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

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LIST OF ABBREVIATIONS AND ACRONYMS

~	approximate, approximately
ac	acre
BRA	Baseline Risk Assessment
CA	Cost Analysis
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CPRB	Coal Pile Runoff Basin
CSM	conceptual site model
D&D	deactivation and decommissioning
DAOU	D-Area Operable Unit
EA	Early Action
EE	Engineering Evaluation
FFA	Federal Facility Agreement
ft	feet
EE/CA	Engineering Evaluation/Cost Analysis
ha	hectare
HAZWOPER	Hazardous Waste Operations and Emergency Response
HH	human health
km	kilometer
LLC	Limited Liability Company
LUC	Land Use Controls
LUCAP	Land Use Controls Assurance Plan
LUCIP	Land Use Controls Implementation Plan
m	meter
mi	mile
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPDES	National Pollution Discharge and Elimination System
OU	operable unit
PCR	Post-Construction Report
QA	Quality Assurance
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
RI	Remedial Investigation
ROD	Record of Decision
RSER	Removal Site Evaluation Report
SCDHEC	South Carolina Department of Health and Environmental Control
SDC	Site Development Control
SEMS	Superfund Enterprise Management System
SRNS	Savannah River Nuclear Solutions, LLC
SRS	Savannah River Site
USDOE	United States Department of Energy
USEPA	United States Environmental Protection Agency
WP	Work Plan
WSRC	Washington Savannah River Company, LLC (October 2005 to present)
WSRC	Westinghouse Savannah River Company, LLC (before October 2005)

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1.0 INTRODUCTION

This Second Early Action (EA) Land Use Control Implementation Plan (LUCIP) 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 closed facilities associated with the operation of the 484-D Powerhouse. The DAOU is approximately (~) 85 hectare (ha) (290 acres [ac]). Groundwater is not considered part of the scope of the DAOU. Two EA Record of Decisions (ROD) documented the selection of early action remedies to implement land use controls (LUCs) for completed DAOU subunits (SRNS 2011a, SRNS 2020). The purpose of this Second EA LUCIP is to describe how the LUCs selected in the DAOU Second EA ROD for the 488-1D Ash Basin (including Inlet Basins), 488-2D Ash Basin, 488-4D Ash Landfill, and the 489-D Coal Pile Runoff Basin (CPRB) (Southern 75%) subunits will be implemented and maintained. The second early action LUC objectives have been documented in the DAOU Second EA ROD 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 1999) to ensure that the LUCs required by numerous remedial decisions at SRS are properly maintained and periodically verified. The requirements of the LUCAP also apply to the LUCs that were selected as part of the early action remedy for the DAOU. This additional document, the DAOU Second EA LUCIP, 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 Second EA LUCIP. Upon final approval, the Second EA

LUCIP will be appended to the LUCAP and should be considered incorporated by reference into the Second DAOU EA ROD, 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 Second EA LUCIP 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 Second EA LUCIP modification will be appropriately documented for incorporation by reference into the DAOU Second EA ROD.

The format of this Second EA LUCIP 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 ~803 kilometers (km^2)[(310 square miles (mi^2)] of land adjacent to the Savannah River, principally in Aiken and Barnwell counties of South Carolina (Figure 1). SRS is located ~40.2-km (25-mi) southeast of Augusta, Georgia, and 32-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, ~914-m (3,000-ft) east of the nearest site boundary, the Savannah River (see Figure 1). The DAOU is ~85 ha (290 ac) and is composed

of multiple subunits and includes both D&D facilities and closed facilities associated with the 484-D Powerhouse as identified in Figure 2.

The Second EA LUCIP applies to the following four DAOU subunits: 488-1D Ash Basin (including Inlet Basins), 488-2D Ash Basin, 488-4D Ash Landfill and the 489-D CPRB (Southern 75%) subunits of the DAOU. 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 HH and prevent unrestricted land use. Unrestricted land use was achieved for some subunits. The response action selected in the Second EA ROD 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 USDOE, USEPA, and SCDHEC agreed to pursue EA RODs to allow the project to remain on track and achieve the targeted footprint reduction. The scope of the EA RODs address LUCs of completed DAOU subunits and areas. The final ROD for DAOU will include the LUCs for all remaining subunits and areas, specifically the remedial decision for the 484-D Powerhouse building and ancillary subunits. Final LUCs required for the 484-D Powerhouse building and associated facilities will be addressed by the appropriate remedial decision after D&D of the Powerhouse building is complete. Table 1 provides a summary of administrative paths for DAOU subunits and areas as established in the EA RODs (SRNS 2011a, SRNS 2020).

An EA ROD Remedial Alternative Selection for the DAOU (SRNS 2011a) integrated the outcomes of the completed removal actions and selected the final action (LUCs) to prevent unrestricted use for the Bubble Tower Subunit, Moderator Processing Subunit, 489-D CPRB (Northern 25%), D-Area Asbestos Pit (including restrictions against land disturbance), and D-Area Process Sewer Lines as Abandoned inside the area fence. The unit-specific EA LUCIP (SRNS 2011b) referenced in the EA ROD provides details and specific measures required to implement and maintain the LUCs selected as part of this remedy.

2.2 Nature and Extent of Contamination

There had not been any prior CERCLA documentation specific to the 488-1D Ash Basin, 488-2D Ash Basin and 488-4D Ash Landfill subunits before submittal of the removal action documents (SRNS 2016, SRNS 2014a, SRNS 2014b, respectively) for each subunit. However, previous remedial investigations (RIs) and baseline risk assessments (BRAs) performed by SRS yield consistent conclusions for coal and/or ash contaminated media which typically contain toxic metals, such as arsenic, and naturally-occurring radionuclides. These historical results were used to presumptively identify the problems warranting action at these subunits. The problems warranting action for the 489-D CPRB are documented in the Resource Conservation and Recovery Act (RCRA) Facility Investigation/Remedial Investigation (RFI/RI) Work Plan (WP) and BRA for the DAOU (SRNS 2009). 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.

488-1D Ash Basin Subunit (including Inlet Basins)

The 488-1D Ash Basin was an unlined, earthen containment structure that was built generally on existing grade (ground elevation). Powerhouse ash slurry flowed via an ash sluice line from the 484-D Powerhouse into one of two Inlet Basins identified as Inlet Basin #1 (northern) and Inlet Basin #2 (southern), each ~1.2 ha (3 ac) in size. The bulk of ash settled out of the slurry in the Inlet Basins and the remaining wastewater flowed into the eastern end of the 488-1D Basin (~14 ha [35 ac]). As the wastewater level increased in the 488-1D Ash Basin, the wastewater flowed through a pipe located at the western end of the basin into the 488-2D Ash Basin for polish settling of any remaining solids.

As part of the early removal action, ash from the western end of the 488-1D Ash Basin was consolidated into the eastern end of the 488-1D Ash Basin and a geosynthetic cover system was constructed over the east end 488-1D Ash Basin. The Inlet Basins were excavated and backfilled.

488-2D Ash Basin Subunit

The 488-2D Ash Basin (6 ha [15 ac]), served as the final settling stage for the treatment of the 484-D Powerhouse operation ash contaminated wastewater. This basin received the overflow

wastewater from the 488-1D Ash Basin and provided final settling of the solids as the water flowed from the western end of the 488-2D Ash Basin to the discharge pipe located at the eastern end of the 488-2D Ash Basin. As the water flowed from west to east, the flow distance, along with the settling velocity of solids, provided sufficient removal of any remaining solids to ensure compliance with the National Pollution Discharge and Elimination System (NPDES) discharge permit at Outfall D-01C. The 488-2D Ash Basin discharged the treated water into the D-Area Discharge Canal at the D-01C Outfall which eventually flowed into Beaver Dam Creek.

As part of the early removal action, ash from the 488-2D Ash Basin was consolidated into the 488-4D Ash Landfill and regraded with common fill and stabilized by vegetation. 488-2D is now a stormwater detention basin that controls stormwater discharges originating from both the 488-1D and 488-4D cover systems.

488-4D Ash Landfill Subunit

The 488-4D Ash Landfill was an 8.9-ha (22-ac) basin that was initially part of the SRS As-Built Construction Permit #7295 and the associated 1991 SRS permit-to-operate for existing SRS wastewater facilities. Per agreement with SCDHEC, the basin was permitted in November 2007 as a Class Two Solid Waste Landfill under Solid Waste Landfill Permit #025800-1602 to accept ash waste for disposal. All storm water drainage was directed into the infiltration basin located within the western end of the landfill which had an overflow channel that directed any contaminated water to the 488-2D Ash Basin for treatment (settling). The water was combined with the 488-1D Ash Basin wastewater, treated per the 488-2D Ash Basin IWT permit, and released through NPDES Outfall D-01C.

As part of the early removal action, ash from outside the western boundary of the 488-4D Ash Landfill, ash from surrounding roads/berms, and ash from the 488-2D Ash Basin was consolidated into the 488-4D Ash Landfill. A geosynthetic SCDHEC Class 3 Solid Waste Landfill cover system was then constructed over the 488-4D Ash Landfill.

489-D Coal Pile Runoff Basin – Southern 75% Subunit

The 489-D CPRB is located in the southern portion of the DAOU and has a total area of ~5.7 ha (14 ac). During operation of the 484-D Powerhouse, runoff storm water from the 484-17D Coal Storage Area was collected through a network of drainage ditches and flowed to the 489-D CPRB via storm sewers for settling. The remedy for this basin was accomplished under the scope of two separate action memorandums. The Northern 25% section of the 489-D CPRB was addressed by the removal action completed in 2010 (US DOE 2010b) with LUCs, and the remaining Southern 75% section removal action was completed in 2018 with a final remedy of No Action (USDOE 2015).

As part of the early removal action, coal fines and contaminated soil from the 489-D CPRB was consolidated into the 488-4D Ash Landfill. 489-D CPRB was regraded with common fill and stabilized by vegetation. 489-D CPRB is now a stormwater retention basin that controls stormwater discharges originating from the adjacent closed 484-17D Coal Storage Area.

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 HH and the environment. As documented in the Second EA ROD for the DAOU, the selected early remedial action is LUCs to prevent unrestricted use for the 488-1D Ash Basin (excluding Inlet Basins which were closed with no unrestricted use), 488-2D Ash Basin, and the 488-4D Ash Landfill subunits of the DAOU. The EA LUC remedy is the final remedial action for the 488-1D Ash Basin, 488-2D Ash Basin, and the 488-4D Ash Landfill. This remedy effectively balances short-term effectiveness, implementability, and cost criteria, while providing a high level of long-term protection to hazardous contaminants that will remain at the site above levels that would allow for unrestricted use.

The selected remedial alternative for the 489-D CPRB (Southern 75%) and the area where the Inlet Basins were formally located is No Action. In their current state, these subunits pose no

unacceptable risk requiring a response action to HH and the environment and support unrestricted land use.

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:

- Signage is located at the 488-1D Ash Basin, 488-2D Ash Basin and 488-4D Ash Landfill subunit boundaries to alert on-site workers to the presence of hazardous substances and to prevent unauthorized entry and unrestricted uses. The signs were installed in 2019. The approximate area of LUCs are shown in Figure 3. Appendix C provides a site map with the SRS site coordinates of the LUC boundaries and sign locations.

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

- SRS access controls to prevent exposure to trespassers, as described in the 2013 RCRA Permit Renewal Application, Volume I, Section F.1, which describes the security procedures and equipment, 24-hour surveillance system, artificial or natural barriers, control entry systems, and warning signs in place at the SRS boundary.

The post-remedial action conceptual site model (CSM) (Figure 4) demonstrates that the exposure pathways to human and ecological receptors 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 coal and coal-combustion waste that is buried underneath the engineered cover systems as well as protect against disturbance of soil overlaying the caps;

- Prohibit the development and use of property for residential housing, elementary and secondary schools, childcare facilities and playgrounds;

- Maintain the integrity of any current or future remedial or monitoring system, such as soil covers or groundwater monitoring wells;

- Prevent construction of inhabitable buildings without an evaluation of indoor air quality to address vapor intrusion; and

- Prevent construction of facilities or structures on/above the engineered cover systems.

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 Second EA ROD 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 EA ROD. 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 have been placed as shown in Appendix C and will be 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 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.

4.2 LUC Boundary Maps

This Second EA LUCIP identifies the proposed areas under land use restrictions in Appendix C. 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 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 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 EA LUCIP 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 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 primary road leads into D Area with access to the area controlled by a locked gate. Only authorized personnel may enter.
- Physical access controls (fencing) 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 was completed in 2019. A total of 12 signs are located as depicted in Appendix C. The final placement of the signage will be documented in the final EA PCR. The signs will be legible for a distance of at least 7.6 m (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 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 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.

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. *RCRA Facility Investigation/Remedial Investigation (RFI/RI) Work Plan and RFI/RI Report with Baseline Risk Assessment for the D-Area Operable Unit (U),* Rev. 1.1, WSRC-RP-2007-4079, Savannah River Nuclear Solutions, LLC, Aiken, SC

SRNS, 2011a. *Early Action Record of Decision Remedial Alternative Selection for the D-Area Operable Unit (DAOU) (U),* SRNS-RP-2010-00162, Rev. 1.1, Savannah River Nuclear Solutions, LLC, Savannah River Site, Aiken, SC

SRNS, 2011b. *Early Action Land Use Control Implementation Plan (EA LUCIP) for the D-Area Operable Unit (DAOU) (U),* SRNS-RP-2011-01166, Rev. 0, Savannah River Nuclear Solutions, LLC, Savannah River Site, Aiken, SC

SRNS, 2014a. *Removal Site Evaluation Report (RSER) for the D-Area Ash Basin (488-2D) (U)*, Revision 1, SRNS-RP-2013-00825, Savannah River Nuclear Solutions, LLC, Savannah River Site, Aiken, SC (September)

SRNS, 2014b. *Removal Site Evaluation Report/Engineering Evaluation/Cost Analysis (RSER/EE/CA) for the D-Area Ash Landfill (488-4D) (U),* Revision 1, SRNS-RP-2014- 00001, Savannah River Nuclear Solutions, LLC, Savannah River Site, Aiken, SC (June)

SRNS, 2016. *Removal Site Evaluation Report/Engineering Evaluation/Cost Analysis (RSER/EE/CA) for the D-Area Ash Basin (488-1D) (U),* Revision 1, SRNS-RP-2015-00490, Savannah River Nuclear Solutions, LLC, Savannah River Site, Aiken, SC (June)

SRNS, 2020. *Second Early Action Record of Decision Remedial Alternative Selection for the D-Area Operable Unit (DAOU) (U),* SRNS-RP-2018-00461, Rev. 1, 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)

USDOE, 2010a. Submittal on the *Action Memorandum and Responsiveness Summary (SRNS-P3000-2009-00731) for the Non-Time Critical Removal Action for the 489-D Coal Pile Runoff Basin, D-006 Outfall, and 484-10D Waste Oil Facility at the D-Area Operable Unit*, (SRNS-RP-2009-00805, Revision 1, Dated September 2009), March 26, 2010, USDOE Savannah River, Aiken SC

USDOE, 2010b. DOE Submittal of the Revised Action Memorandum for the Non-Time Critical Removal Action for the 489-D Coal Pile Runoff Basin, D-006 Outfall, and 484-10D Waste Oil Facility at the D-Area Operable Unit (U), (SRNS-RP-2009-00805, Revision 1, CERCLIS Number: 63, Dated September 2009), August 26, 2010, USDOE Savannah River, Aiken SC

USDOE, 2015. DOE Submittal of the *Revision 3 Action Memorandum for the Non-Time Critical Removal Action for the D Area Coal Pile Runoff Basin 489-D*, CERCLIS Number 63, August 11, 2015, United States Department of Energy, Savannah River Operations, Aiken SC

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

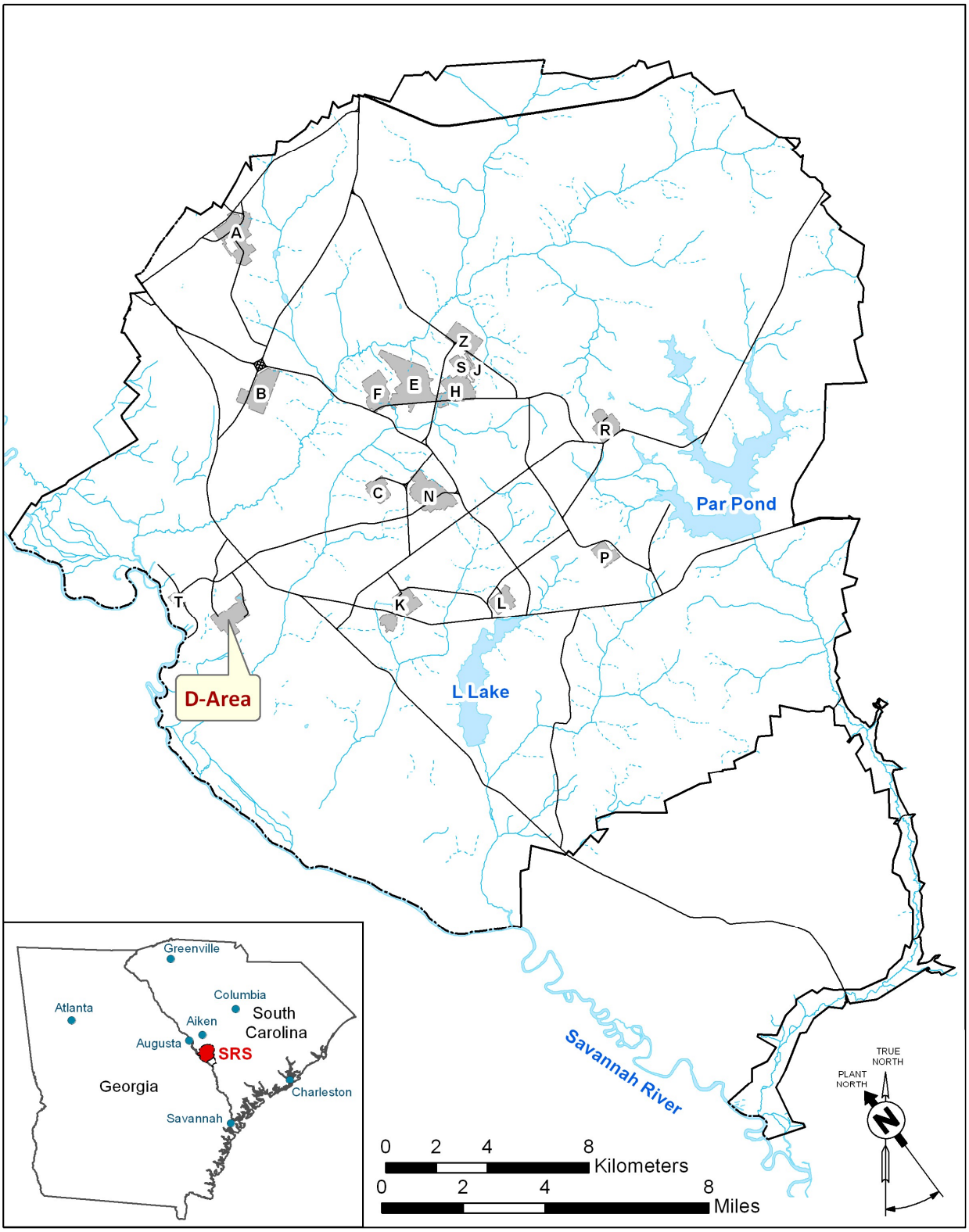

Figure 1. Location of the DAOU within the Savannah River Site

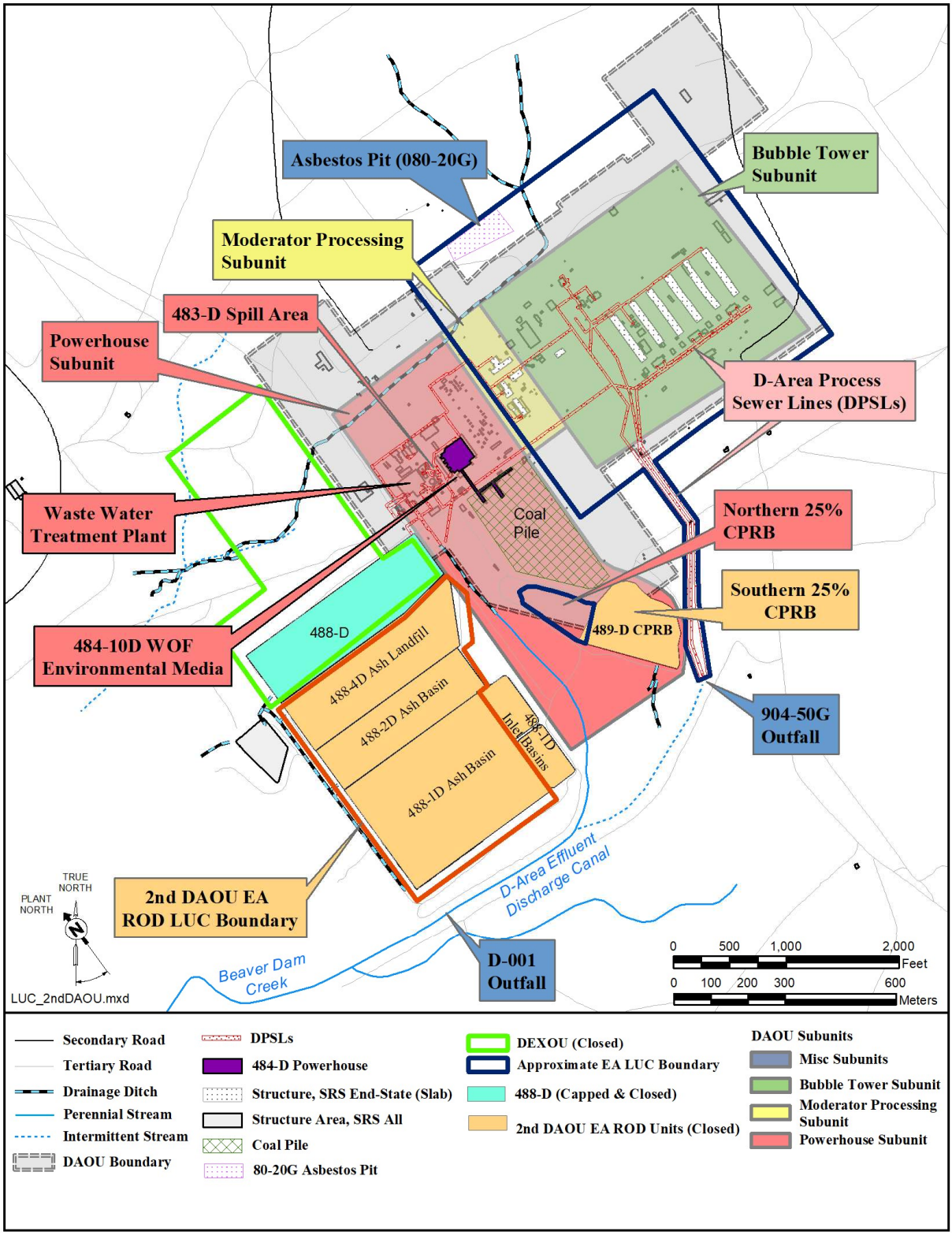

Figure 2. Site Areas and Subunits In and Around the DAOU

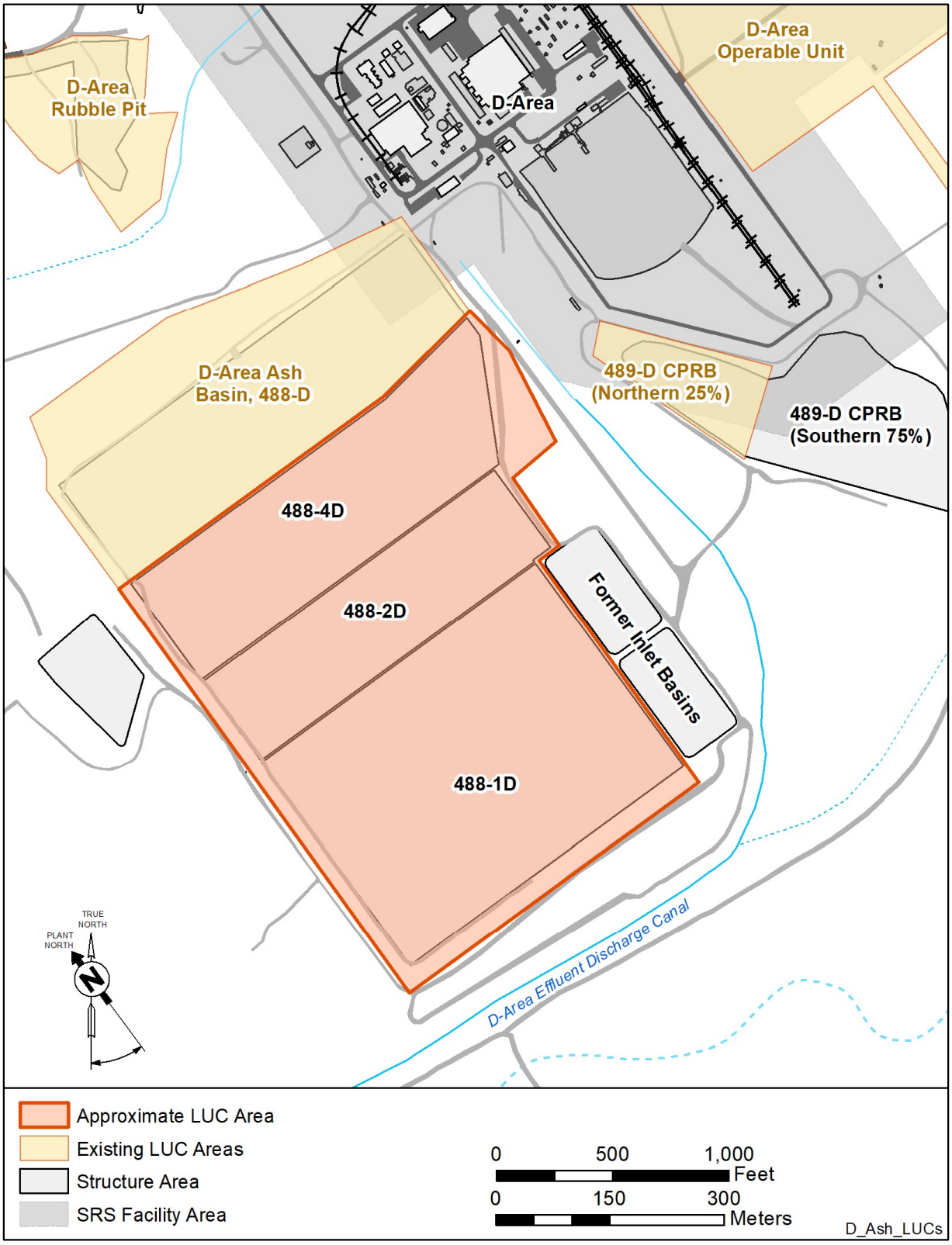

Figure 3. Approximate Areas of Land Use Controls

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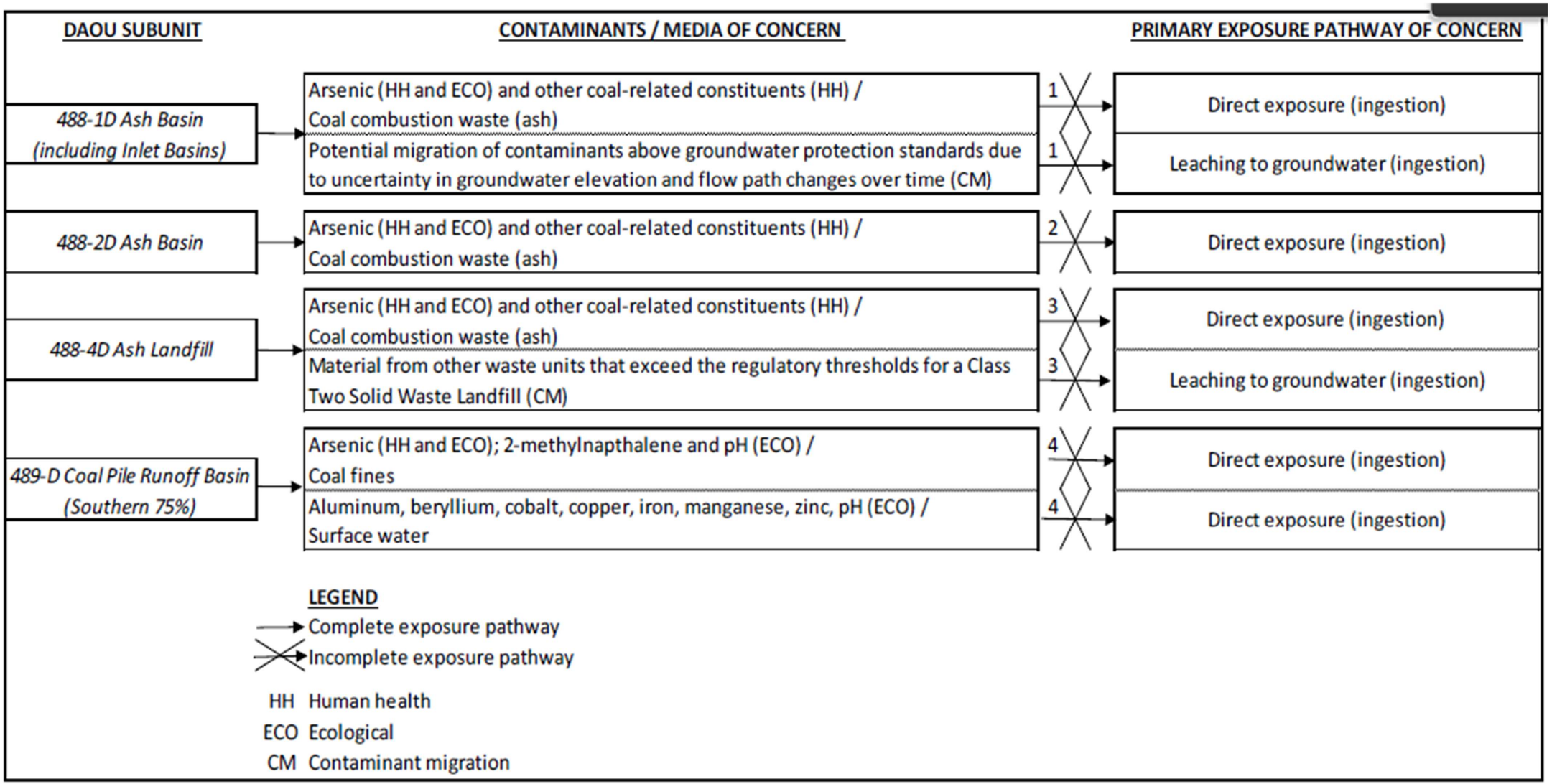

1. Ash Consolidation and Geosynthetic Cover System per RSER/EE/CA (SRNS 2016); 488-1D Ash Basin - LUCs required after completion of early removal action to prevent land disturbance activities and unrestricted land use. Inlet Basins - No LUCs required, meets the criteria for unrestricted land use.
2. Ash Removal per RSER (SRNS 2014a); 488-2D Ash Basin - LUCs required after completion of early removal action to prevent unrestricted land use.
3. Geosynthetic Cover System per RSER/EE/CA (SRNS 2014b); 488-4D Ash Landfill - LUCs required after completion of early removal action to prevent land disturbance activities and unrestricted land use.
4. Excavation and Disposal per Revision 3 Action Memorandum for the Non-Time Critical Removal Action for the D-Area Coal Pile Runoff Basin (489-D) (USDOE 2015); No LUCs required, meets the criteria for unrestricted land use.

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

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Table 1. Summary of Administrative Paths for the DAOU Subunits

SUBUNIT/AREA	ADMINISTRATIVE PATH					
	EA ROD[1]	Second[2] EA ROD	Final ROD	IOU	GW OU	Remedial Decision
Ash Basin (488-D)						Geosynthetic Cover/GW Monitoring/ LUCs (DEXOU ROD 2004)
Ash Basin (488-1D) (including Inlet Basins)		X				LUCs; No Action for the Inlet Basins portion
Ash Basin (488-2D)		X				LUCs
Ash Basin (488-4D)		X				LUCs
Powerhouse Subunit	X		X			
489-D CPRB - Northern 25%	X					LUCs
489-D CPRB - Southern 75%		X				No Action
484-D Powerhouse Building			X			
484-10D WOF Building			X			
484-10D WOF Environmental Media			X			
Ash Sluice Lines			X			
D-Area Coal Storage Area (484-17D)[3]			X			
483-D Combined Spills			X			
Bubble Tower Subunit	X					LUCs
Moderator Processing Subunit	X					LUCs
Miscellaneous Units						
D-006 Outfall (Petroleum Release Site)				X		
904-50G Outfall	X					No Action
D-Area Asbestos Pit (80-20G)	X					LUCs
DIPSLs	X					LUCs
Electrical Transformers	X					No Action
Miscellaneous Buildings	X					No Action
D-Area Rubble Pit (431-2D)						LUCs (DEXOU ROD 2004)
D-Area Oil Seepage Basin						GW Monitoring/LUCs (DAOSB ROD 1998)
D Area Groundwater					X	
Ash Area Adjacent to and Easterly of D-Area Ash Basins 488-1D and 488-2D				X		

1. EA ROD for DAOU, SRNS-RP-2010-00162, Rev 1.1, June 2011.
2. Second EA ROD for DAOU, SRNS-RP-2018-00461, Rev 1, July 2020, subunits in **bold** font are the subject of this document.
3. D-Area Coal Storage Area (484-17D) also referred to as D-Area Coal Pile in SRS documentation
.

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

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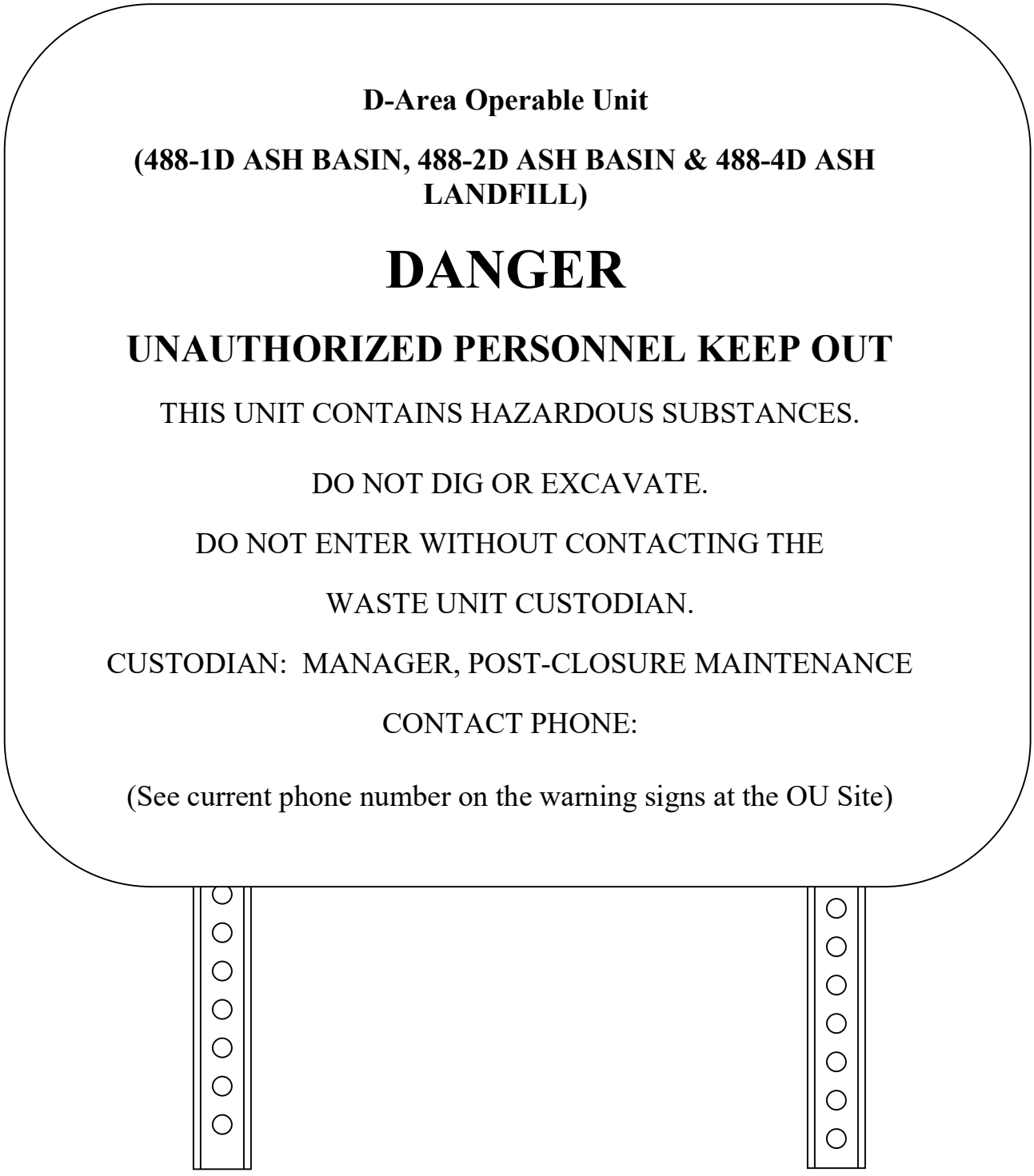

Figure A-1. ***EXAMPLE* — Access Control Warning Sign**

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APPENDIX B

FIELD INSPECTION CHECKLIST

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ANNUAL FIELD INSPECTION CHECKLIST FOR DAOU SECOND 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. Verify integrity of drainage systems 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 on D-Area Ash Basins (488-1D and 488-2D) and D-Area Ash Landfill (488-4D). Remove or identify as needed.		
6. Verify that the grass density D-Area Ash Basins (488-1D and 488-2D) and D-Area Ash Landfill (488-4D) has no bare spots more than 3 by 3 feet in area. The height of the vegetative cover should not impair the visual inspection of the soil cover. This verification will be determined by the inspector.		
7. Verify that the soil cover at the D-Area Ash Basins (488-1D and 488-2D) and D-Area Ash Landfill (488-4D) have no signs of unacceptable erosion or depressions (subsidence).		
8. Verify that signs of burrowing or mounding animals are not present at the D-Area Ash Basins (488-1D and 488-2D) and D-Area Ash Landfill (488-4D).		

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

LAND USE CONTROL BOUNDARIES AND WARNING SIGN LOCATIONS

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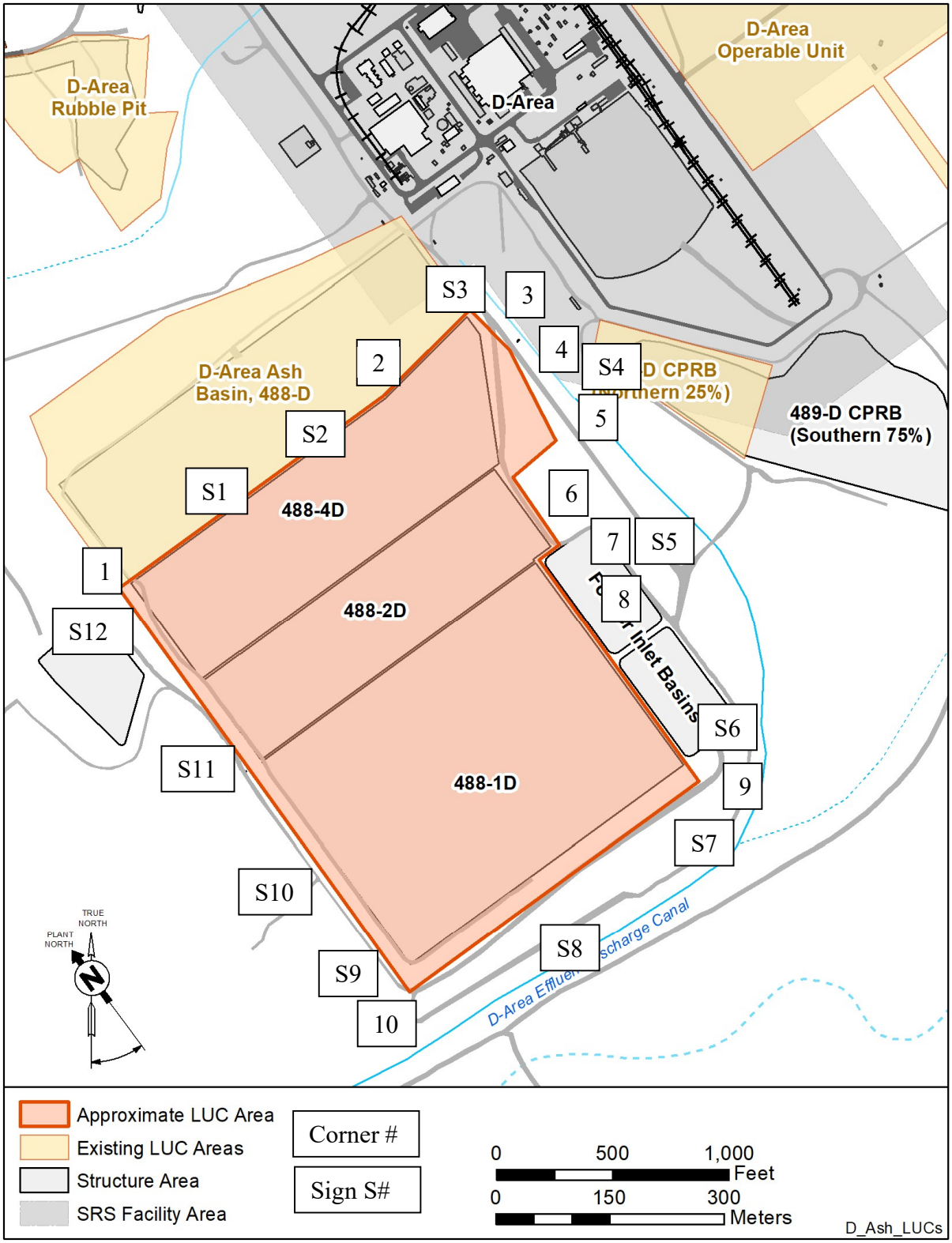

Note: For SRS site coordinates of LUC boundary and sign locations see next page.

SRS Site Coordinates for LUC Boundary and Sign Location

SRS Site Coordinates
DAOU ASH BASINS

Land Use Control Boundaries		
1	N	64289.56
	E	17596.00
2	N	64289.55
	E	18997.58
3	N	64367.68
	E	19508.15
4	N	64142.08
	E	19562.87
5	N	63761.49
	E	19352.38
6	N	63752.51
	E	19244.66
7	N	63370.14
	E	19232.78
8	N	63365.53
	E	19130.79
9	N	62188.99
	E	19130.76
10	N	62189.00
	E	17595.99

DAOU ASH BASINS

Sign Locations		
S1	N	64304.67
	E	18015.47
S2	N	64304.99
	E	18950.69
S3	N	64365.92
	E	19511.91
S4	N	64146.46
	E	19563.93
S5	N	63349.58
	E	19143.28
S6	N	62298.08
	E	19150.15
S7	N	62187.35
	E	19051.93
S8	N	62178.46
	E	18319.11
S9	N	62199.23
	E	17580.70
S10	N	62810.02
	E	17557.50
S11	N	63516.29
	E	17585.07
S12	N	64012.76
	E	17549.62

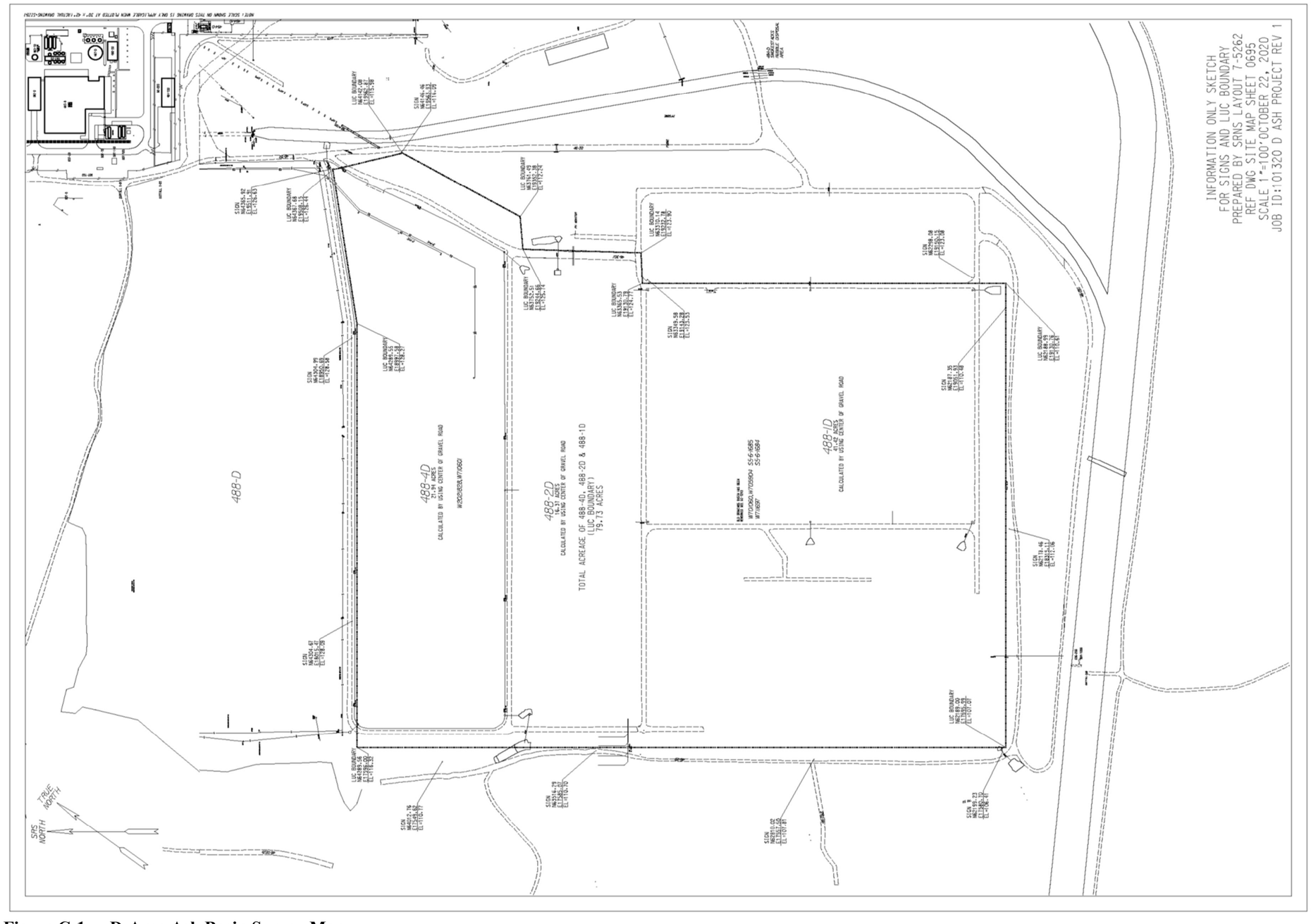

Figure C-1. D-Area Ash Basin Survey Map

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