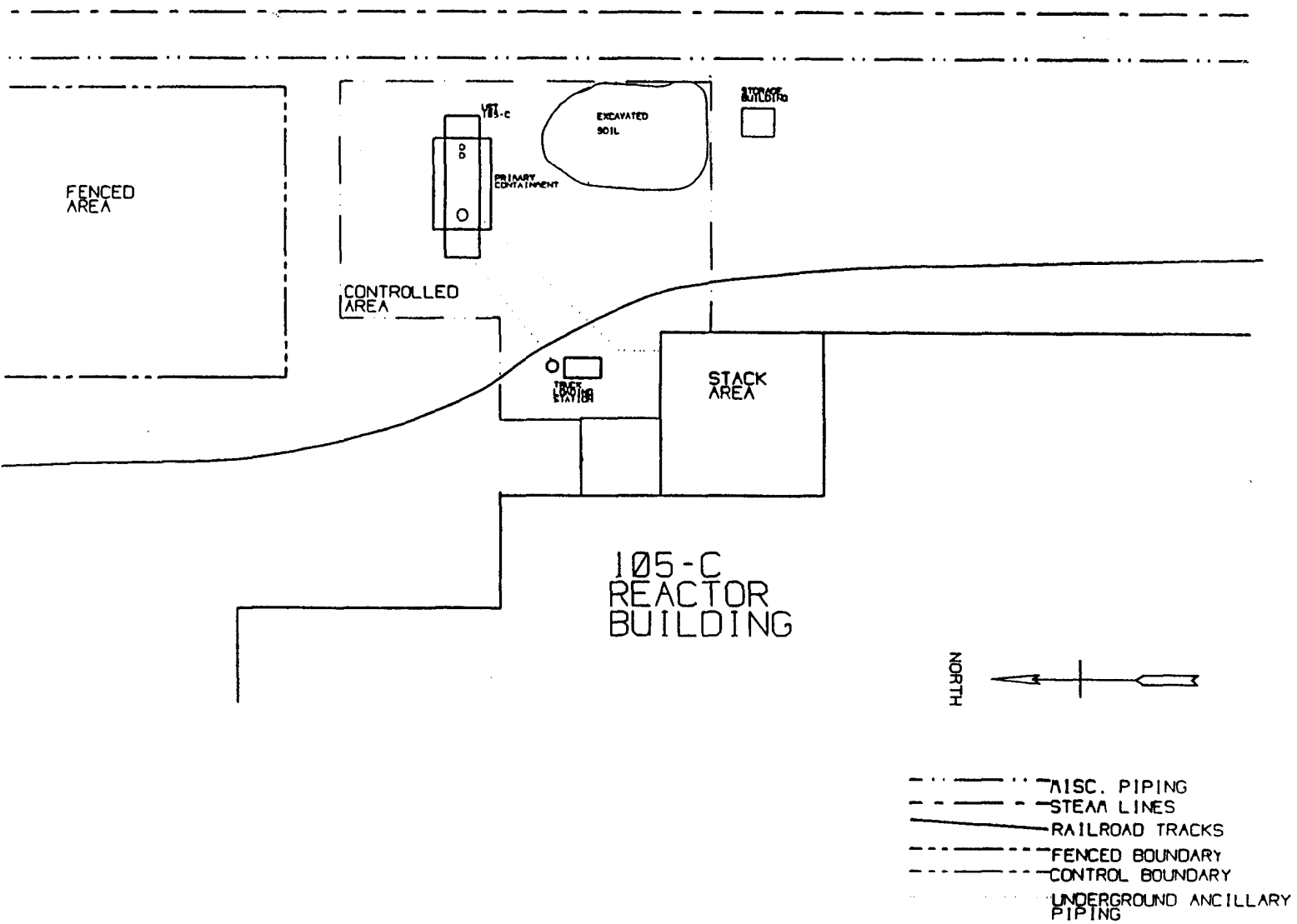


Figure 2: Tank 105-C HWMF General Area Map

solution. Sumps from the heat exchanger cleaning area drained into Tank 105-C. Oil in the tank was probably attributable to oil leaks into these sumps. The reacted or spent oxalic acid solution that resulted from the rinsing process was pumped into an above ground neutralization tank in the stack area of the reactor building. Potassium hydroxide (KOH) was then added and mixed to raise the solution pH to 8.0 or above. After neutralization, the waste was transferred to the underground storage Tank 105-C HWMF for temporary storage. It was common for the neutralization process to require additional pH adjustment inside Tank 105-C, accomplished by circulating the waste in the tank with a pump and adding more KOH to fine tune the pH. A permanent pump was set up to pump the waste into a waste trailer for transportation to a storage/disposal facility. The pump and circulation lines were disassembled in 1983.

The Tank 105-C HWMF was closed by neutralization of waste to a pH of less than 12.5, removal of as much waste as reasonably possible, and shipment of removed waste to an onsite storage/disposal facility. Any remaining waste and the tank void were stabilized with concrete. (Figure 3)

### ***Compliance History***

Previous remediation actions at the Tank 105-C HWMF were conducted pursuant to the requirements of the Resource Conservation and Recovery Act (RCRA) per Settlement Agreement 90-64-SW (September 5, 1994) USDOE, Savannah River Site, which is an agreement between the State of South Carolina Department of Health and Environmental Control (SCDHEC) and the Department of Energy to prepare and submit a closure plan in accordance with R.61-79.265 Subpart G. In October 1990, a RCRA Closure Plan was submitted

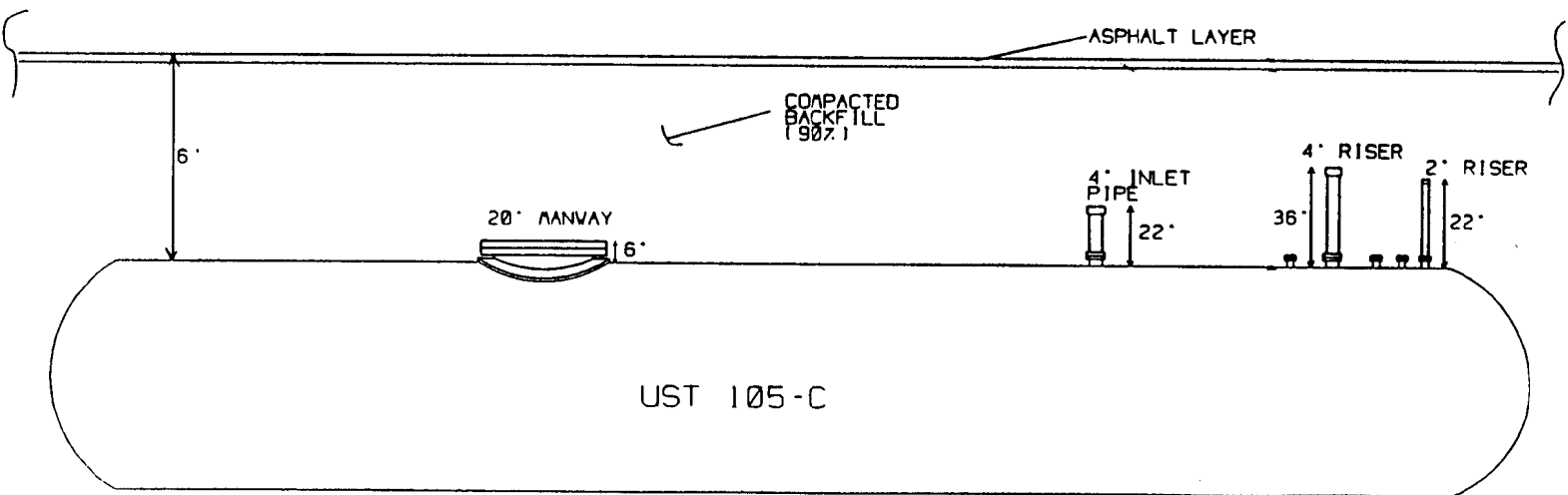


Figure 3: Tank 105-C HWMF

to the SCDHEC. SRS received approval of the closure plan on January 16, 1991, with no revision required. Revisions and subsequent approvals were made to the Closure Plan during closure activities. Closure of the Tank 105-C HWMF began in May 1991 and was completed in September 1991. The Tank 105-C HWMF was certified closed in November 1991. In December 1991, closure certification was accepted by SCDHEC as being in compliance with RCRA requirements.

Closure activities specifically included the neutralization of waste to a pH of less than 12.5, removal of as much waste as reasonably possible, and shipment of removed waste to an onsite storage/disposal facility. Any remaining waste and the tank void were stabilized with concrete. RCRA activities at the Tank 105-C HWMF became subject to CERCLA when the entire SRS facility was placed on the National Priorities List (NPL) in December 1989. The Tank 105-C HWMF is a source-specific operable unit within the C-Area Fundamental Study Area.

### **III. Highlights of Community Participation**

The public comment period for the Proposed Plan ran from August 1, 1994 to August 30, 1994. Comments were received on the Tank 105-C HWMF and are addressed in Appendix B of the Record of Decision in the Responsiveness Summary.

### **IV. Scope and Role of Operable Unit within the Site Strategy**

The selected final action remedy involved the neutralization of waste from a pH of 13.2 to a pH of less than 12.5, removal of as much waste as reasonably possible, and shipment of the waste to an onsite storage/disposal facility. All remaining waste and the tank void were stabilized in place with concrete. This

remedy prevents physical exposure to contaminants (radionuclides) and mitigates potential migration of contaminants to the groundwater by stabilizing the liquid medium and minimizing the pathway for transport.

The No Further Action Decision action will be reviewed every five (5) years to assure continued protection by the RCRA corrective action of human health and the environment. While previous remediation actions did not involve action on the groundwater, future investigations of the C-Area will be made. A site wide risk assessment will be performed at the conclusion of the Savannah River cleanup to ensure that the site as a whole is protective of human health and the environment. Based on the results of this risk assessment, additional cleanup at the SRS may be required.

Due to the previous Tank 105-C HWMF RCRA corrective action, No Further Action under CERCLA is necessary for this source control operable unit. The RCRA corrective action provides the necessary protectiveness to human health and the environment to satisfy all CERCLA requirements.

## **V. Summary of Operable Unit Characteristics**

Previous action taken was under a RCRA Closure Plan approved by the State of South Carolina and was protective of human health and the environment. Therefore, no further action is necessary under CERCLA.

Prior to the RCRA closure, chemicals of concern at the Tank 105-C HWMF included tritium and other radionuclides (gross alpha and gross beta/gamma) in a characteristic hazardous waste with a pH of 13.2. Risks associated with these chemicals were addressed by the RCRA closure of the tank which was consistent with the RCRA Closure Plan. Thus, the constituents no longer pose a

threat to human health and the environment. (Tank 105-C HWMF post closure chemicals of concern are residual minimal quantities of radionuclides solidified with concrete with a pH of less than 12.5.) Since the waste was neutralized, the solidified waste remaining in the tank is radioactive waste which has been immobilized.

## **VI. Summary of Operable Unit Risks**

Due to the previous Tank 105-C HWMF RCRA action, No Further Action is necessary under CERCLA for this source control operable unit. The RCRA corrective action is protective of human health and the environment and satisfies CERCLA requirements.

Wastes remaining in the Tank 105-C HWMF were stabilized along with the tank void following treatment, removal of as much waste as reasonably possible, and shipment to an onsite storage/disposal facility. Additional contaminated soils adjacent to the ancillary piping were removed and shipped to an onsite storage/disposal facility. Therefore, exposure through surface soil and sediment pathways is minimized.

Preventive alternatives were developed for the Tank 105-C HWMF based on effective technologies available at the time the RCRA Closure Plan was prepared. The RCRA Closure Plan was initially submitted to SCDHEC in October 1990 and was approved in January 1991. Revisions and subsequent approvals were made to the Closure Plan during closure activities.

Options regarding the Tank 105-C HWMF evaluated at that time included:

### **Alternative 1**

#### *No Action*

## **Alternative 2**

### *No Waste Removal and Tank Closure*

## **Alternative 3**

### *Waste Removal and Tank Closure*

Alternative 3 was selected within the RCRA closure process in 1990 as the most technically effective of the three alternatives for protection of human health and the environment. Closure of the Tank 105-C HWMF began in May 1991 and was completed in September 1991. The closure was certified in November 1991 and accepted by SCDHEC as being in compliance with RCRA and state requirements in December 1991. The closure is considered a final action under CERCLA.

## **VII. Explanation of Significant Changes**

There were no significant changes.

## **Appendix A**

### **References for Development of ROD Format**

- Weeks, Victor, 1993. "Regarding Records of Decision, F-Area and H-Area, Savannah River Site, Aiken, South Carolina", Letter to Goidell (DOE), Savannah River Site, Aiken, SC, April 14, 1993.
- EPA, 1991. "Guide to Developing Superfund No Action, Interim Action, and Contingency Remedy RODs," OSWER Publication 9355.3-02FS-3, U.S. Environmental Protection Agency, Washington, D.C., April 1991.
- WSRC, 1992. "RCRA Facility Investigation/Remedial Investigation Program Plan," WSRC-RP-89-994, Rev. 1, Chapter 15, Westinghouse Savannah River Company, Aiken, South Carolina, May 1992.



## Appendix B

### Responsiveness Summary

DOE has received comments regarding the Tank 105-C HWMF and they have been addressed in this Responsiveness Summary. These comments are available for review in the Administrative Record.

A reviewer provided a comment on the Tank 105-C HWMF item in the *SRS Environmental Bulletin* volume 5 number 15 dated July 25, 1994. This comment referred to ambiguous wording which implied "...that the neutralized liquid and sludge must have been left in the tank..." and suggested revision of this paragraph. The issue raised in the *SRS Environmental Bulletin* has been addressed and is clearly stated in the Proposed Plan and the Record of Decision.

A reviewer provided comments on the Proposed Plan for the Tank 105-C HWMF (U), WSRC-RP-94-56, June 24, 1994. The introductory comment stated that "The RCRA closure of the tank appears to have been an adequate short-term measure but is premature to state, as this plan does that "no further remedial action is necessary under CERCLA." This specific ROD addresses only the tank and ancillary piping and is a final action. Specific comments are italicized followed by comment response.

- C:** *"Until the contaminated soils around the tank and its piping have been adequately characterized we do not agree that no further remedial actions under CERCLA are necessary."*
- R:** This comment is outside the scope of this ROD. This specific ROD addresses only the tank and ancillary piping and is a final action. DOE will adequately address the contaminated soils surrounding the tank and ancillary piping as the C-Area operable unit is evaluated.

- C:** *"SRS should describe the relationship between the decontamination and decommissioning goals and plans for the C-Area and the CERCLA requirements for the operable units in the C-area Fundamental Study Area. EPA and SCDHEC should describe their understanding and expectations of this relationship as well. It is important that the goals and standards of the RCRA/CERCLA and D&D efforts be compatible, resulting in a very similar level of environmental and public health protection."*
- R:** This comment is outside the scope of this ROD. Buildings and areas contained within the C-Area Fundamental Study Area (FSA) are in the Site Evaluation program and will eventually be addressed per the schedules in Appendices D and E of the Federal Facility Agreement (FFA). Decontamination and decommissioning actions in the C-Area FSA will be addressed based on future evaluations.
- C:** *"There should be a CERCLA risk assessment for the C-Area FSA that encompasses the 105-C HWMF, the other C-Area operable units, and the reactor buildings and other structures requiring decontamination and decommissioning. By consolidating the risk assessment, common assumptions about land use, demographics, and exposure pathways could be assessed to evaluate the consistency and adequacy of all remedial actions within the C-Area FSA."*
- R:** CERCLA risk assessment will be performed for the contaminated soils and groundwater operable units associated with the C-Area FSA after they are characterized per the schedules contained in Appendices D and E of the FFA. The action for the tank and ancillary piping was performed under RCRA and no additional action is required on this unit.
- C:** *"Although we concur that the closed tank does not present a near-term risk to the public health or the environment, SRS should acknowledge that it may be necessary to exhume the tank in order to meet land use objectives."*
- R:** Based on future investigations at the C-Area FSA, DOE acknowledges that it may be necessary to exhume the tank.