LUCIP for the
Lower Three Runs Integrator Operable Unit (IOU)
Tail Portion (Middle and Lower Subunits)
Early Action Land Use Control Implementation Plan for the
Lower Three Runs Integrator Operable Unit Tail Portion (Middle and Lower Subunits)
(SRNS-RP-2013-00046, Revision 1, August 2013)

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United States Department of Energy

Savannah River Site

Early Action Land Use Control Implementation Plan (EALUCIP) for the Lower Three Runs Integrator Operable Unit Tail Portion (Middle and Lower Subunits) (U)

CERCLIS Number: 35

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Revision 1

August 2013

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LIST OF ABBREVIATIONS AND ACRONYMS

ac	acre
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
Cs-137	Cesium 137
CSM	conceptual site model
EALUCIP	Early Action Land Use Controls Implementation Plan
ESD	Explanation of Significant Differences
FFA	Federal Facility Agreement
ft	feet, foot
ft^3	cubic feet
GPRA	Government Performance and Results Act
ha	hectare
HH	human health
IROD	Interim Action Record of Decision
IOU	Integrated Operable Unit
km	kilometer
km^2	square kilometer
LLC	Limited Liability Company
LTR	Lower Three Runs
LUC	Land Use Controls
LUCAP	Land Use Controls Assurance Plan
LUCIP	Land Use Controls Implementation Plan
m	meter
m^3	cubic meters
mi	mile
m^2	square mile
PCR	Post-Construction Report
QA	Quality Assurance
RCRA	Resource Conservation and Recovery Act
RSER	Removal Site Evaluation Report
SCDHEC	South Carolina Department of Health and Environmental Control
SDC	Site Development Control
sec	second
SRNS	Savannah River Nuclear Solutions, LLC
SRS	Savannah River Site
USDOE	United States Department of Energy
USEPA	United States Environmental Protection Agency
WSRC	Washington Savannah River Company, LLC (October 2005 to 2008)
WSRC	Westinghouse Savannah River Company, LLC (before October 2005)

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1.0 INTRODUCTION

This Early Action Land Use Control Implementation Plan (EALUCIP) has been prepared for the Lower Three Runs (LTR) Integrator Operable Unit (IOU) Tail Portion at the Savannah River Site (SRS). The LTR IOU Tail Portion is comprised of the Middle and Lower Subunits. The early action addressed a portion of the Middle Subunit and the Lower Subunit and covers approximately 2212 ha (5,466 ac).

An *Explanation of Significant Differences (ESD) for the Revision 0 Interim Action Record of Decision (IAROD) Remedial Alternative Selection: PAR Pond Unit (U); Lower Three Runs Integrator Operable Unit Tail Portion (Middle and Lower Subunit*s) *(U)* documented the selection of an early action remedy to implement land use controls (LUCs) for the completed LTR IOU Middle and Lower Subunits (SRNS 2012a). The early action LUC objectives are listed in Section 3.0. The purpose of this EALUCIP is to describe the LUCs selected in the ESD and how they will be implemented and maintained.

The selected remedy leaves hazardous substances in place that pose a potential future risk and will require land use restrictions until the concentrations of hazardous substances in the soil and sediment are at levels that allow for unrestricted use. As agreed on March 30, 2000, among the United States Department of Energy (USDOE), the United States Environmental Protection Agency (USEPA), and the South Carolina Department of Health and Environmental Control (SCDHEC), SRS implemented a Land Use Control Assurance Plan (LUCAP) (SRNS 2011) to ensure that the LUCs required by numerous remedial decisions at SRS are properly maintained and periodically verified. The requirements of that LUCAP also apply to the LUCs that were selected as part of this early action remedy. This EALUCIP for the LTR IOU Middle and Lower Subunits implements the LUCs selected as part of the remedial decision. The LUCs shall be maintained until the LTR IOU Tail Portion (Middle and Lower Subunits) is suitable for unlimited exposure and unrestricted use. Approval by USEPA and SCDHEC is required for any modification or termination of the LUCs.

USDOE is responsible for implementing, maintaining, monitoring, reporting, and enforcing the LUCs in accordance with the approved EALUCIP. Upon final approval, the EALUCIP will be appended to the LUCAP and should be considered incorporated by reference into the PAR Pond IROD, establishing implementation and maintenance requirements for the LUCs under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the SRS Federal Facility Agreement (FFA) (FFA 1993). The EALUCIP will remain in effect unless and until modifications are approved by USEPA and SCDHEC as necessary for protection of human health and the environment. In accordance with Section 121(c) of CERCLA and the National Oil and Hazardous Substances Pollution Contingency Plan §300.430(f)(5)(iii)(c), a statutory review will be conducted within five years of initiation of the remedial action, and every five years thereafter, to ensure that the remedy continues to be protective of human health and the environment. Any approved EALUCIP modification will be appropriately documented for incorporation by reference into the PAR Pond IROD.

The format of this EALUCIP is consistent with the FFA protocol format approved by the USEPA and SCDHEC in March 2004.

2.0 OVERVIEW OF EARLY REMEDIAL ACTION

2.1 General Description and History

SRS occupies approximately 802.9 kilometer square (km^2 [310 square miles {mi^2}]) of land adjacent to the Savannah River, principally in Aiken and Barnwell counties of South Carolina. SRS is located approximately 40.2 km (25 mi) southeast of Augusta, Georgia, and 32.1 km (20 mi) south of Aiken, South Carolina (Figure 1).

The USDOE owns SRS, which historically produced tritium, plutonium, and other special nuclear materials for national defense and the space program. Chemical and radioactive wastes are by-products of nuclear material production processes. Hazardous substances, as defined by the CERCLA, are currently present in the environment at SRS.

The LTR IOU is located in the southeastern portion of SRS (Figure 1). LTR is a large blackwater stream that originates in the northeast portion of SRS and follows a southerly direction for approximately 40 km (24.5 mi) before it enters the Savannah River. The LTR IOU includes two SRS facility areas: P-Area Operable Unit including P-Reactor (105-P) and R-Area Operable Unit including R-Reactor (105-R). In addition, the upper portion of the LTR IOU contains a 1,012 hectare (ha [2,500 acre {ac}]) man-made impoundment (PAR Pond), several smaller pre-cooler ponds and canal systems. From the PAR Pond Dam, LTR flows through the Middle and Lower Subunits approximately 30 km (19 mi) before it enters the Savannah River (Figures 2 and 3).

LTR IOU is a remote area. The average discharge of LTR at Patterson Mill Road during calendar year 2012 was 0.69 cubic meters (m^3)/second (sec) (24.5 cubic feet [ft^3]/sec). The LTR watershed comprises about 460 km^2 (180 mi^2). Reactor operations ceased in the 1980's and the reactors placed in cold shutdown with no possibility of restart in the 1990's; however, during operations, secondary reactor cooling water, storm water discharges, disassembly basin water purges, and miscellaneous wastewater was discharged into LTR.

Approximately five miles downstream from the PAR Pond dam just above Patterson Mill Road, the SRS boundary narrows, providing a limited buffer of USDOE property along the LTR stream and floodplain. All the SRS property from Patterson Mill Road to the Savannah River is part of the LTR Lower Subunit and consists of an approximate 0.2 - 0.4-km ($^1/_8$ – ¼-mi) wide area on each side of the stream channel. The area from Patterson Mill Road south is bounded on both sides by private property. There are four public road crossings along this portion of LTR (Figure 4) (SRNS 2012b).

In January 1995, an IROD was issued for the PAR Pond unit to address the exposed contaminated sediment that resulted from drawdown of the PAR Pond reservoir that was necessary for repair of the PAR Pond Dam. The interim action determined that refilling and maintaining the water level in PAR Pond at a 61 m (200 ft) elevation was needed to mitigate the potential radiation dose from the exposed contaminated sediment after the dam repairs were completed. The main contaminant in PAR Pond is cesium-137 (Cs-137). Cs-137 will decay

naturally over time and the potential exposure risk from the sediment will be significantly reduced. Subsequent National Environmental Policy Act determinations associated with PAR Pond allow for the natural fluctuation of the water level provided the minimum water level is maintained greater than 59 m (195 ft) elevation and the minimum discharge rate to LTR is 0.028 m^3/sec (5 ft^3/sec).

In September 2004, the USDOE, with agreement from SCDHEC and the USEPA, prepared an Early Action Fact Sheet to document an early remedial action affecting the area from Patterson Mill Road to the Savannah River of LTR IOU (WSRC 2004 and Appendix C). The Early Action Fact Sheet detailed the installation of warning signs and fences to mitigate the potential health risk by discouraging access to, and contact with, the Cs-137 contamination in the stream system.

On February 6, 2007, the SCDHEC issued a Government Performance and Results Act (GPRA) Human Exposure Environmental Indicator letter indicating that human exposure was not under control unless additional actions were taken along the LTR from Patterson Mill Road to the Savannah River. In response, USDOE conducted an early action plan (WSRC 2007, Appendix D) that included posting additional signs and documenting inspections along the from Patterson Mill Road south. Additionally, the USDOE sent a letter to all property owners adjacent to this portion of the LTR IOU Lower Subunit reinforcing and reminding them that trespassing on USDOE property is illegal. This correspondence also cautioned the property owners that Cs-137 contamination is present in stream and floodplain media, and informed the property owners of increased SRS security patrols in the area.

2.2 Nature and Extent of Contamination

The P-Reactor and R-Reactor effluents that discharged into LTR IOU contained tritium, metallic contaminants, and other radiological contaminants. Many of the radiological contaminants are fixated to the sediments and retained in the cooler ponds, including PAR Pond. Migration of sediments downstream of the pond systems did occur resulting in deposition of contaminated sediments and soil within the LTR IOU. Past characterization efforts of the LTR has shown that

Cs-137 is the major contaminant present. In 2009/2010, extensive sampling of the IOU was accelerated as part of the American Recovery and Reinvestment Act mission at SRS.

The sampling was performed in accordance with an approved Sampling and Analysis Plan for the LTR Stream, Floodplain, and Headwaters (SRNS 2009a). The characterization involved an even spacing of sampling transects designed to collect an unbiased population of data from the stream system. The collected data consisted of direct gamma radiation measurements along each transect supplemented with the collection of sediment, sediment/soil, and surface water samples for laboratory analyses.

Based on the analytical sample data from the sediment/soil that was collected in the 2009/2010 characterization efforts, three sampling transects (transects 4, 13, and 23) in the LTR IOU Middle and Lower Subunits were determined to have elevated Cs-137 in excess of the adolescent trespasser receptor benchmark of 23.7 pCi/g (1×10^{-4} risk). Based on laboratory data, the maximum Cs-137 detection in the LTR IOU was 180 pCi/g.

For the sediment/soil evaluation of the adolescent trespasser at the LTR Middle Subunit (Transect 4), there were five Cs-137 exceedances (out of 30 analyses) with a mean ratio of 0.52 (less than 1) and a 16.7% frequency of exceedance based on the soil benchmark (soil benchmark = 23.7 pCi/g). For the LTR Lower Subunit (Transects 13 and 23), there were two benchmark exceedances out of 72 analyses for Cs-137 with a frequency of exceedance of 2.8% and a mean ratio less than one (0.19). The three transects that contained the elevated concentrations of Cs-137 at greater than 23.7 pCi/g are shown in Figure 4.

The adolescent trespasser scenario assumes the receptor is exposed to the contaminated sediment/soil for 18 hours per day, 90 days per year, for a duration of 10 years. The total exposure time equals 16,200 hours. The receptor is described as an adolescent who has access to the contaminated areas (from Patterson Mill Road to the Savannah River) and utilizes the area for wading, hiking, or other recreational activities (SRNS 2012b).

2.3 Early Remedial Actions Selected

Because the Cs-137 contaminated sediment/soil will remain at levels that would continue to pose an unacceptable future risk to adolescent trespassers (>1 x 10^{-4}), a Time Critical Removal Action in the LTR IOU Middle and Lower Subunits was necessary. On January 5, 2012, representatives of USEPA, SCDHEC, and USDOE, reached agreement that addition of LUCs following a Time Critical Removal Action for excavation of the contaminated sediment/soil media in the LTR IOU Middle and Lower Subunits was appropriate to protect human health and the environment.

The Time Critical Removal Action in the LTR IOU Middle and Lower Subunits was conducted for the identified soil/sediment locations in the three areas (transects 4, 13, and 23) that exceed the 1 x 10^{-4} risk (23.7 pCi/g for the adolescent trespasser receptor. The USDOE, USEPA, and SCDHEC agreed that each excavation area would be limited to a maximum one acre, initiated at the sampling points with Cs-137 activities >23.7 pCi/g. Final agreement was reached that the 1 x 10^{-4} risk (23.7 pCi/g for the adolescent trespasser receptor) would be the action level and 12 pCi/g (5 x 10^{-5} risk for an adolescent trespasser) would be used as the cleanup goal for excavation. Sediment/soil within the defined one acre removal areas would be excavated to the depth necessary to achieve the 12 pCi/g cleanup goal and disposed of in a CERCLA approved disposal facility. This action reduced the volume of available Cs-137 in the LTR IOU Middle and Lower Subunits. In addition, the half-life of Cs-137 is 30 years; therefore, residual activities of Cs-137 in the Lower and Middle Subunits will decay naturally over time and the potential exposure risk from the sediment will be significantly reduced. The Time Critical Removal Action (removal of sediment/soil) was documented by a Removal Site Evaluation Report (SRNS 2012b) and followed by an Action Memorandum (USDOE 2012).

The ESD for the LTR IOU Middle and Lower Subunits documents the LUCs that will be implemented following the Time Critical Removal Action. Portions of the LTR Lower Subunit from Patterson Mill Road south to the Savannah River have signs and fencing previously placed as part of the 2004 early action. Table 1 shows the types of LUCs, purposes of control, duration, and affected areas. The early action LUCs for the LTR IOU Middle and Lower Subunits consist of the following:

- Installation of approximately 6.6 miles of new fencing (three strand barbed wire) at the highest probability trespass zones along the LTR IOU Lower Subunit from Patterson Mill Road to the Savannah River including fencing near Transect 13 and Transect 23 (Figure 4).

- Installation of signage along the entire perimeter of the area from Patterson Mill Road to the Savannah River of the LTR IOU Lower Subunit approximately 61 m (200 ft) apart in approximately 1,050 locations to alert on-site workers and the public of the presence of hazardous substances and to prevent unknowing entry and unrestricted use (Figure 4). The signs include both Warning signs and No Trespassing signs (Appendix A, Figures 1a and 1b).

- Security surveillance measures to control and restrict access to the public as part of existing security measures that are in place at the SRS boundary for the LTR IOU Middle and Lower Subunits.

- Institutional controls (i.e., administrative measures) and use restrictions for on-site workers via the Site Use/Site Clearance Program for the LTR IOU Middle and Lower Subunits. Other administrative controls to ensure worker safety include work controls, worker training, and worker briefings of health and safety requirements.

The post-early action conceptual site model (CSM) (Figure 5) demonstrates that the exposure pathways to an adolescent trespasser are incomplete following implementation of the early remedial action. According to the *Savannah River Site Future Use Project Report* (USDOE 1996), residential use of SRS land is prohibited.

3.0 LTR LOWER AND MIDDLE SUBUNITS LAND USE CONTROL OBJECTIVES

The following LUC objective was developed to ensure the protectiveness of the selected early action remedy:

- To prevent exposure of the adolescent trespasser to Cs-137 contaminated sediment/soil in the LTR IOU Middle and Lower Subunits at levels that would exceed a risk of 1×10^{-4}.

Current access controls and land transfer requirements needed to maintain the future land use are described in the following sections of this EALUCIP.

4.0 IMPLEMENTATION OF LAND USE CONTROLS

This section describes the remedial actions prescribed by the ESD to achieve the LUC objective stated in Section 3.0. A summary of the types of LUCs is provided in Table 1. USDOE is responsible for implementing, maintaining, monitoring, reporting and enforcing the LUCs. The EALUCIP will become enforceable and will be implemented when approved by USEPA and SCDHEC following the completion of the remedial actions prescribed by the ESD. USDOE shall notify USEPA and SCDHEC 60 days in advance of any proposed land use changes that are inconsistent with the LUC objective or the selected remedy.

LUCs for the trespasser at the affected area will be maintained by implementation of the property record notices and restrictions (Section 4.1) and the LUC boundary map (Section 4.2). The Site Use Program (Section 4.3) will be implemented to prevent onsite worker exposure to contamination left in place. Other existing SRS measures (i.e. Site Clearance Program, worker training, health and safety requirements, work controls) will also be used to ensure worker safety. Physical access controls (Section 4.4) are implemented at the SRS boundary to control and restrict public and trespasser access. The Middle Subunit is located within the SRS boundary.

Fencing was installed at the highest probability trespass zones on the SRS property from Patterson Mill Road to the Savannah River of the LTR IOU Lower subunit. In addition, access

and warning signs were installed on both sides of the SRS property at approximately 61 m (200 ft) intervals from Patterson Mill Road to the Savannah River. These signs will be maintained to alert onsite workers and trespassers to the presence of hazardous substances. The signs will also convey the restrictions of unauthorized personnel. Access control warning signs have been placed as shown in Figure 4 and maintained to prevent unknowing entry and unrestricted use.

4.1 Property Record Notices and Restrictions

In the long term, if the property, or any portion thereof, is ever transferred from USDOE, the U.S. Government and/or USDOE will take those actions necessary pursuant to Section 120(h)(1) of CERCLA. Those actions will include in any contract, deed, or other transfer document, notice of the type and quantity of any hazardous substances that were known to have been stored (for more than one year), released, or disposed of on the property. The notice will also include the time at which the storage, release, or disposal took place to the extent such information is available.

In addition, if the property, or any portion thereof, is ever transferred by deed, the U.S. Government will also satisfy the requirements of CERCLA 120(h)(3). The requirements include: a description of the remedial action taken, a covenant, and an access class.

LUCs will be implemented through the following:

- The contract, deed, or other transfer document shall also include restrictions precluding residential use of the property. However, the need for these 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 LUCs 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.

In the event of a property lease or interagency agreement, the equivalent restrictions will be implemented as required by CERCLA Section 120(h).

USDOE shall provide the USEPA and SCDHEC at least six month notice prior to transfer or sale of property subject to LUCs to ensure that USEPA and SCDHEC can be involved in discussions to ensure that appropriate provisions are included in the transfer documents to maintain effective LUCs. If it is not possible for the USDOE to notify the USEPA and SCDHEC at least six months prior to the transfer or sale, then the facility will notify the USEPA and SCDHEC as soon as possible but no later than 60 days prior to the transfer or sale of any property subject to LUCs. In addition to the land transfer notice and discussion provisions above, USDOE further agrees to provide the USEPA and SCDHEC with similar notice within the same time frames as to federal-to-federal transfer of property.

4.2 LUC Boundary Maps

This LUCIP identifies the proposed area under land use restrictions in Figure 3 for the LTR IOU Middle and Lower Subunits. A final as-built LUC boundary plat has been developed and includes the coordinates for the area subject to land use restrictions and general locations of access control warning signs (Appendix E). This final as-built LUC boundary plat will be submitted to USEPA and SCDHEC in the Removal Action Report.

In addition, if the site is ever transferred to non-federal ownership, a certified survey plat of the LTR IOU will be prepared by a professional land surveyor registered in the State of SC at or near the time of conveyance to support the LUCIP required restrictive covenants on land use. The certified survey plat will be recorded with the appropriate county recording agency.

4.3 Site Use Program

Under DOE Order 430.1A, *Life Cycle Management* (USDOE 1998), SRS is required to implement an asset management program for the use, maintenance, and disposal of physical assets, including real estate. SRS complies with this DOE Order through the Site Use Program which is administered by Site Development Control (SDC) in accordance with SRS Manual 1D,

Site Infrastructure and Services Manual, Procedure 3.02, "Site Real Property Configuration Control" (SRS 2006). Use of all lands and waters on the SRS are coordinated via the Site Use Program. No use of land (i.e., excavation or any other land use) shall be undertaken without prior approval by the USDOE and documented by a Site Use Permit.

SRS identifies all buildings, facilities, and FFA waste units on SRS site development maps that are maintained by SDC in accordance with SRS Manual 1D. If LUCs are required for an FFA waste unit, the unit-specific LUC boundaries are identified on the SRS site development maps. SDC must verify that any proposed work to be performed on a site is sanctioned by a Site Use Permit and verify that the proposed activity does not conflict with any previously approved land use.

In addition to the management of the use of SRS lands and waters through the Site Use Program, the SDC also administers the Site Clearance Program to control the construction, alteration, or demolition activities at SRS. Before any work that adds or modifies features or facilities portrayed on the SRS site development maps is conducted, a Site Clearance Permit is required. USDOE approval of the intended land via a Site Use Permit must be verified before a Site Clearance Permit is issued. If a Site Clearance request potentially impacts a FFA waste unit, the Site Clearance Request Form is sent to the appropriate FFA reviewer for approval. The FFA reviewer will evaluate the proposed activity to identify any conflicts with the waste unit and to verify that waste unit specific LUCs are not compromised. The roles and responsibilities of the individuals responsible for review and approval of Site Use and Site Clearance permits are detailed in SRS 1D, Procedure 3.02. All employees, contractors, and visitors at SRS are required to adhere to the Site Use Program and the Site Clearance Program.

The USDOE will notify USEPA and SCDHEC in advance of any change to any internal procedure, including the Site Use Program, which would affect implementing or maintaining the LUCs. Approval by USEPA and SCDHEC is required for any modification or termination of the LUCs and implementation actions, and the USDOE must obtain prior approval from USEPA and SCDHEC before taking any anticipated action that may disrupt the effectiveness of the LUCs or alter or negate the need for LUCs. The Site Use Permit and site development maps must be

amended when the geographic configuration or buffer zone used to establish the permit boundary changes or there is a change to the land use. The processes are controlled within the SRS Quality Assurance (QA) Program in accordance with SRS 1Q Manual, *Quality Assurance* (SRS 2007). The SRS QA program governs all SRS activities.

4.4 Physical Access Controls

Physical access controls (fencing, security gates) are provided at the SRS boundary of the LTR IOU with the exception of the Lower Subunit. There are no additional physical access controls required at the LTR IOU Middle Subunit and the small portion of the Lower Subunit located within the main SRS boundary fencing. For the remaining LTR IOU Lower Subunit not located within the main SRS boundary fencing (the area from Patterson Mill Road to the Savannah River), additional physical access controls were needed. Fencing (10.6 km [6.6 mi]), consisting of three strand barbed wire, was installed along the highest probability trespass zones on this portion of the LTR Lower Subunit as shown in Figure 4.

4.5 Warning Signs

To prevent unknowing entry and to ensure that unrestricted use of the waste unit does not occur while the unit is under ownership of the USDOE, access control warning signs and USDOE "No Trespassing" signs, are posted along the entire perimeter of the Lower Subunit (from Patterson Mill Road to the Savannah River) at approximately 61 m (200 ft) intervals from the SRS boundary to the Savannah River (Figure 4). Custodial responsibilities for maintenance and inspection will be performed by SRS.

4.6 Other Access Controls and Security/Surveillance Measures

While under the ownership of USDOE, access control of the entire SRS will be maintained in accordance with the 2000 RCRA Part B Permit Renewal Application, Volume I, Section F.1. 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

access control warning signs (R.61-79.264.14(c)) in place at the SRS boundary to comply with the security requirements for a RCRA-permitted facility.

4.7 Field Inspection and Maintenance for Land Use Controls

After remediation, only inspection and maintenance activities will be required by this remedial action. Inspections will be performed per the Field Inspection Checklists in Appendix B and the schedule in Table 2. The inspection walkdowns along the entire LTR Lower Subunit boundary (both sides of the creek) from Patterson Mill Road to the Savannah River will be conducted on a continuing five year inspection frequency to look for indications of trespassing and to inspect signs and fencing. Corrective actions will include the removal of unauthorized structures on DOE property. Additional inspections may be necessary in the event of unusual weather or any other condition warranting inspection.

Any activity that is inconsistent with the LUC objectives or use restrictions, or any other action that may interfere with the effectiveness of the LUCs will be addressed by the USDOE as soon as practicable, but in no case will the process be initiated later than 10 days after the USDOE becomes aware of the breach. The USDOE will notify USEPA and SCDHEC as soon as practicable but no longer than 10 days after discovery of any activity that is inconsistent with the LUC objectives or use restrictions, or any other action that may interfere with the effectiveness of the LUCs. The USDOE will notify USEPA and SCDHEC regarding how the USDOE has addressed or will address the breach within 10 days of sending USEPA and SCDHEC notification of the breach.

The FFA Annual Progress Report, submitted to the regulatory agencies by USDOE, will provide the status of the LUCs and describe how any LUC deficiencies or inconsistent uses have been addressed. In the event of property transfer or lease, the Annual Report will cite findings on the following: whether the use restrictions and controls referenced above were communicated in the deed(s) or lease restrictions; whether property use conforms with the deed or lease restrictions and controls; and whether the owners and state/local agencies have been notified regarding the

deed or lease restrictions and controls. The FFA Annual Progress Report(s) will be used in the preparation of the Five-Year Remedy Review Report.

All other routine maintenance activities will be documented and maintained in files subject to USEPA and SCDHEC review and audit. A copy of the completed inspection form is maintained in SRS records. The LUCs shall be maintained until the concentration of hazardous substances associated with the unit have been reduced to levels that allow for unlimited exposure and unrestricted use.

The waste unit inspectors are to be trained as applicable for the specific inspection. They will also be trained based on the individual requirements of the regulatory approved documents for the waste unit. In addition, the inspectors are to attend yearly refresher courses. Over the years, different personnel may conduct the inspections and maintenance activities.

This unit-specific LUCIP, including the checklist (Appendix B), will be appended to the SRS LUCAP upon final regulatory approval. After completion of the final PCR, the preliminary checklist in the LUCAP will be replaced with the final approved checklist.

Upon approval, the inspection, maintenance activities and schedule required by this EALUCIP will supersede the requirements defined in the September 2004, Early Action Fact Sheet (WSRC 2004 and Appendix C) and December 2007, Early Action Fact Sheet (WSRC 2007 Appendix D) in their entirety.

5.0 REFERENCES

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SRS, 2007. SRS Procedure Manual 1Q, *Quality Assurance (U)*, Savannah River Nuclear Solutions, Savannah River Site, Aiken, SC

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USDOE, 1998. DOE Order 430.1A, *Life Cycle Management* (Approved October 14, 1998)

USDOE, 2012. *DOE Submittal of the Action Memorandum for the time critical removal action for the Lower Three Runs Integrator Operable Unit Tail Portion Middle And Lower Subunits and the Removal Site Evaluation Report for the Lower Three Runs Integrator Operable Unit Tail Portion Middle and Lower Subunits,* SRNS-RP-2012-00118, Revision 1, April 2012, CERCLIS Number 35, ACP-12-150, U.S. Department of Energy, Savannah River Operations Office, Aiken SC

WSRC, 2004. *Lower Three Runs IOU Early Action Fact Sheet*, WSRC-RP-2004-4087, September 20, 2004, ARF # 011467, Westinghouse Savannah River Company, LLC, Savannah River Site, Aiken, SC

WSRC, 2007. *Lower Three Runs IOU Early Action Fact Sheet*, WSRC-RP-2007-4043, December 2007, ARF #15176, Washington Savannah River Company, LLC, Savannah River Site, Aiken, SC

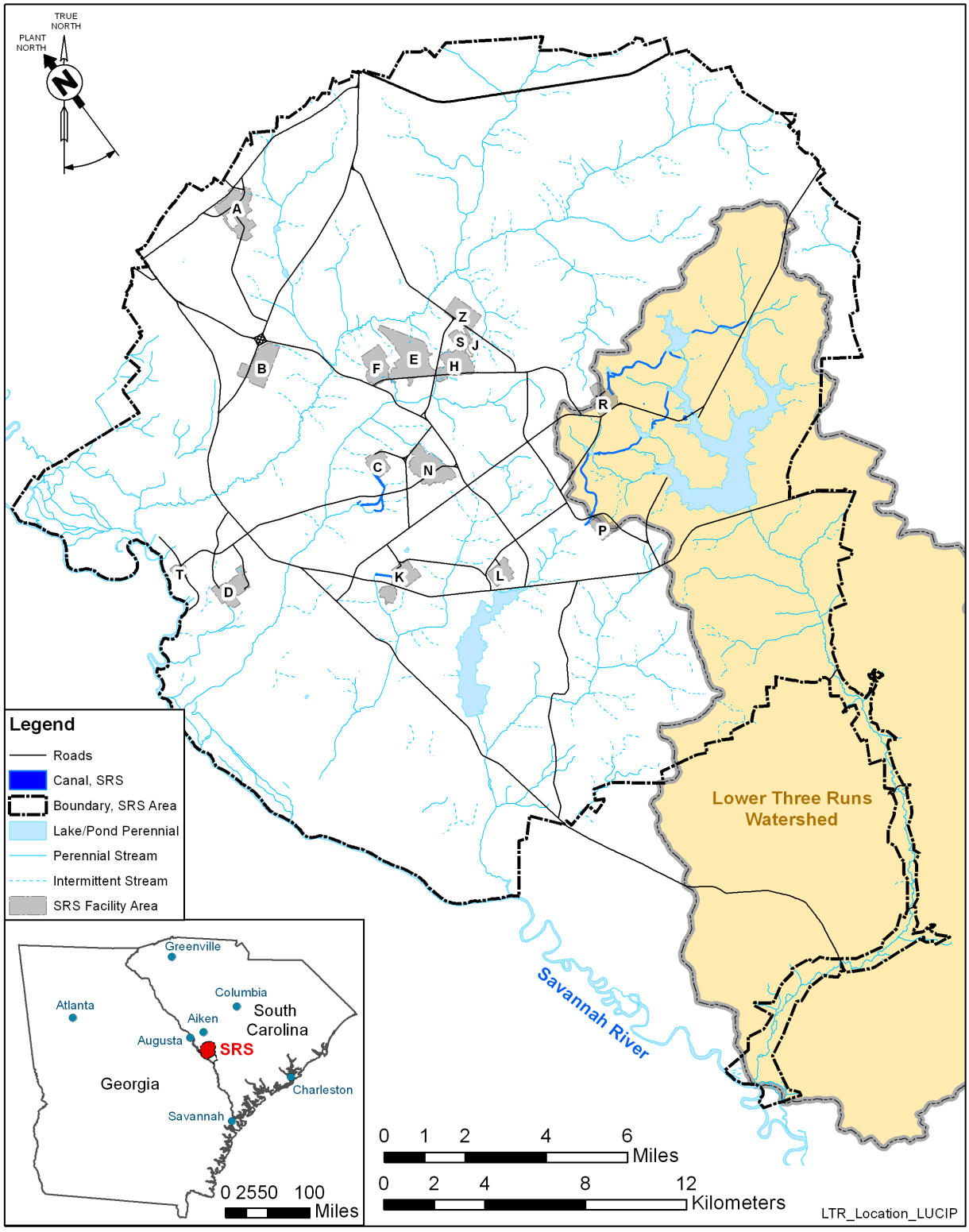

Figure 1. Location of the Lower Three Runs IOU within the Savannah River Site

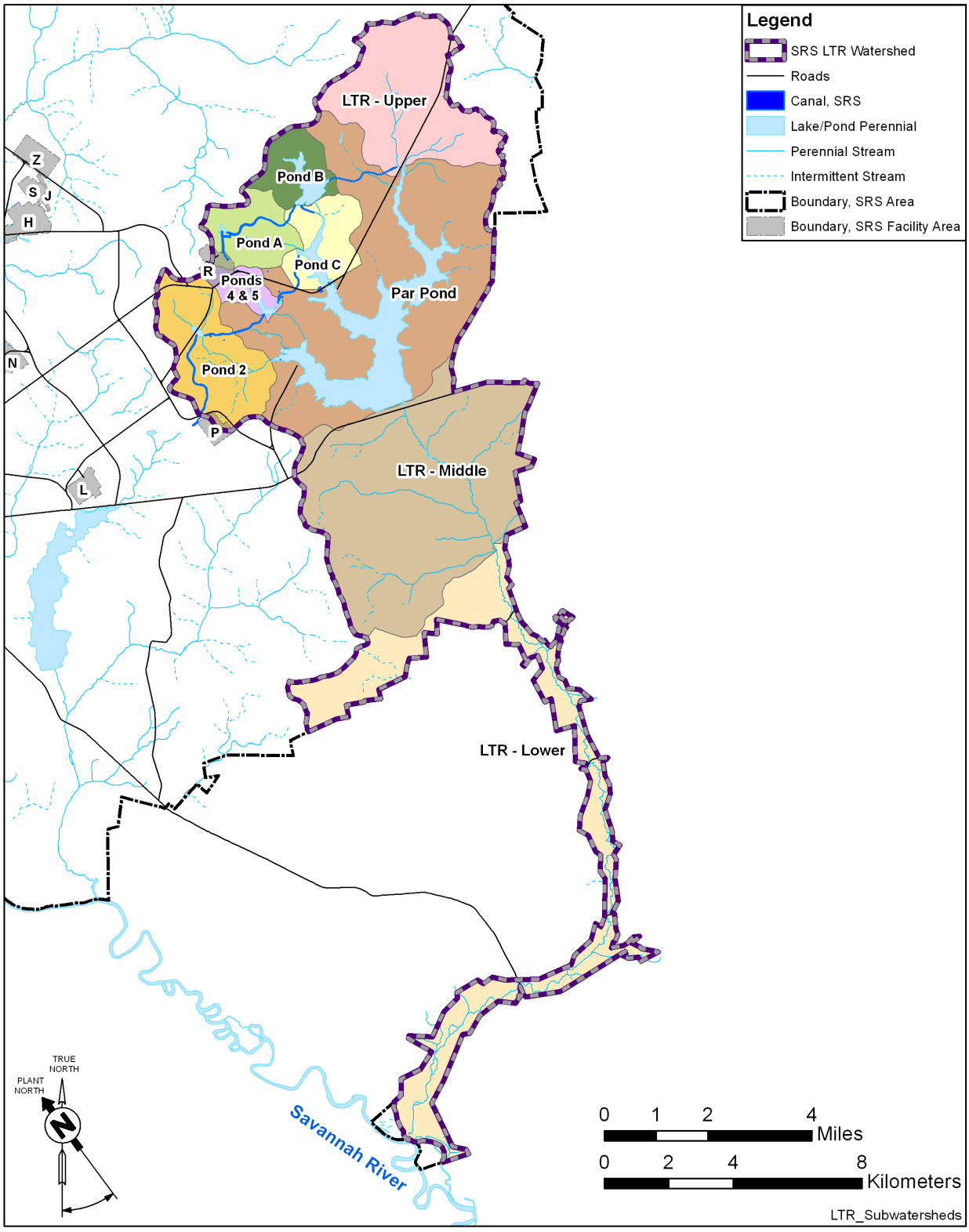

Figure 2. LTR Subunits

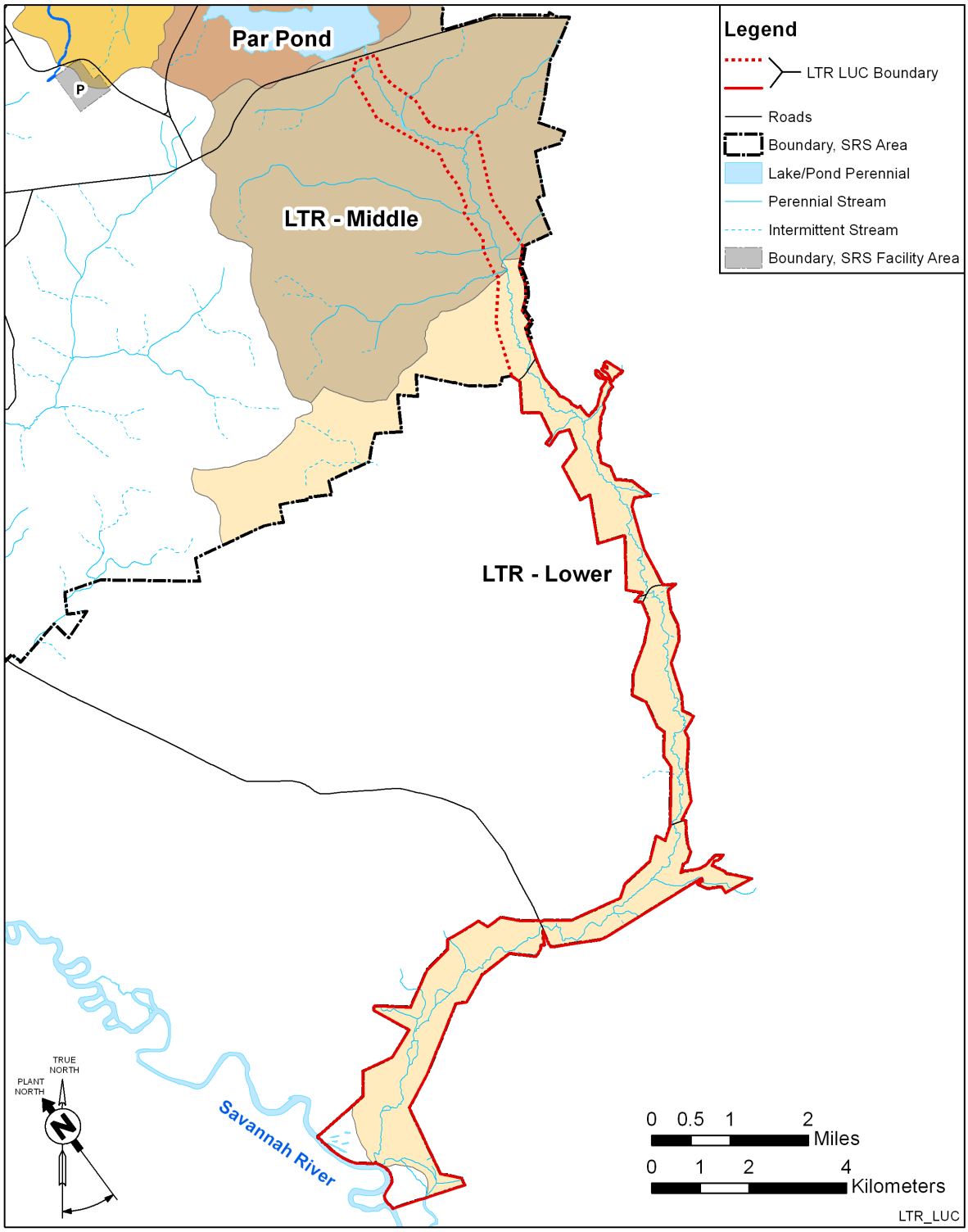

Figure 3. Early Action LUC Boundary Map for the LTR Middle and Lower Subunits

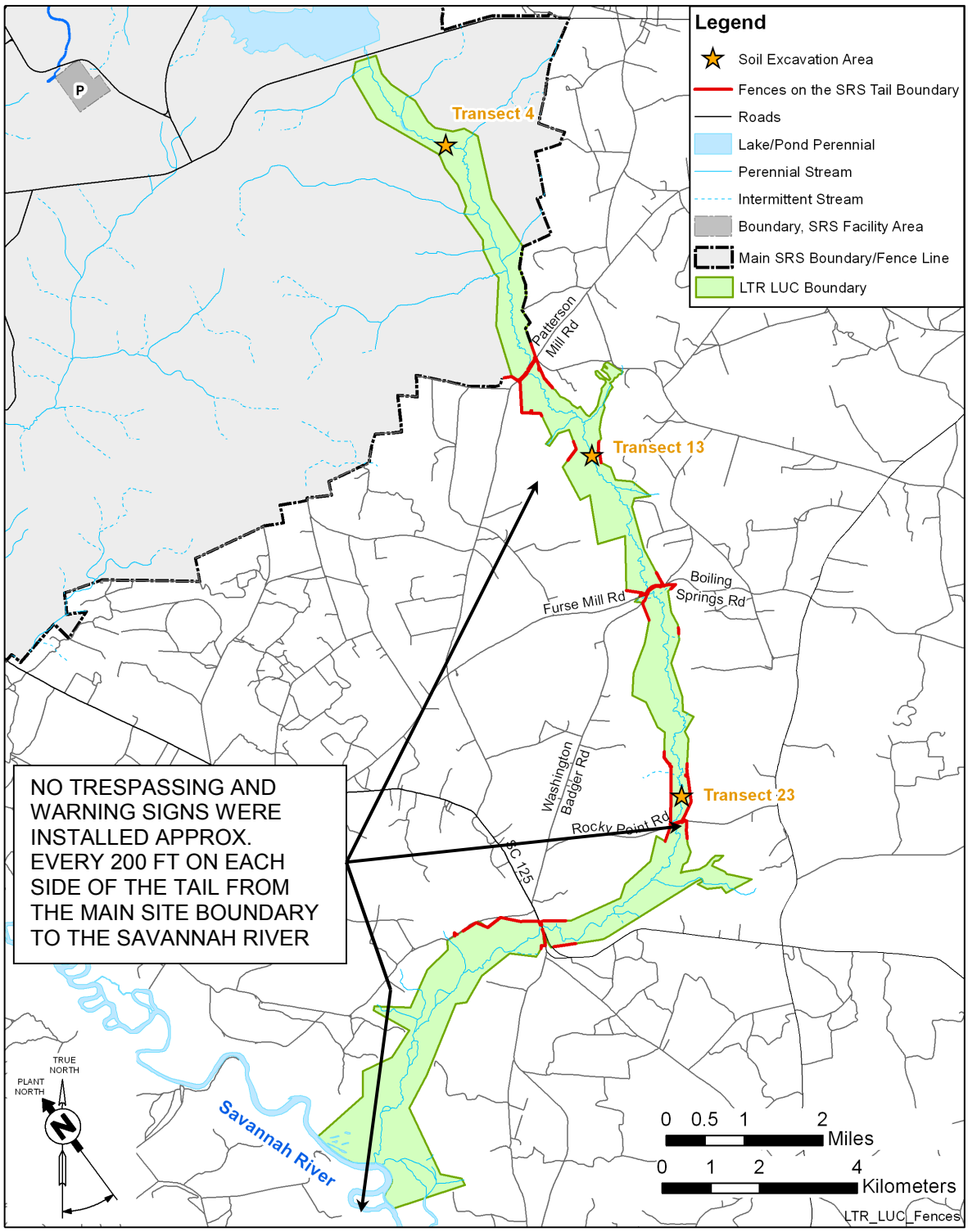

Figure 4. **Fences and Signs on the LTR Lower Subunit from Patterson Mill Road to the Savannah River**

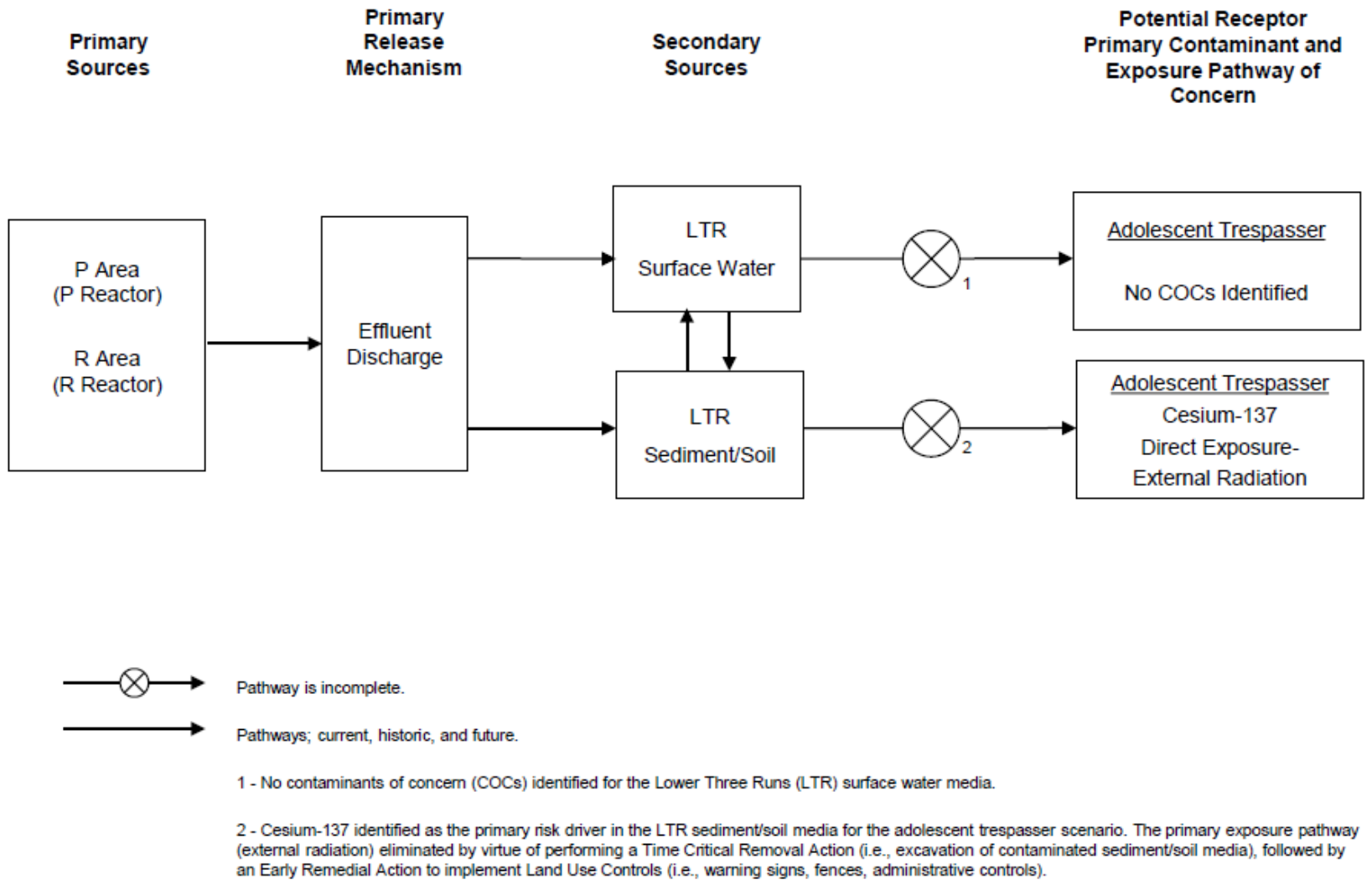

Figure 5. Conceptual Site Model after Completion of the Early Remedial Actions

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Table 1. Land Use Controls for the LTR IOU Middle and Lower Subunits

Type of Control	Purpose of Control	Duration	Implementation	Affected Areas[a]
1. Property Record Notices[b]	Provide notice to anyone searching records about the existence and location of contaminated areas.	Until the concentration of hazardous substances associated with the unit have been reduced to levels that allow for unlimited exposure and unrestricted use.	Notice recorded by USDOE in accordance with state laws at County Register of Deeds office if the property or any portion thereof is ever transferred to non-federal ownership.	At LTR IOU Middle and Lower Subunits where hazardous substances are left in place at levels requiring land use and/or groundwater restrictions.
2. Property record restrictions[c]: A. Land Use	Restrict use of property by imposing limitations.	Until the concentration of hazardous substances associated with the unit have been reduced to levels that allow for unlimited exposure and unrestricted use.	Drafted and implemented by USDOE upon any transfer of affected areas. Recorded by USDOE in accordance with state law at County Register of Deeds office.	At LTR IOU Middle and Lower Subunits, where hazardous substances are left in place at levels requiring land use.
3. Other Notices[d]	Provide notice to city &/or county about the existence and location of waste disposal and residual contamination areas for zoning/planning purposes.	Until the concentration of hazardous substances associated with the unit have been reduced to levels that allow for unlimited exposure and unrestricted use.	Notice recorded by USDOE in accordance with state laws at County Register of Deeds office if the property or any portion thereof is ever transferred to non-federal ownership.	At LTR IOU Middle and Lower Subunits, where hazardous substances are left in place at levels requiring land use and/or groundwater restrictions.
4. Site Use Program[e]	Provide notice to worker/developer (i.e., permit requestor) on extent of contamination and prohibit or limit excavation/penetration activity.	As long as property remains under USDOE control	Implemented by USDOE and site contractors Initiated by permit request	At LTR IOU Middle and Lower Subunits where levels requiring land use and/or groundwater restrictions.
5. Physical Access Controls[f] (e.g., fences, gates, portals)	Control and restrict access to the public to prevent unauthorized access.	Until the concentration of hazardous substances associated with the unit have been reduced to levels that allow for unlimited exposure and unrestricted use.	Controls maintained by USDOE. Any unauthorized structures or items found (i.e. deer stands, swing ropes, etc.) will be removed from DOE property.	Security is provided at site boundaries in accordance with SRS procedures.
6. Warning Signs[g]	Provide notice or warning to prevent unauthorized uses.	Until the concentration of hazardous substances associated with the unit have been reduced to levels that allow for unlimited exposure and unrestricted use.	Signage maintained by USDOE.	Warning signs will be posted in accordance with applicable site procedures and will be placed in appropriate areas of the LTR IOU Middle and Lower Subunits.
7. Security Surveillance Measures	Control and restrict access to the public.	Until the concentration of hazardous substances associated with the unit have been reduced to levels that allow for unlimited exposure and unrestricted use.	Established and maintained by USDOE	Security and surveillance measures are in place at the SRS boundary in accordance with RCRA permit requirements.

[a] Affected areas – Specific locations identified in the LUCIP or subsequent post-ROD documents.
[b] Property Record Notices – Refers to any non-enforceable, purely informational document recorded along with the original property acquisition records of USDOE and its predecessor agencies that alerts anyone searching property records to important information about residual contamination; waste disposal areas in the property.
[c] Property Record Restrictions – Includes conditions and/or covenants that restrict or prohibit certain uses of real property and are recorded along with original property acquisition records of USDOE and its predecessor agencies.
[d] Other Notices – Includes information on the location of waste disposal areas and residual contamination depicted on as survey plat, which is provided to a zoning authority (i.e., city planning commission) for consideration in appropriate zoning decisions for non-USDOE property.
[e] Site Use Program – Refers to the internal USDOE/USDOE contractor administrative program(s) that requires the permit requestor to obtain authorization, usually in the form of a permit, before beginning any excavation/penetration activity (e.g., well drilling) for the purpose of ensuring that the selected activity will not affect underground utilities/structures, or in the case of contaminated soil or groundwater, will not disturb the affected areas without the appropriate precautions and safeguards.
[f] Physical Access Controls – Physical barriers or restrictions to entry.
[g] Signs – Posted command, warning or direction

Table 2. LTR Lower Subunit (Area from Patterson Mill Road to the Savannah River) 10-Year Cycle Inspection Schedule

	INSPECTION SCHEDULE[1]										Total Inspections in a 10 Year Cycle
Year Ending In[2]	0	1	2	3	4	5	6	7	8	9	
Five-Year Remedy Review			X					X			**NA**
Inspection A[3]		A[4]					A[4]				**2**
Inspection B[5]	B	B[6]		B	B	B	B[6]		B	B	**8**

1 The inspection frequency includes observations and reconnaissance of the LTR Lower Subunit from Patterson Mill Road to the Savannah River from 2004-2012, issuance of the first Early Action Fact Sheet, and implementation of these EALUCIP requirements. Observations and recons have shown that trespassing is **infrequent** and occurs mainly at the bridge crossings or easy access areas. There is little evidence of long periods of trespassing except for deer stands; currently there are no deer stands located on the DOE property. DOE has requested additional emphasis by SRS security support (Wackenhut Services, Inc.) in the LTR Lower Subunit from Patterson Mill Road to the Savannah River to include more patrols and helicopter over flights. The USEPA and SCDHEC will be contacted to discuss the need to revise the inspection frequency should conditions change.

2 Represents years in a 10 year cycle. For example, "1" refers to years 2011, 2021, 2031, etc.

3 Inspection "A" Requirements- Inspection of all signs and fences on the Lower Subunit (from Patterson Mill Road to the Savannah River) beginning at the main site boundary to the north and ending at the Savannah River to the south (Figures 3 and 4). Inspections will insure that all signs and fences are in place and signs are legible.

4 For 5 Year Remedy Review reporting, only one (1) inspection is required in either the year preceding or the year of the review.

5 Inspection "B" Requirements - Inspections of signs and fences at the four (4) public road crossings for a distance of 1200 ft in each direction (4800 ft total at each public road crossing). Inspections will insure that all signs and fences are in place and signs are legible.

6 Inspection B to be conducted only in the year Inspection A does not occur for the purpose of the Five-Year Remedy review.

APPENDIX A

ACCESS CONTROL WARNINGS SIGNS

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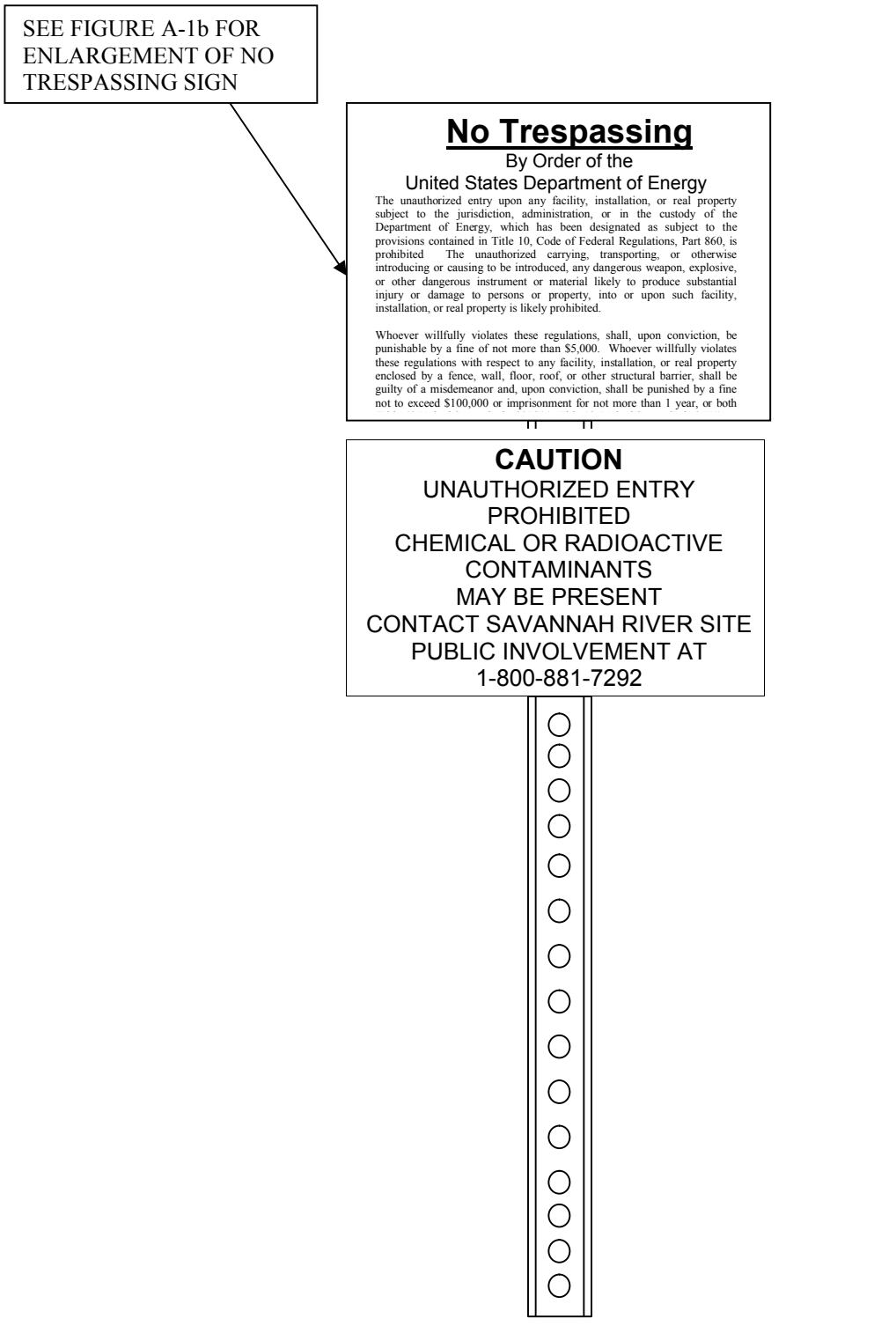

Note: Editorial changes to signs do not require changes to this document.

Figure A-1a. *EXAMPLE* — Access Control Warning Sign

No Trespassing

By Order of the
United States Department of Energy

The unauthorized entry upon any facility, installation, or real property subject to the jurisdiction, administration, or in the custody of the Department of Energy, which has been designated as subject to the provisions contained in Title 10, Code of Federal Regulations, Part 860, is prohibited The unauthorized carrying, transporting, or otherwise introducing or causing to be introduced, any dangerous weapon, explosive, or other dangerous instrument or material likely to produce substantial injury or damage to persons or property, into or upon such facility, installation, or real property is likely prohibited.

Whoever willfully violates these regulations, shall, upon conviction, be punishable by a fine of not more than $5,000. Whoever willfully violates these regulations with respect to any facility, installation, or real property enclosed by a fence, wall, floor, roof, or other structural barrier, shall be guilty of a misdemeanor and, upon conviction, shall be punished by a fine not to exceed $100,000 or imprisonment for not more than 1 year, or both (Title 42 United States Code, 2278(a); Title 18, United States Code 3571)

By authority of Section 229 of the Atomic Energy Act of 1954, as amended (Title 42, United States Code, 2278(a) and Title 10, Code of Federal Regulations, Part 860 of the rules and regulations of the Department of Energy) this facility, installation, or real property has been designated as subject to these regulations by the United States Department of Energy. Trespassers may be subject to the provisions stated above.

Figure A-1b. *EXAMPLE* — Enlargement of No Trespassing Sign

APPENDIX B

FIELD INSPECTION CHECKLISTS

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INSPECTION A

FIELD INSPECTION CHECKLIST

FOR THE LTR IOU LOWER SUBUNIT

(from Patterson Mill Road to the Savannah River**)**

☐ **SCHEDULED** **YEAR** _____ ☐ **UNSCHEDULED**

A = Satisfactory **X** = Unsatisfactory (Explanation required)	**A** or **X**	Observation of Corrective Action Taken
1. Verify that the signs are in acceptable condition, have the correct information, and are legible.		
2. Verify that the fences are in acceptable condition.		
3. Document and provide appropriate notification of the location of any evidence of trespassing within the LUC/Site Boundaries.		
4. Verify that there are no unauthorized structures (e.g. deer stands, rope swings) on DOE property.		

Notes
Items 1 and 2-The general location(s) and description of unsatisfactory condition(s) shall be noted on a map.
Item 3- The general location(s) shall be noted on a map.
Item 4 - Corrective Action must include removal of unauthorized structures.

Inspected by:

_____/_____ Date:_____
(Print Name) (Signature)

Post-Closure Manager:

_____/_____ Date:_____
(Print Name) (Signature)

CAUTION: The inspector shall notify the Post-Closure Manager (PCM) and Environmental Compliance Authority (ECA) **IMMEDIATELY** if there has been a breach or compromise of the land use controls of this waste unit. The notification shall be in accordance with SRS post-closure inspection procedures.

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INSPECTION B

FIELD INSPECTION CHECKLIST
FOR THE LTR IOU Lower Subunit

(At the Four (4) Public Road Crossings from Patterson Mill Road to the Savannah River)

❑ **SCHEDULED** **YEAR** _____ ❑ **UNSCHEDULED**

A = Satisfactory **X** = Unsatisfactory (Explanation required)	**A** or **X**	Observation of Corrective Action Taken
1. Verify that the signs, within the limits of the inspection 1200 ft each way, are in acceptable condition, have the correct information, and are legible.		
2. Verify that the fences, within the limits of the inspection 1200 ft each way are in acceptable condition.		
3. Document and provide appropriate notification of the location of any evidence of trespassing within the limits of the inspection		
4. Verify that there are no unauthorized structures (e.g. deer stands, rope swings) on DOE property within the limits of the inspection.		

Notes
Items 1 and 2-The general location(s) and description of unsatisfactory condition(s) shall be noted on a map.
Item 3- The general location(s) shall be noted on a map.
Item 4 - Corrective Action must include removal of unauthorized structures.

Inspected by:

_____ / _____ Date: _____
(Print Name) (Signature)

Post-Closure Manager:

_____ / _____ Date: _____
(Print Name) (Signature)

CAUTION: The inspector shall notify the Post-Closure Manager (PCM) and Environmental Compliance Authority (ECA) **IMMEDIATELY** if there has been a breach or compromise of the land use controls of this waste unit. The notification shall be in accordance with SRS post-closure inspection procedures.

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APPENDIX C

Lower Three Runs IOU Early Action Fact Sheet

WSRC-RP-2004-4087

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Lower Three Runs IOU **WSRC-RP-2004-4087**
Early Action Fact Sheet **September 20, 2004**

Introduction

This Early Action Fact Sheet is being issued by the United States Department of Energy (USDOE) with concurrence from the United States Environmental Protection Agency (USEPA) and South Carolina Department of Health and Environmental Control (SCDHEC). The purpose of this Early Action Fact Sheet is to describe the proposed early response action for the Lower Three Runs Integrator Operable Unit and to provide for public involvement in the decision-making process.

IOU Program

The Lower Three Runs (LTR) Creek and floodplain is one of six Savannah River Site (SRS) Integrator Operable Units (IOUs) corresponding to each of the major onsite watersheds. The other five IOUs are the Upper Three Runs, Fourmile Branch, Pen Branch, Steel Creek, and the Savannah River & Floodplain Swamp. IOUs are defined as surface water bodies (e.g., streams and lakes) and associated wetlands, including the sediment, floodplain soil, and related biota (animal and plant life). The IOUs are being evaluated to determine if past releases of contamination from SRS pose unacceptable risks to the environment, onsite workers, or off site general public.

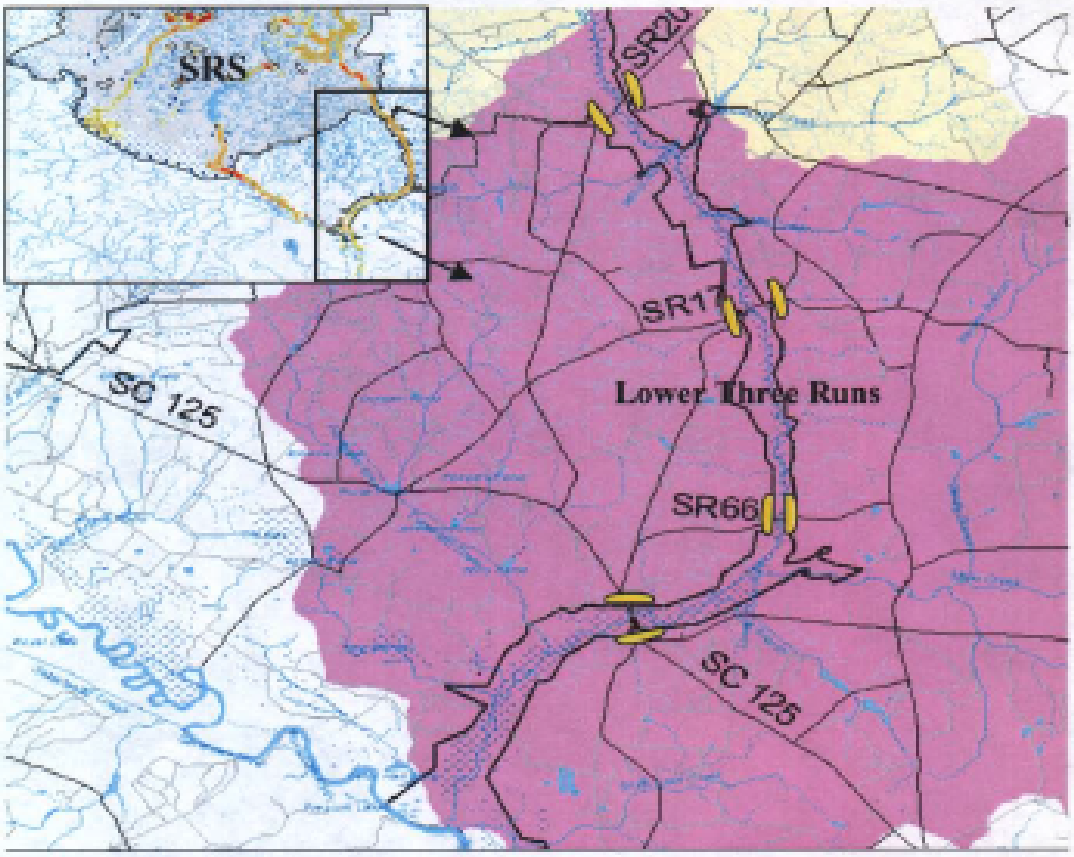
The investigation of IOUs is being performed in three phases. Phase I, which has been completed for all IOUs, included the evaluation of existing data and historical information. Phase II involves the ongoing sampling and evaluation of new data to determine if contamination levels call for consideration of an early response action. Phase III will include the final risk assessment with the final remedial actions to be documented in a Record of Decision.

Lower Three Runs IOU Background

The Lower Three Runs (LTR) IOU is located in the southeastern portion of SRS. P Reactor Area and R Reactor Area are the two primary SRS facilities located within the LTR watershed. In addition, the watershed contains a 2,500-acre lake (PAR Pond) used during reactor operations. From the PAR Pond Dam, Lower Three Runs Stream flows approximately 19 miles before it enters the Savannah River. Between the dam and the Savannah River, the SRS boundary includes a narrow strip

of land known as the Lower Three Runs tail. The tail of Lower Three Runs is bounded on both sides by private property. The tail consists of an approximate 1/8 to 1/4-mile wide densely vegetated buffer on each side of the stream that limits access by trespassers. There are four public road crossings where public access to contamination in the tail is possible. Members of the public entering SRS property at any of these locations are considered trespassers.

The Phase II evaluations of the Lower Three Runs IOU identified deposits of radioactive cesium-137 contamination below PAR Pond Dam and along the LTR tail section. Cesium-137 is a concern to human health because at elevated levels, it can increase the chance of developing cancer.



General Location of the "No Trespassing, No Fishing, and Caution" Signs and Fencing at Road Crossings

Contaminant of Concern

Cesium-137 was deposited throughout the length of the LTR during discharges of contaminated water from P and R Reactors that were shut down in 1991 and 1963, respectively. Cesium-137 quickly binds securely with sediment in the stream.

Risk Evaluation

The level of cesium-137 contamination in the LTR IOU does not present an increased risk of cancer to the off-site general public. However, it was determined that the cesium-137 levels do pose an unacceptable health risk to SRS workers and potential trespassers on SRS that may come in contact with contamination in this area.

The LTR Phase II IOU investigations also include an ecological evaluation. Results from the evaluation indicate that no action is needed at this time to protect the environment (e.g. animal and plant life).

Early Action

Two early response action alternatives were evaluated to address the present risk in the LTR IOU.

- No Action
- Institutional Controls

The no action alternative was determined not to be protective of SRS workers and a trespasser who unintentionally enters SRS property.

The United States Department of Energy (US DOE) with agreement from the United States Environmental Protection Agency (US EPA) and South Carolina Department of Health and Environmental Control (SCDHEC) is proposing to implement the following institutional controls to mitigate the risk by eliminating inadvertent exposure to cesium-137 by SRS workers and unintentional trespassers.

- Installation of warning signs below PAR Pond Dam and at the public road crossings along the LTR tail.
- Installation of fencing at public road crossings.
- Annual inspections of public road crossings to ensure signs and fencing are in place.

The warning signs state, "Caution, Unauthorized Entry Prohibited, Chemical or Radioactive Contaminants May be Present, Contact SRS Public Involvement 1-800-249-8155." The barbed wire fence will be placed on DOE property adjacent to

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the road. These early action will be in place as long as contaminant levels requiring early action remain, or until the final remedial actions are implemented. The cost of implementing this proposed early action is approximately $50,000.

Public Involvement

This document will be available for public comment from September 22, 2004, to October 21, 2004.

If there is interest in discussing this early action approach, a public meeting may be requested. Comments on the Early Action Fact Sheet should be sent to Mr. Jim Moore. For additional information or to request a public meeting contact:

Jim Moore
Westinghouse Savannah River Company
Savannah River Site
Building 742-A
Aiken, SC 29808
1-800-249-8155
jim02.moore@srs.gov

APPENDIX D

***Lower Three Runs IOU Early Action Fact Sheet*, WSRC-RP-2007-4043**

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ARF # 15176

Lower Three Runs IOU **WSRC-RP-2007-4043**
Early Action Fact Sheet **December 2007**

Introduction

This Early Action Fact Sheet is being issued by the United States Department of Energy (DOE) with concurrence from the United States Environmental Protection Agency (EPA) and South Carolina Department of Health and Environmental Control (SCDHEC). The purpose of this Early Action Fact Sheet is to describe the additional proposed early response actions for the Lower Three Runs (LTR) Integrator Operable Unit (IOU) and to provide for public involvement in the decision-making process. The first Early Action Fact Sheet for LTR was issued November 3, 2004.

IOU Program

The LTR Creek and floodplain is one of six Savannah River Site (SRS) IOUs corresponding to each of the major onsite watersheds. IOUs are defined as surface water bodies (e.g., streams and lakes) and associated wetlands, including the sediment, floodplain soil, and related biota (animal and plant life). IOUs are evaluated to determine if past releases of contamination from SRS pose unacceptable risks to the environment, SRS workers, or off-site general public.

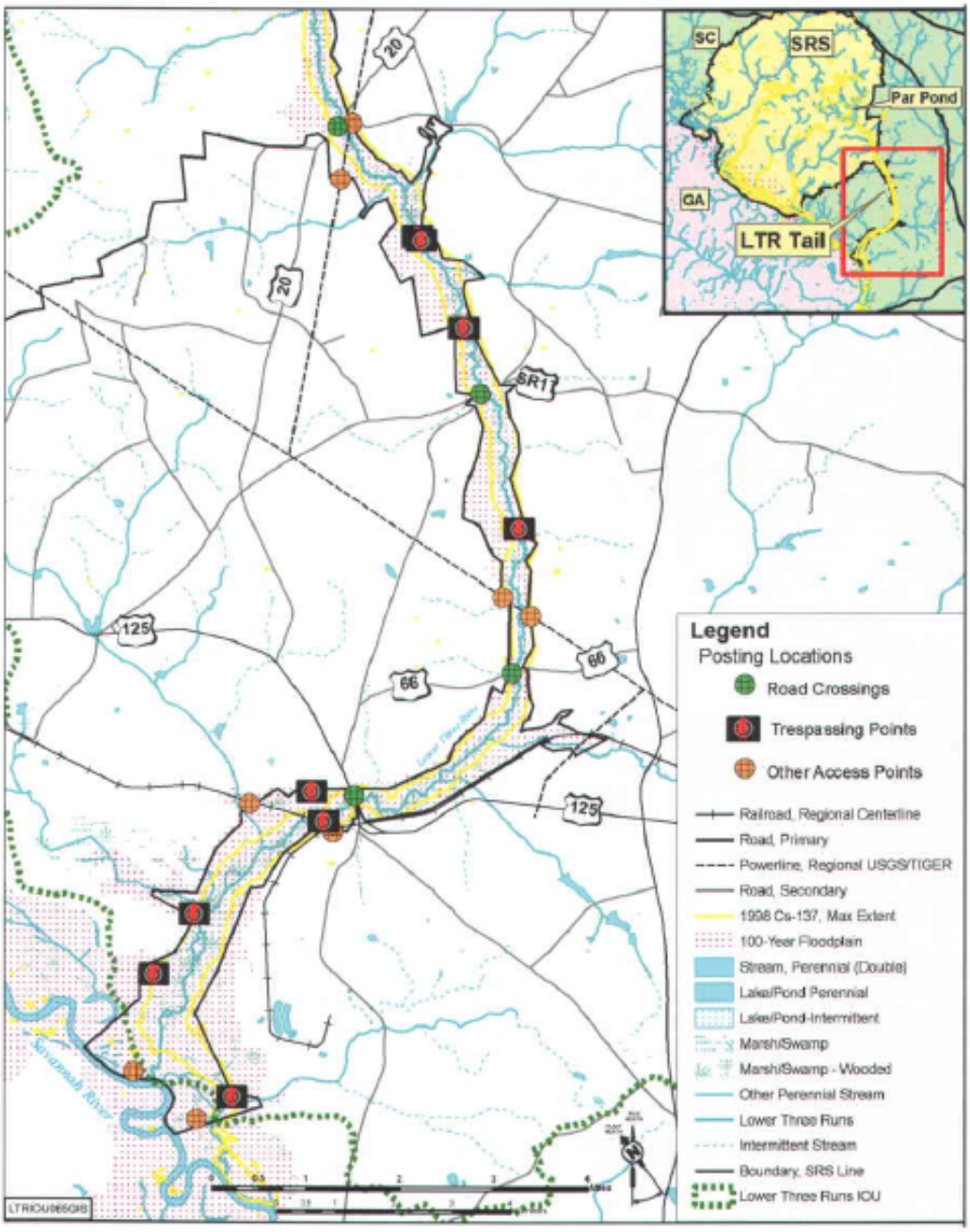
The investigation of IOUs is performed in three phases. Phase I, which has been completed for all IOUs, included the evaluation of existing data and historical information. Phase II involves the ongoing sampling and evaluation of new data to determine if contamination levels call for consideration of an early response action. Phase III will include the final risk assessment with the final remedial decisions to be documented in a Record of Decision. The LTR IOU is in the Phase II stage.

Lower Three Runs IOU Background

The LTR IOU is located in the southeastern portion of SRS (see figure on following page). P-Area Reactor and R-Area Reactor are the two primary SRS facilities located within the LTR watershed. In addition, the watershed contains a 2,500-acre lake (PAR Pond) used by both P Reactor and R Reactor during reactor operations. From the PAR Pond Dam, LTR flows approximately 19 miles south to southwest before it enters the Savannah River. Beginning at State Route 20 (Patterson Mill Bridge), the SRS boundary narrows on both sides of the creek to a strip of land known as the LTR tail. The LTR tail section is owned by DOE and is bounded on both sides by private property. The LTR tail section generally consists of the creek and the 1/8 to 1/4-mile wide densely vegetated floodplain on each side of the creek. There are four public roads, a railroad, and two power lines that cross the LTR tail where public access to contamination in the LTR tail section is possible. However, members of the public entering SRS property at any locations along the LTR tail are trespassing, and are subject to prosecution.

ARF # 15176

Lower Three Runs IOU **WSRC-RP-2007-4043**
Early Action Fact Sheet **December 2007**



Trespassing locations and other potential access points in LTR tail.

ARF # 15176

Lower Three Runs IOU **WSRC-RP-2007-4043**
Early Action Fact Sheet **December 2007**

Contaminant of Concern

Cesium-137 is a radioactive fission product from P Reactor and R Reactor which ceased operations in 1988 and 1964, respectively. Cesium-137 binds securely to stream sediments, and the radioactivity is reduced by one-half every 30 years through decay. The Phase II evaluations of the LTR IOU identified cesium-137 contamination below the PAR Pond Dam in floodplain sediments along the entire length of the LTR tail section. Analysis of fish throughout LTR has also shown the presence of cesium-137.

Risk Evaluation

Cesium-137 is a concern to human health because at elevated levels, it can increase the chance of developing cancer. Cesium - 137 was not found at levels in the LTR IOU that would present an increased risk of cancer to the off-site general public. However, it was determined that the cesium-137 levels could pose an unacceptable health risk (increased cancer incidence of greater than 1 in 10,000) to SRS workers and potential trespassers on the SRS that may have frequent and prolonged contact with contaminated floodplain sediments.

The LTR Phase II IOU investigations also include an ecological evaluation. Results from the evaluation indicate that no early action is needed at this time to protect the environment (e.g. animal and plant life).

Early Action

As specified in the November 3, 2004, Early Action Fact Sheet, actions taken to prevent the inadvertent exposure to cesium-137 by SRS workers and unintentional trespassers included the installation and inspection of warning signs and fencing at public road crossings along the LTR tail section. A reconnaissance survey conducted in 2005 identified evidence of trespassing in the LTR floodplain at locations along the tail section, indicating that the 2004 early actions alone are not adequately protective of an inadvertent trespasser.

The DOE, with agreement from the EPA and SCDHEC, proposes to implement the following additional institutional controls to mitigate the potential risk to unintentional trespassers from exposure to cesium-137:

- Notification of adjacent property owners
- Posting and maintenance of additional signs at likely and observed locations of ingress
- Removal of unauthorized structures (e.g. deer stands, rope swings) on DOE property
- Additional reconnaissance surveys

Annual inspections and maintenance of all signs will be conducted to ensure they are in place and readable. Results of the

inspections and reconnaissance surveys will be documented in subsequent LTR Periodic Reports. Actions (such as additional postings) will be taken in a timely manner (initiated within 30 days) if inspections identify previously unidentified evidence of trespassing.

The warning signs state, "Caution, Unauthorized Entry Prohibited, Chemical or Radioactive Contaminants May be Present, Contact Savannah River Site Public Involvement 1-800-249-8155." Maintenance of signs and removal of unauthorized structures will continue as long as contaminant levels warranting early action remain, or until the final remedial actions are implemented. The cost of implementing these proposed additional early actions is approximately $50,000.

Thus far, signs have been posted at all the trespassing and access points identified in the 2005 reconnaissance (see figure on page 2). Another reconnaissance of the portion of LTR between Patterson Bridge and Hwy. 125 conducted in 2007 found no additional evidence of trespassing activities. Security patrols have also been increased, including helicopter overflights.

Public Involvement – Responsiveness Summary

This document was made available for public comment from January 4, 2008 to February 3, 2008. There were no public comments, questions or request for a public meeting to discuss this early action approach. It will also be presented to the SRS Citizens Advisory Board later this year along with the annual IOU update.

APPENDIX E

As-Built LUC Boundary Plat and Table of Coordinates

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Table E-1 LTR IOU TAIL PORTION (MIDDLE AND LOWER SUBUNITS) Control Point / Monument Coordinates

LTR IOU TAIL PORTION (MIDDLE AND LOWER SUBUNITS) Control Point / Monument Coordinates			
Control Point / Monument Number	**UTM_27_E**	**UTM_27_N**	**Comments**
A	452044.8462	3677175.270	Non Monument Control Point
B	452161.5604	3676805.369	Non Monument Control Point
C	452361.523	3676585.045	Non Monument Control Point
D	452852.0205	3676248.365	Non Monument Control Point
E	453109.9414	3675826.772	Non Monument Control Point
F	453260.7096	3675694.078	Non Monument Control Point
G	453626.7157	3675622.533	Non Monument Control Point
H	453853.2879	3675680.952	Non Monument Control Point
I	454137.7201	3675521.247	Non Monument Control Point
J	454425.6381	3674227.497	Non Monument Control Point
K	454515.1476	3671626.496	Non Monument Control Point
L	454567.0193	3672615.733	Non Monument Control Point
M	454473.5423	3672708.235	Non Monument Control Point
N	454251.5397	3673168.694	Non Monument Control Point
O	454247.5354	3673394.499	Non Monument Control Point
P	453853.6706	3673935.513	Non Monument Control Point
Q	453897.3862	3674081.513	Non Monument Control Point
R	453721.5576	3674522.861	Non Monument Control Point
S	453472.3746	3674854.349	Non Monument Control Point
T	453350.9434	3675139.922	Non Monument Control Point
U	452064.5648	3675883.402	Non Monument Control Point
V	451569.8438	3676733.357	Non Monument Control Point
W	451631.2855	3677045.931	Non Monument Control Point
141	455062.902	3673249.380	Monument Control Point
142	454995.887	3672815.111	Monument Control Point
143	455115.956	3672489.123	Monument Control Point
144	455131.932	3672238.276	Monument Control Point
145	455053.9858	3671939.117	Monument Control Point
146	455217.2322	3671696.633	Monument Control Point
147	455117.9564	3671569.094	Monument Control Point
148	455408.6439	3670758.793	Monument Control Point
149	455504.393	3670553.895	Monument Control Point
150	455692.5408	3670335.320	Monument Control Point
150A	455733.5811	3670302.165	Monument Control Point
151	455831.4105	3670171.364	Monument Control Point
151A	455912.0667	3670143.018	Monument Control Point
151B	456023.5339	3670079.343	Monument Control Point
151C	456064.9345	3670023.259	Monument Control Point
151D	456076.262	3670003.604	Monument Control Point

Table E-1 LTR IOU TAIL PORTION (MIDDLE AND LOWER SUBUNITS) Control Point / Monument Coordinates (continued)

LTR IOU TAIL PORTION (MIDDLE AND LOWER SUBUNITS) Control Point / Monument Coordinates			
Control Point / Monument Number	**UTM_27_E**	**UTM_27_N**	**Comments**
151E	456120.9385	3669979.443	Monument Control Point
151F	456187.7967	3669933.499	Monument Control Point
151G	456242.8586	3669966.098	Monument Control Point
151H	456307.844	3669875.433	Monument Control Point
151I	456367.2278	3669806.296	Monument Control Point
152	456426.1763	3669767.412	Monument Control Point
152A	456429.7553	3669773.715	Monument Control Point
152B	456481.3382	3669831.046	Monument Control Point
153	456561.3239	3669911.463	Monument Control Point
153A	456555.5343	3669921.378	Monument Control Point
153B	456599.2756	3669974.549	Monument Control Point
153C	456641.2722	3670150.193	Monument Control Point
153D	456676.373	3670272.276	Monument Control Point
153E	456682.6679	3670337.094	Monument Control Point
153F	456692.7414	3670366.253	Monument Control Point
153G	456741.1316	3670419.070	Monument Control Point
154	456767.1624	3670471.093	Monument Control Point
154A	456754.9951	3670509.287	Monument Control Point
154B	456677.8878	3670543.315	Monument Control Point
154C	456647.5163	3670540.381	Monument Control Point
154D	456566.083	3670623.244	Monument Control Point
154E	456554.8938	3670694.047	Monument Control Point
154F	456594.9732	3670696.951	Monument Control Point
154G	456732.2045	3670572.676	Monument Control Point
154H	456838.3552	3670513.374	Monument Control Point
154I	456862.8155	3670535.273	Monument Control Point
154J	456792.5432	3670644.782	Monument Control Point
154K	456676.7058	3670721.611	Monument Control Point
154L	456705.3911	3670747.585	Monument Control Point
154M	456717.3455	3670797.935	Monument Control Point
154N	456792.0257	3670746.175	Monument Control Point
154O	456796.4794	3670768.578	Monument Control Point
154P	456730.6623	3670829.851	Monument Control Point
154Q	456788.3023	3670887.875	Monument Control Point
154R	456872.2083	3670836.654	Monument Control Point
154S	456932.2535	3670794.928	Monument Control Point
154T	457108.2742	3670689.971	Monument Control Point
155	456869.4857	3670428.836	Monument Control Point
156	456913.1263	3670365.270	Monument Control Point

Table E-1 LTR IOU TAIL PORTION (MIDDLE AND LOWER SUBUNITS) Control Point / Monument Coordinates (continued)

LTR IOU TAIL PORTION (MIDDLE AND LOWER SUBUNITS) Control Point / Monument Coordinates			
Control Point / Monument Number	**UTM_27_E**	**UTM_27_N**	**Comments**
157	456840.1529	3670279.353	Monument Control Point
158	456812.3338	3670195.048	Monument Control Point
159	456760.955	3670115.930	Monument Control Point
160	456720.5405	3670033.970	Monument Control Point
161	456748.1744	3669941.075	Monument Control Point
162	456675.174	3669753.146	Monument Control Point
163	456639.0005	3669496.956	Monument Control Point
164	456668.0258	3669312.749	Monument Control Point
165	456620.5518	3669236.531	Monument Control Point
166	456609.9107	3669053.166	Monument Control Point
167	456643.6644	3668980.262	Monument Control Point
168	456674.4066	3668812.962	Monument Control Point
169	456871.9655	3668721.856	Monument Control Point
170	456969.2249	3668463.796	Monument Control Point
171	457315.2141	3668432.635	Monument Control Point
172	457686.3149	3668134.223	Monument Control Point
173	457356.85	3668082.055	Monument Control Point
174	457308.2204	3667911.464	Monument Control Point
175	457551.7208	3667039.547	Monument Control Point
176	457943.9477	3666301.421	Monument Control Point
177	458201.2868	3666311.658	Monument Control Point
178	458048.4027	3666176.958	Monument Control Point
179	458113.858	3665750.783	Monument Control Point
180	458250.4307	3665487.305	Monument Control Point
181	458275.4544	3665173.653	Monument Control Point
182	458111.0909	3664706.178	Monument Control Point
183	458336.9702	3664013.336	Monument Control Point
184	458346.7012	3663717.730	Monument Control Point
185	458570.3044	3663599.072	Monument Control Point
186	458389.19	3663298.688	Monument Control Point
187	458464.674	3663148.427	Monument Control Point
188	458429.9978	3662532.419	Monument Control Point
189	458522.6417	3661853.342	Monument Control Point
190	458334.8491	3661487.166	Monument Control Point
191	458417.8911	3661454.369	Monument Control Point
192	458426.4899	3661290.214	Monument Control Point
193	458420.0157	3661256.220	Monument Control Point
194	458446.2809	3660986.030	Monument Control Point
195	458514.1372	3660819.414	Monument Control Point

Table E-1 LTR IOU TAIL PORTION (MIDDLE AND LOWER SUBUNITS) Control Point / Monument Coordinates (continued)

LTR IOU TAIL PORTION (MIDDLE AND LOWER SUBUNITS) Control Point / Monument Coordinates			
Control Point / Monument Number	**UTM_27_E**	**UTM_27_N**	**Comments**
196	458437.4583	3660611.416	Monument Control Point
197	458360.8083	3660562.730	Monument Control Point
198	458307.8567	3660389.421	Monument Control Point
199	458381.3594	3660420.883	Monument Control Point
200	458689.683	3660468.344	Monument Control Point
201	458828.9439	3660549.314	Monument Control Point
202	458932.795	3660672.384	Monument Control Point
203	459016.2833	3660745.017	Monument Control Point
204	459179.1541	3660749.799	Monument Control Point
205	459081.7954	3660648.464	Monument Control Point
206	459000.6492	3660631.768	Monument Control Point
207	458948.6038	3660540.178	Monument Control Point
208	459211.7135	3660416.251	Monument Control Point
209	459251.8508	3660371.358	Monument Control Point
210	459349.0388	3660354.076	Monument Control Point
210A	459765.2204	3660263.870	Monument Control Point
210B	459235.1218	3659977.246	Monument Control Point
210C	459150.8369	3660099.089	Monument Control Point
210D	458850.9667	3660061.807	Monument Control Point
211	458651.2266	3660160.746	Monument Control Point
211A	458757.9816	3660215.439	Monument Control Point
211B	458752.781	3660229.831	Monument Control Point
211C	458742.2113	3660258.390	Monument Control Point
211D	458737.2598	3660272.812	Monument Control Point
212	458619.4424	3660212.564	Monument Control Point
213	456825.5783	3659094.448	Monument Control Point
214	456717.1786	3659037.649	Monument Control Point
215	456647.1207	3659015.325	Monument Control Point
216	455686.8558	3658870.866	Monument Control Point
216A	455646.5074	3658864.868	Monument Control Point
216B	455595.4147	3658936.121	Monument Control Point
216C	455560.2518	3659003.515	Monument Control Point
216D	455474.6523	3659199.582	Monument Control Point
217	455482.8061	3659058.580	Monument Control Point
218	455501.3526	3658912.559	Monument Control Point
218B	455511.5965	3658912.249	Monument Control Point
219	455437.9431	3658903.706	Monument Control Point
220	455439.9081	3658834.185	Monument Control Point
221	455395.4143	3658766.086	Monument Control Point

Table E-1 LTR IOU TAIL PORTION (MIDDLE AND LOWER SUBUNITS) Control Point / Monument Coordinates (continued)

LTR IOU TAIL PORTION (MIDDLE AND LOWER SUBUNITS) Control Point / Monument Coordinates			
Control Point / Monument Number	**UTM_27_E**	**UTM_27_N**	**Comments**
222	455336.4692	3658671.346	Monument Control Point
223	454792.0849	3658738.894	Monument Control Point
224	454220.6286	3658280.036	Monument Control Point
225	453905.495	3657732.234	Monument Control Point
226	453683.7195	3657699.544	Monument Control Point
227	453091.3019	3656242.753	Monument Control Point
228	452728.9537	3655565.826	Monument Control Point
229	453370.5392	3654205.075	Monument Control Point
230	453804.249	3654114.727	Monument Control Point
231	453873.0695	3653981.900	Monument Control Point
232	453420.7547	3653833.971	Monument Control Point
233	453022.5693	3653701.730	Monument Control Point
234	452948.6222	3653680.652	Monument Control Point
235	452389.7447	3653495.815	Monument Control Point
236	450874.8167	3654998.536	Monument Control Point
237	451779.0495	3655804.614	Monument Control Point
238	451775.3782	3656319.002	Monument Control Point
239	452380.1406	3656607.707	Monument Control Point
240	452730.5247	3657160.063	Monument Control Point
241	451998.4068	3657568.844	Monument Control Point
242	452013.7287	3657655.835	Monument Control Point
243	452754.9044	3657628.077	Monument Control Point
244	453103.0091	3658398.799	Monument Control Point
245	453518.755	3658816.238	Monument Control Point
246	453511.436	3659012.318	Monument Control Point
247	453730.9166	3659142.571	Monument Control Point
247A	454145.7196	3659397.410	Monument Control Point
248	454151.4102	3659393.890	Monument Control Point
249	454339.5327	3659277.548	Monument Control Point
250	454607.0546	3659477.043	Monument Control Point
251	455010.0795	3659398.683	Monument Control Point
252	455385.5948	3659406.881	Monument Control Point
253	455430.3848	3659387.581	Monument Control Point
254	455489.4661	3659411.963	Monument Control Point
255	456051.3591	3659412.973	Monument Control Point
256	457064.9147	3659872.490	Monument Control Point
257	457162.3409	3660164.671	Monument Control Point
258	457679.3571	3660626.740	Monument Control Point
259	457809.3494	3661148.940	Monument Control Point

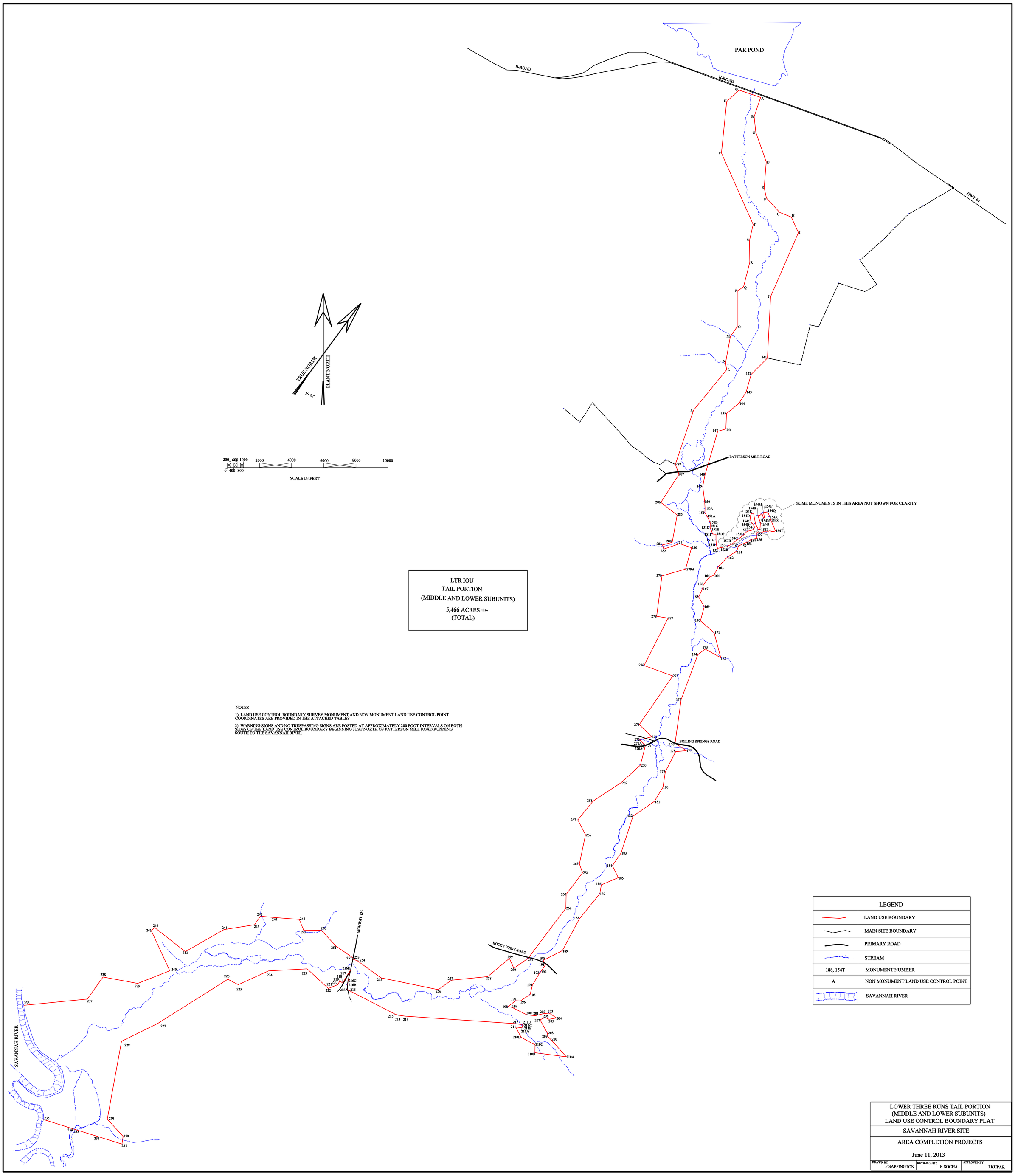
Table E-1 LTR IOU TAIL PORTION (MIDDLE AND LOWER SUBUNITS) Control Point / Monument Coordinates (continued)

LTR IOU TAIL PORTION (MIDDLE AND LOWER SUBUNITS) Control Point / Monument Coordinates			
Control Point / Monument Number	**UTM_27_E**	**UTM_27_N**	**Comments**
260	457987.8447	3661046.075	Monument Control Point
261	458094.5205	3661357.416	Monument Control Point
262	458114.1309	3662550.922	Monument Control Point
263	457963.9426	3662767.357	Monument Control Point
264	457975.4785	3663280.877	Monument Control Point
265	457827.7163	3663383.110	Monument Control Point
266	457595.132	3663897.914	Monument Control Point
267	457311.8387	3664039.441	Monument Control Point
268	457336.0849	3664496.109	Monument Control Point
269	457564.3204	3665106.580	Monument Control Point
270	457660.6374	3665581.591	Monument Control Point
270A	457522.909	3665924.975	Monument Control Point
271	457516.4962	3665940.288	Monument Control Point
271A	457498.562	3665943.173	Monument Control Point
272	457365.4422	3665962.470	Monument Control Point
273	457519.2151	3666141.835	Monument Control Point
274	457191.1291	3666190.570	Monument Control Point
275	457160.4794	3667310.637	Monument Control Point
276	456604.2547	3667149.690	Monument Control Point
277	456441.5223	3668146.650	Monument Control Point
278	456245.6998	3668047.572	Monument Control Point
279	455877.9935	3668724.575	Monument Control Point
280	456016.5527	3669488.343	Monument Control Point
281	455790.3082	3669418.116	Monument Control Point
282	455607.0098	3669158.327	Monument Control Point
283	455538.9949	3669204.669	Monument Control Point
284	455659.3446	3669354.322	Monument Control Point
285	455430.8787	3669829.550	Monument Control Point
286	455039.2811	3669841.850	Monument Control Point
287	455004.1966	3670475.963	Monument Control Point
288	454836.2178	3670587.227	Monument Control Point

Lower Three Runs Tail Portion

(Middle and Lower Subunits)

Land Use Control Boundary Plat


PAR POND
B-ROAD
B-ROAD
HWY 64
TRUE NORTH
PLANT NORTH
36° 22'
200 600 1000 2000 4000 6000 8000 10000
0 400 800
SCALE IN FEET
PATTERSON MILL ROAD
SOME MONUMENTS IN THIS AREA NOT SHOWN FOR CLARITY
BOILING SPRINGS ROAD
ROCKY POINT ROAD
HIGHWAY 125
SAVANNAH RIVER
LTR IOU
TAIL PORTION
(MIDDLE AND LOWER SUBUNITS)
5,466 ACRES +/-
(TOTAL)
NOTES
1) LAND USE CONTROL BOUNDARY SURVEY MONUMENT AND NON MONUMENT LAND USE CONTROL POINT COORDINATES ARE PROVIDED IN THE ATTACHED TABLES
2) WARNING SIGNS AND NO TRESPASSING SIGNS ARE POSTED AT APPROXIMATELY 200 FOOT INTERVALS ON BOTH SIDES OF THE LAND USE CONTROL BOUNDARY BEGINNING JUST NORTH OF PATTERSON MILL ROAD RUNNING SOUTH TO THE SAVANNAH RIVER
LEGEND
LAND USE BOUNDARY
MAIN SITE BOUNDARY
PRIMARY ROAD
STREAM
188, 154T MONUMENT NUMBER
A NON MONUMENT LAND USE CONTROL POINT
SAVANNAH RIVER
LOWER THREE RUNS TAIL PORTION
(MIDDLE AND LOWER SUBUNITS)
LAND USE CONTROL BOUNDARY PLAT
SAVANNAH RIVER SITE
AREA COMPLETION PROJECTS
June 11, 2013
DRAWN BY F SAPPINGTON
REVIEWED BY R SOCHA
APPROVED BY J KUPAR

LUCIP for the
C-Area Operable Unit Early Action (consists of Potential Release from C-Area Disassembly Basin, Potential Release from C-Area Reactor Cooling Water System, C-Area Cask Car Railroad Tracks as Abandoned, ECODS C-1, C-Area Process Sewer Lines as Abandoned)
Land Use Control Implementation Plan for the C-Area Operable Unit Early Action
SRNS-RP-2015-00034, Revision 1, September 2015

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United States Department of Energy

Savannah River Site

Early Action Land Use Control Implementation Plan for the C-Area Operable Unit (U)

CERCLIS Number: 79

SRNS-RP-2015-00034

Revision 1

September 2015

Prepared By:
Savannah River Nuclear Solutions, LLC
Savannah River Site
Aiken, SC 29808

Prepared for the U.S. Department of Energy Under Contract No. DE-AC09-08SR22470

DISCLAIMER

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LIST OF ABBREVIATIONS AND ACRONYMS

~	approximately
ACP	Area Completion Projects
ARAR	applicable, or relevant and appropriate requirement
CAOU	C-Area Operable Unit
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CM	contaminant migration
+D	plus daughters
D&D	deactivation and decommissioning
EACMIR/RACR	Early Action Corrective Measures Implementation Report / Remedial Action Completion Report
EALUCIP	Early Action Land Use Control Implementation Plan
EAROD	Early Action Record of Decision
ECODS	Early Construction and Operational Disposal Site
ERA	ecological risk assessment
FFA	Federal Facility Agreement
HH	human health
HHRA	human health risk assessment
km, km^2	kilometer, square kilometers
LUC	land use control
LUCAP	Land Use Control Assurance Plan
mi, mi^2	miles, square miles
NTCR	non-time critical removal
OU	operable unit
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PSA	Potential Source Area
PTSM	principal threat source material
QA	Quality Assurance
RCOC	refined constituent of concern
RCRA	Resource Conservation and Recovery Act
RG	remedial goal
SCDHEC	South Carolina Department of Health and Environmental Control
SDC	Site Development Control
SRNS	Savannah River Nuclear Solutions, LLC
SRS	Savannah River Site
TCR	total cumulative risk
U.S.	United States
USDOE	United States Department of Energy
USEPA	United States Environmental Protection Agency
WSRC	Washington Savannah River Company, LLC

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1.0 INTRODUCTION

This Early Action Land Use Control Implementation Plan (EALUCIP) has been prepared for the C-Area Operable Unit (CAOU) at the Savannah River Site (SRS). The CAOU comprises multiple subunits, Potential Source Areas (PSAs), and deactivation and decommissioning (D&D) facilities within C Area. Groundwater is not considered part of the scope of the CAOU. An Early Action Record of Decision (EAROD) documented the selection of an early action remedy to implement land use controls (LUCs) for portions of the CAOU (SRNS 2015). The purpose of this EALUCIP is to describe how the LUCs selected in the CAOU EAROD will be implemented and maintained. The LUC objectives have been documented in the CAOU EAROD and are listed in Section 3.0.

The selected remedy leaves hazardous substances in place that pose a potential future risk and will require land use restrictions until the concentrations of hazardous substances in the contaminated media (i.e., soil, gravel, concrete and steel) are at levels that allow for unrestricted use. As agreed on March 30, 2000, among the United States Department of Energy (USDOE), the United States Environmental Protection Agency (USEPA), and the South Carolina Department of Health and Environmental Control (SCDHEC), SRS is implementing a Land Use Control Assurance Plan (LUCAP) (WSRC 1999) to ensure that the LUCs required by numerous remedial decisions at SRS are properly maintained and periodically verified. The requirements of that LUCAP also apply to the LUCs that were selected as part of the early action remedy for the CAOU. This additional document, the CAOU EALUCIP, contains the detailed and specific measures required to implement and maintain the LUCs selected as part of this particular remedial decision. The LUCs shall be maintained until the operable unit (OU) is suitable for unlimited exposure and unrestricted use. Approval by USEPA and SCDHEC is required for any modification or termination of the LUCs.

USDOE is responsible for implementing, maintaining, monitoring, reporting, and enforcing the LUCs in accordance with the approved EALUCIP. Upon final approval, the EALUCIP will be appended to the LUCAP and should be considered incorporated by reference into the CAOU EAROD, establishing implementation and maintenance requirements for the LUCs under the

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the SRS Federal Facility Agreement (FFA) (FFA 1993). The EALUCIP will remain in effect unless and until modifications are approved by USEPA and SCDHEC as necessary for protection of human health (HH) and the environment. In accordance with Section 121(c) of CERCLA and National Oil and Hazardous Substances Pollution Contingency Plan §300.430(f)(5)(iii)(c), a statutory review will be conducted within five years of initiation of the remedial action, and every five years thereafter, to ensure that the remedy continues to be protective of HH and the environment. Any approved EALUCIP modification will be appropriately documented for incorporation by reference into the CAOU EAROD.

The format of this EALUCIP is consistent with the FFA protocol format approved by the USEPA and SCDHEC in March 2004.

2.0 OVERVIEW OF CAOU EARLY REMEDIAL ACTION

2.1 General Description and History of the CAOU

SRS occupies approximately (~) 802.9 km^2 (310 mi^2) of land adjacent to the Savannah River, principally in Aiken and Barnwell counties of South Carolina. SRS is located ~40.2-km (25-mi) southeast of Augusta, Georgia, and 32.1-km (20-mi) south of Aiken, South Carolina.

The CAOU is one of several OUs identified at SRS. It is located within the Fourmile Branch watershed (Figure 1). In 1955, C-Reactor began operations with a mission of producing nuclear materials for the defense program. SRS reactors were both low pressure and low temperature reactors with heavy water cooling of the core. C-Reactor was placed on cold standby in 1987, followed by shutdown due to reduced requirements for defense-related products. Reactor operations resulted in the generation of chemical and radioactive wastes. The C-Reactor is currently used as a storage site for tritiated-moderator water in tanks and for cask car refurbishment.

The CAOU is located in an area currently designated for industrial land use and is expected to remain industrial in the future. The *Early Action Record of Decision Remedial Alternative Selection for the C-, K-, L-, and R-Reactor Complexes* (SRNS 2009) selected in situ

decommissioning as the preferred end-state, with current LUCs in place for the C-Reactor Complex as specified by the *Early Action Land Use Control Implementation Plan (EALUCIP) for the C-, K-, and L-Reactor Complexes* (SRNS 2010).

Several CAOU subunits have undergone removal actions. Non-Time Critical Removal (NTCR) actions were completed for the C-Area Reactor Area Cask Car Railroad Tracks as Abandoned subunit and the C-Area Process Sewer Lines as Abandoned subunit in June 2011 and May 2012, respectively. A NTCR action was also completed for the C-Reactor (105-C) Disassembly Basin to evaporate the basin water and grout the basin to ground surface in September 2012. This NTCR action also included removal and evaporation of the tritiated water from the Containment Tank (C803-7-1). Upon future completion of ongoing missions at the C-Reactor Building Complex, the details of the final in situ decommissioning remedy will be selected in the final CAOU Record of Decision.

The CAOU subunits, PSAs, and D&D facilities are grouped based on potential future land use scenarios. Figure 2 identifies the subunits and the D&D facilities associated with the CAOU. The three D&D facilities (Air Compressor Building [607-9C], Effluent Monitoring Building [614-2C], and Gatehouse Entrance at Building 105 [701-2C]) are listed on Appendix K.2 and require no further action.

In addition, no action is required for the following subunits located outside the C Area perimeter fence line that have been determined to pose no threat to HH (residential and industrial) or the environment:

- Building 904-89G, Retention Basin for 100-C Containment (including Containment Tank C803-7-1 [no building number]); and
- Outfall C-01.

Groundwater is not part of the CAOU. Groundwater is being addressed separately under the C-Area Groundwater OU.

Subunits located within the C Area perimeter fence line were evaluated for industrial land use only since this area will not support unrestricted land use due to proximity to the reactor building complex. Therefore, all subunits inside the perimeter fence will require LUCs as part of any remedial decision to prevent unrestricted land use. For risk management purposes, subunits and PSAs outside the C Area perimeter fence were evaluated for both the industrial and residential land use scenarios since some of these units may be able to support unrestricted land use if residual risks do not pose a threat to HH and the environment.

The early remedial action selected in the EAROD is LUCs for the following subunits located within the C Area perimeter fence line to prevent unrestricted use and/or meet remedial goals (RGs):

- Building 717-C, Contaminated Maintenance Facility;
- C-Area Process Sewer Lines as Abandoned (including the Process Water Storage Tank [106-C], Cooling Water Effluent Sump [107-C], and Storage Basin [109-C]);
- C-Area Reactor Area Cask Car Railroad Tracks as Abandoned;
- Potential Release from C-Area Disassembly Basin (including the Pre-Manufactured Metal Shelter [710-C]); and
- Potential Release from C-Area Reactor Cooling Water System (186/190-C).

In addition, LUCs are the selected early remedial action at the following subunits located outside the C Area perimeter fence line to prevent unrestricted use and/or meet RGs:

- Early Construction and Operational Disposal Site (ECODS) C-1; and
- Outfall C-03.

2.2 Nature and Extent of Contamination in CAOU

A detailed description of the nature and extent of contamination associated with each of the CAOU subunits can be found in the *RCRA Facility Investigation / Remedial Investigation (RFI/RI) Report with Baseline Risk Assessment (BRA) and Focused Corrective Measures Study / Feasibility Study (CMS/FS) for the C-Area Operable Unit (U)* (SRNS 2014). Table 1

summarizes the results of the human health risk assessment (HHRA), ecological risk assessment (ERA), principal threat source material (PTSM) evaluation and contaminant migration (CM) to groundwater analysis and identifies refined constituents of concern (RCOCs) for each subunit that requires remedial action.

Subunits located inside the C Area perimeter fence line for which RCOCs were determined include:

- *Building 717-C, Contaminated Maintenance Facility:* surface concrete media, RCOCs identified for the future industrial worker scenario include cesium-137 and strontium-90, with a total cumulative risk (TCR) = 1.2E-05.

- *C-Area Cask Car Railroad Tracks as Abandoned:* surface soil/gravel media, cesium-137 identified as a RCOC for the future industrial worker scenario with a risk = 2.8E-06.

- *C-Area Process Sewer Lines as Abandoned*: potential exposure to fixed radiological contaminants within the subsurface pipelines (concrete/steel media).

The other subunits located within the current C Area perimeter fence line [i.e., Potential Release from C-Area Disassembly Basin and Potential Release from C-Area Reactor Cooling Water System (186/190-C)] were determined to have no problems warranting action under the industrial land use scenario. However, these subunits will be managed with LUCs because of their proximity to the C-Reactor Building (105-C).

Subunits located outside the perimeter fence line for which RCOCs were determined include:

- *ECODS C-1:* surface soil media, RCOCs identified for the future resident scenario include Aroclor 1254 and polycyclic aromatic hydrocarbons (PAHs) that include benzo(a)pyrene and benzo(b)fluoranthene, with a TCR = 2.2E-05. Aroclor 1254 was also identified as a RCOC for the future industrial worker scenario with a risk = 3.6E-06.

- *Outfall C-03:* surface soil media, cesium-137 identified as a RCOC for the future resident scenario with a risk = 1.9E-05 and the future industrial worker scenario with a risk = 1.2E-05.

No ecological or CM RCOCs were identified for any of the subunits that comprise the CAOU.

The following remedial action objectives were developed for CAOU:

- Prevent future resident exposure to contaminated media or structures located within the perimeter fence line.

- Prevent industrial worker exposure to cesium-137(+D) and strontium-90(+D) contaminated concrete that exceed 1E-06 risk levels at Building 717-C, Contaminated Maintenance Facility subunit.
- Prevent industrial worker exposure to fixed radiological contamination in concrete and/or steel inside the inactive C-Area Process Sewer Lines as Abandoned that exceeds a 1.0E-06 risk or PTSM levels.
- Prevent industrial worker exposure to cesium-137(+D) in rail bed gravels and soils that exceed 1E-06 risk levels at the C-Area Reactor Area Cask Car Railroad Tracks as Abandoned subunit.
- Prevent residential and industrial worker exposure to Aroclor 1254 in soils that exceed the polychlorinated biphenyl (PCB) applicable, or relevant and appropriate requirement (ARAR) and 1E-06 risk at ECODS C-1 subunit.
- Prevent residential exposure to PAHs in surface soil that exceed 1E-06 risk at ECODS C-1 subunit.
- Prevent residential and industrial worker exposure to cesium-137(+D) in surface soil at Outfall C-03 subunit.

The selected remedy for portions of the CAOU leaves hazardous substances that pose a potential future risk and will require land use restrictions until the concentrations of hazardous substances in the contaminated media (i.e., soil, gravel, concrete and steel) are at levels that allow for unrestricted use and exposure.

2.3 Early Remedial Action Selected

LUCs will be implemented to limit access to and the use of the contaminated portions of the CAOU so human exposure to contaminated media is controlled within acceptable limits for the industrial worker and/or future resident. LUCs do not remove or eliminate receptor exposure potential by removal or treatment of hazardous substances – only exposure is controlled. Through administrative and engineering controls, work activities are limited and controlled by the use of work clearance permits throughout the area of contamination. LUCs restrict access to, contact with, and excavation of the contaminated media. Warning signs will be posted informing personnel to contact the waste unit custodian prior to conducting work to prevent contact with hazardous substances. LUCs prevent the current and future industrial worker from being exposed to hazardous substances in the contaminated media. Deed restrictions will be in place to prevent future industrial uses that result in unacceptable exposure to contaminated media and to prohibit future residential housing, elementary and secondary schools, childcare facilities and playground uses of the property.

The post-early remedial action conceptual site model (Figure 3) demonstrates that the exposure pathways to an industrial worker are incomplete following implementation of the early action remedy. According to *the Savannah River Site Future Use Project Report* (USDOE 1996), residential use of SRS land is prohibited.

3.0 LAND USE CONTROL OBJECTIVES

The following CAOU LUC objectives have been developed to ensure the protectiveness of the remedy described above:

- Restrict unauthorized worker access to prevent contact, removal, or excavation of contaminated media (i.e., soil / gravel / concrete / steel).
- Prohibit the development and use of property for residential housing, elementary and secondary schools, child care facilities and playgrounds.

Current access controls and land transfer requirements needed to maintain the future land use are described in the following sections of this EALUCIP.

4.0 IMPLEMENTATION OF LAND USE CONTROLS

This section describes the LUCs selected in the EAROD to achieve the LUC objectives stated in Section 3.0. Table 2 contains a summary of the LUCs, including the purpose, duration, implementation, and affected areas. USDOE is responsible for implementing, maintaining, reporting on and enforcing the LUCs required for the CAOU. The EALUCIP will become enforceable and will be implemented when approved by USEPA and SCDHEC following the completion of the early remedial actions prescribed by the CAOU EAROD. USDOE shall notify USEPA and SCDHEC 60 days in advance of any proposed land use changes that are inconsistent with LUC objectives or the selected remedy.

The affected areas in the CAOU will be maintained as industrial use areas by implementation of the property record notices and restrictions (Section 4.1) and the LUC boundary map (Section 4.2).

The Site Use Program (Section 4.3) will be implemented to prevent onsite worker exposure to contamination left in place at the CAOU. Other existing measures (i.e. Site Clearance Program, worker training, health and safety requirements, work controls) will also be used to ensure worker safety at the CAOU. Physical access controls (Section 4.4) are implemented at the SRS boundary to control and restrict public and trespasser access to the CAOU.

Signs at the affected areas in the CAOU will be maintained to alert onsite workers to the presence of hazardous substances. The signs will also convey the restrictions of unauthorized personnel. Access control warning signs will be placed and maintained around the CAOU to prevent unknown entry and unrestricted use.

4.1 Property Record Notices and Restrictions

The term ‘Property Record Notice,’ as used in this LUCIP, refers to nonenforceable, information device(s) included in or recorded by USDOE along with a property transfer document(s) alerting anyone searching the records to important information about the contamination present in the CAOU, as depicted in Figure 4. The term ‘Deed Restriction,’ as used in this LUCIP, refers to conditions and/or covenants running with the land that restrict or prohibit certain uses of real

property as necessitated by residual contamination, and in accordance with federal and state law. In the long term, if the property, or any portion thereof, is ever transferred from USDOE, the U.S. Government and/or USDOE will take those actions necessary pursuant to Section 120(h)(1) of CERCLA. Those actions will include in any contract, deed, or other transfer document, notice of the type and quantity of any hazardous substances that were known to have been stored (for more than one year), released, or disposed of on the property. The notice will also include the time at which the storage, release, or disposal took place to the extent such information is available.

In addition, if the property, or any portion thereof, is ever transferred by deed, the U.S. Government will also satisfy the requirements of CERCLA 120(h)(3). The requirements include: a description of the remedial action taken, a covenant, and an access class. These requirements are also consistent with the intent of the Resource Conservation and Recovery Act (RCRA) deed notification requirements at final closure of a RCRA facility if contamination will remain at the unit.

LUCs will be implemented through the following:

- The contract, deed, or other transfer document shall also include restrictions to prevent future industrial uses that result in unacceptable exposure to contaminated media and to prohibit future residential housing, elementary and secondary schools, childcare facilities and playground uses of the property. If any portion of CAOU is transferred to non-federal ownership, the deed(s) (or other transfer document) will contain appropriate provisions to ensure that the use restrictions continue to run with the land and are enforceable by the USDOE against the Grantee (including any successors and/or assigns). The deed(s) will provide that any lease or subsequent deed executed by the Grantee for the parcel(s) within CAOU must include land use restrictions that are no less restrictive than the use restrictions described in this LUCIP. However, the need for these restrictions may be re-evaluated 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 re-evaluation

of the LUCs will be done through an amended EAROD with USEPA and SCDHEC review and approval.

- In addition, if the Site is ever transferred to nonfederal ownership, a survey plat of the OU depicting the areas subject to LUCs as indicated on Figure 4 will be prepared, certified by a professional land surveyor, and recorded with the appropriate county recording agency.

In the event of a property lease or interagency agreement, the equivalent restrictions will be implemented as required by CERCLA Section 120(h).

USDOE shall provide the USEPA and SCDHEC at least a six month notice prior to transfer or sale of property subject to LUCs to ensure that USEPA and SCDHEC can be involved in discussions to ensure that appropriate provisions are included in the transfer documents to maintain effective LUCs. If it is not possible for the USDOE to notify the USEPA and SCDHEC at least six months prior to the transfer or sale, then the facility will notify the USEPA and SCDHEC as soon as possible, but no later than 60 days prior to the transfer or sale of any property subject to LUCs. In addition to the land transfer notice and discussion provisions above, USDOE further agrees to provide the USEPA and SCDHEC with similar notice within the same time frames as to federal-to-federal transfer of property. The USDOE shall provide a copy of executed deed or transfer assembly to USEPA and SCDHEC.

4.2 LUC Boundary Maps

This LUCIP identifies the proposed areas under land use restrictions in Figure 4. Following field implementation of the early remedial action, a final (as-built) survey plat for each of these areas will be developed and certified by a professional land surveyor registered in the State of South Carolina. The final plat will include the boundary coordinates for the area subject to land use restrictions and general locations of access control warning signs. The final as-built survey plats will be submitted to USEPA and SCDHEC in the Early Action Corrective Measures Implementation Report / Remedial Action Completion Report (EACMIR/RACR).

In addition, if the Site is ever transferred to non-federal ownership, a certified survey plat of the OU will be prepared at or near the time of conveyance to support the EALUCIP required

restrictive covenants on land use and will be recorded with the appropriate county recording agency.

4.3 Site Use Program

Under USDOE Order 430.1A, *Life Cycle Management* (USDOE 1998), SRS is required to implement an asset management program for the use, maintenance, and disposal of physical assets, including real estate. SRS complies with this USDOE Order through the Site Use Program which is administered by Site Development Control (SDC) in accordance with SRS Manual 1D, *Site Infrastructure and Services Manual*, Procedure 3.02, "Site Real Property Configuration Control" (SRS 2006). Use of all lands and waters on the SRS are coordinated via the Site Use Program. No use of land (i.e., excavation or any other land use) shall be undertaken without prior approval by the USDOE and documented by a Site Use Permit.

SRS identifies all buildings, facilities, and FFA waste units on SRS site development maps that are maintained by SDC in accordance with SRS Manual 1D. If LUCs are required for an FFA waste unit, the unit-specific LUC boundaries are identified on the SRS site development maps. SDC must verify that any proposed work to be performed on a site is sanctioned by a Site Use Permit and verify that the proposed activity does not conflict with any previously approved land use.

In addition to the management of the use of SRS lands and waters through the Site Use Program, the SDC also administers the Site Clearance Program to control the construction, alteration, or demolition activities at SRS. Before any work that adds or modifies features or facilities portrayed on the SRS Site development maps is conducted, a Site Clearance Permit is required. USDOE approval of the intended land via a Site Use Permit must be verified before a Site Clearance Permit is issued. If a Site Clearance request potentially impacts a FFA waste unit, the Site Clearance Request Form is sent to the appropriate FFA reviewer for approval. The FFA reviewer will evaluate the proposed activity to identify any conflicts with the waste unit and to verify that waste unit specific LUCs are not compromised. The roles and responsibilities of the individuals responsible for review and approval of Site Use and Site Clearance permits are

detailed in SRS Manual 1D, Procedure 3.02. All employees, contractors, and visitors at SRS are required to adhere to the Site Use Program and the Site Clearance Program.

The USDOE will notify USEPA and SCDHEC in advance of any change to any internal procedure, including the Site Use Program, which would affect implementing or maintaining the LUCs. Approval by USEPA and SCDHEC is required for any modification or termination of the LUCs and implementation actions, and the USDOE must obtain prior approval from USEPA and SCDHEC before taking any anticipated action that may disrupt the effectiveness of the LUCs or alter or negate the need for LUCs. The Site Use Permit and site development maps must be amended when the geographic configuration or buffer zone used to establish the permit boundary changes or there is a change to the land use. The processes are controlled within the SRS Quality Assurance (QA) Program in accordance with SRS 1Q Manual, *Quality Assurance* (SRS 2007). The SRS QA Program governs all SRS activities.

4.4 Physical Access Controls

There are no physical access controls, including fencing, required at the affected areas of the CAOU. Physical access controls are provided at the SRS boundary as mentioned in Table 2, Item 5.

4.5 Warning Signs

To prevent unknowing entry and to ensure that unrestricted use of the waste unit does not occur while the unit is under ownership of the USDOE, access control warning signs as shown in Appendix A will be posted at the unit. Approximate sign locations for the affected CAOU areas are indicated in Figure 4. Warning signs will not be posted on a portion of the west side of the Outfall-C-03 subunit since this area is not accessible due to the steep terrain. Installation of the access control warning signs will follow the CAOU construction schedule as identified in the CAOU EAROD with an early remedial action start date of January 5, 2016. In addition, the final placement of the signage will be documented in the EACMIR/RACR. The signs will be legible for a distance of at least 7.6 meters (25 feet).

Custodial responsibilities for maintenance and inspection of the CAOU will be maintained by the SRS Post-Closure Maintenance Group.

4.6 Other Access Controls and Security/Surveillance Measures

While under the ownership of USDOE, access control of the entire SRS will be maintained in accordance with the 2013 RCRA Permit Renewal Application, Volume I, Section F.1. 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 access control warning signs (R.61-79.264.14(c)) in place at the SRS boundary to comply with the security requirements for a RCRA-permitted facility.

4.7 Field Inspection and Maintenance for Land Use Controls

After remediation of the CAOU, only inspection and maintenance activities will be required by this early remedial action.

The affected areas of the CAOU will be inspected per the Field Inspection Checklist in Appendix B. Field inspections will be performed annually. Additional inspections may be necessary in the event of unusual weather or any other condition warranting inspection. Inspections will be performed to ensure that access control signs are in place and undamaged. Necessary repairs will be performed for items in Appendix B that are found to be in unsatisfactory condition.

Any activity that is inconsistent with the LUC objectives or use restrictions, or any other action that may interfere with the effectiveness of the LUCs will be addressed by the USDOE as soon as practicable, but in no case will the process be initiated later than 10 days after the USDOE becomes aware of the breach. The USDOE will notify USEPA and SCDHEC as soon as practicable, but no longer than 10 days after discovery of any activity that is inconsistent with the LUC objectives or use restrictions, or any other action that may interfere with the effectiveness of the LUCs. The USDOE will notify USEPA and SCDHEC regarding how the USDOE has addressed or will address the breach within 10 days of sending USEPA and SCDHEC notification of the breach.

The FFA Annual Progress Report, submitted to the regulatory agencies by USDOE, will provide the status of the LUCs and describe how any LUC deficiencies or inconsistent uses have been addressed. In the event of property transfer or lease, the annual report will cite findings on the following: whether the use restrictions and controls referenced above were communicated in the deed(s) or lease restrictions; whether property use conforms with the deed or lease restrictions and controls; and whether the owners and state/local agencies have been notified regarding the deed or lease restrictions and controls. The FFA Annual Progress Report(s) will be used in the preparation of the Five-Year Remedy Review Report(s) to evaluate the effectiveness of the remedy.

All other routine maintenance activities will be documented and maintained in files subject to USEPA and SCDHEC review and audit. A copy of the completed inspection form is maintained in the Area Completion Projects (ACP) Document Control. The LUCs shall be maintained until the concentration of hazardous substances associated with the unit have been reduced to levels that allow for unlimited exposure and unrestricted use.

The waste unit inspectors are to be trained in Hazardous Waste Operations and Emergency Response RCRA Well Inspections (ACP-specific training), ACP RCRA Waste Unit Inspections, Radiological Worker Training, etc., as applicable for the specific inspection. They will also be trained based on the individual requirements of the regulatory approved closure documents for each waste unit. In addition, the inspectors are to attend yearly refresher courses. Over the years, different personnel may conduct the inspections and maintenance activities.

This unit-specific EALUCIP, including the checklist (Appendix B), will be appended to the SRS LUCAP upon final regulatory approval. After completion of the EACMIR/RACR, the preliminary checklist in the LUCAP will be replaced with the final approved checklist.

5.0 REFERENCES

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

SRNS, 2009. *Early Action Record of Decision Remedial Alternative Selection for the C-, K-, L-, and R-Reactor Complexes (U),* SRNS-RP-2009-00707, Revision 1, September 2009, Savannah River Nuclear Solutions LLC, Savannah River Site, Aiken, SC

SRNS, 2010. *Early Action Land Use Control Implementation Plan (EALUCIP) for the C-, K-, and L- Reactor Complexes (U),* SRNS-RP-2009-01470, Revision 1, May 2010, Savannah River Nuclear Solutions LLC, Savannah River Site, Aiken, SC

SRNS, 2014. *RCRA Facility Investigation / Remedial Investigation (RFI/RI) Report with Baseline Risk Assessment (BRA) and Focused Corrective Measures Study / Feasibility Study (CMS/FS) for the C-Area Operable Unit (U),* SRNS-RP-2013-00456, Revision 1, May 2014, Savannah River Nuclear Solutions, LLC, Savannah River Site, Aiken, SC

SRNS, 2015. *Early Action Record of Decision Remedial Alternative Selection for the C-Area Operable Unit (U),* SRNS-RP-2014-00836, Revision 1, May 2015, Savannah River Nuclear Solutions, LLC, Savannah River Site, Aiken, SC

SRS, 2006. SRS Procedure Manual 1D, *Site Infrastructure and Services Manual (U)*, Procedure 3.02, “Site Real Property Configuration Control," Savannah River Site, Aiken, SC

SRS, 2007. SRS Procedure Manual 1Q, *Quality Assurance (U)*, Savannah River Site, Aiken, SC

USDOE, 1996. *Savannah River Site Future Use Project Report*, Stakeholder-Preferred Recommendations for SRS Land and Facilities, USDOE Savannah River Operations Office, January

USDOE, 1998. DOE Order 430.1A, *Life Cycle Management* (Approved October 14, 1998)

WSRC, 1999. *Land Use Control Assurance Plan for the Savannah River Site*, WSRC-RP-98-4125, Revision 1.1, August 1999, latest update, Savannah River Nuclear Solutions, LLC, Savannah River Site, Aiken, SC

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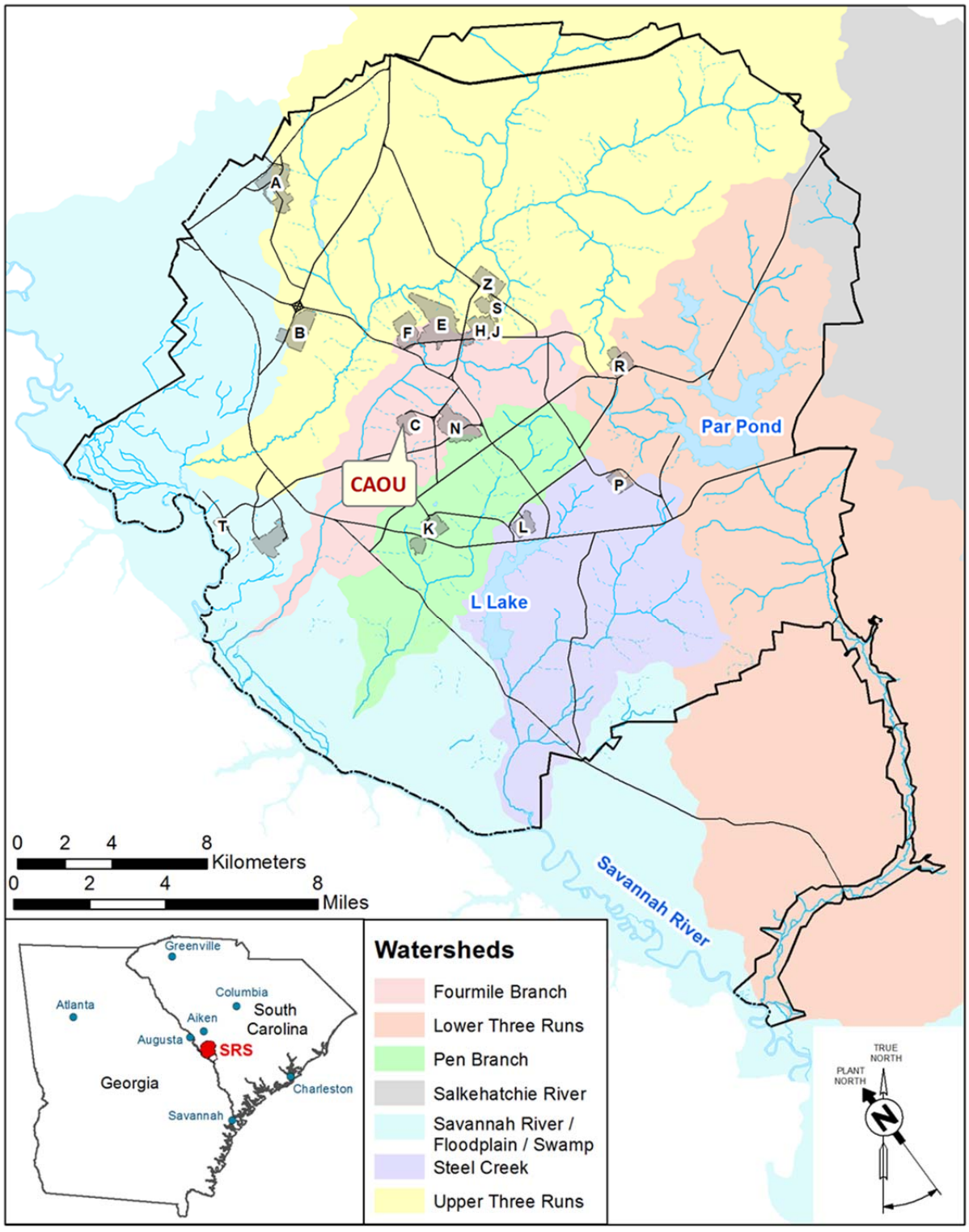


Figure 1. Location of the CAOU within the Savannah River Site

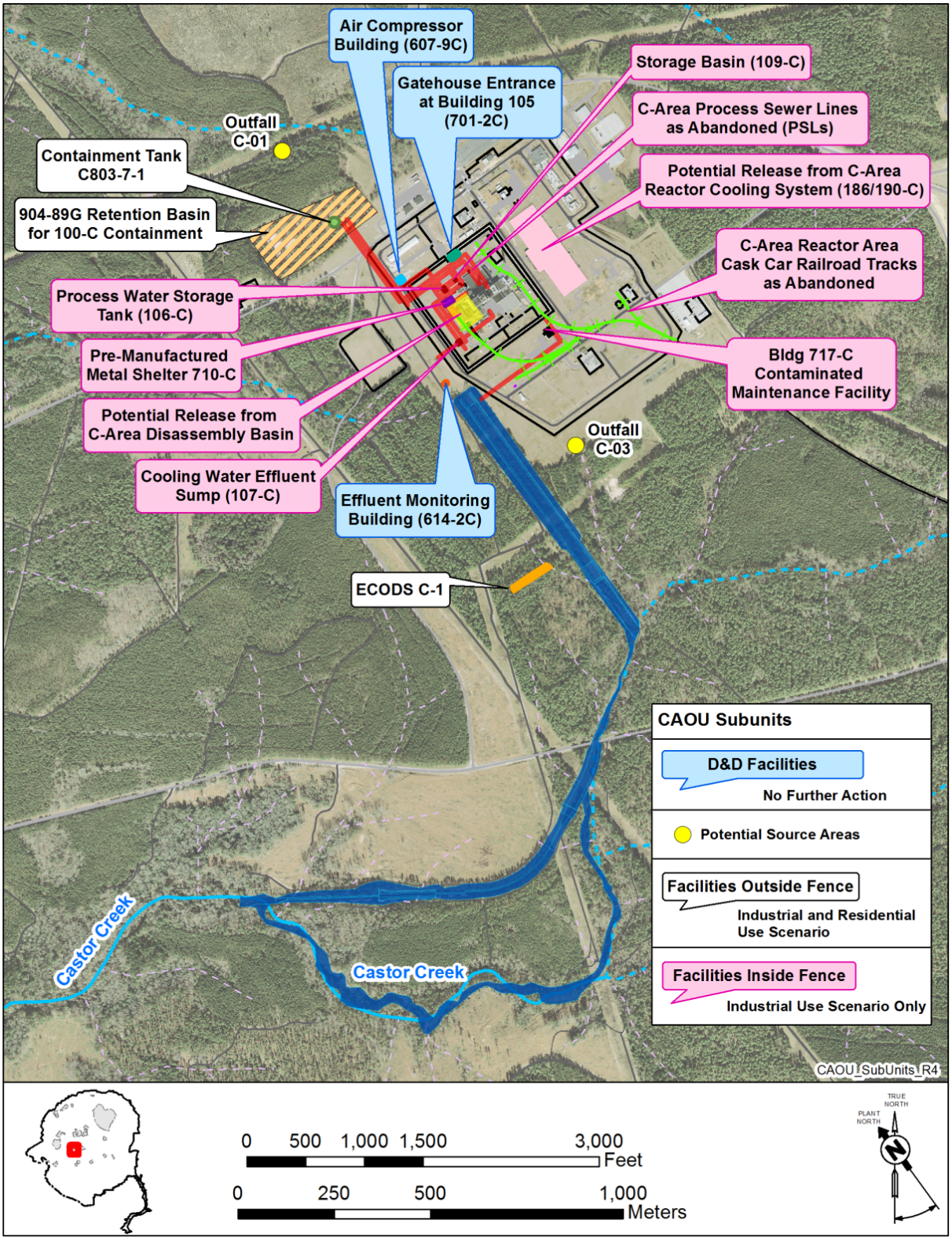
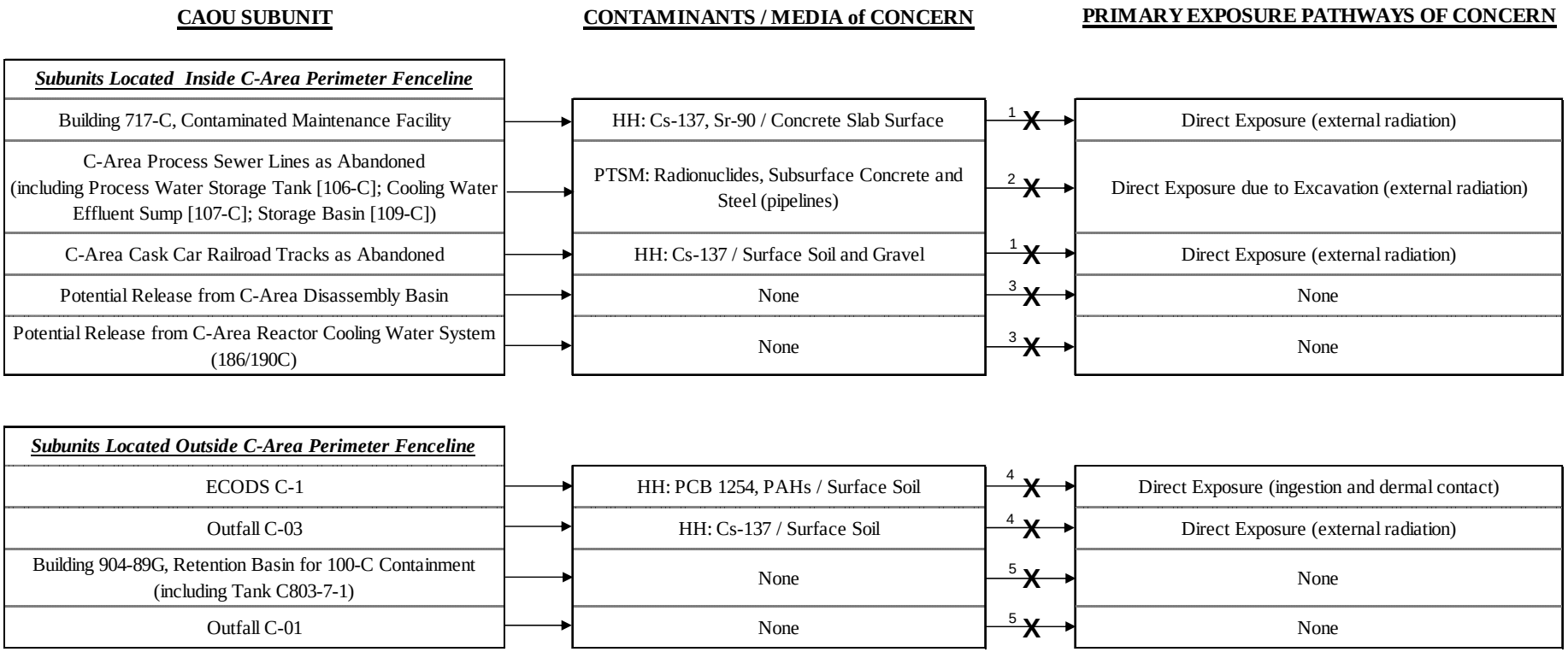


Figure 2. Location of the CAOU Subunits



HH = human health risk assessment
PTSM = principal threat source material
1 - COCs identified based on an evaluation of the industrial land use scenario; CAOU Land Use Controls required to prevent land disturbance activities and unrestricted land use.
2 - Radionuclides qualitatively identified as PTSM due to fixed contamination inside buried pipelines; CAOU Land Use Controls required to prevent land disturbance activities and unrestricted land use.
3 - No COCs identified based on an evaluation of the industrial land use scenario; CAOU Land Use Controls required to prevent unrestricted land use.
4 - COCs identified based on an evaluation of the residential and industrial land use scenarios; CAOU Land Use Controls required to prevent land disturbance activities and unrestricted land use.
5 - No COCs identified based on either the residential or industrial land use scenario; Land Use Controls are not required and unrestricted use is permitted (No Action).

Figure 3. Post-Early Remedial Action Conceptual Site Model for the CAOU

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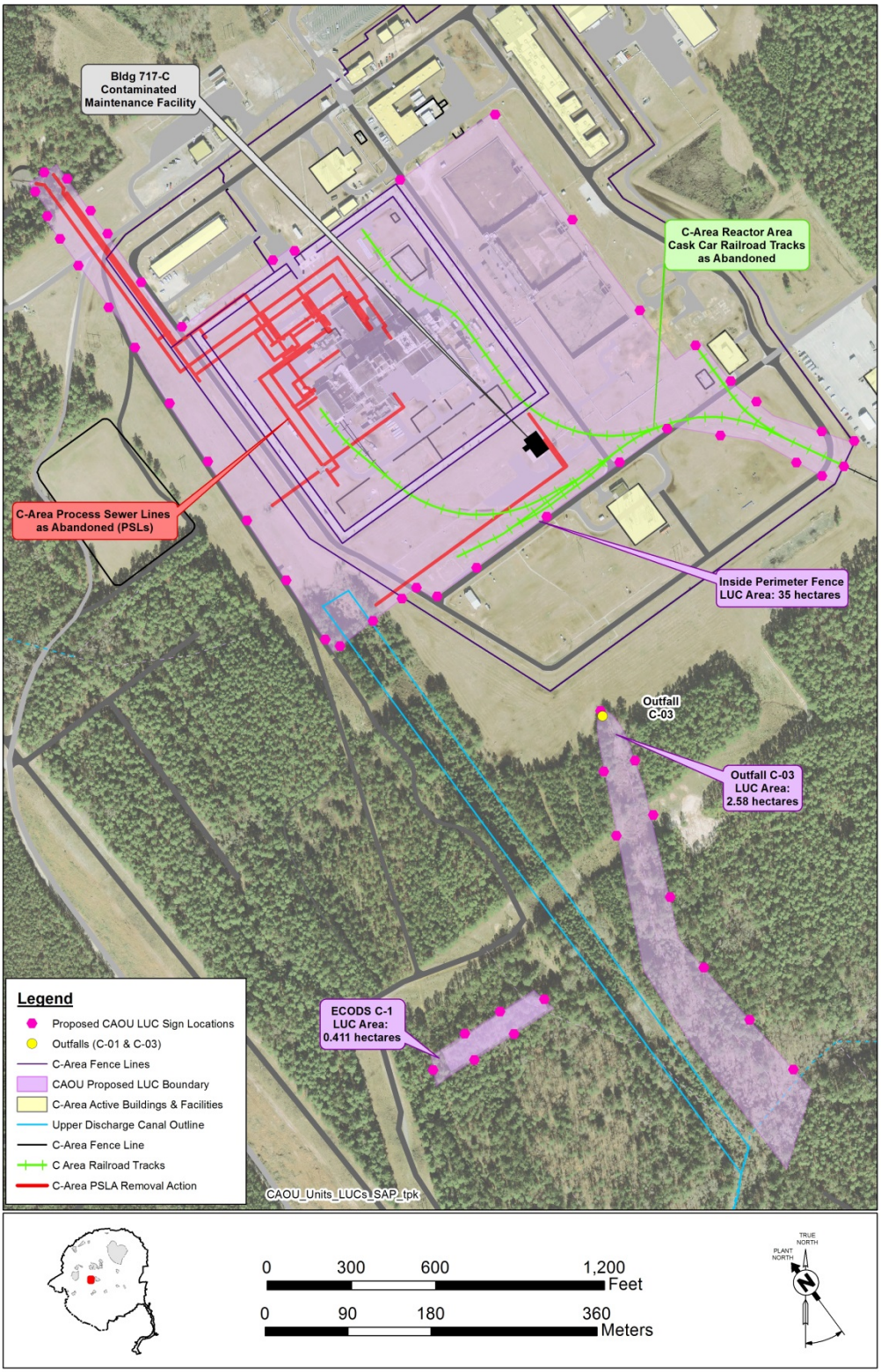

Figure 4. Approximate LUC Boundaries for CAOU Subunits

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Table 1. CAOU Risk Summary

Subunit	Media	ARAR[1]	PTSM[2]	HHRA[3]	ERA[4]	CM[5]
Building 717-C, Contaminated Maintenance Facility	Soil	None	None	*Resident*: NC *Worker:* None	NC	None
	Concrete	None	None	*Resident:* NC *Worker*: **Cs-137 (risk = 9.3E-06); Sr-90 (risk = 2.2E-06); TCR = 1.2E-05**	NC	None
C-Area Process Sewer Lines as Abandoned	Concrete / Steel	None	**Radionuclides**[6]	*Resident:* NC *Worker*: None (potential risk to fixed radiological contamination)	NC	None
C-Area Reactor Area Cask Car Railroad Tracks as Abandoned	Soil/Gravel	None	None	*Resident:* NC *Worker:* **Cs-137 (risk = 2.8E-06)**	NC	None
Potential Release from C-Area Disassembly Basin	Soil	None	None	*Resident:* NC *Worker*: None	NC	None
Potential Release from C-Area Reactor Cooling Water System (186/190C)	Soil/Sediment	None	None	*Resident*: NC *Worker:* None	NC	None
	Surface Water	None	None	*Resident:* NC *Worker:* None	NC	NC
Building 904-89G, Retention Basin for 100-C Containment	Soil	None	None	*Resident:* None *Worker:* None	None	None
ECODS C-1	Soil	**PCB 1254**	None	*Resident:* **PCB 1254 (risk = 1.2E-05); Benzo(a) pyrene (risk = 8.5E-06); Benzo(b)fluoranthene (risk = 1.5E-06); TCR = 2.2E-05** *Worker:* **PCB 1254 (risk = 3.6E-06)**	None	None
Outfall C-01	Soil	None	None	*Resident:* None *Worker:* None	None	None
Outfall C-03	Soil	None	None	*Resident:* **Cs-137 (risk = 1.9E-05)** *Worker:* **Cs-137 (risk = 1.2E-05)**	None	None

1 - ARAR = applicable or relevant and appropriate requirement
2 - PTSM = principal threat source material evaluation
3 - HHRA = human health risk assessment
4 - ERA = ecological risk assessment
5 - CM = contaminant migration analysis
6 - radionuclides qualitatively identified as PTSM due to fixed contamination inside the pipelines

NC = not calculated for this receptor or this media- for the HHRA, a quantitative residential evaluation was not required for the subunits inside the fence. For the ERA, a quantitative evaluation was not performed for the subunits located inside the fence because the exposure pathways were considered incomplete for wildlife receptors.
TCR = total cumulative risk

Table 2. Land Use Controls for the CAOU

Type of Control	Purpose of Control	Duration	Implementation	Affected Areas[a]
1. Property Record Notices[b]	Provide notice to anyone searching records about the existence and location of contaminated areas.	Until the concentration of hazardous substances associated with the unit have been reduced to levels that allow for unlimited exposure and unrestricted use.	Notice recorded by USDOE in accordance with state laws at County Register of Deeds office if the property or any portion thereof is ever transferred to non-federal ownership.	Waste management areas/subunits identified in this EALUCIP where hazardous substances are left in place at levels requiring land use restrictions.
2. Property record restrictions[c]: A. Land Use	Restrict use of property by imposing limitations.	Until the concentration of hazardous substances associated with the unit have been reduced to levels that allow for unlimited exposure and unrestricted use.	Drafted and implemented by USDOE upon any transfer of affected areas. Recorded by USDOE in accordance with state law at County Register of Deeds office.	Waste management areas/subunits identified in this EALUCIP where hazardous substances are left in place at levels requiring land use restrictions.
3. Other Notices[d]	Provide notice to city and/or county about the existence and location of waste disposal and residual contamination areas for zoning/planning purposes.	Until the concentration of hazardous substances associated with the unit have been reduced to levels that allow for unlimited exposure and unrestricted use.	Notice recorded by USDOE in accordance with state laws at County Register of Deeds office if the property or any portion thereof is ever transferred to non-federal ownership.	Waste management areas/subunits identified in this EALUCIP where hazardous substances are left in place at levels requiring land use restrictions.
4. Site Use Program[e]	Provide notice to worker/developer (i.e., permit requestor) on extent of contamination and prohibit or limit excavation/penetration activity.	As long as property remains under USDOE control.	Implemented by USDOE and Site contractors. Initiated by permit request.	Waste management areas/subunits identified in this EALUCIP where hazardous substances are left in place at levels requiring land use restrictions.
5. Physical Access Controls[f] (e.g., fences, gates, portals)	Control and restrict access to workers and the public to prevent unauthorized access.	Until the concentration of hazardous substances associated with the unit have been reduced to levels that allow for unlimited exposure and unrestricted use.	Controls maintained by USDOE.	Fencing and security is provided at SRS Site boundaries in accordance with SRS procedures. Additional physical access controls, including fencing, is not required at the affected areas of the CAOU.

Table 2. Land Use Controls for the CAOU *(Continued/End)*

Type of Control	Purpose of Control	Duration	Implementation	Affected Areas[a]
6. Warning Signs[g]	Provide notice or warning to prevent unauthorized uses.	Until the concentration of hazardous substances associated with the unit have been reduced to levels that allow for unlimited exposure and unrestricted use.	Signage maintained by USDOE.	Warning signs will be posted in accordance with applicable Site procedures and will be placed in appropriate areas at the CAOU.
7. Security Surveillance Measures	Control and monitor access by workers/public.	Until the concentration of hazardous substances associated with the unit have been reduced to levels that allow for unlimited exposure and unrestricted use.	Established and maintained by USDOE. Necessity of patrols evaluated upon completion of remedial actions or property transfer.	Patrol of waste management areas/subunits identified in this EALUCIP, as necessary.

[a]Affected areas – Specific locations identified in the OU-specific EALUCIP.
[b]Property Record Notices – Refers to any non-enforceable, purely informational document recorded along with the original property acquisition records of USDOE and its predecessor agencies that alerts anyone searching property records to important information about residual contamination; waste disposal areas in the property.
[c]Property Record Restrictions – Includes conditions and/or covenants that restrict or prohibit certain uses of real property and are recorded along with original property acquisition records of USDOE and its predecessor agencies.
[d]Other Notices – Includes information on the location of waste disposal areas and residual contamination depicted on as survey plat, which is provided to a zoning authority (i.e., city planning commission) for consideration in appropriate zoning decisions for non-USDOE property.
[e]Site Use Program – Refers to the internal USDOE/USDOE contractor administrative program(s) that requires the permit requestor to obtain authorization, usually in the form of a permit, before beginning any excavation/penetration activity (e.g., well drilling) for the purpose of ensuring that the proposed activity will not affect underground utilities/structures, or in the case contaminated soil or groundwater, will not disturb the affected areas without the appropriate precautions and safeguards.
[f]Physical Access Controls – Physical barriers or restrictions to entry.
[g]Signs – Posted command, warning or direction.

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APPENDIX A

ACCESS CONTROL WARNING SIGNS

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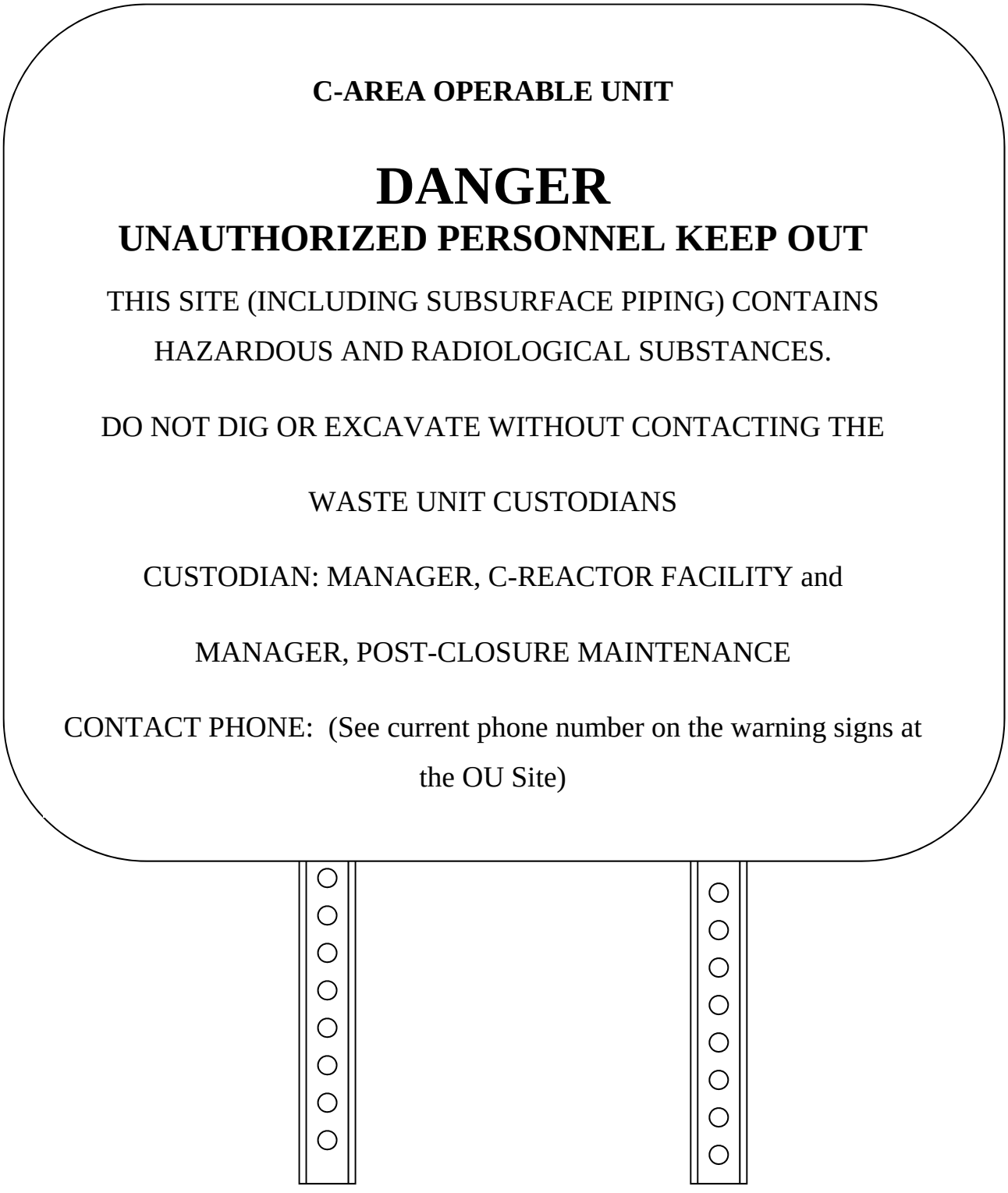

Figure A-1. Access Control Warning Sign for the CAOU Subunits

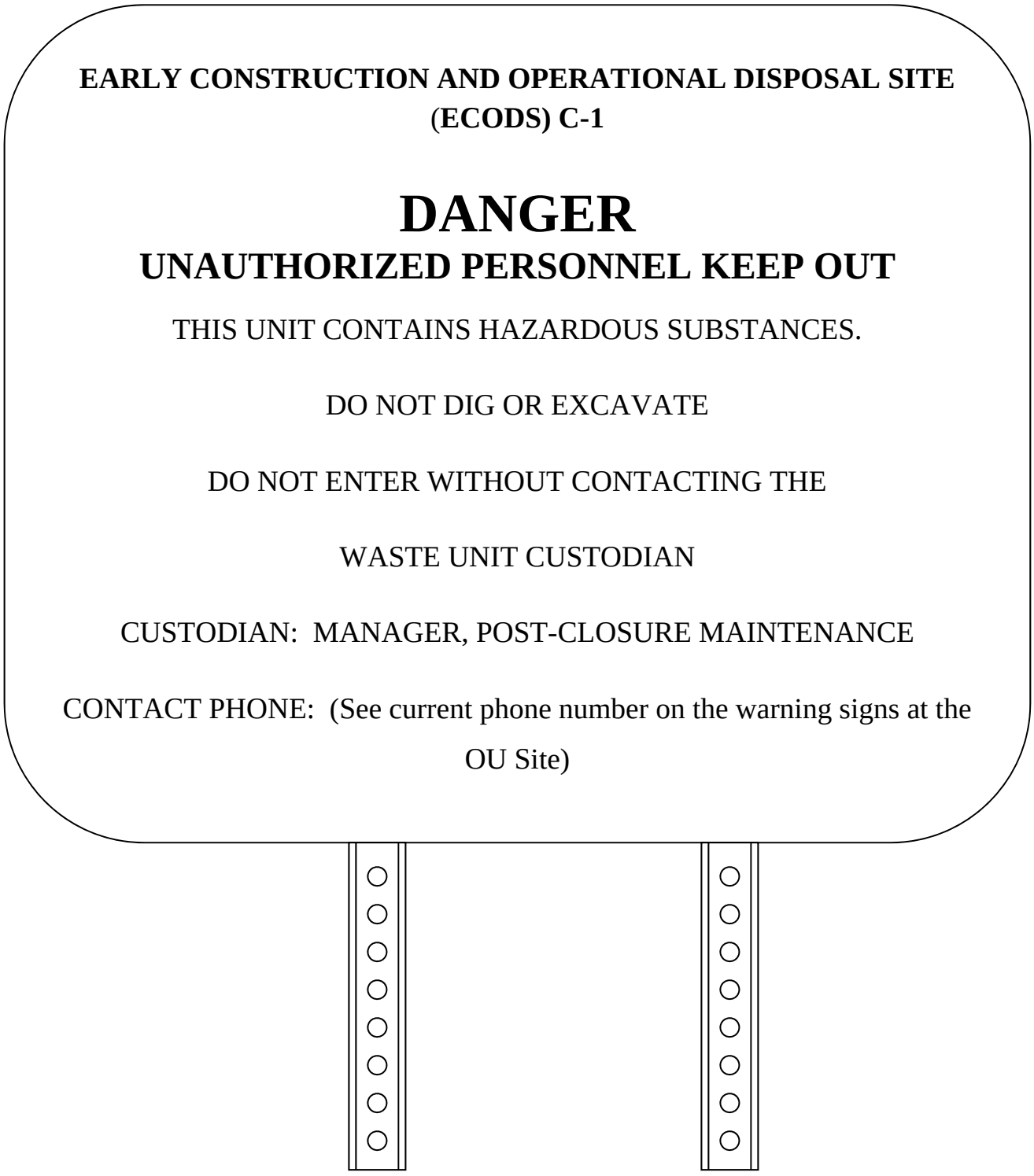

Figure A-2. Access Control Warning Sign for ECODS C-1

Figure A-3. Access Control Warning Sign for Outfall C-03

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APPENDIX B

FIELD INSPECTION CHECKLIST

FOR C-AREA OPERABLE UNIT

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FIELD INSPECTION CHECKLIST

FOR C-AREA OPERABLE UNIT

☐ **SCHEDULED** ☐ **UNSCHEDULED**

A= Satisfactory X= Unsatisfactory (Explanation required)	A or X	Observation of Corrective Action Taken
1. Verify that the roads are accessible.		
2. Verify that the waste unit signs are in acceptable condition, have the correct information, and are legible from a distance of 25 feet.		
3. Verify that there are no unauthorized excavation, digging, or construction activities within the boundaries.		

Inspected by:

_____/_____ Date:_____
(Print Name) (Signature)

Post-Closure Manager:

_____/_____ Date:_____
(Print Name) (Signature)

CAUTION: The inspector shall notify the Post-Closure Manager (PCM) and Environmental Compliance Authority (ECA) **IMMEDIATELY** if there has been a breach or compromise of the land use controls of this waste unit. The notification shall be in accordance with SRS post-closure inspection procedures.

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