LUCIP for the
F-Area Retention Basin, 281-3F

Appendix A of Corrective Measures Implementation/Post-Construction Report/Final Remediation Report for the F-Area Retention Basin, 281-3F

WSRC-RP-2001-4049, Revision.1, September 2001

NOTE: The Westinghouse Savannah River Company (WSRC) and Department of Energy (DOE) organizations responsible for environmental restoration at the Savannah River Site underwent name changes in 2003, as shown below. The responsibilities as outlined in the following document did not change.

Organization	**Previous Name**	**Current Name**
WSRC	Environmental Restoration Division (ERD)	Soils and Groundwater Closure Projects (SGCP)
DOE	Environmental Restoration Division (ERD)	Soil and Groundwater Project (SGP)

This page was intentionally left blank.

APPENDIX A

Unit Specific LUCIP for

F-Area Retention Basin (Bldg. 281-3F) (U)

APPENDIX A

LUCIP
F-Area Retention Basin (Bldg. 281-3F) (U)

LAND USE CONTROL IMPLEMENTATION PLAN (LUCIP)

The F-Area Retention Basin (Bldg. 281-3F) Land Use Control Implementation Plan (LUCIP) will be appended to the Savannah River Site (SRS) Land Use Control Assurance Plan (LUCAP), which has been approved by the USDOE, USEPA, and SCDHEC. SRS is responsible for implementing the land use controls (LUCs) (e.g., inspections, maintenance, etc.) outlined in this unit specific LUCIP.

1.0 REMEDY SELECTION

The F-Area Retention Basin (FRB) is a Resource Conservation Recovery Act (RCRA)/Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) unit located within SRS. The FRB is designated as Building 281-3F and is located outside and south of the F-Area perimeter fence, approximately 1,035 m (3,397 ft) north of Fourmile Branch.

The FRB became operational in 1955, remained active until 1972, and was closed in December 1978. At the time of closure, soil sampling was performed at the basin, and approximately 0.6 m (2 ft) of soil was excavated from the bottom of the basin. A total of 970 m^3 (34,209 ft^3) of contaminated soil was removed from the basin and transported to Building 643-G for disposal. The basin was backfilled with clean soil and the area was seeded with grass.

The FRB covers an area of approximately 2,400 m^3 (0.6 acre). The basin is approximately 61 m (200 ft) long, 36.6 m (129 ft) wide, and 2.1 m (6.9 ft) deep. Prior to implementation of this remedial action, the FRB was an inactive basin,

filled with clean soil and covered with grass, lying at an elevation of approximately 275 ft above mean sea level. Surface water drains from the southeast to Fourmile Branch via an unnamed drainage ditch (tributary) and overland flow. The basin was designed and operated as an unlined, temporary container for potentially contaminated cooling water from the F-Area Canyon Facility and stormwater drainage from the F-Area Tank Farm.

Water was conveyed to the basin by a process sewer line [approximately 168 M (550 ft) of 61-cm (24-inch) diameter and approximately 212 m (700 ft) of 91-cm (36-inch) diameter] that discharged into the north side of the basin. The depth to the top of the process sewer line ranges from less than 1 m (3 ft) to 4.6 m (15 ft).

The FRB RCRA Facility Investigation/Remedial Investigation/Baseline Risk Assessment (RFI/RI/BRA) (WSRC1997a) reports that the primary constituents of concern (COCs) are located at depth in FRB soils and consist of elevated levels of cesium-137 (Cs-137), strontium-90 (Sr-90), and radium-226 (Ra-226).

On March 2, 1999, the combined Corrective Measures Implementation (CMI)/Remedial Design Report (RDR)/Remedial Action Work Plan (RAWP) for the FRB (281-3F) (WSRC 1999c), which provides the design details of the remedial action for the FRB, was approved by USEPA and SCDHEC. The selected remedy specified in the Record of Decision (ROD) is source control. The key elements of the selected remedial action and associated design, as identified in the CMI/RDR/RAWP, for the FRB soils and process sewer line sediment are as follows:

- Placement of all contaminated soils inside the basin (contaminated soil from the basin side walls and from hot spots surrounding the process sewer line)

- In situ stabilization/solidification (S/S) of contaminated soil at the bottom of the basin and contaminated soils placed in the basin from the basin side walls and process sewer line

- In situ grouting of contaminated sediments contained within the process sewer line

- Construction and placement of an engineered low-permeability soil cover (hydraulic conductivity of 1×10^{-5} or less) over the S/S soil mass

- Implementation of institutional controls to limit access to the site and associated pipelines and to restrict future use of this site to industrial applications

The CMI/RDR/RAWP provides the design details for the remedial action at the FRB per the remedy specified in the ROD. The FRB remedial action was performed in accordance with the applicable and relevant federal, state, and local environmental laws and statutes. The technology of choice for this remediation was soil S/S using grouting materials and admixtures in conjunction with a low-permeability soil cover.

1.1 Groundwater Monitoring and Reporting

The selected remedial action includes groundwater monitoring to confirm that the source remediation has achieved the required stabilization of contaminants; to relieve any uncertainty in the analytical data; and to verify that there exists no upgradient source contributing any contamination to the FRB OU groundwater. The existing monitoring wells (FRB-01, -02, -03, and –04) will continue to be used to collect samples semi-annually.

These FRB monitoring wells were used in the remedial investigation process to determine impact from the basin to the groundwater and should be sufficient for the above-stated purposes. Sketches showing the location relative to the basin can be found in the Remedial Design Work Plan (Figure 1) or the ROD (Figure 18).

The analytes being monitored include Cs-137, Sr-90, Ra-226, trichloroethylene (TCE), gross alpha, and non-volatile beta as well as normal field measurements. Cs-137, Sr-90, and Ra-226 will be monitored to confirm the stabilization. Minor detection results (below maximum contaminant levels (MCLs)) of TCE were found during the remedial investigation. Since this constituent is not associated with the basin, the possibility of an upgradient source exists. Should the levels increase, TCE will be monitored for trigger action. If monitoring detects contamination above MCLs (or risk-based concentration (RBCs) without MCLs) for those constituents attributable to the FRB OU or an unknown upgradient source, for two consecutive monitoring periods, the regulators will be informed within 30 days. A plan for evaluating the data and developing further action will be submitted within 90 days for regulatory approval. The results of the monitoring activities will be reported annually.

2.0 LAND USE CONTROL

For the FRB, the following land use control (LUC) objective is necessary to ensure protectiveness of the remedy:

- Controlled access to the FRB unit in accordance with the current site use/site clearance programs, including access controls to the sewer line by grouting the sewer pipeline, manholes, and associated structures and posting signs in the area to indicate that the sewer line and soil beneath the unit has been contaminated with radionuclides.

The elements of the institutional control corrective action, which consists of land restrictions without any engineering controls, are composed of deed notifications when the parcel is transferred from federal ownership (Section 2.1) and access controls including posting identification signs (Section 2.2) and field walkdowns for general site conditions (Section 2.3). These LUCs will be implemented for perpetuity.

Each element of the institutional controls corrective action is discussed below.

2.1 Deed Notification

A deed notification shall be filed in the appropriate county records in accordance with CERCLA 120(h), which requires the government to create a deed when land on which any hazardous substance was stored, released, or disposed of is transferred to non-federal ownership. In the event the property is transferred, a deed notification will be filed with Aiken County. Per CERCLA 120(h)(3)(A), the deed shall contain, to the extent practical, such information as is available based on the complete search of agency files, including the following:

- A notice of the type and quantity of such hazardous substances
- Notice of the time at which such storage, release, or disposal took place
- A description of the remedial action taken, if any

Per CERCLA 120(h)(3)(B), the deed shall also contain a covenant warranting that

- all remedial action necessary to protect human health and the environment with respect to any such substance remaining on the property has been taken before the date of such transfer; and

- any additional remedial action found to be necessary after the date of such transfer would be conducted by the United States Government.

2.2 Access Controls

2.2.1 On-Site Workers

In accordance with WSRC ID, *Site Infrastructure and Services Manual,* Procedure 3.02, "Site Real Property Configuration Control," use of all lands and waters at SRS shall be coordinated via the Site Use Program. No use of land (i.e., excavation or any other land use) shall be undertaken without prior approval documented by a Site Use Permit. Also, in accordance with Procedure 3.02, all work at SRS that adds to or modifies features or facilities portrayed on SRS development maps (i.e., plot plans of facilities/utilities at SRS) will be authorized by a Site Clearance Permit before excavation activities take place. All Site Clearance Requests are reviewed to verify that either an approved Site Use Permit has been obtained or that an existing Site Use Permit has sanctioned the request. Verification of USDOE approval for intended land use must be obtained before a Site Clearance Permit is issued. The site use and site clearance processes are applicable to all activities and personnel on site (including subcontractors). The processes are controlled within the SRS Quality Assurance Program.

SRS identifies all buildings and facilities on maps used in the Site Use/Site Clearance Program and requires a 200-foot buffer zone around each facility. This waste unit is identified on these maps as a CERCLA facility.

Any work proposed in these areas will be strictly controlled, and workers will be appropriately trained and briefed about health and safety requirements if work is deemed necessary for maintenance. Any changes in the use or disturbance of the FRB will be cleared with USEPA and SCDHEC before any disturbance occurs.

To prevent unknowing entry and to ensure that unrestricted use of the waste unit does not occur while under government ownership, identification signs have been posted at the unit. The signs are legible from a distance of 25 feet and located approximately every 100 feet along the process sewer line, at each manhole, and at each side of the basin as shown in Figure 7, sheet 1 and 2. The signs read as follows:

F-Area Retention Basin

"DANGER"
UNAUTHORIZED PERSONNEL
KEEP OUT.
THIS UNIT WAS USED TO MANAGE HAZARDOUS SUBSTANCES. DO NOT DIG OR EXCAVATE. DO NOT ENTER WITHOUT CONTACTING THE WASTE SITE CUSTODIAN.

CUSTODIAN: MANAGER, POST-CLOSURE MAINTENANCE
PHONE: (803) 952-6882

F-Area Process Piping

"DANGER"
UNAUTHORIZED PERSONNEL
KEEP OUT.
THIS SUBSURFACE PIPING SYSTEM WAS USED TO CONVEY HAZARDOUS SUBSTANCES. DO NOT DIG OR EXCAVATE WITHOUT CONTACTING THE WASTE SITE CUSTODIAN.

CUSTODIAN: MANAGER POST-CLOSURE MAINTENANCE
PHONE: (803) 952-6882

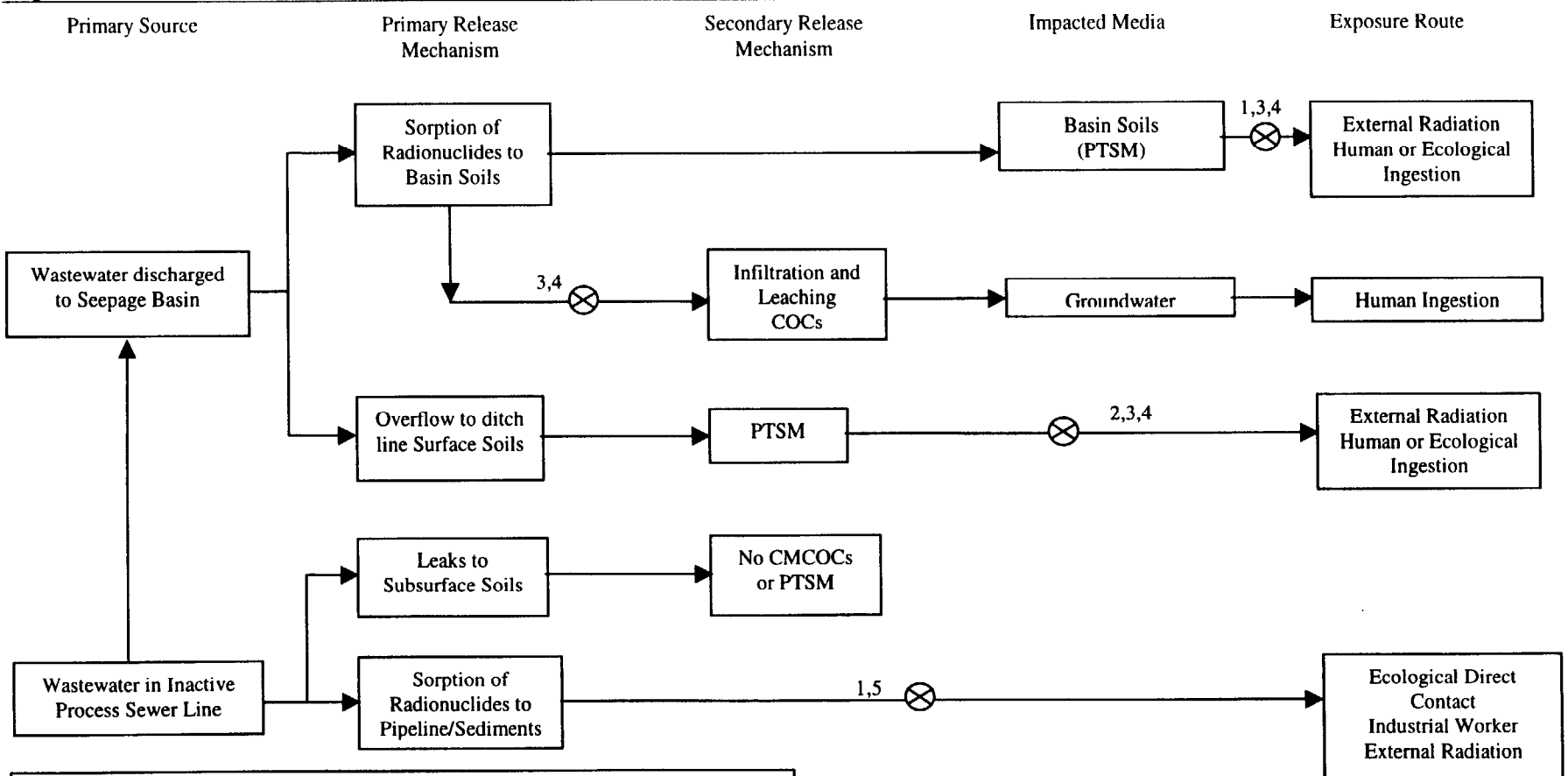
Additionally, while under the ownership of USDOE, access control of the entire SRS will continue to be maintained in accordance with the 1992 RCRA Part B Permit Renewal Application, Volume I, Section F.1. To comply with the security requirements for a RCRA-permitted facility, this section describes the 24-hour surveillance system (R.61-79.264.14(b)(1)), artificial or natural barriers (R.61-79.264.14(b)(2)(i)), control entry systems (R.61-79.264.14(b)(2)(ii)), and warning signs (R.61-79.264.14(c)) in place at the SRS boundary.

2.3 Field Walkdowns and Maintenance for Institutional Controls

Monitoring will be performed to verify that LUCIP requirements have been met. Semi-annual monitoring of the FRB OU, 281-3F, will be conducted for accuracy and legibility of signs, visible subsidence or erosion of the waste unit, proper

vegetative growth, burrowing animals, proper access to the facility, mowing, etc. Subsidence or erosion will be corrected by backfilling the affected area with clean soil and seeding the area to prevent further erosion. USEPA and SCDHEC will be notified of the results of any inspection, event, and/or action that indicates a potential compromise of institutional controls within 30 days of identification. The notification and the reason for the notification will be documented in the Federal Facility Agreement Annual Progress Report. All other routine maintenance activities (i.e., mowing, etc.) will be documented, and the documentation will be maintained in files that are subject to USEPA and SCDHEC review and audit. A copy of the completed inspection form will be maintained in Environmental Restoration Division administrative record files.

Inspections at the FRB will be performed to ensure that institutional controls remain protective and consistent with all remedial action objectives. Monthly inspections will be performed for the first 2 years and until permanent vegetation is established. After that time, inspections will be performed semi-annually per the inspection checklist.



LEGEND

→ = Pathways – past, current and hypothetical future
1. = Institutional Controls
2. = Consolidation of Soils into Basin
3. = In Situ Stabilization
4. = Low-permeability Soil Cover
5. = Grouting of manholes and pipeline
⊗ = Remedy breaks this pathway

Notes: In Situ stabilization meets CERCLA preference for treatment and provides qualitative reduction in leachability.

PTSM = principal threat source material
COC = contaminant of concern
CMCOC = contaminant migration contaminant of concern

Figure A-1. Conceptual Site Model (CSM) for the F-Area Retention Basin Post Remedial Action

APPENDIX B ER INSPECTION CHECKLIST FOR F-AREA RETENTION BASIN

Waste Site: _____ **A = Satisfactory** **X = Unsatisfactory (Comments required)**	**A or X**	**Comments or Corrective Action Taken (See Maintenance Register for Corrected Items)**
Check to see if the site needs mowing.		
Verify that the basin and roads are accessible.		
Check for potential encroachments. (Ensure that there is no building on the site.)		
Verify all signs are intact, in good condition, and legible from a distance of at least 25 feet.		
Visually check vegetative cover for grass density. There should be no woody vegetation or shrubs growing on the cover. The height of the vegetative growth should not impair the visual inspection of the site.		
Check the integrity of drainage ditches (if any) for presence of excessive erosion, sediment buildup, and any debris restricting water flow.		
Visually inspect the concrete markers at four corners of the basin to ensure their integrity. The concrete should be visible and free of damage.		
Visually check the basin cover for signs of erosion subsidence and/or depressions.		
Verify that conditions of the roads to the well sites are adequate.		
Inspect the grounds surrounding well sites for vegetation overgrowth, debris, and existence and/or development of erosion features.		

APPENDIX B **ER INSPECTION CHECKLIST FOR F-AREA RETENTION BASIN (Cont'd.)**

Waste Site: _____ **A = Satisfactory** **X = Unsatisfactory (Comments required)**	**A or X**	**Comments or Corrective Action Taken (See Maintenance Register for Corrected Items)**
Verify that the well posts and protective covers are in place.		
Verify the well is properly identified per R.61-71.6H (South Carolina well standards and regulations).		
Verify the wells' casings are properly locked per R.61-71.11.C.6 (South Carolina well standards and regulations).		
Verify that the previous "Quarterly Monitoring Well Inspection Summary Report" has been sent to ERD Records Interim Storage. This report can be obtained from ERD Waste Treatment.		
Other		
Comments:		

Inspected By:_____ / _____ Date:_____ Time:_____
(Print Name) (Signature)

Reviewed By:_____ / _____ Date:_____ Time:_____
PM or Designee (Print Name) (Signature)

Note: USEPA and SCDHEC must be notified within 30 days of identification of any area where any breach or compromise of restrictions placed on this institutional control operable unit has occurred.