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POST-CONSTRUCTION REPORT/CORRECTIVE MEASURES IMPLEMENTATION  
REPORT/FINAL REMEDIATION REPORT FORMAT

1.0 GENERAL DESCRIPTION

1.1 Purpose and Scope

This Post-Construction Report/Corrective Measures Implementation Report/Final Remediation Report (PCR/CMIR/FRR) documents the completion of field implementation of the remedial action (RA) for the closure of the *Operable Unit Name* operable unit (OU). It summarizes construction activities performed to implement the RA requirements in the *Operable Unit Name (acronym)* Record of Decision (ROD) (WSRC XXXX) in accordance with the approved Corrective Measures Implementation /Remedial Action Implementation Report (CMI/RAIP) (WSRC XXXX). [Note: Delete CMIR from throughout this document if the OU is CERCLA only.]

This PCR/CMIR/FRR was completed after final inspection of construction and a determination that the RA is complete. The Savannah River Site (SRS) notified U.S. Environmental Protection Agency (USEPA) Region IV and South Carolina Department of Health and Environmental Control (SCDHEC) regarding completion of the aforementioned final inspection and the operation and function determination on (date). This PCR/CMIR/FRR is submitted to USEPA and SCDHEC for approval in accordance with Federal Facility Agreement (FFA) (FFA 1993) requirements. The planned post-construction activities are reported in Section 7.0 in accordance with the FFA.

This report includes the following items:

- A brief description of the OU background, including a brief statement on RA requirements and objectives in the ROD
- A chronology of completed events related to remediation of the OU
- A summary of construction activities performed
- Deviations from the original design of the approved CMI/RAIP (WSRC XXXX)
- Performance standards and quality control inspections, including a summary of performance test results documenting verification of compliance with the acceptance criteria in the CMI/RAIP
- Final inspection and certification of OU closure
- As-built drawings
- Land use controls
- Project costs [including RA capital costs incurred to date, forecast RA operating costs, post-RA annual operations and maintenance (O&M) costs and total present worth (PW) costs.]

#### ***1.1.1 Document Format***

[Typically addresses the document format used, including the basis for the format. This section should include specific details regarding any deviation from the generic description as well as the basis of the deviation.]

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This report has been prepared in accordance with the requirements for submittal of regulatory documents as identified in the FFA and the latest format for the PCR/CMIR/FRR. This format was developed in accordance with the resolution of the USEPA comments on required contents for PCR/CMIR/FRR and USEPA latest guidelines (USEPA 2000).

The Operable Unit name RA is complete and does not require long-term RAs, i.e., the final RA does not require long-term operation of constructed equipment or systems for treatment of contaminants in the source unit or in the groundwater. Therefore, the PCR and CMIR/FRR are herein combined. The ERD Regulatory Handbook (WSRC 2001) includes an approved format for the PCR/CMIR/ FRR, which is the basis of this document's format.

## **1.2 Operable Unit Background**

The *Operable Unit Name* source OU is listed as a RCRA 3004(u) Solid Waste Management Unit/CERCLA unit in Appendix C of the FFA for SRS.

[Copy an abbreviated description of the waste unit from the ROD. Include only the components addressed by the RA. Include all components with an RAO. The description should include location, size, and the background and operational history of the unit requirements, including whether the OU is a RCRA and/or CERCLA unit. The section may also include a short paragraph identifying the predecessor documents related to the selection of the RA. Provide figures showing RA location at SRS (Figure 1) and a pre-RA site layout (Figure 2). A very condensed presentation of information is appropriate for this section since the same information has been covered in greater detail in previous documents required by the FFA process.]

**Figure 1.     *Operable Unit Name Location on SRS Map***

**Figure 2.      *Operable Unit Name* Pre-Remedial Action Site Plan**

**1.2.1 General Description and Location of Operable Unit Name**

The *Operable Unit Name* (Figure 1) is located within the SRS, approximately TBD feet south of the (e.g., C, K, L, P, or R-Area Reactor) perimeter fence and XXXX feet north of .....

**1.2.2 Nature and Extent of Contamination in Operable Unit Name Soils (Source Unit)**

[Briefly identifies the constituents of concern (COCs) and principal threat source material (PTSM) copied from the ROD (the table may be used) that are considered for the RA, and the associated risks, specific components of the unit requiring remediation and locations of COCs and PTSMs with respect to the zone of remediation (areas and depths). Because the information is covered in greater detail in previous FFA documents, a condensed presentation (synopsis or summary) is appropriate for this section. Provide or reference figures or maps for the design clarification of data already provided in the ROD to illustrate the nature and horizontal and vertical extent of COCs and PTSMs (Figure 3).]

**Figure 3. Nature and Horizontal and Vertical Extent of COCs**

### **1.3 Remedial Action Requirements and Objectives**

#### **1.3.1 Remedial Action Objectives**

As detailed in the ROD, the remedial action objectives (RAOs) for the *Operable Unit Name* are as follows:

[Copy RAO text from the ROD for OU.]

Per the ROD, RAOs for this RA would be achieved by implementing the RA described below.

achieved by implementing the below remedial action.

#### **1.3.2 Selected Remedial Action**

As stated in the ROD (WSRC XXXX), the selected RA for the *Operable Unit Name* soils included the following key elements:

[May include a schematic illustration of the selected remedy from the ROD.]

**Figure 4. Post-Remediation Action Site Plan**

**Figure 5. Conceptual Site Model**

### 1.4 Chronology of Events

[A tabular summary (reference Table 1) that lists major milestones and dates related to the RA for the OU, including the ROD signature, CMI/RAIP approval, major construction events (e.g., RA start, mobilization, pilot test, etc.), verification sampling and performance testing, inspections, identification and resolution of non-conformances (if any), demobilization and final inspection (regulatory walkdown) of completed construction.]

**Table 1. Chronology of Events**

<u>Description of Activity</u>	<u>Start Date</u>

### 2.0 CONSTRUCTION ACTIVITIES

[Provides a summary of construction activities performed during the construction phase in accordance with the approved CMI/RAIP. The first numbered section, which should be titled "OU Construction Team," briefly describes names and roles of prime subcontractors associated with the RA. The next numbered sections will provide a brief narrative following the sequence of activities listed in Section 1.4. The narrative will describe any treatment process required to implement the remedial design, materials and equipment used, successes and problems encountered during construction and resolution of problems (including innovative solutions, if any), and causes for delay. These sections also include brief discussions of unexpected conditions encountered in the field, particularly those that affected the scope or schedule of the construction work.]

The last numbered section, which should be titled "Secondary Waste Disposal," provides the specific details of the unit's waste management plan and the CMI/RAIP waste section. Describe the waste types, waste volumes, methods, consistent with SRS procedures, that were used for waste characterization (e.g., testing methods), disposal (include location such as onsite, offsite at SRS, off SRS at XYZ facility) and transportation (include contaminant limits) during construction, as applicable to the selected RA].

### **3.0 DEVIATIONS FROM ORIGINAL DESIGN**

[Identifies design changes required during construction as well as the technical basis for those changes. The discussion includes all changes made during construction, regardless of whether those changes were previously communicated to South Carolina Department of Health and Environmental Control (SCDHEC) and United States Environmental Protection Agency (USEPA). The process and scope of design change notifications are discussed in the CMI/RAIP.]

Several design and construction changes were needed during construction to resolve construction problems. The project team reviewed all changes prior to implementation to ensure compliance with regulatory requirements in the ROD and the CMI/RAIP. Consistent with the CMI/RAIP, notifications were made to USEPA and SCDHEC prior to implementation, as appropriate. Table 2 provides a summary of all such changes.

The basis and resolution of deviations from the original design are detailed below. Where applicable, a statement is provided on whether the deviation still meets a performance criterion.

**Table 2. Summary of Design Changes**

<b>Item</b>	<b>Change</b>	<b>Reason</b>
1		
2		
3		

**4.0 VERIFICATION SAMPLING, TESTING, ANALYSIS, PERFORMANCE STANDARDS, AND CONSTRUCTION QUALITY CONTROL**

**4.1 Performance Requirements/Standards**

[For each RA component (e.g., cover, soil treatment, soil disposal, etc.), subsections of Section 4.0 will cite appropriate references to the performance requirements (acceptance criteria) as required per the CMI/RAIP for the RA and the construction quality control requirements in the specification. Provides a brief discussion and table of test samples, a comparison of test results with CMI/RAIP acceptance criteria, and a description of how those criteria were met but with allowances for deviations outlined in Section 3.0. It also provides discussion on other non-conforming conditions identified during the quality control inspection and how those non-conformances were resolved to meet the specified performance criteria.]

[Each subsequent section should provide a list or table of performance requirements, acceptance criteria and/or process control parameters copied from the approved CMI/RAIP. A summary table (Table 3) is suggested which lists the specific attributes required and the specific tests for each attribute. If numerous tests are conducted, a summary providing minimum, maximum, and average test results shall be provided with footnotes for failed entries where applicable.]

**Table 3.      *Operable Unit Name As-Built CMI/RAIP Characteristic Test Results***

#### **4.2 Construction and Quality Control**

[Provides a summary of quality assurance (QA) and quality control procedures that were implemented to ensure successful implementation of the RA. It also includes any special or unit-specific strategy applicable to the RA.]

#### **5.0 CERTIFICATION OF RA COMPLETION AND FINAL INSPECTION**

[Note: If the waste unit is being released for unrestricted land use (e.g., no institutional controls) use the words "OU Closure" instead of "RA Completion" in the title. Provide text stating the following:

- (1) As detailed in Section 4.0, the construction activities required for the RA have met the acceptance criteria established in the approved CMI/RAIP, but with allowances for deviations outlined in Section 3.0;
- (2) As detailed in Section 5.1, the RA is certified as complete and construction and testing was in accordance with the ROD RAOs. Section 5.1's certification is typically based upon the result of performance tests and quality control inspections provided in the verification in Section 4.0.
- (3) As outlined in Section 5.2, the final walkdown inspection with participation of USEPA and SCDHEC (as applicable) has been performed and issues have been closed out.]

## **5.1 Certification of RA Completion**

[List the primary RA components (e.g., a cover, soil treatment, soil disposal, etc.) and include a certification statement on which and how each applicable RAO was met. Each RAO should be copied from the ROD.]

In accordance with the guidance from USEPA Region IV office regarding the intent of "certification" terminology, a Professional Engineer's certification is not required. This section provides the verification that RAOs established in the ROD have been met through field implementation of the RA per the approved CMI/RAIP (WSRC XXXX). The verification is based on the Section 5.2 walkdown and successful achievement of the RAOs per discussion above. It is concluded that the *Operable Unit Name* closure has been completed satisfactorily in accordance with the requirements of the *Operable Unit Name* ROD. The results of any analytical sampling and testing have been documented and the records are on file at SRS ERD Document Control in the project file. In accordance with the ROD, applicable post-closure activities (e.g., land use control, 5-year remedy reviews, etc.) will be performed as described in Section 7.0 of this PCR/CMIR/FRR.

## **5.2 Final Inspection for Acceptance of *Operable Unit Name* Closure**

A final joint walkdown was performed on month/day/year by the *Operable Unit Name* Project Team, SCDHEC and USEPA. No further outstanding issues resulted from the walkdown. A summary and participants of the USEPA/SCDHEC inspection are provided in Appendix A.

## **6.0 AS-BUILT DOCUMENTATION**

### **6.1 As-Built Drawings**

[This section provides the as-built drawings for the project, which are updated CMI/RAIP drawings and are included in Attachment A of this PCR/CMIR/FRR.]

### **6.2 Well Modifications**

[This section provides a summary or attaches a report of any well modifications (e.g., well abandonment, well extension or protection).]

See Appendix A of this PCR/CMIR/FRR for attached reports.

## **7.0 POST-PCR/CMIR/FRR ACTIVITIES AND LAND USE CONTROL IMPLEMENTATION PLAN (LUCIP)**

For Post-PCR/CMIR/FRR activities, see the OU specific LUCIP required for the RA. Maintenance and institutional controls per the LUCIP (if applicable) will be reported during the five-year review of the remedy.

### **7.1 5-Year Remedy Review**

Section 300.430(f)(ii) of the National Contingency Plan (NCP) requires that a five-year remedy review be performed if hazardous substances, pollutants, or contaminants above levels that allow for unlimited use and unrestricted exposure remain in the OU. The three parties, SCDHEC, USEPA, and USDOE have determined that a five-year review of the remedy for the *Operable Unit Name* will be performed to ensure that the remedy continues to provide adequate protection of human health and the environment.

**8.0 PROJECT COSTS**

[Provides (reference Table 4) a cost comparison of the final costs for the RA to the original ROD cost estimate. Cost deviations, beyond -30% and +50%, from the ROD cost estimate are discussed. The cost breakdown is limited to that which was presented in the ROD (e.g., limited to the soil cover total capital and total O&M costs and the air spurge/soil vapor extraction (AS/SVE) total capital and total five-year O&M costs). As an example, the combined RA comparative capital costs and O&M costs for a soil cover and an AS/SVE system are as follows:]

**Table 4. Project Cost Comparison**

<b>Project Cost Comparison (Example)</b>			
	<b>ROD Cost (\$K)</b>	<b>Incurred Cost (\$K)</b>	<b>Delta Cost (%)</b>
Soil Cover Capital	175	157	(10%)
AS/SVE Capital	800	690	(14%)
Soil Cover O&M	20	25	+25%
AS/SVE O&M	1200	2735*	+228%**

[If applicable, separate costs into equipment, non-equipment and O&M categories.]

## 9.0 REFERENCES

[Provides a list of documents referenced in the body of the PCR/CMIR/FRR document. Note: Regulators have asked that the Erosion Control Plan, HASP and well abandonment applications be included in the appendix rather than simply referenced.]

EPA, 2000. *Closeout Procedures for National Priorities List Sites*, #EPA-540-R-98-016, January 2000

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

WSRC, 1994. *Investigation-Derived Waste Management Plan (U)* WSRC-RP-94-1227, Rev. 2, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC

WSRC, 1994a. WSRC E7 Manual, *Conduct of Engineering and Technical Support (U)*, Rev. 7, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC

WSRC, 1994b. WRSC Procedure Manual 1Q, *Quality Assurance (U)*, Rev. 0, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC

WSRC, 1997a. *Record of Decision, Remedial Alternative Selection for the Operable Unit Name*

WSRC, 1999. *Corrective Measures Implementation Plan/Remedial Action Implementation Plan/Remedial Action Implementation Plan for the Operable Unit Name*

WSRC, 1999b. *Operable Unit Name Remediation System Startup Test Plan (U)*, Q-SUP-X-XXXX, Revision 2, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC

WSRC, 1999c. "*Operable Unit Name Startup Test Procedure (U)*", ER-TP-XXX, Revision 0, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC

WSRC, 2001. *ERD Regulatory Handbook*, ERD-AG-003, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC

## **10.0 APPENDICES**

[Provides a list of reports or other stand-alone documents referenced in the body of the PCR/CMIR/FRR.]

Appendix A Significant Reference Documents

## **11.0 ATTACHMENTS**

[Provides documents developed specifically for this project (e.g., as-built drawings).]

Attachment A As-Built Drawings

**Appendix A**  
**Significant Reference Documents**

[Examples: RA Start Notification Letter, Fact Sheet, USEPA/SCDHEC Walkdown Memo, Erosion Control Plan, HASP, and Well Abandonment Reports.]

**Attachment A**  
**As-Built Drawings**