United States Department of Energy

Savannah River Site

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

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ERRATA SHEET

Early Action Land Use Control Implementation Plan (EALUCIP) for the D-Area Operable Unit (DAOU) (U), SRNS-RP-2011-01166, Revision 0, July 2011

Replacement of the following pages is necessary to correct two figures in the regulatory approved Revision 0 document.

Change Pages	Reason for Change
Cover Page: Replace cover page with new cover page reflecting "Revision 0 (corrected)"	The revised cover page indicates that a correction was made.
Table of Contents, Page iii of vi: Replace Table of Contents page with new page that reflects "Rev.0 (corrected)" in the header.	Corrected Table of Contents page reflects the revised figure names for Figure 2 and Figure 3, correct page number for Table 1, and corrected titles for Appendix A and Appendix B.
Page 23: Replace "Figure 2. Site Areas and Subunits In and Around the DAOU" with "Figure 2. Site Areas and Subunits In and Around the DAOU (corrected)."	The revised figure correctly depicts the land use control boundary to include the D Area Inactive Process Sewer Lines (DIPSL) subunit.
Page 25: Replace "Figure 3. Early Action LUC Boundary Map" with "Figure 3. Early Action LUC Boundary Map (corrected)."	The revised figure correctly depicts the land use control boundary to include the D Area Inactive Process Sewer Lines (DIPSL) subunit.

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LIST OF ABBREVIATIONS AND ACRONYMS

ac	acre
ARAR	applicable or relevant and appropriate requirement
ARRA	American Recovery and Reinvestment Act
BRA	Baseline Risk Assessment
CA	Cost Analysis
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
cm	centimeter
CM	contaminant migration
CMI	Corrective Measures Implementation
CMI/RAIP	Corrective Measures Implementation Remedial Action Implementation Plan
CPRB	Coal Pile Runoff Basin
CSM	conceptual site model
DAOU	D-Area Operable Unit
DHWF	D-Area Heavy Water Facility
DIPSL	D-Area Inactive Process Sewer Line
EA	Early Action
EALUCIP	Early Action Land Use Controls Implementation Plan
EAROD	Early Action Record of Decision
EE	Engineering Evaluation
ERA	ecological risk assessment
FFA	Federal Facility Agreement
FS	Feasibility Study
ft	feet
EE/CA	Engineering Evaluation/Cost Analysis
GMZA	Groundwater Mixing Zone Application
ha	hectare
HAZWOPER	Hazardous Waste Operations and Emergency Response
HHRA	human health risk assessment
in	inch
IOU	Integrated Operable Unit
km	kilometer
LLC	Limited Liability Company
LUC	Land Use Controls
LUCAP	Land Use Controls Assurance Plan
LUCIP	Land Use Controls Implementation Plan

LIST OF ABBREVIATIONS AND ACRONYMS *(Continued/End)*

m	meter
mi	mile
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
OU	operable unit
PAH	polycyclic aromatic hydrocarbon
PCE	tetrachloroethylene
PCR	Post-Construction Report
PTSM	principal threat source material
QA	Quality Assurance
RAIP	Remedial Action Implementation Plan
RAO	remedial action objective
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
RFI/RI	RCRA Facility Investigation/Remedial Investigation
RG	remedial goal
RI	Remedial Investigation
ROD	Record of Decision
RSER	Removal Site Evaluation Report
SB/PP	Statement of Basis/Proposed Plan
SCDHEC	South Carolina Department of Health and Environmental Control
SCHWMR	South Carolina Hazardous Waste Management Regulations
SDC	Site Development Control
SE	Site Evaluation
SRFS	Savannah River/Floodplain/Swamp
SRNS	Savannah River Nuclear Solutions, LLC
SRS	Savannah River Site
SVE	Soil Vapor Extraction
USDOE	United States Department of Energy
USEPA	United States Environmental Protection Agency
UST	underground storage tank
VOC	volatile organic compound
WOF	Waste Oil Facility
WP	Work Plan
WSRC	Washington Savannah River Company, LLC (October 2005 to present)
WSRC	Westinghouse Savannah River Company, LLC (before October 2005)

1.0 INTRODUCTION

This Early Action Land Use Control Implementation Plan (EALUCIP) has been prepared for D-Area Operable Unit (DAOU) at the Savannah River Site (SRS). The DAOU is comprised of multiple subunits and includes both deactivation and decommissioning (D&D) facilities and active facilities associated with the operation of the 484-D Powerhouse. The DAOU is approximately 85 hectare (ha) (210 acres [ac]). Groundwater is not considered part of the scope of the DAOU. An Early Action Record of Decision (EAROD) documented the selection of an early action remedy to implement land use controls (LUCs) for completed DAOU subunits (SRNS 2011). The purpose of this EALUCIP is to describe how the LUCs selected in the DAOU EAROD will be implemented and maintained. The early action LUC objectives have been documented in the DAOU 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 soil 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, 2009) 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 DAOU. This additional document, the DAOU 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 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 DAOU 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 (NCP) §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 DAOU 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 EARLY REMEDIAL ACTION

2.1 General Description and History of the DAOU

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 (Figure 1). SRS is located approximately 40.2 km (25 mi) southeast of Augusta, Georgia, and 32.1 km (20 mi) south of Aiken, South Carolina.

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 DAOU is located in the southwest quadrant of the SRS, approximately 914 m (3,000 ft) east of the nearest site boundary, the Savannah River (see Figure 1). The DAOU is approximately 85 ha (210 ac) and is composed of multiple subunits and includes both D&D facilities and active facilities associated with the operation of the 484-D Powerhouse as identified in Figure 2.

Regulatory decisions (i.e., early removal actions) were previously made for the Bubble Tower Subunit, the Moderator Processing Subunit, the Powerhouse Subunit, and Miscellaneous Units and documented in their Action Memorandums. Cleanup goals established for the DAOU subunits (including goals identified for the early removal actions) are based on industrial land use. Therefore, hazardous substances will remain at the DAOU at levels that pose a threat to human health and prevent unrestricted land use. The response action selected in the EAROD for a portion of DAOU is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

During a teleconference held on September 15, 2010, SCDHEC identified a problem with proceeding with a final ROD for the DAOU given that the 484-D Powerhouse would still be operational after approval of the ROD. Therefore, the Core Team agreed to instead pursue an EAROD. Pursuing an EAROD would allow the project to remain on track and achieve the targeted footprint reduction. The scope of the EAROD would cover LUCs of completed subunits and areas. The final ROD would cover LUCs for all remaining subunits and areas. Specifically, the remedial decision for the 484-D Powerhouse building and ancillary subunits are not included in the early action LUCs for DAOU. Final LUCs required for the 484-D Powerhouse building and associated facilities will be addressed by the appropriate remedial decision after operational closure of the Powerhouse building is complete. Table 1 provides a summary of administrative paths for subunits and areas in and around DAOU, as established in the EAROD (SRNS 2011).

2.2 Nature and Extent of Contamination

A complete site history for each DAOU subunit is documented in the RCRA Facility Investigation/Remedial Investigation (RFI/RI) Work Plan (WP) and Baseline Risk Assessment (BRA) for the DAOU (SRNS 2009a). A summary of the nature and extent of contamination for the DAOU subunits selected for early remedial action as identified in Table 1 is presented below.

Bubble Tower Subunit

The Bubble Tower Subunit is approximately 38 ha (95 ac) and consists of the D-Heavy Water Facility (DHWF), Firefighting Training Facility, and the 717-D Maintenance Facility. The RFI/RI/BRA determined that the DHWF and Firefighting Training Facility pose no threat to future industrial workers or ecological receptors, no contaminant migration (CM) threat, and no constituents identified as PTSM. However, tetrachloroethylene (PCE) was identified as a CM refined constituents of concern (RCOCs) in the vicinity of the 717-D Maintenance Facility. The contaminated area is approximately 11,000 ft^2 and a volume of 4,033 yd^3 of contaminated soil.

The volatile organic compound (VOC) contaminated soil is being addressed as an early removal action (USDOE 2009a) with the installation of eleven MicroBlower™-equipped soil vapor extraction (SVE) systems. The MicroBlower™ system is anticipated to operate for less than a decade to achieve the remedial goals. Additional details of this selected alternative can be found in the Removal Site Evalution Report/Engineering Evaluation/Cost Analysis (RSER/EE/CA) for the VOC-contaminated soil at the Bubble Tower Subunit (SRNS 2009c). The PCE contamination is being addressed with SVE as an early removal action. Once the removal action achieves remedial goals, no further action is warranted beyond LUCs to prevent land disturbance activities and unrestricted use. Petroleum product contamination was also detected at the 717-D Maintenance Facility and will be addressed under the Underground Storage Tank (UST) Program under Permit Number 18936.

Moderator Processing Subunit

The Moderator Processing Subunit is composed of the 420-D Concentrator Building, 420-2D Rework Handling Facility, 421-D Finishing Building, 421-2D Moderator Handling and Storage Building, 421-4D Drum Storage Facility, and the 772-D Control Laboratory and Supervisor's Office. The Moderator Processing Subunit is approximately 6 ha (15 ac). No problems that warrant a remedial action were identified for 421-D, 421-4D and 772-D.

Tritium was identified as a CM RCOC for concrete 15.2 cm (6 in) thick and soil 0 to 3 m (0 to 10 ft) bls at the 420-D, 420-2D, and 421-2D locations. The total impacted media volume is approximately 2,294 m^3 (3,000 yd^3) of tritium contaminated soil and concrete.

The tritium contaminated media is being addressed as an early removal action with the selected remedy being on unit thermal treatment with LUCs (USDOE 2009b). This remedy involves excavating contaminated media and application of heat to the stockpiled material to induce volatilization of tritium using thermal treatment. The four thermal detritiation units completed operation in July 2011. The review of the confirmation results indicated RGs have been achieved. Further details regarding this removal action can be found in the RSER/EE/CA for the Tritium-Contaminated Soil and Concrete at the Moderator Processing Subunit at the DAOU (SRNS 2009d). Once the removal action achieves RGs, no further action is warranted beyond LUCs to prevent unrestricted use.

489-D Coal Pile Runoff Basin (CPRB) - Northern 25%

The CPRB received runoff from the Powerhouse coal pile. The CPRB has been segmented into a northern 25% section and a southern 75% section (see Figure 2) so that the southern area can continue with Powerhouse operations while the northern section begins closure under the early action. The nature and extent of contamination identified arsenic as a human health RCOC in the 489-D CPRB sediment. Ecological RCOCs for the 489-D CPRB include arsenic and 2-methylnaphthalene in sediment and aluminum, beryllium, cobalt, copper, iron, manganese, zinc, and pH in surface water.

The human health and ecological problems warranting action are being addressed as an early removal action. The selected remedy is surface water management at the 489-D CPRB, consolidation of the contaminated sediment from the D-006 Outfall and 484-10D Waste Oil Facility (WOF) into the northern 25% of the 489-D CPRB, and application of a soil cover (USDOE 2009b, USDOE 2010, USDOE 2011a, USDOE 2011b). Under the early action, the northern 25% of the CPRB will be isolated from the southern 75% with the installation of a new berm, and a new swale will be installed directing runoff to the southern section of the CPRB.

The northern 25% of the CPRB will then be dewatered by pumping runoff into the southern section. After placement of a soil cover over the northern section of the CPRB, it will then be considered finalized and closed under the EAROD. The DAOU final ROD will document closure of the southern section, which will continue to operate until the shut down of the Powerhouse. Further details concerning this Early Action can be found in the RSER/EE/CA for the 489-D CPRB, D-006 Outfall and 484-10D WOF at the DAOU (SRNS 2009e). Once the removal action achieves remedial goals, no further action is warranted other than LUCs to prevent land disturbance activities and unrestricted use.

Miscellaneous Units (904-50G Outfall and D Area Asbestos Pit)

There are two miscellaneous units identified in the DAOU and include the 904-50G Outfall and D-Area Asbestos Pit. At the 904-50G Outfall, three soil samples and a surface water sample were obtained. There were no RCOCs for surface water or surface soil associated with the 904-50G Outfall. Based on CM screening, no contaminants pose a CM risk. There are no contaminants that constitute principal threat source material (PTSM) in soil. As documented in the RFI/RI/BRA, no constituents exceeded the preliminary constituents of potential concern screen based on a residential scenario. Therefore, there is no threat to human health or ecological receptors and LUCs are not needed at the 904-50G Outfall.

At the D-Area Asbestos Pit (080-20G), there is a threat of release of and unacceptable exposure to asbestos if the cover is breached and asbestos containing material is brought to the surface. Therefore, USDOE is taking a response action as allowed in the USEPA "Framework for Investigating Asbestos-Contaminated Superfund Sites, OSWER Directive #9200.0-68" (USEPA 2008). USDOE is proceeding directly to a response because, if LUCs are not in place to prevent land disturbances, an exposure is possible.

D-Area Inactive Process Sewer Lines (DIPSL)

The DIPSLs traverse approximately 4,328 m (14,200 ft) of the DAOU and are located in all three subunits. They are composed of vitrified clay pipe and reinforced-concrete pipe ranging in diameter from 15.2 cm (6 in) to 61 cm (24 in). No CM or PTSM RCOCs were identified for the

sediment in the DIPSLs based on the evaluation of contaminant migration and PTSM. Because the potential releases from the DIPSLs are at a depth greater than 12 m (4 ft), there are no human health or ecological concerns. The manholes associated with the DIPSLs have been plugged and grouted as an engineering control to restrict access to impacted areas (i.e., residual contaminants in the DIPSLs) and for general safety. Because of the location of the DIPSLs within the DAOU industrial setting, LUCs will be in place to prevent residential (i.e., unrestricted) land use.

Electrical Transformers

Electrical transformer substations are located throughout D Area. In 1996, SRS determined that all of the SRS transformers and large capacitors that were regulated due to PCB content had been replaced or rendered non-PCB. There are no records indicating a spill or release from the transformers while they were operated with PCB oil. During pre-work plan characterization, visual inspections of the remaining concrete pads were performed with no evidence of spills on the pads. There are no problems warranting action for the electrical transformers and LUCs are not required.

Miscellaneous Buildings

In addition to the probable source facilities within each subunit, D Area contains miscellaneous buildings (SRNS 2009a) that were used for administrative purposes, general storage, etc. The miscellaneous buildings have been classified through the Facility Decommissioning Evaluation process as Simple Model Decommissioning and have been deactivated and decommissioned with concurrence from USEPA and SCDHEC. There are no problems warranting action for the miscellaneous buildings and LUCs are not required.

2.3 Early Remedial Actions Selected

The current land use for the DAOU is industrial with USDOE maintaining control of the land as long as necessary to keep the selected remedy fully protective of human health and the environment. As documented in the EAROD for the DAOU, the selected early remedial action is LUCs. Successful completion of the removal actions at the Bubble Tower Subunit, Moderator

Processing Subunit, and CPRB (25% northern section) will result in hazardous substances remaining at the DAOU above levels that allow for unrestricted land use. In addition, there is a threat of release of and unacceptable exposure to asbestos at the D-Area Asbestos Pit (080-20G) if the cover is breached and asbestos containing material is brought to the surface. Early action LUCs are needed for the Bubble Tower Subunit, Moderator Processing Subunit, northern 25% portion of the CPRB, Asbestos Pit, and DIPSLs to prevent unrestricted land use and land disturbances.

Table 2 shows the types of LUCs, purposes of control, duration, and affected areas. The early action LUCs for the DAOU will consist of the following:

- Controlled physical access into D Area. A single primary road leads into D Area with access to the area controlled (i.e., fence, guard house) and monitored by SRS security personnel. Only authorized personnel may enter.

- Signage and monuments will be located at the boundaries shown in Figure 3 to alert on-site workers to the presence of hazardous substances and to prevent unknowing entry and unrestricted use. The date and location for installation of the signs and monuments are documented in Section 4.5.

- Administrative controls as managed through the SRS Site Use/Site Clearance Program to require authorization before beginning any excavation activity. This authorization is usually in the form of an internal SRS permit.

- Maintenance of the existing soil cover for the D-Area Asbestos Pit to ensure that there is no erosion damage and to prevent unauthorized excavation or construction activities.

- Maintenance of newly installed soil cover at the northern section of the 489-D CPRB to ensure that there is no erosion damage and to prevent unauthorized excavation or construction activities.

- Plugging and grouting of the manholes associated with the DIPSLs as an engineering control to restrict access to impacted areas and for general safety.

The post-remedial action conceptual site model (CSM) (Figure 4) demonstrates that the exposure pathways to an industrial worker are incomplete following implementation of the remedial action. According to the *Savannah River Site Future Use Project Report* (USDOE 1996), residential use of SRS land is prohibited.

3.0 DAOU LAND USE CONTROL OBJECTIVES

The following DAOU LUC objectives have been developed to ensure the protectiveness of the selected EA remedy:

- Prevent contact, removal, or excavation of subsurface soil and buried asbestos-containing waste;
- Prohibit the development and use of property for residential housing, elementary and secondary schools, child care facilities and playgrounds;
- Maintain the integrity of any current or future remedial or monitoring systems, such as soil vapor extraction systems, soil covers; and
- Prevent construction of inhabitable buildings without an evaluation of indoor air quality to address vapor intrusion.

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

4.0 IMPLEMENTATION OF LAND USE CONTROLS

This section describes the remedial actions prescribed by the EAROD to achieve the LUC objectives stated in Section 3.0. A summary of the types of LUCs controls is provided in Table 2. USDOE is responsible for implementing, maintaining, reporting on and enforcing the LUCs. The LUCIP will become enforceable and will be implemented when approved by USEPA and SCDHEC following the completion of the remedial actions prescribed by the 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 area will be maintained as an industrial use area 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 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.

Signs 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 as shown in Figure 3 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. These requirements are also consistent with the intent of the RCRA deed notification requirements at final closure of a RCRA facility if contamination will remain at the unit.

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 months 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 EALUCIP identifies the proposed areas under land use restrictions in Figure 3. Following field implementation of the remedial action, a final (as-built) survey plat is developed and certified by a professional land surveyor registered in the State of SC. 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 plat will be submitted to USEPA and SCDHEC in the final action DAOU Post-Construction Report (PCR).

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 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

- Controlled physical access into D Area. A single primary road leads into D Area with access to the area controlled (i.e., fence, guard house) and monitored by SRS security personnel. Only authorized personnel may enter.

- Plugging and grouting of the manholes associated with the DIPSLs as an engineering control to restrict access to impacted areas and for general safety.

- Physical access controls are also 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, monuments and access control warning signs, as worded in Appendix A, will be posted at the unit. Installation of the access control warning signs will follow the construction schedule as described in the EAROD and will be completed by mid 2012. Signs will be located as depicted in Figure 3. The final placement of the signage will be documented in the final EA post-construction report (PCR). The signs will be legible for a distance of at least 25 ft. Custodial responsibilities for maintenance and inspection will be performed 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 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 annually per the Field Inspection Checklist in Appendix B. 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 a

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 in Hazardous Waste Operations and Emergency Response (HAZWOPER), RCRA Well Inspections, 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 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.

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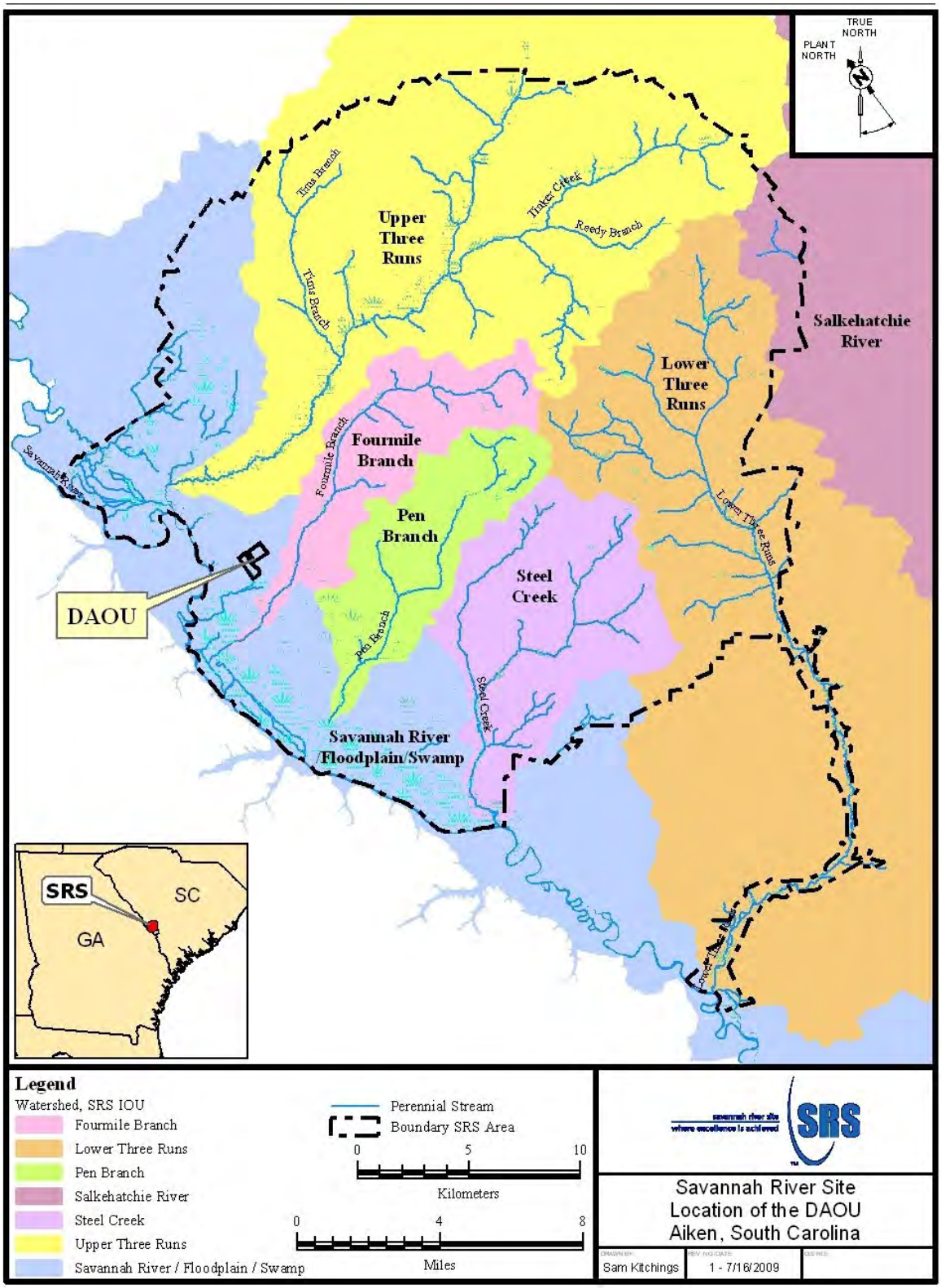

Figure 1. Location of the DAOU within the Savannah River Site

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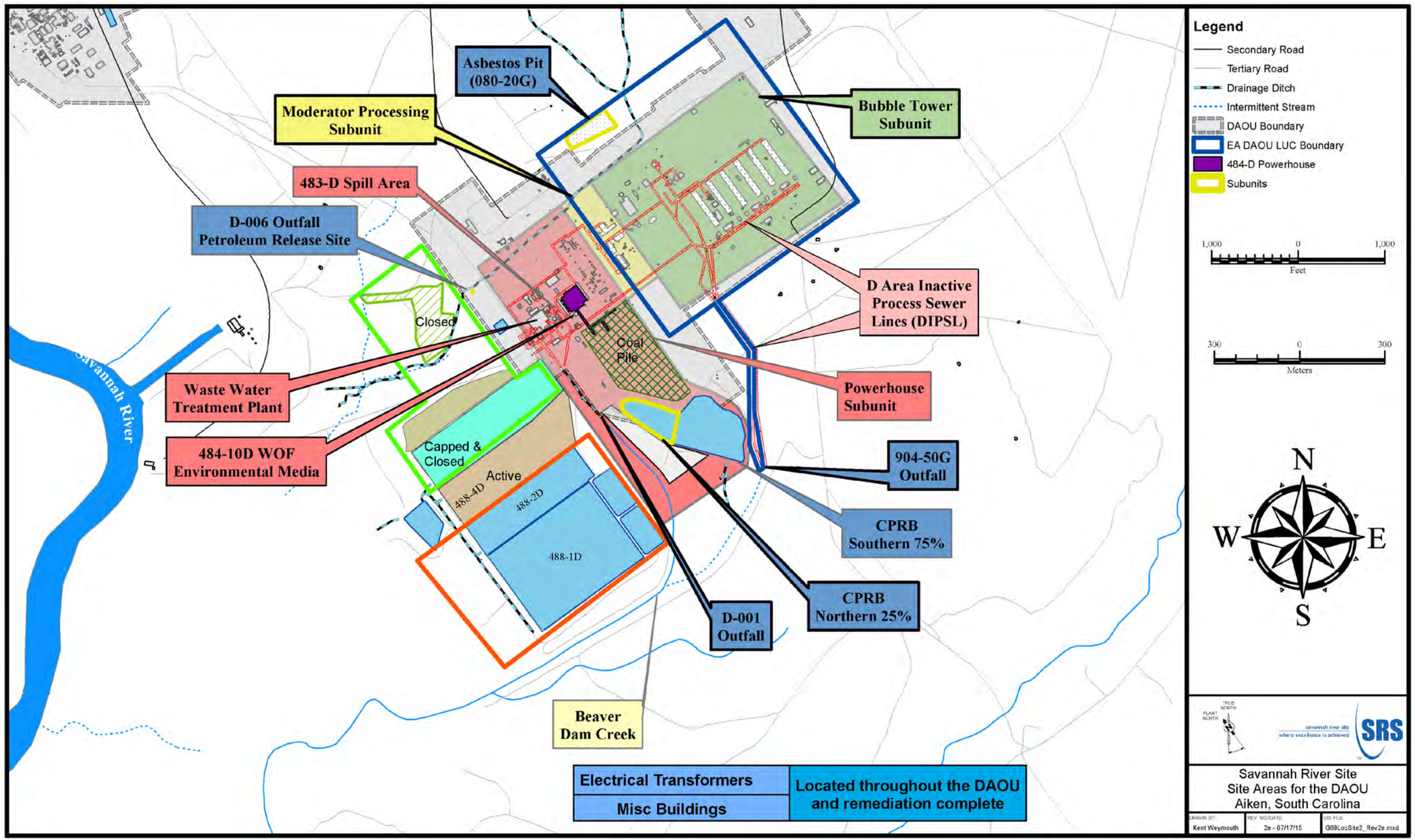

Figure 2. Site Areas and Subunits in and Around the DAOU (corrected)

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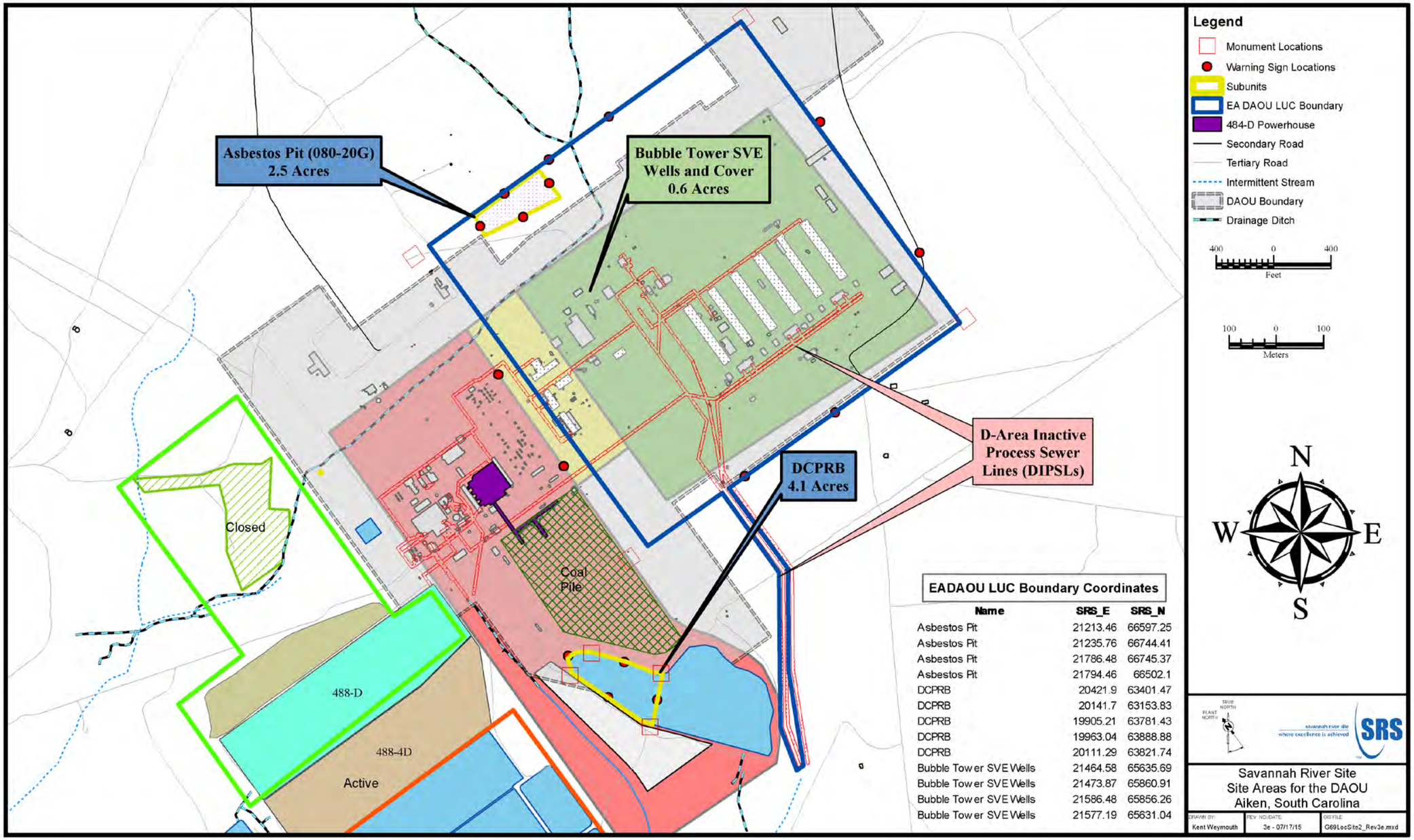

Figure 3. Early Action LUC Boundary Map (corrected)

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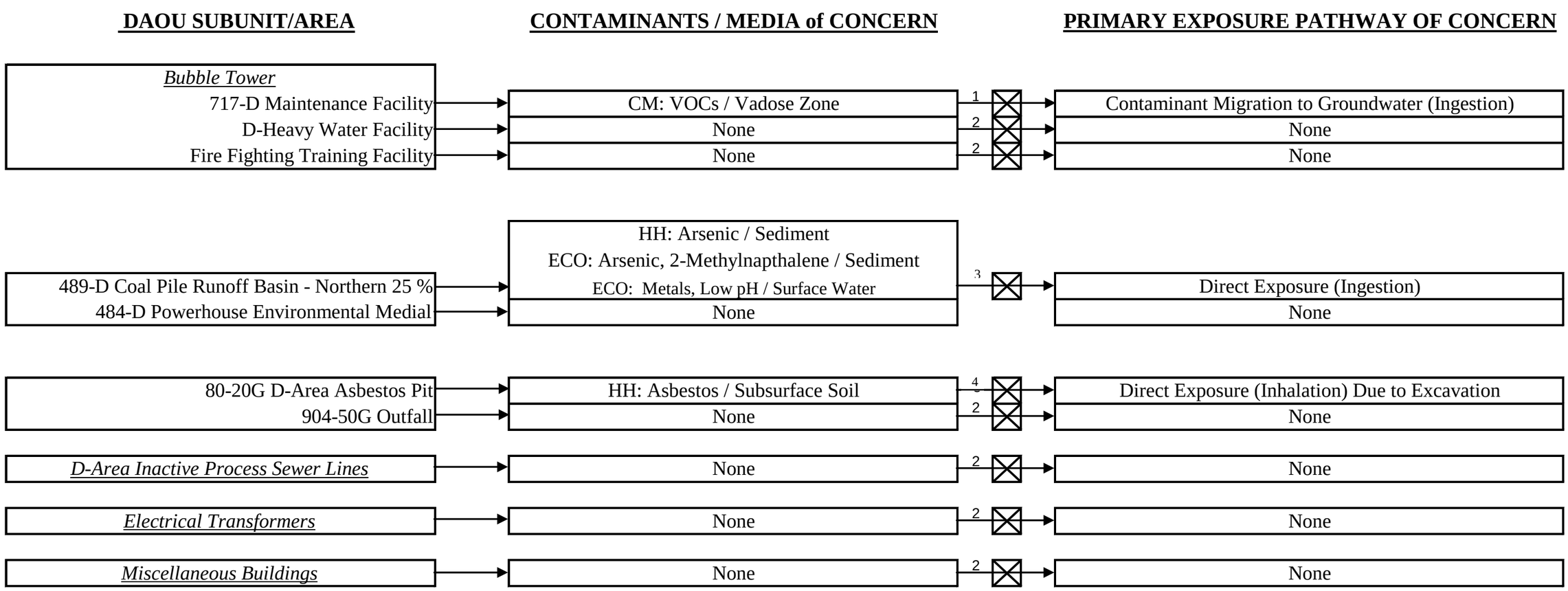

LEGEND

Complete exposure pathway

Incomplete exposure pathway due to final remedial action

CM = contaminant migration evaluation
HH = human health risk assessment
ECO = ecological risk assessment (ERA)
1 - Soil Vapor Extraction per RSER/EE/CA (SRNS 2009c); EA DAOU Land Use Controls required after completion of early removal action to prevent land disturbance activities and unrestricted land use.
2 - No COCs based on an industrial land use scenario; EA DAOU Land Use Controls required to prevent unrestricted land use.
3 - Surface Water Management, Consolidation of Contaminated Soil and Sediment, Placement of Soil Cover per RSER/EE/CA (SRNS 2009e); Land Use Controls required after completion of early removal action to prevent land disturbance activities and unrestricted land use.
4 - Although not formally evaluated in the HHRA, asbestos waste present in subsurface is a problem warranting action under an excavation scenario; Land Use Controls required to prevent land disturbance activities and unrestricted land use.

Figure 4. Conceptual Site Model after Completion of the Early Remedial Actions

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Table 1. Summary of Administrative Paths for the DAOU

SUBUNIT/AREA	ADMINISTRATIVE PATH				
	EAROD	Final ROD	IOU	GW OU	Other
Bubble Tower Subunit	X				
Moderator Processing Subunit	X				
489-D CPRB - Northern 25%	X				
489-D CPRB - Southern 75%		X			
484-D Powerhouse Building		X			
484-10D WOF Building		X			
484-10D WOF Environmental Media		X			
ash sluice lines		X			
D-Area Coal Pile		X			
483-D Combined Spills		X			
D-001 Outfall				X	
D-006 Outfall (Petroleum Release Site)			X		
904-50G Outfall	X				
D-Area Asbestos Pit (80-20G)	X				
DIPSLs	X				
Electrical Transformers	X				
Miscellaneous Buildings	X				
D-Area Rubble Pit (431-2D)					Closed; DEXOU ROD 2004
D-Area Oil Seepage Basin					Closed; DAOSB ROD 1998
Ash Basin (488-D)					Closed; DEXOU ROD 2004
Ash Basin (488-1D)					Operational: to be closed via IWT
Ash Basin (488-2D)					Operational: to be closed via IWT
Ash Basin (488-4D)					Operational; to be closed via SW permit
D Area Groundwater				X	

Table 2. Land Use Controls for the DAOU

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 DAOU, where hazardous substances are left in place at levels requiring land use and/or groundwater restrictions.
2. Property record restrictions[c]: A. Land Use B. Groundwater	Restrict use of property by imposing limitations. Prohibit the use of groundwater.	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 DAOU, where hazardous substances are left in place at levels requiring land use and/or groundwater restrictions.
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 DAOU, 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 DAOU 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.	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 DAOU.
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 Necessity of patrols evaluated upon completion of remedial actions.	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.

APPENDIX A

ACCESS CONTROL WARNINGS SIGNS

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

Figure A-1b. *EXAMPLE* — Access Control Warning Sign (Asbestos)

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APPENDIX B

FIELD INSPECTION CHECKLIST

ANNUAL FIELD INSPECTION CHECKLIST FOR DAOU EARLY ACTION

☐ **SCHEDULED** ☐ **UNSCHEDULED**

A = Satisfactory **X** = Unsatisfactory (Explanation required)	**A** or **X**	Observation of Corrective Action Taken
1. Verify that the roads are accessible for authorized maintenance and inspections.		
2. Verify that the waste unit signs (12) 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 LUC Boundaries.		
4. At the Asbestos Pit, on the Bubble Tower Subunit Coal Pile Runoff Basin soil covers, verify that the integrity of any drainage ditches, sediment basins and required land grading for proper drainage is maintained and they are free of excessive erosion, sediment buildup, and any debris restricting water flow.		
5. Verify that no woody vegetation is growing at the Asbestos Pit, the Bubble Tower Subunit or the Coal Pile Runoff Basin soil covers. Remove or identify as needed.		
6. Verify that the grass density has no bare spots more than 3 by 3 feet in area at the Asbestos Pit, the Bubble Tower Subunit or the Coal Pile Runoff Basin soil covers. The height of the vegetative cover should not impair the visual inspection of the soil cover.		
7. Verify that the soil cover at the Asbestos Pit, the Bubble Tower Subunit and the Coal Pile Runoff Basin have no signs of unacceptable erosion or depressions (subsidence).		
8. Verify that signs of burrowing or mounding animals are not present at the Asbestos Pit, the Bubble Tower Subunit or the Coal Pile Runoff Basin soil covers.		

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.