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United States Department of Energy

Savannah River Site

Unit-Specific Amended Plug-In Proposed Plan for the C-Area Reactor Seepage Basin (904-67G) and L-Area Reactor Seepage Basin (904-64G) (U)

WSRC-RP-2001-4255

Revision 1

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LIST OF ACRONYMS AND ABBREVIATIONS

ARAR	applicable or relevant and appropriate requirement
bls	below land surface
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
Ci	Curies
cm/s	centimeters per second
COC	constituent of concern
CRSB	C-Area Reactor Seepage Basins
ESD	Explanation of Significant Difference
FFA	Federal Facility Agreement
LUC	Land Use Controls
LUCAP	Land Use Controls Assurance Plan
LUCIP	Land Use Controls Implementation Plan
LLC	Limited Liability Company
LRSB	L-Area Reactor Seepage Basin
MCL	maximum contaminant level
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
OU	operable unit
pCi/g	pico curies per gram
PP	Proposed Plan
PTSM	principal threat source material
ROD	Record of Decision
RG	remedial goal
RI	Remedial Investigation
RBC	risk-based concentration
SRS	Savannah River Site
SCDHEC	South Carolina Department of Health and Environmental Control
TER	Technical Evaluation Report
USDOE	United States Department of Energy
USEPA	United States Environmental Protection Agency
WSRC	Westinghouse Savannah River Company

I. INTRODUCTION AND BACKGROUND

Introduction

This Proposed Plan (PP) is being issued by the United States Department of Energy (USDOE), which functions as the lead agency for Savannah River Site (SRS) remedial activities, with concurrence by the United States Environmental Protection Agency (USEPA) and the South Carolina Department of Health and Environmental Control (SCDHEC). This PP is being issued for the L-Area Reactor Seepage Basin (904-64G) (LRSB) and basin #2 at the C-Area Reactor Seepage Basin (904-67G) (CRSB). (This PP does not affect the Plug-in remedy for CRSB basins #1 and #3.)

A Technical Evaluation Report (TER) (WSRC 2000a) and Explanation of Significant Difference (ESD) (WSRC 2000c) were submitted for CRSB and approved by USEPA and SCDHEC in 2000. A TER (WSRC 2000b) and ESD (WSRC 2001) were submitted for LRSB in 2001. The ESDs required that these operable units (OUs) be remediated under the Plug-in Record of Decision (ROD) (WSRC 1999). The Plug-in ROD was signed on November 29, 1999 in which in situ stabilization with a low-permeability soil cover was identified as the preferred alternative for the K-Area, C-Area, L-Area, and P-Area Reactor Seepage Basins. The L-Area Reactor Seepage Basin and Basin #2 at the C-Area Reactor Seepage Basin are covered in this amendment. The TERs provided the technical information needed to demonstrate that these OUs met the requirements for using the Plug-in ROD to specify the remediation for these OUs (Figure 1).

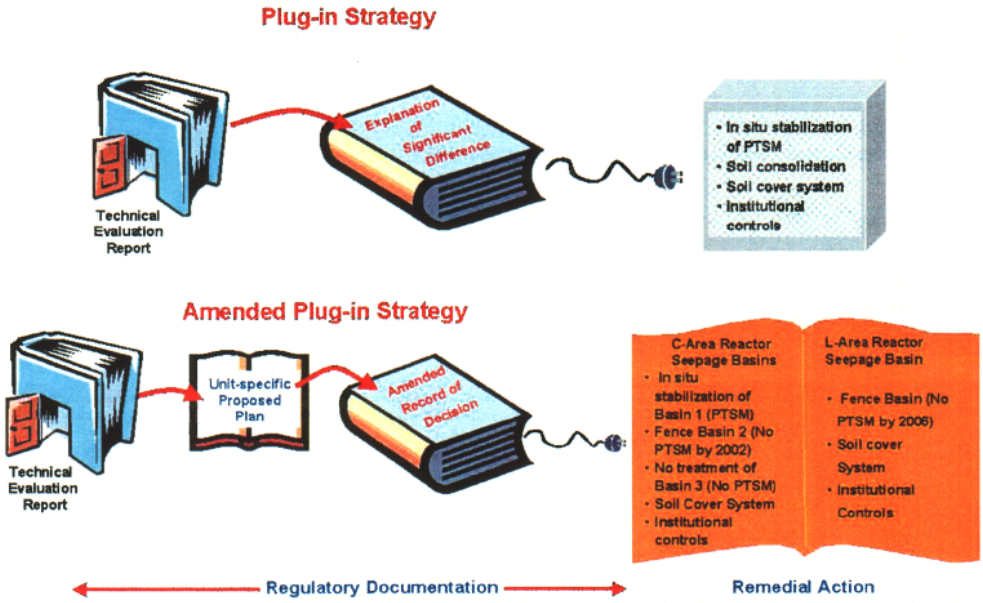


Figure 1. Amended Plug-in Strategy

The Amended Plug-in Strategy includes a proposed plan in the documentation process. The Unit-specific Proposed Plan allows the public an opportunity to provide comments.

Since that time, USDOE, USEPA, and SCDHEC have reassessed the Plug-in remedy in terms of the USDOE's ability to control access to principal threat source material (PTSM) at the LRSB and basin #2 at the CRSB. The three parties have agreed that the following actions are the best way to protect human health and the environment:

- Place a low permeability soil cover over the LRSB and basin #2 at the CRSB
- Place warning signs and a fence around these basins while they contain PTSM.
- Provide institutional controls that will restrict future activities that might result in exposure to contamination.

In situ stabilization is eliminated as a component of the Plug-in remedy at the LRSB and basin #2 at the CRSB. (Basin #1 at the CRSB will be stabilized because PTSM represents a long-term risk. Basin #3 at the CRSB does not contain PTSM and will not be stabilized.) This change represents an appreciable change to the scope of the Plug-in remedy and is considered a fundamental change. An amended ROD is required to document these changes. Due to the similarities between both units, one PP and one amended ROD is being issued. The purpose of this PP is to

- document that these units meet the plug-in criteria.
- describe the short-term risk from PTSM at these units.
- evaluate the Amended Plug-in remedial action which takes credit for administrative controls being in place as long as PTSM is present.
- provide for public involvement in the decision-making process.

On December 21, 1989, SRS was included on the National Priorities List (NPL). In accordance with Section 120 of Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) 42 United States Code Section 9620, USDOE has negotiated a Federal Facility Agreement (FFA) (FFA 1993) with the USEPA and SCDHEC to coordinate remedial activities at SRS. The FFA lists the CRSB and LRSB as CERCLA units requiring further evaluation using a remedial investigation process to determine the actual or potential impact to human health and the environment of releases of hazardous substances to the environment.

CERCLA requires the public to be given an opportunity to review and comment on the draft permit modification and proposed remedial alternatives. Public participation requirements are listed in Sections 113 and 117 of CERCLA 42 United States Code Sections 9613 and 9617. These requirements include establishment of an Administrative Record File that documents the investigation and selection of remedial alternatives and allows for review and comment by the public regarding those alternatives (See Section II). The Administrative Record File must be established at or near the facility at issue. The SRS Public Involvement Plan (USDOE 1994) is

designed to facilitate public involvement in the decision-making process for permitting, closure, and the selection of remedial alternatives. Section 117(a) of CERCLA, as amended, requires notice of any proposed remedial action to provide the public an opportunity to participate in the selection of the remedial action.

Community involvement in consideration of this evaluation of alternatives for the CRSB and LRSB is strongly encouraged. All submitted comments will be reviewed and considered. Following the public comment period, a Responsiveness Summary will be prepared to address issues raised during the public comment period. The Responsiveness Summary will be made available with an Amendment to the Unit-specific Plug-in ROD for the CRSB and LRSB.

The final remedial decision will be made only after the public comment period has ended and all the comments have been received and considered. Selection of the remedial alternative that will satisfy the FFA requirements will be made by USDOE, in consultation with USEPA and SCDHEC. It is important to note that the final action(s) may be different from the preferred alternative discussed in this plan depending on new information or public comments. The alternative chosen will be protective of human health and the environment and comply with all federal and state laws.

Background

SRS occupies approximately 310 square miles of land adjacent to the Savannah River, principally in Aiken and Barnwell counties of South Carolina. SRS is located approximately 25 miles southeast of Augusta, Georgia, and 20 miles south of Aiken, South Carolina (Figure 2). The LRSB and CRSB are both located at the SRS in Aiken County, South Carolina.

SRS is owned by the USDOE. Management and operating services are provided by Westinghouse Savannah River Company (WSRC). SRS has historically produced tritium, plutonium, and other special nuclear materials for national defense. Chemical and radioactive wastes are byproducts of nuclear material production processes. Hazardous substances, as defined by CERCLA, are currently present in the environment at SRS.

II. COMMUNITY PARTICIPATION

The FFA Administrative Record File, which contains the information pertaining to the selection of the response action and copies of all referenced documents, is available at the following locations:

U.S. Department of Energy
Public Reading Room
Gregg-Graniteville Library
University of South Carolina – Aiken
171 University Parkway
Aiken, South Carolina 29801
(803) 641-3465

Thomas Cooper Library
Government Documents Department
University of South Carolina
Columbia, South Carolina 29208
(803) 777-4866

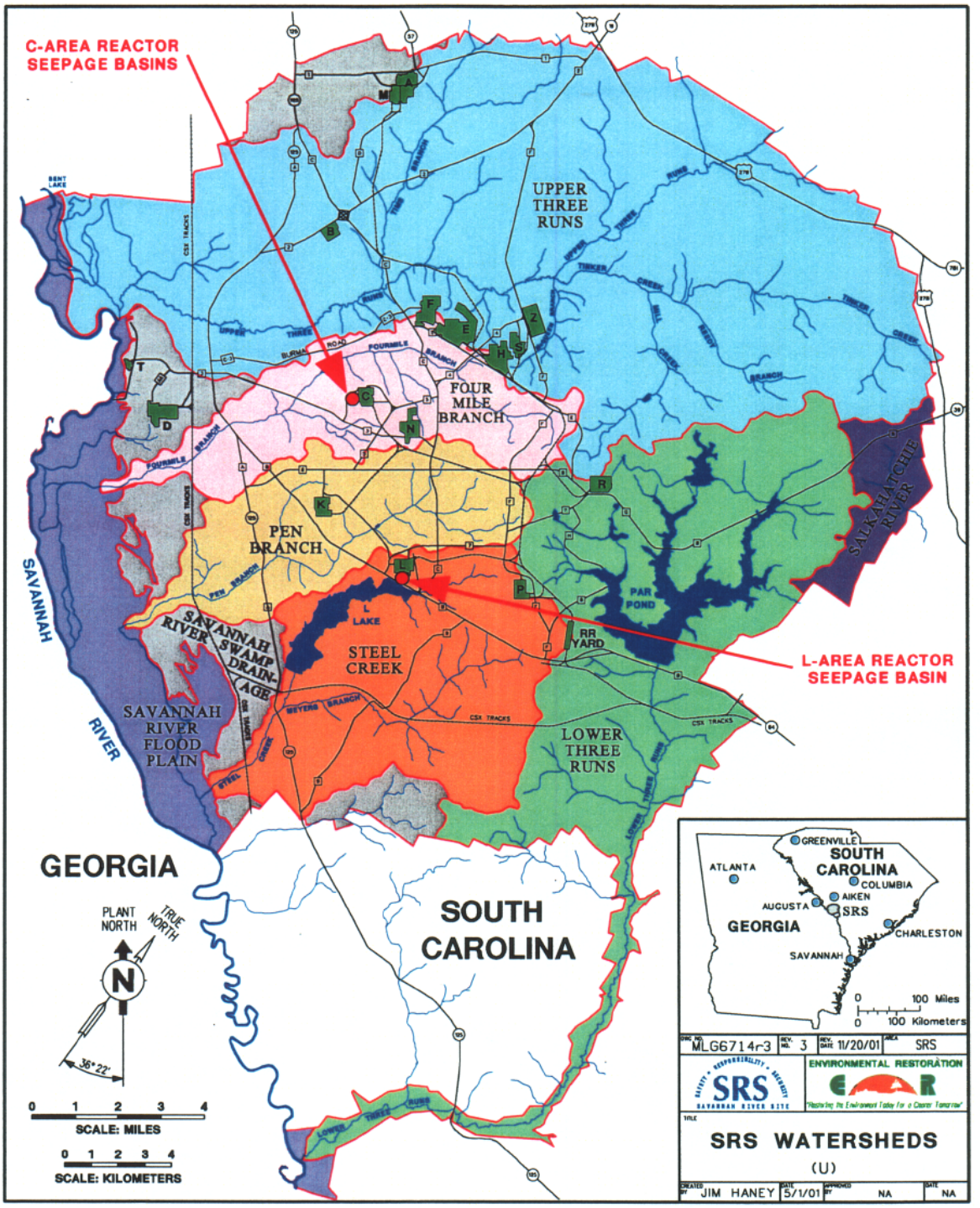


Figure 2. **Location of CRSB and LRSB within the Savannah River Site**

Hard copies of the PP are available at the following locations:

Reese Library
Augusta State University
2500 Walton Way
Augusta, Georgia 30910
(706) 737-1744

Asa H. Gordon Library
Savannah State University
Tompkins Road
Savannah, Georgia 31404
(912) 356-2183

The public will be notified of the public comment period through the *SRS Environmental Bulletin*, a newsletter sent to citizens in South Carolina and Georgia, and through notices in the *Aiken Standard*, the *Allendale Citizen Leader*, the *Augusta Chronicle*, the *Barnwell People-Sentinel*, and *The State* newspapers. The public comment period will also be announced on local radio stations.

USDOE will provide an opportunity for a public meeting during the public comment period if significant interest is expressed. The public will be notified of the date, time, and location. At the meetings, the proposed action will be discussed, and questions about the action will be answered.

To request a public meeting during the public comment period, to obtain more information concerning this document, or to submit written comments, contact one of the following:

Jim Moore
Westinghouse Savannah River Company
Public Involvement
Savannah River Site
Building 742-A
Aiken, South Carolina 29808
1-800-249-8155
jim02moore@srs.gov

The South Carolina Department of Health and Environmental Control
Attn: J. T. Litton, P. E., Director
Division of Waste Management
Bureau of Land and Waste Management
2600 Bull Street
Columbia, South Carolina 29201
(803) 896-4000

Following the public comment period, an amended ROD will be signed. The amended ROD will detail the remedial alternative chosen for this OU and include responses to oral and written comments received during the public comment period in the Responsiveness Summary.

III. OPERABLE UNIT BACKGROUND

L-Area Reactor Seepage Basin

The LRSB OU is located in the central portion of SRS, southeast of the L-Reactor facility (Figure 2). The basin is in an open area with sparse vegetative cover. Water accumulates in the basin during and after rainfalls. The ground slopes to the south toward L-Lake approximately 1,220 feet away. The LRSB is located in an industrial zone identified in the proposed SRS future land use map of the SRS FFA Implementation Plan (WSRC 1996). The basin is adjacent to a nuclear facility and has been selected to remain an industrial use area.

The LRSB is an L-shaped unlined earthen basin with dimensions of 200 feet on each outer side of the L-shape, 36 feet in width, and 7 feet in depth (Figure 3). The basin has not been backfilled to grade and is currently open.

The process sewer line is a 3-inch diameter, high density, polyethylene pipe that is approximately 450 feet long and extends from the disassembly basin with the L-Reactor facility to the discharge point at the north end of the basin. In addition to the process sewer line, a concrete pad, approximately 10 by 10 feet, sits adjacent to the basin. This pad was most likely used as an offloading area. Liquid waste was disposed of into the basin from tanker trucks at the offloading pad via a flexible pipe that extends from the pad into the north end of the basin.

In 1958, the process sewer line began conveying low-level radioactive purge water from the L-Area Reactor disassembly basin to the seepage basin. The disassembly basin was used to store irradiated reactor fuel and target rods prior to shipment to the separations area. Purge water was necessary to keep tritium concentrations in the disassembly basin at levels that ensured safe working conditions. The LRSB received purge water from 1958 to 1968 and from 1985 to 1988. No purge water was generated from 1968 to 1985. The L-Area Reactor was not in operation from 1968 to 1985. However, from 1985 to 1988, mixed-bed deionizers and sand filters intercepted the purge water before it was discharged into the LRSB. In 1988, L Reactor was placed on warm standby; in 1993, it was placed in shutdown status and has not been restarted.

Although many radionuclides were discharged to LRSB, almost all of the radioactivity was due to tritium. Other radionuclides include strontium-90, cesium-137, cobalt-60, and promethium-147. Radioactive contaminants entered the disassembly basin principally in three ways: (1) as a film of liquid on irradiated components as they were discharged from the reactor tank to the disassembly basin; (2) in the oxide corrosion film on the irradiated components; and (3) infrequently from leaks in porous components. In addition, chemical components entered the disassembly basin in small amounts through additions for pH control, filter promotion, and algae treatment as well as through minimal additions of wastewater to the settler tank from other sources in L-Reactor building. These contaminants entered LRSB when purge water from L-Reactor disassembly basin was released to the seepage basin.

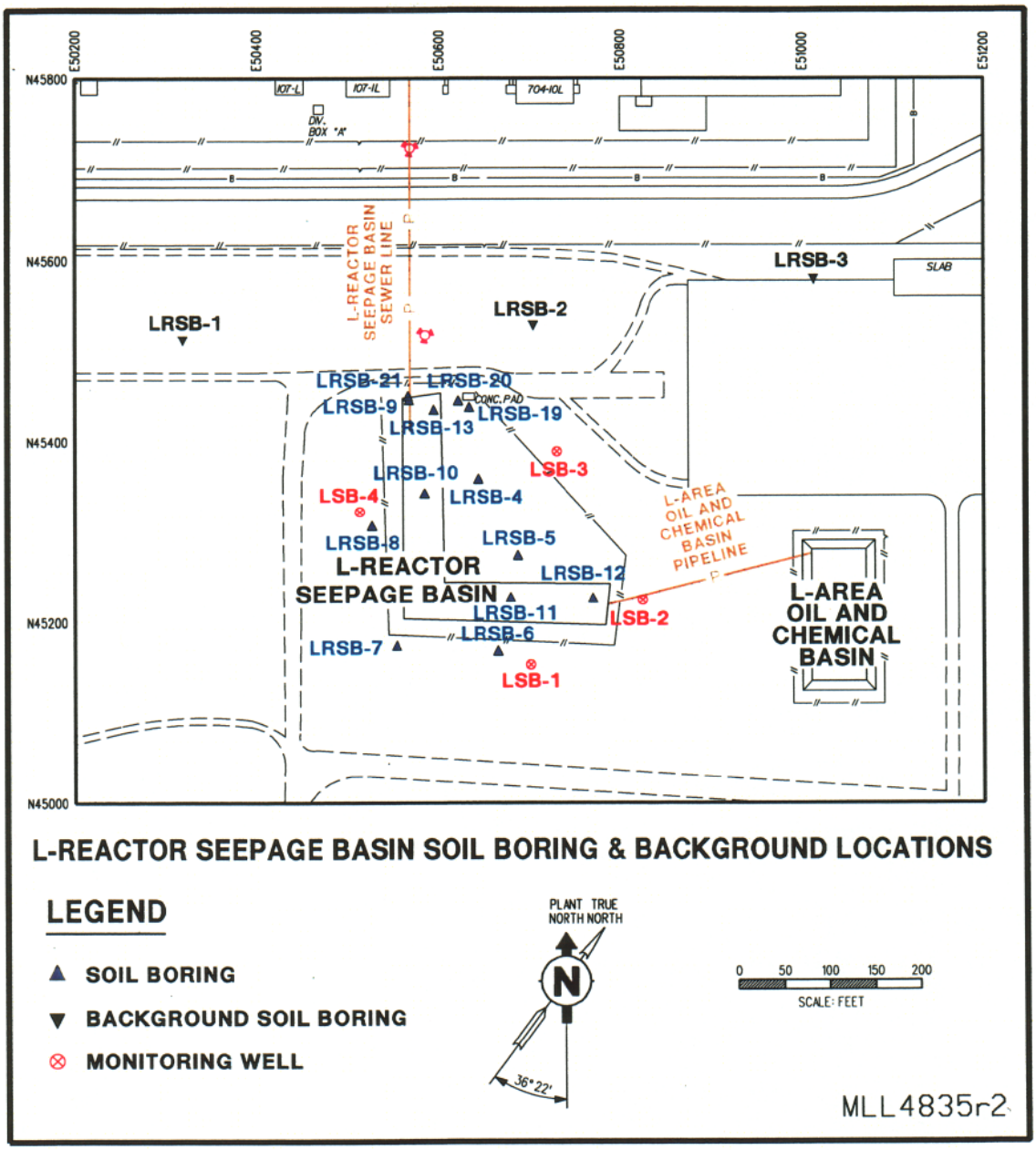


Figure 3. **Layout of the LRSB**

C-Area Reactor Seepage Basins

The CRSB OU is located in the central portion of SRS in the southwestern portion of C Area (Figure 2). The three basins are in an open area with sparse vegetative cover. The ground slopes southwestward toward an unnamed tributary of Fourmile Branch approximately 600 feet to SRS west. The CRSBs are located in an industrial zone identified in the proposed SRS future land use map of the SRS FFA Implementation Plan (WSRC 1996). The basins are adjacent to a nuclear facility and have been selected to remain an industrial use area.

Three unlined (earthen) basins were constructed in 1957 that comprise the CRSB OU. Basin #1 is L-shaped and was constructed with an approximate outside dimension of 250 by 35 feet in the north-south direction, approximately 180 by 35 feet in the east-west direction, and a depth of 7 feet below land surface (bls). Basin #2 was constructed with an approximate outside dimension of 300 x 60 feet and a depth of 11 feet bls. Basin #3 was constructed with approximate outside dimensions of 180 x 90 feet and a depth of 12 feet bls. (Figure 4)

The process sewer line is a 3-inch diameter polyethylene pipe that is approximately 800 feet long and extends from the disassembly basin to Basin #1. From 1957 until 1970 and from 1978 until 1986, the process sewer line conveyed low-level radioactive purge water from the C-Area Reactor disassembly basin to the seepage basins. The process sewer line has been grouted as part of the CRSB remedial action.

The C-Reactor process sewer line discharged to the southeastern end of Basin #1. This L-shaped basin slopes to the north and west where a cascade overflow pipe connects it to Basin #2. Basin #2 also has a similar cascade overflow into Basin #3 at its southeastern corner. Flow between the basins was via the cascade overflow pipes positioned near the top of the basin walls.

In addition to the process sewer line in Basin #1, a metal chute was placed at the northeastern bend of the basin during operation. The chute consists of an exterior, corrugated metal pipe surrounding a 10-inch diameter, stainless steel pipe. This 20- to 25-foot long metal chute is open-ended and extends to the top of the CRSB berms (Figure 4). Historically, wastewater from the settler tank backwash from the reactor disassembly basin was disposed of in the seepage basins through the metal chute. Any wastewater transferred into the reactor seepage basins through the chute had to meet the discharge requirements for the seepage basins. There is no documentation indicating when the chute was used and if it was used for waste disposal. Previous surveys have posted the chute as radiologically contaminated but soils surrounding the chute have been surveyed and are consistent with background radiation levels.

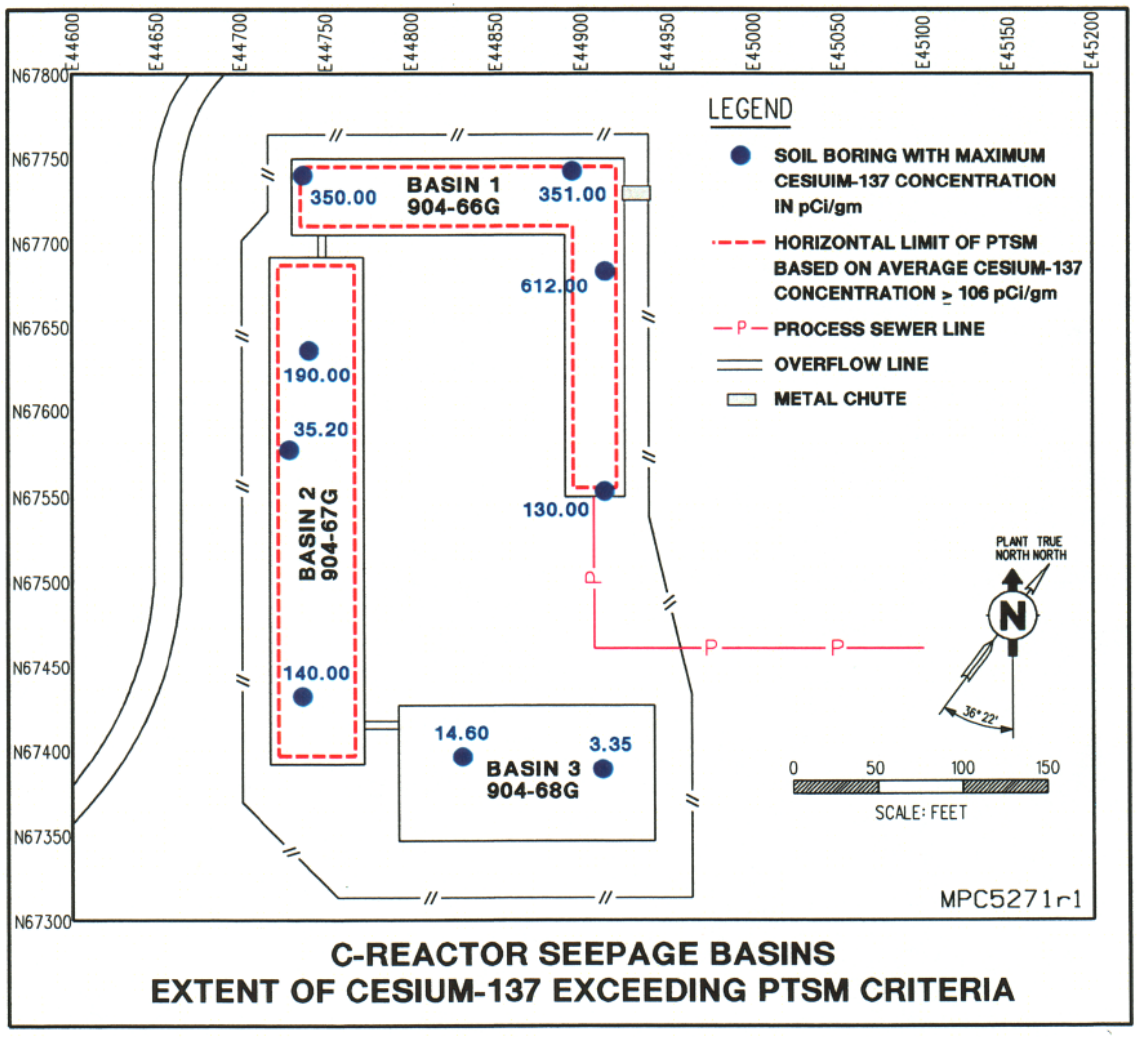


Figure 4. **Layout of the CRSB**

The seepage basins were used from 1959 to 1970 to dispose of low-level radioactive process purge water from the reactor disassembly basin. In 1963, disassembly basin wastewater was deionized and filtered prior to discharge, which reduced radioactivity and removed solids and sludges. The seepage basins were not used from 1970 to 1978 while purge water was mixed with large volumes of heat exchanger cooling water and discharged to area streams. After improvements for processing disassembly basin water, purge water discharges to the seepage basins resumed in 1978. The C-Reactor was shut down for repairs in 1985, placed on cold standby in 1987, and followed by shutdown. The seepage basins have not received wastewater since 1986.

Waste disposal records indicate that the main basin (Basin #1) received aqueous radioactive waste. Radionuclides in the wastewater from the disassembly basin, sumps, tanks, and drums included tritium, chromium-51, cobalt-60, cesium-134, cesium-137, and other beta-gamma fission products. The records show almost all of the radioactivity in the reactor seepage basin discharge water was due to tritium, with lesser amounts of cesium-137, cobalt-60, and strontium-90. During the entire operation of the CRSBs, it is estimated that 56,000 curies (Ci) of tritium was released to the basins. Prior to 1970, 0.08 Ci of strontium-90, 0.07 Ci of cesium-137, and 240 Ci of nonvolatile beta emitters were released to the CRSBs.

The sidewalls of the basins were originally sprayed with an asphalt emulsion to control vegetation and soil erosion and to enhance vertical infiltration of wastewater. The asphalt emulsion has since deteriorated and eroded. The basins now show signs of surface erosion. This is pronounced in Basins #1 and #3. Material from the basin walls appears to have been eroded and transported by rainwater and slumping to the basin bottoms, and a significant accumulation now covers the edges of the basin bottoms but thins to 1 foot or less in the centers. Basin #2 is deeper than Basin #1; it shows little evidence of erosion, and the sidewalls have remained steep. Basin #2 has intermittent standing water in its central portion; Basin #1 has intermittent standing water in its lower end following periods of precipitation; and Basin #3 is generally dry. Currently, all three basins are open and have not been backfilled, and there is no standing water in any of the basins.

IV. SCOPE AND ROLE OF OPERABLE UNIT OR RESPONSE ACTION

The overall strategy for addressing the LRSB and basin #2 at the CRSB is to (1) evaluate the units against the plug-in criteria, (2) calculate the length of time that PTSM will be present at the units, (3) evaluate the amended remedial alternative, (4) acquire community involvement in the remedial selection and document the process, and (5) perform a final action to remediate the identified media.

Plug-In Strategy

The Plug-in strategy established a common remedy to be used for OUs that have similar histories and similar characteristics. The remedy is applicable to those radioactively contaminated OUs that are located within a current industrial use area (with buffer) adjacent to a nuclear facility that will be maintained under institutional controls in the long term. In order to use the Plug-in remedy, a unit must meet all of the Plug-in criteria. These criteria are as follows:

1. The OU is radiologically contaminated.
2. The unit is located in an industrial land area and is adjacent to an existing nuclear facility.
3. The unit contains PTSM.
4. The PTSM is not in direct contact with surface water or groundwater.

For the plug-in remedy, PTSM has been defined as soil that poses a radiological (or cancer) risk to the future industrial worker of 1×10^{-3}, which is equal to 1 additional cancer in 1,000 people.

When an OU fully meets all of the Plug-in criteria, the Plug-in remedy may be applied. This remedy consists of five aspects, as follows:

1. ***Institutional controls*** will consist of near- and long-term actions. For the near-term, signs and existing SRS access controls will be used to restrict access to current uses. In the long term, if the property is ever transferred to non-federal ownership, the U.S. Government will take those actions necessary pursuant to Section 120(h) of CERCLA. Those actions will likely include deed restrictions precluding residential use or excavation within the boundaries of the unit.

2. ***In situ stabilization*** through grouting will be used to address PTSM soil within the basins which poses a risk in excess of 1×10^{-3} for future industrial workers, that is practicable to treat.

3. A ***low-permeability soil cover system*** (10^{-5} cm/s hydraulic conductivity soil cover) will be provided over the in situ stabilized soil to reduce water infiltration and to provide shielding to potential receptors on the surface. For basins that contain non-PTSM soil, but may leach contaminants to groundwater, a low-permeability soil cover system will be placed over the soil. The soil cover system will be designed with a permeability low enough to prevent migration of contaminants to groundwater in less than 1,000 years at concentrations that will exceed maximum contaminant levels (MCLs). The depth to the contaminated soils will exceed 6 feet or a bio-barrier will be included as part of the cover system so plants and animals will not contact the waste.

4. ***Consolidation*** of any contaminated soil surrounding the pipelines or found at the surface exceeding remedial goals will occur. The soils will be excavated and placed into the primary discharge basin. Consolidated

soil that is PTSM will be stabilized with the rest of the soil in that basin.

5. ***Grouting*** will be used to stabilize the pipelines in place.

Plug-In Criteria Evaluation

The approved unit-specific TER and ESD for the CRSB documented that the CRSB met the Plug-in criteria. The LRSB is required to be evaluated against the Plug-in criteria to show that the Plug-in remedy is the appropriate response action. The criteria in the Plug-in ROD have been formulated as the following four key questions. If the answer to any of the four questions is "NO", other remedial alternatives should be considered.

1. Is the Unit Radiologically Contaminated?

Yes. Data collected for the LRSB OU indicate that soil in the seepage basin is contaminated by radionuclides. Cobalt-60 is the primary radionuclide in the basin.

2. Is the Unit Located in a Current Industrial Use Area (With Buffer) Adjacent to a Nuclear Facility?

Yes. The LRSB is approximately 300 feet south of the L-Reactor Area (Figure 3). This area is located in an industrial zone identified on the proposed SRS future land use map in the SRS Federal Facility Agreement Implementation Plan, and is adjacent to a nuclear facility.

3. Does the Unit Contain PTSM?

Yes. The characterization data indicate that an approximate risk equal to or greater than 3×10^{-3} may result from exposure of a future industrial worker to surficial basin soils. Cobalt-60 is the primary contributor to this risk. PTSM has been identified to the depth of 1 foot in the basin (Figure 5). Basin soil is the only PTSM at the LRSB OU.

4. Is PTSM Not in Direct Contact with Groundwater or Immediately Adjacent to Surface Water?

Yes. The PTSM at LRSB is not in direct contact with groundwater or surface water. The groundwater table at LRSB is approximately 6 to 14 feet below the bottom of the basin at the waste unit (Figure 4).

Rainwater is temporarily impounded within the basin until it infiltrates and evaporates. As a result, there is no overflow to the outside of the basin. However, in the spring of 1998, it was necessary to pump out several feet of rainwater from the LRSB to prevent any potential for breaching the berm of the basin. No surface water features are located adjacent to the LRSB OU. The closest surface water is L-Lake about 1200 feet to the south.

Because the CRSB and LRSB OUs meet all plug-in criteria, components of the plug-in remedy will be used at the CRSB and LRSB.

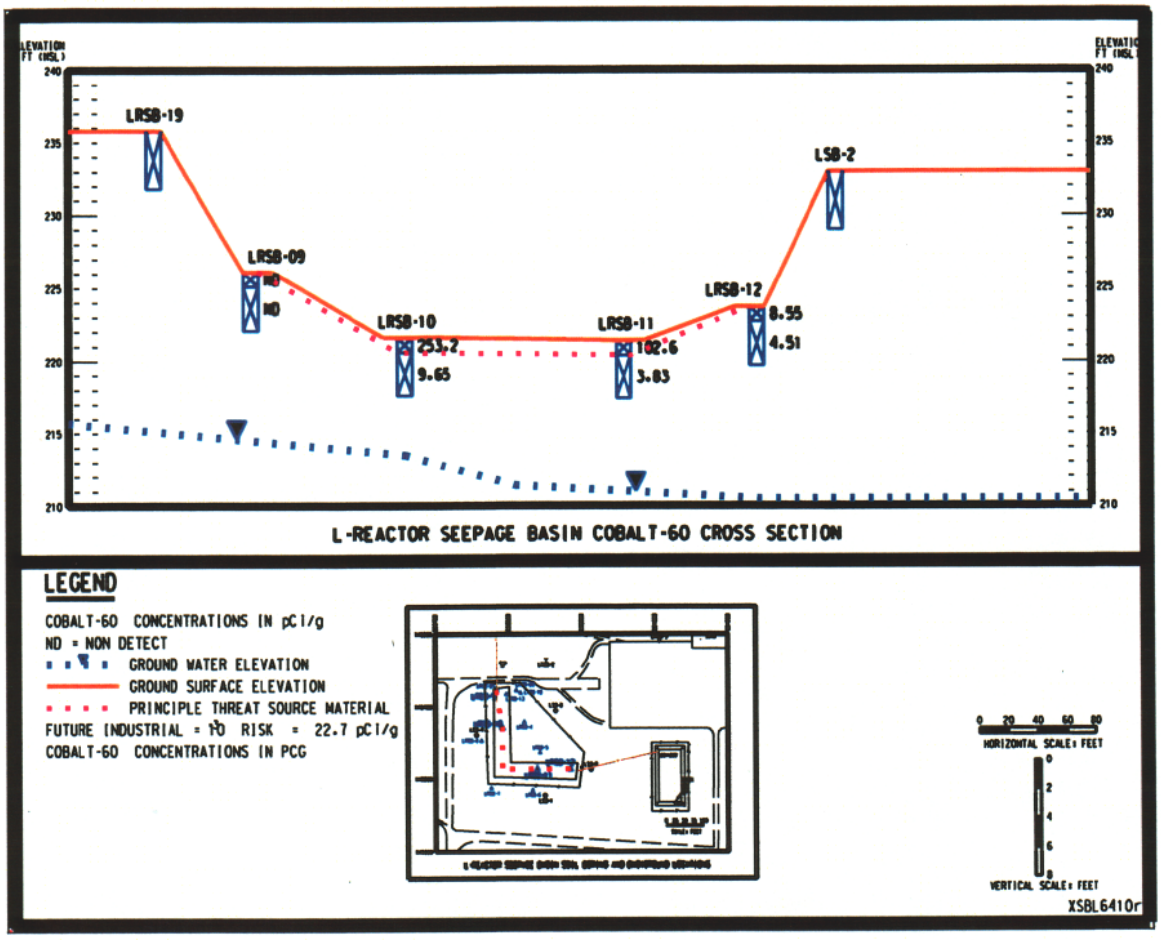


Figure 5. Distribution of PTSM in L-Reactor Seepage Basin

V. SUMMARY OF SITE RISKS

Both of these basins have been contaminated with radionuclides from past activities at SRS. The cumulative radiological risk to the industrial worker from the LRSB is 3×10^{-3} and from Basin #2 at the CRSB is 2×10^{-3}. Radiological risk assessments for humans are more conservative than ecological health risk assessments. Therefore, only human health risk evaluations were considered. At LRSB, the primary contaminant is Cobalt-60 (which has a half-life of 5.27 years). The primary contaminant at CRSB is Cesium-137 (which has a half-life of 30.17 years). The half-life indicates the time necessary for a radionuclide to naturally decay to half of its radioactivity. Currently, the level of contamination in the soil at these basins creates a risk in excess of 1×10^{-3} (may cause one additional incidence of cancer in every 1,000 people that become exposed to the radionuclides). This level of contamination is considered PTSM.

Additionally, at the LRSB, strontium-90 was detected at depth (7 to 10 feet bls) in the buffer area at a concentration (4.8 pCi/g) approximately equal to the average strontium-90 concentration in the basin (4.03 pCi/g). Because strontium-90 was identified as a potential threat to future groundwater due to migration through the basin soils, it is also identified as a contaminant migration concern for the buffer area.

Actual or threatened releases of hazardous substances from this waste unit, if not addressed by the Amended alternative or one of the other active measures considered, may present a current or potential threat to public health, welfare, or the environment.

VI. REMEDIATION OBJECTIVES

The Plug-in ROD specifies three remedial action objectives applicable to the LRSB and CRSB.

1. Prevent human exposure to highly contaminated basin soils PTSM by performing stabilization treatment to the extent practicable and backfilling the basins with clean soil. Reduce risks to the future worker from surface soils (0 to 1 foot) outside the basin by establishing remedial goals (RGs) for constituents of concern (COCs) at concentrations equivalent to 1×10^{-6} for carcinogens and a hazard quotient of 1 for noncarcinogens or background (where background levels of COCs exceed 1×10^{-6}).

2. Prevent the release of COCs in the soil (basin soil and buffer area) to groundwater beneath the unit above MCLs or risk-based concentrations (RBCs) if there are no MCLs. The soil RGs are back-calculated based on MCLs or RBCs.

3. Protect the ecological receptors indigenous to the area by preventing or limiting contact with contaminated basin soil/pipelines and preventing plants and animals from bringing contaminants up toward the surface.

Principal Threat Source Material

The National Oil and Hazardous Substances Contingency Plan (NCP) states that USEPA expects to use treatment to address principal threats posed by a site wherever practicable. The LRSB and Basin #2 at the CRSB have PTSM based on the concentrations of Cobalt-60 and Cesium-137 respectively, but an analysis of the data indicates that the risk from PTSM will be reduced over time due to radioactive decay. The level of Cobalt-60 at LRSB will drop below a risk level of 1×10^{-3} by the year 2006 (Figure 6). The level of Cesium-137 at Basin #2 at CRSB will drop below a risk level of 1×10^{-3} in the year 2002.

USDOE, USEPA, and SCDHEC have agreed that the current access controls and site use controls at SRS will effectively protect human health and the environment at least through 2006; therefore, a low permeability soil cover is an appropriate remedy for these basins. In addition, the basins will be surrounded by a fence with warning signs while the basins pose a risk of 1×10^{-3} or more. After this period, the radioactively contaminated basins will not pose a risk greater than 1×10^{-3} and will no longer require in situ stabilization with a grout-like material as a component of the prescribed remedy presented in the Plug-in ROD.

VII. SUMMARY OF ALTERNATIVES

No Action, a Soil/Debris Consolidation Facility, and In Situ Stabilization with a Low-Permeability Soil Cover System were evaluated as part of the plug-in proposed plan. In Situ Stabilization with a Low-Permeability Soil Cover System was selected as the preferred plug-in remedy.

To eliminate the stabilization component of the Plug-in remedy, an amended ROD must be submitted that shows the OU meets all of the Plug-in ROD criteria in addition to the following criteria:

1) The current PTSM will radioactively decay to levels that no longer pose a 1×10^{-3} risk to future industrial workers within a relatively short time.

2) USDOE, USEPA, and SCDHEC agree that it is reasonable to assume that USDOE will continue to own and operate the SRS for this time period and access controls will be provided to prevent exposure to the current PTSM.

Because the CRSB and LRSB OUs meet all Plug-in criteria, components of the Plug-in remedy will be used at the CRSB and LRSB. A schematic drawing (Figure 7) shows how the amended remedy will be applied. Table 1 summarizes how elements of the remedy will be applied at the LRSB and Basin #2 at the CRSB.

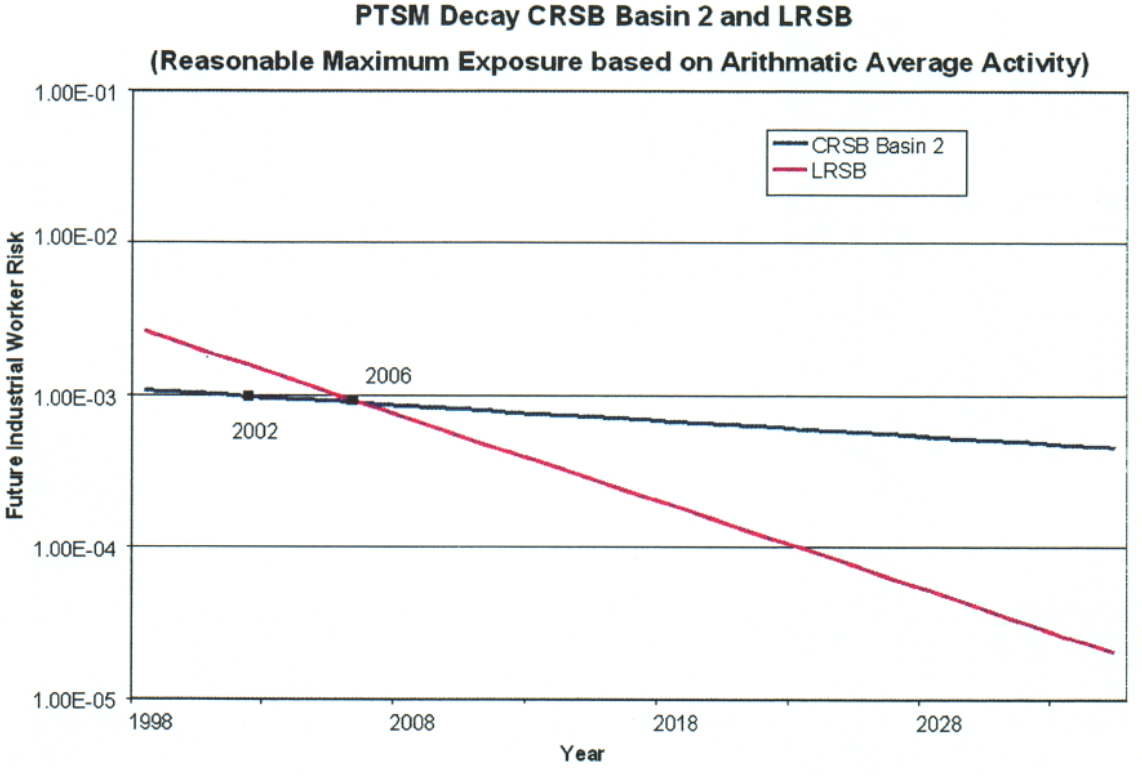


Figure 6. PTSM Decay in the LRSB and Basin #2 at the CRSB

Figure 6 indicates that PTSM (risk to future industrial workers greater than 1 x 10^{-3}) will be present in the LRSB (Cobalt-60) through the year 2006 and in Basin #2 at the CRSB (Cesium-137) through the year 2002. The risk from PTSM decreases over time due to radioactive decay. The rate that radionuclides decay is a function of the half-life (time for one-half of the radionuclides to decay). The risk from PTSM in LRSB decreases more rapidly than the risk from PTSM in CRSB because the half-life for Cobalt-60 (5.27 years) is shorter than for Cesium-137 (30.17 years).

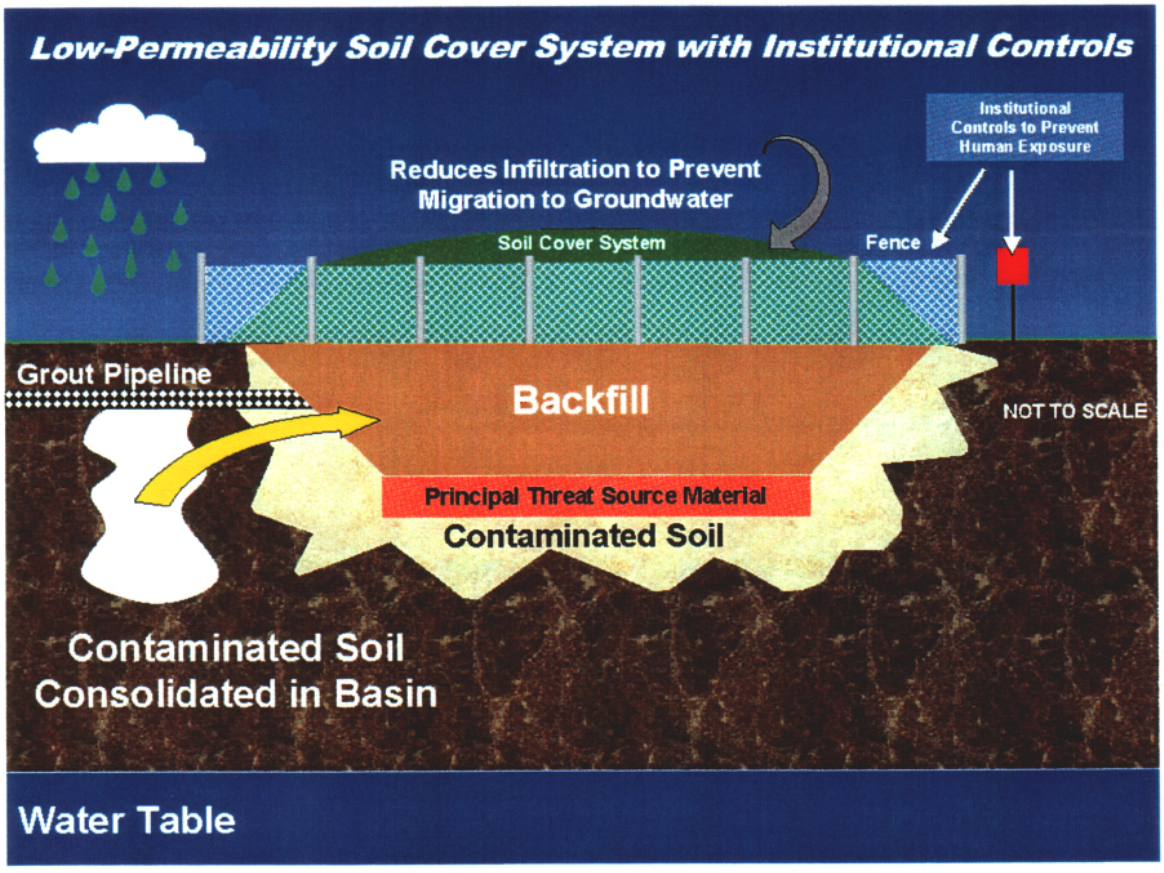


Figure 7. Typical Basin with the Amended Plug-in remedy

Figure 7 illustrates components of the remedial action that will be implemented at the L-Area Reactor Seepage Basin and Basin #2 at the C-Area Reactor Seepage Basin. Principal threat source material will not be treated as long as the USDOE is able to provide access control and engineering controls (institutional controls). The fence is required as an element of institutional controls to prevent exposure to untreated principal threat source material.

Table 1. Summary of the Amended Plug-in Remedial Actions

Components of the Plug-in remedy	Amended Remedy for LRSB	Amended Remedy for Basin #2 at CRSB
In situ stabilization to stabilize PTSM	In situ stabilization will not be performed. USDOE will continue to own and operate the SRS for as long as PTSM is present (through the year 2006) and will provide access controls to prevent exposure to the current PTSM.	In situ stabilization will not be performed. USDOE will continue to own and operate the SRS for as long as PTSM is present (through the year 2002) in Basin #2 and will provide access controls to prevent exposure to the current PTSM.
Land use controls (institutional control) to prevent disturbance of the cover system and excavation of the PTSM. Residential or agricultural use of the area will be prohibited.	In addition, a fence will be erected around the basin(s) and warning signs will be posted for the time period that the contaminated soil would be considered PTSM.	In addition, a fence will be erected around the basin(s) and warning signs will be posted for the time period that the contaminated soil would be considered PTSM.
Contaminated Soil Consolidation	The LRSB pipeline will be grouted from where it was disconnected at the reactor building to the LRSB to prevent exposure to burrowing animals. The remaining portion of the L-Area Oil and Chemical Basin pipeline (from the L-Area Oil and Chemical Basin to the LRSB) will be removed and placed into the LRSB to eliminate a potential pathway to the basin. The concrete pad adjacent to the seepage basin will be removed and placed into the basin.	Not applicable
Soil Cover System	A low permeability soil cover (10^{-5}cm/s hydraulic conductivity) placed over the basin, the buffer area, and the footprint of the concrete pad will reduce infiltration through the stabilized soil, prevent contaminant migration to groundwater, and prevent exposure of humans or animals to radionuclides in the basin soil.	A low permeability soil cover will be placed over the basin to prevent exposure of humans or animals to radionuclides in the basin soil.

VIII. EVALUATION OF ALTERNATIVES

The No Action, a Soil/Debris Consolidation Facility, and In Situ Stabilization with a Low-Permeability Soil Cover System alternatives were evaluated as part of the plug-in proposed plan. In Situ Stabilization with a Low-Permeability Soil Cover System was selected as the preferred plug-in remedy.

This section will compare the Plug-in ROD remedy with the amended Plug-in ROD remedy using the nine evaluation criteria. Normally No Action is used as the base case; however, in this instance, the Plug-in remedy is considered the base case.

The nine remedial criteria were established by the NCP. The criteria were derived from the statutory requirements of CERCLA Section 121. The NCP [40 CFR-300.430 (e)(9)] sets forth the nine evaluation criteria that provide the basis for evaluating alternatives and selecting remedies. See the insert box for a brief description of the criteria.

Table 2 compares the Plug-in remedy with the Amended Plug-in remedy for LRSB and Basin #2 at CRSB. Additional discussion is provided in the sections following the table.

EVALUATION CRITERIA FOR SUPERFUND REMEDIAL ALTERNATIVES
THRESHOLD CRITERIA
Overall Protection of Human Health and the Environment determines whether an alternative eliminates, reduces, or controls threats to public health and the environment through institutional controls, engineering controls, or treatment.
Compliance with ARARs evaluates whether the alternative meets Federal and State environmental statutes, regulations, and other requirements that pertain to the site, or whether a waiver is justified.
BALANCING CRITERIA
Long-term Effectiveness and Permanence considers the ability of an alternative to maintain protection of human health and the environment over time.
Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment evaluates an alternative's use of treatment to reduce the harmful effects of principal contaminants, their ability to move in the environment, and the amount of contamination present.
Short-term Effectiveness considers the length of time needed to implement an alternative and the risks the alternative poses to workers, residents, and the environment during implementation.
Implementability considers the technical and administrative feasibility of implementing the alternative, including factors such as the relative availability of goods and services.
Cost includes estimated capital and annual operations and maintenance costs, as well as present worth cost. Present worth cost is the total cost of an alternative over time in terms of today's dollar value. Cost estimates are expected to be accurate within a range of +50 to –30 percent.
MODIFYING CRITERIA
State/Support Agency Acceptance considers whether the State agrees with the analyses and recommendations, as described in the RI/FS and Proposed Plan.
Community Acceptance considers whether the local community agrees with the analyses and preferred alternative. Comments received on the Proposed Plan are an important indicator of community acceptance.

Overall Protection of Human Health and the Environment

The Plug-in remedy was designed to provide protection against migration to groundwater with the low permeability soil cover. No credit was

Table 2. Comparison of Alternatives against the Nine Criteria

CERCLA Criteria	Plug-In Remedy	Amended Plug-in remedy for LRSB	Amended Plug-in remedy for Basin #2 at the CRSB
Overall Protection of Human Health and the Environment	Protects human health and the environment.	Protects human health and the environment.	Protects human health and the environment.
Compliance With ARARs	Fully meets all ARARs.	Fully meets all ARARs.	Fully meets all ARARs.
Long-term Effectiveness	Long-term effectiveness provided through land use controls and less accessible form of material (stabilized). Access controls prevent worker contact while USDOE operates SRS.	Long-term effectiveness provided through radioactive decay and land use controls. Access controls prevent worker contact while USDOE operates SRS.	Long-term effectiveness provided through radioactive decay and land use controls. Access controls prevent worker contact while USDOE operates SRS.
Reduction in Toxicity. Mobility, or Volume	PTSM is stabilized in situ. The soil cover reduces mobility to groundwater and limits exposure to workers. Natural radioactive decay will reduce the toxicity over time	No treatment, but the soil cover reduces mobility to groundwater and limits exposure to workers. Natural radioactive decay will reduce the toxicity over time	No treatment, but the soil cover reduces mobility to groundwater and limits exposure to workers. Natural radioactive decay will reduce the toxicity over time
Short-term Effectiveness	Higher potential worker exposure during stabilization. Minimal worker exposure during installation of the soil cover.	Minimal worker exposure during installation of the soil cover.	Minimal worker exposure during installation of the soil cover.
Implementability	Fully implementable. Numerous subcontractors available to install a soil cover. Fewer subcontractors available for stabilization, but still readily available.	Fully implementable. Numerous subcontractors available to install a soil cover.	Fully implementable. Numerous subcontractors available to install a soil cover.
Cost	Most expensive remedy.	Significant cost reduction over Plug-in remedy.	Significant cost reduction over Plug-in remedy.
State Acceptance	Approved ROD.	State acceptance for instances where radioactive contaminants decay over a short time period to below PTSM levels.	State acceptance for instances where radioactive contaminants decay over a short time period to below PTSM levels.
Community Acceptance	Approved ROD.	Cannot be determined until after public comment period is over.	Cannot be determined until after public comment period is over.

taken for any reduction in mobility due to the use of in situ stabilization. This feature of the remedy will not be changed in the Amendment.

While the soil cover would also shield any future workers from direct radiation, SCDHEC and USEPA required in situ stabilization of PTSM to limit the accessibility of the contaminated soil to potential receptors in case the property was no longer owned and operated by USDOE. The stabilization would convert the PTSM to a form that would be less likely to endanger the public and the environment.

In the Amendment, PTSM no longer requires in situ stabilization, provided the PTSM will naturally decay to levels that no longer pose a 1×10^{-3} risk to future industrial workers within a period where USDOE (or successor) will continue to own and operate the SRS over this time period. In this instance, USDOE will provide access controls limiting visitors to the site through their badging requirements, will prevent exposure to SRS workers through their Site Use/Site Clearance program, and will further prevent access by installing a fence with warning signs surrounding the PTSM area. With these access restrictions, the Amendment provides equal protection to the public and the environment from the risks posed by the PTSM.

Compliance With ARARs

A list of chemical-, action-, and location-specific ARARs are included in Table V of the Plug-In Proposed Plan (WSRC 1998).

Both the Plug-in remedy and the Amended Plug-in remedy comply with Applicable or Relevant and Appropriate Requirements (ARARs) as discussed in the Plug-in ROD.

Long-term Effectiveness

The two remedies provide identical long-term effectiveness once the PTSM has naturally decayed to a risk level below 1×10^{-3} because the remedy used in the amendment is the same as that used for basins that do not contain PTSM. While the OU contains PTSM, the Plug-in remedy relies on in situ stabilization to reduce access to potential receptors; alternately, the Amendment remedy relies on engineering and institutional controls to reduce access to the PTSM.

Reduction in Toxicity, Mobility, or Volume

The Plug-in remedy provides in situ stabilization of the PTSM to limit accessibility to potential receptors in the event that the OU is no longer owned and operated by USDOE. The Amended Plug-in remedy does not treat the PTSM, but does limit access to the contaminated soil through institutional controls until the natural radioactive decay reduces the risk to levels that no longer pose a 1×10^{-3} risk to industrial workers. Both remedies provide a soil cover designed to reduce mobility of the contaminants to groundwater. In both cases, natural radioactive decay will reduce the level of toxicity over time.

Short-term Effectiveness

The Amended remedy provides a higher level of protection to the remedial workers than the Plug-in remedy because it does not require in situ stabilization of the PTSM. Stabilization poses some moderate risk to the workers through potential direct contact with the PTSM. This risk, however, is minimized through the use of SRS procedures and personal protective equipment. Construction activities already completed or planned for basins #1 and #3 at the CRSB will not be impacted by the Amended remedy. Construction completion will not occur earlier than originally projected for the CRSB.

Implementability

The Amended remedy is slightly more implementable than the Plug-in remedy because it does not include in situ stabilization. While the number of qualified contractors that can perform this operation in radioactively contaminated, soil is limited; there are sufficient numbers of contractors available so that this is not a concern. The low permeability cover in the amended remedy will not require any more operations and maintenance than for the low permeability cover in the Plug-in remedy.

Cost

The cost for the Amended remedy is considerably less than for the Plug-in remedy because the Amended remedy does not require in situ stabilization. In situ stabilization is an expensive process that varies from OU to OU depending on the volume and depth of soil to be treated. The only additional cost that the Amended remedy incurs over the Plug-in remedy without stabilization is the cost for the fence and signs. This cost is a very small fraction of the typical cost of in situ stabilization. Table 3 compares the present worth cost of the Plug-in remedy with present worth cost for the amended remedy.

Table 3. Comparison of Present Worth Costs for the Alternatives

	Plug-in remedy Present Worth Cost	Amended Remedy Present Worth Cost
LRSB	$3,566,693	$1,738,693
CRSB	$7,738,123	$3,108,766

State Acceptance

The State has agreed that the Amended remedy is acceptable in instances where it can be shown that the PTSM will decay to a level that no longer poses a 1×10^{-3} risk to current and future industrial workers within a short time period during which USDOE will likely continue to own and operate SRS. The Plug-in ROD has previously been approved by the State.

Community Acceptance

The Plug-in ROD has previously been available for public comment. The community is being provided an opportunity to review and comment on the Amended remedy through this document. Community acceptance can be determined after the 45-day public comment period has been completed.

IX. PREFERRED ALTERNATIVE

The Amended remedy is identical to the Plug-in remedy in all respects except for the following:

1. PTSM will not require in situ stabilization when it can be demonstrated that the radioactive contamination will naturally decay to a level that no longer poses a 1×10^{-3} risk to future industrial workers within a short time period during which the USDOE will likely continue to own and operate SRS.

2. A fence and warning signs will be placed around the PTSM until the risk posed has been reduced to below 1×10^{-3} for future industrial workers.

Current access controls such as badging requirements, security guards, Site Use/Site Clearance policy, etc. will continue to be provided as long as USDOE continues to own and operate SRS.

Per the USEPA – Region IV Land Use Controls (LUCs) Policy, a LUC Assurance Plan (LUCAP) for SRS has been developed and approved by the regulators. In addition, a LUC Implementation Plan (LUCIP) for OUs that use the Amended Plug-in remedy will be developed and submitted to the regulators for their approval with the post-ROD documentation. The LUCIP will detail how SRS will implement, maintain, and monitor the land use control elements of the OUs that use the Amended Plug-in remedy to ensure that the remedy remains protective of human health and the environment.

In the long term, if the property is ever transferred to nonfederal ownership, the U.S. Government will take those actions necessary pursuant to Section 120(h) of CERCLA. Those actions will include a deed notification disclosing former waste management and disposal activities as well as remedial actions taken on the site. The deed notification shall, in perpetuity, notify any potential purchaser that the property has been used for the management and disposal of waste. These requirements are also consistent with the intent of the RCRA deed notification requirements at final closure of a RCRA facility if contamination will remain at the unit.

The deed shall also include deed restrictions precluding residential use of the property. However, the need for these deed restrictions may be reevaluated at the time of transfer in the event that exposure assumptions differ and/or the residual contamination no longer poses an unacceptable risk under residential use. Any reevaluation of the need for the deed restrictions will be done through an amended ROD with USEPA and SCDHEC review and approval.

In addition, if the site is ever transferred to nonfederal ownership, a survey plat of the OU will be prepared, certified by a professional land surveyor, and recorded with the appropriate county recording agency.

The Amended Plug-in remedy may change due to responses to public comments or new information.

The Amended Plug-in remedy was selected because it provides similar protection to human health and the environment as the Plug-in remedy with lower potential risk to remedial workers, within a slightly shorter time period, and at a reduced cost. For those OUs that contain relatively short-lived PTSM, the current access controls at SRS will effectively prevent any potential receptors from coming into contact with the PTSM until it decays to a lower risk level.

SCDHEC has concurred with this Amended Plug-in remedy.

Based on information currently available, USDOE believes the Amended Plug-in remedy provides the best balance of tradeoffs among the other alternatives with respect to the evaluation criteria. The USDOE expects the Amended Plug-in remedy to satisfy the statutory requirements in CERCLA Section 121(b) to: (1) be protective of human health and the environment, (2) comply with ARARs, (3) be cost-effective, and (4) utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. The requirement, (5) satisfy the preference for treatment as a principal element, is not met directly. Natural radioactive decay could be considered to be a treatment that will permanently reduce the level of radioactive contaminants at the OU. The Amended Plug-in remedy provides protection to human health and the environment while this process occurs.

X. POST-ROD SCHEDULE

Implementation schedules are attached which include amended Plug-in ROD dates and post-ROD document submittals and Remedial Action Start date for LRSB (Figures 8 and 9).

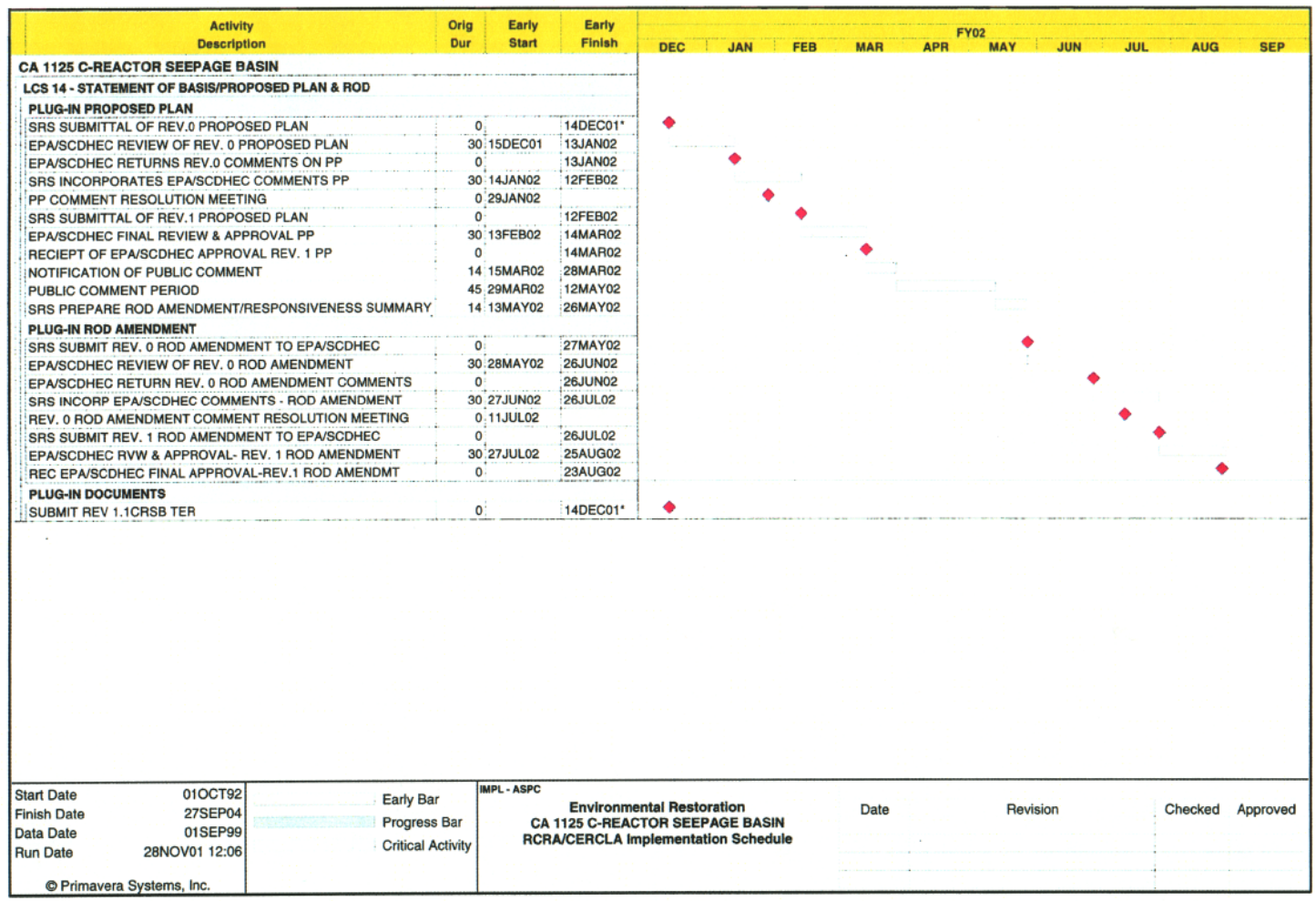
XI. REFERENCES

FFA, 1993. *Federal Facility Agreement for the Savannah River Site*, Administrative Docket No. 89-05-FF (Effective Date: August 16, 1993)

USDOE, 1994. *Public Involvement, A Plan for the Savannah River Site*, Savannah River Operations Office, Aiken SC

WSRC, 1996. *Federal Facility Agreement Implementation Plan,* WSRC-RP-94-1200, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC

WSRC, 1998. *Plug-In Proposed Plan for In Situ Stabilization with a Low Permeability Soil Cover System for Radiological Contaminants in Soil (U),* WSRC-RP-98-4098, Revision 0, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC



Activity Description	Orig Dur	Early Start	Early Finish
CA 1125 C-REACTOR SEEPAGE BASIN			
LCS 14 - STATEMENT OF BASIS/PROPOSED PLAN & ROD			
PLUG-IN PROPOSED PLAN			
SRS SUBMITTAL OF REV.0 PROPOSED PLAN	0		14DEC01*
EPA/SCDHEC REVIEW OF REV. 0 PROPOSED PLAN	30	15DEC01	13JAN02
EPA/SCDHEC RETURNS REV.0 COMMENTS ON PP	0		13JAN02
SRS INCORPORATES EPA/SCDHEC COMMENTS PP	30	14JAN02	12FEB02
PP COMMENT RESOLUTION MEETING	0	29JAN02	
SRS SUBMITTAL OF REV.1 PROPOSED PLAN	0		12FEB02
EPA/SCDHEC FINAL REVIEW & APPROVAL PP	30	13FEB02	14MAR02
RECIEPT OF EPA/SCDHEC APPROVAL REV. 1 PP	0		14MAR02
NOTIFICATION OF PUBLIC COMMENT	14	15MAR02	28MAR02
PUBLIC COMMENT PERIOD	45	29MAR02	12MAY02
SRS PREPARE ROD AMENDMENT/RESPONSIVENESS SUMMARY	14	13MAY02	26MAY02
PLUG-IN ROD AMENDMENT			
SRS SUBMIT REV. 0 ROD AMENDMENT TO EPA/SCDHEC	0		27MAY02
EPA/SCDHEC REVIEW OF REV. 0 ROD AMENDMENT	30	28MAY02	26JUN02
EPA/SCDHEC RETURN REV. 0 ROD AMENDMENT COMMENTS	0		26JUN02
SRS INCORP EPA/SCDHEC COMMENTS - ROD AMENDMENT	30	27JUN02	26JUL02
REV. 0 ROD AMENDMENT COMMENT RESOLUTION MEETING	0	11JUL02	
SRS SUBMIT REV. 1 ROD AMENDMENT TO EPA/SCDHEC	0		26JUL02
EPA/SCDHEC RVW & APPROVAL- REV. 1 ROD AMENDMENT	30	27JUL02	25AUG02
REC EPA/SCDHEC FINAL APPROVAL-REV.1 ROD AMENDMT	0		23AUG02
PLUG-IN DOCUMENTS			
SUBMIT REV 1.1CRSB TER	0		14DEC01*

Start Date	01OCT92
Finish Date	27SEP04
Data Date	01SEP99
Run Date	28NOV01 12:06

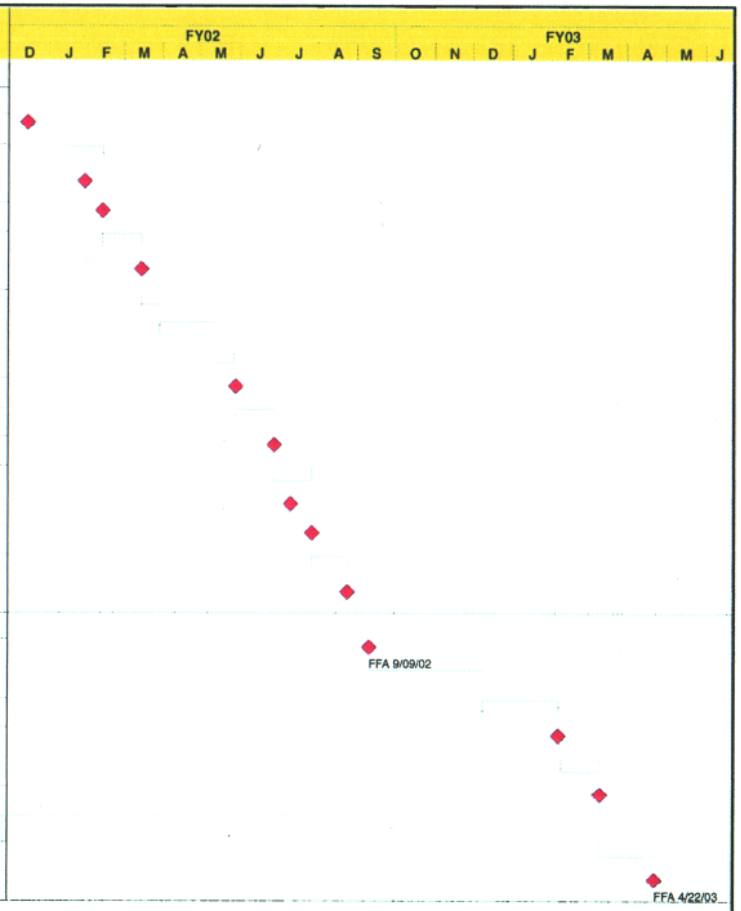
Early Bar
Progress Bar
Critical Activity

IMPL - ASPC
Environmental Restoration
CA 1125 C-REACTOR SEEPAGE BASIN
RCRA/CERCLA Implementation Schedule

Date	Revision	Checked	Approved

Figure 8. CRSB Implementation Schedule

Activity Description	Orig Dur	Early Start	Early Finish
CA 5003 L AREA REACTOR SEEPAGE BASIN			
LCS 14 - STATEMENT OF BASIS/PROPOSED PLAN & ROD			
SUBMIT REV 1.1 LRSB TER	0		14DEC01*
SRS INCORPORATES EPA/SCDHEC COMMENTS PP	30	14JAN02	12FEB02
PP COMMENT RESOLUTION MEETING	0	29JAN02	
SRS SUBMITTAL OF REV.1 PROPOSED PLAN	0		12FEB02
EPA/SCDHEC FINAL REVIEW & APPROVAL PP	30	13FEB02	14MAR02
RECIEPT OF EPA/SCDHEC APPROVAL REV. 1 PP	0		14MAR02
NOTIFICATION OF PUBLIC COMMENT	14	15MAR02	28MAR02
PUBLIC COMMENT PERIOD	45	29MAR02	12MAY02
SRS PREPARE ROD AMENDMENT/RESPONSIVENESS SUMMARY	14	13MAY02	26MAY02
SRS SUBMIT REV. 0 ROD AMENDMENT TO EPA/SCDHEC	0		27MAY02
EPA/SCDHEC REVIEW OF REV. 0 ROD AMENDMENT	30	28MAY02	26JUN02
EPA/SCDHEC RETURN REV. 0 ROD AMENDMENT COMMENTS	0		26JUN02
SRS INCORP EPA/SCDHEC COMMENTS - ROD AMENDMENT	30	27JUN02	26JUL02
REV. 0 ROD AMENDMENT COMMENT RESOLUTION MEETING	0	11JUL02	
SRS SUBMIT REV. 1 ROD AMENDMENT TO EPA/SCDHEC	0		26JUL02
EPA/SCDHEC RVW & APPROVAL- REV. 1 ROD AMENDMENT	30	27JUL02	25AUG02
REC EPA/SCDHEC FINAL APPROVAL-REV.1 ROD AMENDMT	0		23AUG02
LCS 15 - DETAILED ENG & PRECONST ACTIVITIES			
SRS SUBMITTAL OF REV.0 RAIP	0		09SEP02
EPA/SCDHEC REVIEW OF RAIP REV. 0	90	10SEP02	08DEC02
SRS INCORPORATE EPA/SCHDEC COMMENTS REV. 1	60	09DEC02	06FEB03
SRS SUBMITTAL OF REV.1 RAIP	0		06FEB03
EPA/SCHDEC FINAL REVIEW & APPROVAL RAIP	30	09FEB03	10MAR03
EPA/SCHDEC APPROVAL OF RAIP	0		10MAR03
LCS 16 - CONSTRUCTION			
MOBILIZATION	30	11MAR03	22APR03
REMEDIAL ACTION (RA) START DATE - (SOURCE UNIT)	0	22APR03	



Start Date 01OCT92
Finish Date 22APR03
Data Date 01AUG99
Run Date 31JAN02 12:41

Early Bar
Progress Bar
Critical Activity

FIPC
Sheet 1 of 1

Environmental Restoration
CA 5003 L REACTOR SEEPAGE BASIN
RCRA/CERCLA Implementation Schedule

Date	Revision	Checked	Approved

Figure 9. LRSB Implementation Schedule

WSRC, 1999. *Plug-In Record of Decision for In Situ Stabilization with a Low Permeability Soil Cover System for Radiological Contaminants in Soil (U)*, WSRC-RP-98-4099, Revision 0, November, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC

WSRC, 2000a. *Unit-Specific Plug-In TER for the C-Reactor Seepage Basins (904-66G, 904-67G, and 904-68G) Operable Unit (U)*, WSRC-RP-2000-4008, Revision 1, April, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC

WSRC, 2000b. *Unit-Specific Plug-In Technical Evaluation Report for the L-Area Reactor Seepage Basin Operable Unit (U)*, WSRC-RP-2000-4130, Revision 0, October, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC

WSRC, 2000c, *Explanation of Significant Difference for the Plug-In ROD for In Situ Stabilization with a Low Permeability Soil Cover System for Radiological Contaminants in Soil – CRSB (U)*, WSRC-RP-2000-4032, Revision 1.1, June, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC

WSRC, 2001. *Explanation of Significant Difference for the Plug-In ROD for In Situ Stabilization with a Low Permeability Soil Cover System for Radiological Contaminants in Soil – LRSB (U)*, WSRC-RP-2000-4127, Revision 1, June, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC

XII. GLOSSARY

Administrative Record File: A file that is maintained and contains all information used to make a decision on the selection of a response action under the Comprehensive Environmental Response, Compensation & Liability Act. This file is to be available for public review, and a copy is to be established at or near the Site, usually at one of the information repositories. Also a duplicate file is held in a central location, such as a regional or state office.

ARARs: Applicable, or Relevant and Appropriate Requirements. Refers to the federal and state requirements that a selected remedy will attain. These requirements may vary from site to site.

Baseline Risk Assessment: Analysis of the potential adverse health effects (current or future) caused by hazardous substance release from a site in the absence of any actions to control or mitigate these releases.

Characterization: The compilation of all available data about the waste units to determine the rate and extent of contaminant migration resulting form the waste site, and the concentration of any contaminants that may be present.

Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 1980: A federal law passed in 1980 and modified in 1986 by the Superfund Amendments and Reauthorization Act. The Acts created a special

tax that goes into a Trust Fund, commonly known as Superfund, to investigate and clean up abandoned or uncontrolled hazardous waste sites.

Exposure: Contact of an organism with a chemical or physical agent. Exposure is quantified as the amount of the agent available at the exchange boundaries of the organism (e.g., skin, lungs, digestive tract, etc.) and available for absorption.

Federal Facility Agreement (FFA): The legally binding agreement between regulatory agencies (USEPA and SCDHEC) and regulated entities (USDOE) that sets the standards and schedules for the comprehensive remediation of the SRS.

Media: A pathway through which contaminants are transferred. Five media by which contaminants may be transferred are air, groundwater, soil, surface water, and sediments.

National Priorities List: USEPA's formal list of the nation's most serious uncontrolled or abandoned waste sites, identified for possible long-term remedial response, as established by CERCLA.

Operable Unit (OU): A discrete action taken as one part of an overall site cleanup. The term is also used in USEPA guidance documents to refer to distinct geographic areas or media-specific units within a site. A number of operable units can be used in the course of a cleanup.

Operation and Maintenance (O&M): Activities conducted at a site after a response action occurs to ensure that the cleanup and/or systems are functioning properly.

Overall Protection of Human Health and the Environment: The assessment against this criterion describes how the alternative, as a whole, achieves and maintains protection of human health and the environment.

Proposed Plan: A legal document that provides a brief analysis of remedial alternatives under consideration for the site/operable unit and proposes the preferred alternative. It actively solicits public review and comment on all alternatives under consideration.

Reasonable Maximum Exposure (RME): This is the value that the average concentration will fall below 95 percent of the time.

Record of Decision (ROD): A legal document that explains to the public which alternative will be used at a site/operable unit. The record of decision is based on information and technical analysis generated during the remedial investigation/ feasibility study and consideration of public comments and community concerns.

Responsiveness Summary: A summary of oral and/or written comments received during the proposed plan comment period and includes responses to those comments. The responsiveness summary is a key part of the ROD, highlighting community concerns.

Superfund: The common name used for CERCLA; also referred to as the Trust Fund. The

Superfund program was established to help fund cleanup of hazardous waste sites. It also allows for legal action to force those responsible for the sites to clean them up.

Target Risk Range: USEPA guidance for carcinogenic risk due to exposure to a known or suspected carcinogen between one excess cancer in an exposed population of ten thousand (1.0×10^{-4}) and one excess cancer in an exposed population of one million (1.0×10^{-6}). Risks within this range require risk management evaluation of remedial action alternatives to determine if risks can be reduced below one excess cancer in one million (1.0×10^{-6}). Risks greater than 1.0×10^{-4} indicate that remedial action is generally warranted.