Savannah River NUCLEAR SOLUTIONS℠

Statement of Basis/Proposed Plan for D-Area Ash Basin Wetlands (NBN) in Support of the Savannah River and Floodplain Swamp Integrator Operable Unit (U)

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DISCLAIMER

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and
Savannah River Nuclear Solutions, LLC
Aiken, South Carolina

CERTIFICATION

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SEMS Number(s) : 69
SRNS-RP-2025-01449, Revision 0, November 2025

[REF: 40CFR270.11 (d)(1)]

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Duane F. McLane, Senior Vice President
Environment, Safety, Health and Quality (ESH&Q)
for Savannah River Nuclear Solutions, LLC
as the Co-Operator with the U.S. Department of Energy
Savannah River Operations Office

Date Signed

Karen D. Morrow
Office Director for Closure and Project Management
Savannah River Operations Office
Office for Environmental Management
U.S. Department of Energy
Owner and Co-Operator

Date Signed

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LIST OF ACRONYMS AND ABBREVIATIONS

ac	acre(s)
ARAR	Applicable, or Relevant and Appropriate Requirement
ARF	Administrative Record File
BRA	Baseline Risk Assessment
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CM	Contaminant Migration
DABW	D-Area Ash Basin Wetlands
DAG	D-Area Groundwater
DEXOU	D-Area Expanded Operable Unit
ea	each
EC&ACP	Environmental Compliance and Area Completion Projects
ERA	Ecological Risk Assessment
FCMS/FS	Focused Corrective Measures Study/Feasibility Study
FFA	Federal Facility Agreement
ft	foot/feet
ha	hectare(s)
HH	Human Health
HHRA	Human Health Risk Assessment
IOU	Integrator Operable Unit
K-40	Potassium-40
kg	kilogram
km/km^2	kilometer(s)/square kilometer(s)
LLC	Limited Liability Company
LUCs	Land Use Controls
LUCAP	Land Use Control Assurance Plan
LUCIP	Land Use Control Implementation Plan
m/m^3	meter(s)/cubic meter(s)
mi/mi^2	mile(s)/square mile(s)
mg	milligram
NCP	National Oil and Hazardous Substances Contingency Plan
NPL	National Priorities List
O&M	operation and maintenance
OU	Operable Unit
PRG	Preliminary Remedial Goal
PTSM	Principal Threat Source Material
RAO	Remedial Action Objective
RCOC	Refined Constituents of Concern
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
RI	Remedial Investigation
ROD	Record of Decision
SB/PP	Statement of Basis/Proposed Plan
SCDES[1]	South Carolina Department of Environmental Services
SCHWMR	South Carolina Hazardous Waste Management Regulations
SEMS	Superfund Enterprise Management System
SRFS	Savannah River and Floodplain Swamp
SRNS	Savannah River Nuclear Solutions, LLC
SRS	Savannah River Site
TCR	Total Cumulative Risk
Th-232	Thorium-232
USDOE	United States Department of Energy

[1] SCDES was known as the South Carolina Department of Health and Environmental Control prior to July 1, 2024.

LIST OF ACRONYMS AND ABBREVIATIONS (*CONTINUED/END*)

USEPA	United States Environmental Protection Agency
U-238	Uranium-238
WSRC	Westinghouse Savannah River Company, LLC
yd / yd^3	yard(s) / cubic yard(s)

I. INTRODUCTION AND BACKGROUND

Introduction

This Statement of Basis/Proposed Plan (SB/PP) is being issued by the United States Department of Energy (USDOE), which functions as the lead agency for Savannah River Site (SRS) remedial activities, with concurrence by the United States Environmental Protection Agency (USEPA) and the South Carolina Department of Environmental Services (SCDES). The SB/PP is a document that the lead agency is required to issue to fulfill the requirements of Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 117(a) and National Oil and Hazardous Substances Contingency Plan (NCP) Section 300.430 (f)(2). The purpose of this SB/PP is to describe the preferred remedial alternative(s) for the D-Area Ash Basin Wetlands (DABW) in support of the Savannah River and Floodplain Swamp (SRFS) Integrator Operable Unit (IOU), and to provide for public involvement in the decision-making process. The SB/PP provides basic background information, describes the other remedial options considered, and solicits public input on all remedial alternatives and the rationale for the preferred remedial alternative.

The SB/PP highlights key information from the Focused Corrective Measures Study/Feasibility Study (FCMS/FS) for DABW in support of the SRFS IOU (SRNS 2025). Refer to the FCMS/FS report and the SRS Administrative Record File (ARF) for more information regarding the remedial action.

SRS occupies approximately 803 square kilometers (km^2) (310 square miles [mi^2]) of land adjacent to the Savannah River, principally in Aiken and Barnwell counties of South Carolina. SRS is located approximately 40 km (25 mi) southeast of Augusta, Georgia, and 32 km (20 mi) south of Aiken, South Carolina.

SRS is owned by the USDOE. Management and operating services are provided by Savannah River Nuclear Solutions, LLC (SRNS). SRS has historically produced tritium, plutonium, and other special nuclear materials for national defense. Chemical and radioactive wastes are byproducts of nuclear material production processes. Hazardous substances, as defined by CERCLA, are currently present in the environment at SRS.

The DABW is located at the SRS in Barnwell County, South Carolina (Figures 1 and 2). A remedial action is needed at the DABW because one metal (arsenic), and three radionuclides (potassium-40 [K-40], thorium-232 [Th-232], and uranium-238 [U-238]) are present in surface ash/soil that may pose a threat to human health. There are no problems warranting action identified for ecological receptors, principal threat source material (PTSM), or contaminant migration (CM). The preferred remedial alternative for the DABW is Land Use Controls (LUCs). LUCs were selected because they are easily implemented and provide adequate protection from human exposure to contaminated media.

The DABW is outside of the boundary of any industrial or general support area. No current or future development of the DABW is planned.

SRS Compliance History

SRS manages certain waste materials that are regulated under the Resource Conservation and

Recovery Act (RCRA), 42 U.S.C. § 6901–6992k, a comprehensive law requiring responsible management of hazardous waste. The DABW is a solid waste management unit under RCRA Section 3004(u). SRS received a RCRA hazardous waste permit from the SCDES, which was most recently renewed on October 27, 2025 (SC1 890 008 989). Module VIII of the Hazardous and Solid Waste Amendments portion of the RCRA permit mandates corrective action requirements for non-regulated solid waste management units subject to RCRA 3004(u).

On December 21, 1989, SRS was included on the National Priorities List (NPL). The inclusion created a need to integrate the established RCRA Facility Investigation (RFI) program with CERCLA requirements to provide for a focused environmental program. In accordance with Section 120 of CERCLA 42 U.S.C. § 9620(e)(2), USDOE has negotiated a Federal Facility Agreement (FFA) (FFA 1993) with the USEPA and SCDES to coordinate remedial activities at SRS into one comprehensive strategy which fulfills these dual regulatory requirements. The FFA lists the DABW as a RCRA/CERCLA unit requiring further evaluation using an investigation/assessment process that integrates and combines the RFI process with the CERCLA Remedial Investigation (RI) process to determine the actual or potential impact to human health and the environment of releases of hazardous substances to the environment.

Both RCRA and CERCLA require the public to be given an opportunity to review and comment on the draft RCRA permit modification and proposed remedial alternatives. Public participation requirements are listed in South Carolina Hazardous Waste Management Regulations (SCHWMR) R.61-79.124 and Sections 113 and 117 of CERCLA, 42 U.S.C. § 9613(k) and 9617(a). These requirements include establishment of an ARF that documents the investigation and selection of remedial alternatives and allows for review and comment by the public regarding those alternatives (See Section II). The ARF must be established at or near the facility at issue. The SRS FFA Community Involvement Plan (WSRC 2011) is designed to facilitate public involvement in the decision-making process for permitting, closure, and the selection of remedial alternatives. SCHWMR R.61-79.124 and Section 117(a) of CERCLA, as amended, require the advertisement of the draft permit modification and notice of any proposed remedial action and provide the public an opportunity to participate in the selection of the remedial action.

SCHWMR R.61-79.124 requires that a brief description and response to all significant comments be made available to the public as part of the RCRA Administrative Record. Community involvement in consideration of this evaluation of alternatives for the DABW is strongly encouraged. All submitted comments will be reviewed and considered. Following the public comment period, a Responsiveness Summary will be prepared to address issues raised during the public comment period. The Responsiveness Summary will be made available with the final RCRA permit modification and the Record of Decision (ROD).

The final remedial decision will be made only after the public comment period has ended and all the comments have been received and considered. The final remedial decision under RCRA will be in the form of a final permit modification, which is made by

SCDES. Selection of the remedial alternative that will satisfy the FFA requirements will be made by USDOE, in consultation with USEPA and SCDES. It is important to note that the final action(s) may be different from the preferred alternative discussed in this plan depending on new information or public comments. The alternative chosen will be protective of human health and the environment and comply with all federal and state laws.

II. COMMUNITY PARTICIPATION

The FFA ARF, which contains the information pertaining to the selection of the response action, is available at the following locations:

US Department of Energy
Public Reading Room
Gregg-Graniteville Library
University of South Carolina – Aiken
471 University Parkway
Aiken, South Carolina 29801
(803) 641-3465

Thomas Cooper Library
Government Information and Maps Department
University of South Carolina
1322 Greene Street
Columbia, South Carolina 29208
(803) 777-4841

The FFA ARF is available electronically at the following address:

http://www.srs.gov/general/programs/soil/arf/arfirf.html

Hard copies of the SB/PP are available at the following locations:

Reese Library
Government Information Department
Augusta University
2500 Walton Way
Augusta, Georgia 30904
(706) 737-1744

Asa H. Gordon Library
Savannah State University
2200 Tompkins Road
Savannah, Georgia 31404
(912) 358-4324

The RCRA ARF for SCDES is available for review by the public at the following locations:

The South Carolina Department of Environmental Services
Bureau of Land and Waste Management
2600 Bull Street
Columbia, South Carolina 29201
(803) 898-2000

The South Carolina Department of Environmental Services
Aiken Environmental Affairs Office
206 Beaufort Street, Northeast
Aiken, South Carolina 29801
(803) 642-1637

The public will be notified of the public comment period through mailings of the SRS Environmental Bulletin, a newsletter sent to citizens in South Carolina and Georgia, and through notices in the *Aiken Standard*, *The Augusta Chronicle*, *The People-Sentinel*, and *The State* newspapers. The public comment period will also be announced on local radio stations.

USDOE will provide an opportunity for a public meeting during the public comment period if significant interest is expressed. The public will be notified of the date, time, and location. At the meetings, the proposed action will be discussed, and questions about the action will be answered.

To request a public meeting during the public comment period, to obtain more information concerning this document, or to submit written comments, contact one of the following:

Barbara Smoak
Savannah River Nuclear Solutions, LLC
Savannah River Site
Building 703-43A
Aiken, South Carolina 29808
(803) 952-8060
barbara.smoak@srs.gov

The South Carolina Department of
Environmental Services
Attn: Mr. Kent Krieg, Director
Division of Waste Management
Bureau of Land and Waste Management
2600 Bull Street
Columbia, South Carolina 29201
(803) 898-0255

Following the public comment period, a ROD will be signed, and a final decision for the SRS RCRA permit will be issued. The ROD and RCRA permit will detail the remedial alternative chosen for this operable unit (OU) and include responses to oral and written comments received during the public comment period in the Responsiveness Summary.

III. OPERABLE UNIT BACKGROUND

Early infrastructure development of the SRS between 1951 and 1955 included the use of coal-fired powerhouses to generate steam and electricity. These powerhouses were located in each industrial/administrative area of the SRS with coal ash (coal combustion products) produced as a waste as a result of boiler operations. The D-Area Powerhouse was the longest running coal-fired powerhouse on SRS, operating from 1952 until 2012. Ash basins in D Area received ash from the coal fired D-Area Powerhouse via a wet sluice line.

The DABW is located downgradient and southwest of the 488-D Ash Basin, and a portion of the southeastern boundary of the DABW is adjacent to Beaver Dam Creek (Figure 2). The DABW is a forested mixed compositional bottomland wetland. Bottomland forest habitats range from more frequently flooded areas, to areas of open canopy, to a climax swamp forest approaching the Savannah River. Depending on precipitation events, river flood levels, and groundwater table fluctuations, portions of the DABW hold water seasonally/periodically.

The DABW is the result of overflow ash from the D-Area Ash Basins. Ash is believed to have been deposited in the DABW via an upgradient drainage ditch. The area no longer presents a source to the DABW. The DABW ash depositional area has an estimated area of ~36 hectares (ha) (90 acres [ac]) with an estimated volume of ~565,006 cubic meters [m^3] (~739,000 cubic yards [yd^3]) of ash. Field measurements from the *Ecological Sampling and Analysis Plan for the D-Area Wetlands Operable Unit* indicate an ash depth up to ~1.3 meters (m) (4.3 feet [ft]) in portions of the DABW (WSRC 2002a). The area has a gentle relief that slopes toward the Savannah River. The depth to groundwater is ~0 m (0 ft) (wetland/floodplain) to 3.1 m (10 ft) below ground surface (Figure 3).

No previous CERCLA regulatory actions have been implemented for the DABW. However, the DABW was investigated as part of the *RFI/RI/Baseline Risk Assessment (RFI/RI/BRA) for the D-Area Expanded Operable Unit (DEXOU)* in 2002 (WSRC 2002b). Multiple years of surface water and soil/sediment samples were collected to support the assessment. Figure 4 shows the sampling locations associated with the DABW. The DEXOU RFI/RI/BRA concluded that there was a risk for exposure of human receptors to coal-related contaminants in surface ash/soil at the

DABW subunit, but there were no ecological, PTSM, or CM problems warranting actions.

Although the DEXOU RFI/RI/BRA concluded that there were no ecological contaminants of concern for the DABW subunit (WSRC 2002b), the regulatory agencies determined that additional ecological study of the wetland area was needed to support a final remedial decision. A Core Team (i.e., representatives from USDOE, USEPA, and SCDES) scoping meeting was held in October 2002, and the DABW was administratively transferred to the SRFS IOU to allow for additional ecological study. The DEXOU RFI/RI/BRA was approved by the USEPA and SCDES in 2003, and ecological studies continued for several more decades for the DABW.

In 2022, SRS proposed a comprehensive remedial approach for the remaining SRS coal ash and coal fines OUs, including the DABW. While the other coal ash and coal fines OUs have the potential for beneficial reuse of contaminated ash material, the Core Team agreed that LUCs was the more likely remedial action for the DABW due to the wetland/floodplain environment. For this reason, the Core Team agreed to develop a stand-alone FCMS/FS, SB/PP, and final ROD for the DABW. The proposed strategy was documented in the *Preferred Remedial Action and Regulatory Strategy for Remaining Savannah River Site's Coal Ash and Coal Fines Operable Units (U)* (SRNS 2022) and approved by the USEPA and SCDES in 2022.

The strategy for the DABW FCMS/FS document was to use the information and conclusions of the DEXOU RFI/RI/BRA for the human health risk assessment (HHRA), PTSM evaluation, CM analysis, and the results of the site-specific ecological studies. In 2022-2024, a site-specific ecological study was conducted for the DABW. The study was based on results of previous studies and the approach and findings associated with the Wetland Area at Dunbarton Bay, a similar SRS wetland-related ash depositional area. Results of the 2022-2024 study were included in Appendix C of the updated ecological risk assessment (ERA) in the DABW FCMS/FS (SRNS 2025).

The conclusions of the DEXOU RFI/RI/BRA were verified in the DABW FCMS/FS through implementation of the approved technical protocols documented in the *Environmental Compliance & Area Completion Projects (EC&ACP) Regulatory Document Handbook* (SRNS 2023).

IV. SCOPE AND ROLE OF OPERABLE UNIT OR RESPONSE ACTION

Due to the complexity and size of multiple waste units located in different areas of the SRS, the site is divided into watersheds for the purpose of managing a comprehensive cleanup strategy. The SRS is segregated into six watersheds: Upper Three Runs, Lower Three Runs, Fourmile Branch, Steel Creek, Pen Branch, and the SRFS. In addition, the SRS also identifies six IOUs which are the surface water bodies and associated wetlands that correspond to the six respective watersheds. Waste units within a watershed may be evaluated and remediated individually or grouped with other waste units and evaluated as part of a larger Area OU. Upon disposition of all the waste units within a watershed, a final comprehensive ROD for the corresponding IOU (i.e., surface water and associated wetlands) will be pursued with additional public involvement. The DABW is located within the SRFS IOU downgradient of D Area (Figure 1).

V. SUMMARY OF SITE RISKS

This section identifies the basis for taking action and identifies the contaminants that were retained following a weight-of-evidence evaluation (i.e., refined contaminants of concern [RCOCs]) and exposure pathways that the remedial actions need to address. Additional information pertaining to the risk assessment is in the DABW FCMS/FS (SRNS 2025).

Summary of Human Health Risk Assessment

A HHRA was included in Appendix B of the DABW FCMS/FS document (SRNS 2025). The HHRA evaluates the potential for adverse effects associated with exposure to constituents present at the DABW. The assessment for each subunit estimates the risk potential in the absence of any remedial action and provides a basis for determining whether a remedial action is necessary.

The DABW is located in an area that precludes any residential (unrestricted) or industrial land use in the future. However, in order to support risk management decision making, the standard hypothetical resident (i.e., unrestricted land use) and the industrial worker receptor scenarios were evaluated in addition to the IOU onsite worker which was determined to be the most likely hypothetical receptor.

The IOU onsite worker receptor scenario is site-specific and describes a worker who is performing maintenance, collecting site samples, or conducting research within the IOU. The exposure assumptions for the IOU onsite worker are 20 years, 150 days/year, and 8 hours per day. This is the most likely receptor exposure scenario for this wetland/floodplain environment and is consistent with recent BRAs with similar ecological settings (e.g., Lower Three Runs IOU, Wetland Area at Dunbarton Bay).

The future resident receptor scenario evaluates long term risks to individuals assumed to have unrestricted use of the area. This scenario considers residents (adults and children) who hypothetically live on the subunits and are exposed chronically, both indoors and outdoors, to subunit contaminants. The standard exposure assumptions are 26 years, 350 days per year, and 24 hours per day.

The future industrial worker scenario is a standard USEPA exposure scenario that addresses long-term risks to workers who are exposed to subunit contaminants within an industrial setting. The standard exposure assumptions are 25 years, 250 days per year, and 8 hours per day. The USEPA refers to this receptor as “composite worker,” and it is analogous to the term “industrial worker” used herein. The future industrial worker scenario considers an adult who hypothetically works on-unit in an outdoor setting most of the time.

The results of the DEXOU HHRA for the DABW identified arsenic and coal-related radionuclides as HH (human health) RCOCs (WSRC 2002b). RCOCs are identified as those constituents that warrant a response action. There were no RCOCs identified in surface water media.

The conclusions of the 2002 HHRA for the DABW were reprocessed in accordance with the approved EC&ACP protocols and exposure assumptions (SRNS 2023) to verify that the original risk assessment conclusions were still valid. The updated HHRA is presented in Appendix B of the DABW FCMS/FS (SRNS 2025). The updated HHRA confirms that arsenic and coal-related radionuclides (i.e., K-40, Th-232, and U-238) exceed the 1E-06 risk threshold for the IOU onsite worker (total cumulative risk [TCR] = 1.7E-04), the industrial worker (TCR = 3.4E-04), and

the hypothetical resident (TCR = 5.8E-04), from the 0 to 0.3 m (0 to 1 ft) surface ash/soil interval and are identified as RCOCs.

Summary of Ecological Risk Assessment

The ERA for the DABW is presented in Appendix C of the DABW FCMS/FS (SRNS 2025). The ERA consists of steps that provide a scientifically based and defensible evaluation of exposure and hazard to ecological resources that will support a risk management decision regarding site remediation.

Ecological risk is associated with the potential for harmful effects to ecological systems resulting from exposure to an environmental stressor. A stressor is any physical, chemical, or biological entity that induces an environmental response. Stressors may adversely affect specific natural resources or entire ecosystems, including plants and animals, as well as the environment with which they interact. The site-specific ecological data are the final determining factor in assessing whether remedial action is required for the protection of ecological resources. Despite finding elevated concentrations of trace elements within soil and biota, the ERA for the DABW concluded that ecological risks associated with the DABW are negligible and there is little evidence that ash-associated contaminants are impacting the ecological community.

Overall, the site-specific ecological data show species composition, as well as other environmental variables at the DABW, is reflective of a typical southeastern floodplain forest, and there were no ecological RCOCs identified for the DABW that require a remedial action.

Summary of Fate and Transport Analysis

A CM analysis was conducted in the DEXOU RFI/RI/BRA (WSRC 2002b) and concluded that contaminant mobility was not a concern for the DABW. Since publication of the DEXOU RFI/RI/BRA in 2002, a more extensive groundwater monitoring network is available in D Area to evaluate the impact of coal and ash surface units on groundwater. As part of the D-Area Groundwater (DAG) OU monitoring, seven shallow wells are located at the perimeter of the DABW (Figure 5). As previously discussed, arsenic and coal- related radionuclides are common constituents in coal and ash units at SRS. As documented in the DABW FCMS/FS, review of the groundwater monitoring data from the seven wells at DABW supports the conclusions of the DEXOU RFI/RI/BRA that ash located in the DABW wetland/floodplain is not a CM concern to groundwater.

Summary of Principal Threat Source Material

An evaluation for source materials that are highly toxic was conducted as part of the PTSM assessment in the DEXOU RFI/RI/BRA (WSRC 2002b). The quantitative evaluation concluded that there were no contaminants that constitute PTSM at the DABW.

Problems Warranting Action

There are no ecological, PTSM, or CM problems warranting action for the DABW. However, arsenic and coal-related radionuclides (i.e., K-40, Th-232 series, and U-238 series) that pose an unacceptable risk for human receptors (i.e., potential future resident, industrial worker, and IOU onsite worker) are present in surface ash/soil and identified as HH RCOCs. As determined in the DABW FCMS/FS (SRNS 2025), the

problem warranting action for the DABW for the most likely hypothetical receptor is as follows:

> Arsenic and coal-related radionuclides (K-40, Th-232, and U-238) are present in the 0.0 to 0.3 m (0 to 1 ft) ash/soil interval that pose an unacceptable risk to the IOU onsite worker (TCR = 1.7E-04).

The most likely cleanup levels for arsenic and the coal-related radionuclides are based on SRS background concentrations (Table 1).

Conclusion

It is the lead agency's current judgement that the preferred alternative identified in this SB/PP, or one of the other active measures considered in the SB/PP, is necessary to protect public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

VI. REMEDIAL ACTION OBJECTIVES

Remedial action objectives (RAOs) are media- or site-specific objectives for protecting human health and the environment. RAOs usually specify potential receptors and exposure pathways, and are identified during project scoping once the conceptual site model is understood. RAOs describe what the remediation must accomplish and are used as a framework for developing remedial alternatives. The RAOs are based on the nature and extent of contamination, threatened resources, and the potential for human and environmental exposure.

The DABW is located within the Savannah River floodplain and is outside the boundary of any industrial or general support area. No current or future development of the DABW and floodplain area is planned. In support of the future land use, the RAO identified for the DABW is as follows:

> Prevent the IOU onsite worker from exposure to contaminants in surface ash/soil and concentrations exceeding 1E-06 or SRS background levels.

Preliminary Remedial Goals

Preliminary Remedial Goals (PRGs) serve to provide a range of cleanup goals for each RCOC and are typically identified along with the RAOs. These cleanup goals are either concentration levels that correspond to a specific risk or hazard or are based on Applicable, or Relevant and Appropriate Requirements (ARARs). Following public comment and approval of the SB/PP, the PRGs for the selected remedy are documented as final cleanup goals in the ROD.

The DABW FCMS/FS presents a range of HH PRGs corresponding to target cancer risks of 1E-06 (SRNS 2025). PRGs were calculated for all human receptors, including the IOU onsite worker and are presented in Table 1.

The most restrictive and the most likely PRGs presented in Table 1 are an appropriate starting point for developing remedial alternatives. Final cleanup levels will be agreed upon by USDOE, SCDES, and USEPA concurrent with selection of a remedial action. Final cleanup levels will be documented in the ROD.

Applicable or Relevant and Appropriate Requirements

ARARs are Federal and more stringent, promulgated State environmental or facility siting requirements in a

law or regulation that a selected remedy must attain, which vary from site to site. They specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site. Section 121(d) of CERCLA, as amended by the Superfund Amendments Reauthorization Act, requires that remedial actions comply with requirements and standards set forth under federal and state environmental laws.

Three categories of ARARs are identified to clarify how to identify and comply with environmental requirements. They include action-specific, location-specific, and chemical-specific requirements:

- Action-specific ARARs control or restrict the design, performance, and other aspects of implementation of specific remedial activities;
- Location-specific ARARs reflect the physiographic and environmental characteristics of the unit or the immediate area, and may restrict or preclude remedial actions depending on the location or the characteristics of the unit;
- Chemical-specific ARARs are media-specific concentration limits promulgated under federal or state law.

No ARARs were identified for the preferred alternative.

VII. SUMMARY OF REMEDIAL ALTERNATIVES

The range of alternatives includes options that 1) restrict exposure to contaminated media; 2) reduce exposure to contaminated media; and 3) eliminate exposure to contaminated media. A detailed description of each alternative is provided in the DABW FCMS/FS (SRNS 2025). A detailed cost analysis for the proposed alternatives is provided in Appendix A of this document.

Alternative A-1: No Action

The No Action alternative is required by the NCP to serve as a baseline for comparison with other remedial alternatives. Under this alternative, no effort would be made to control access, limit exposure, or reduce toxicity, mobility, or volume of RCOCs at the DABW. This alternative would leave the DABW in its current condition with no additional controls. This alternative does not include five-year remedy reviews.

Summary of Costs

Capital Cost $0
Operation and Maintenance (O&M) $0
Total Present-Worth Cost $0

Alternative A-2: Land Use Controls

This alternative involves the use of administrative and engineering controls to limit access to the entire ECODS L-3 subunit. LUCs have been implemented successfully within SRS and are fully employed in all areas of the site to limit access at the site boundary and on-site facilities. Administrative measures include use of the SRS Site Use/Site Clearance Program to require authorization before beginning work activities at the site (e.g., no excavation). Other administrative measures include property record notices and deed restrictions if the property is ever transferred to non-federal ownership to disclose former waste management and disposal activities, as well as remedial actions taken at the ash sites. Engineering controls would be implemented at the DABW through the use of warning and no trespassing signs at likely ingress locations. The LUCs will be described in detail

in a Land Use Control Implementation Plan (LUCIP). Five-year remedy reviews would be required under this alternative. LUCs would be applied to the entire area of contaminated media, ~36 ha (90 ac). The proposed LUC boundary is depicted in Figure 6 based on the ash extent and HH RCOC concentrations above the SRS Background 95th percentile for arsenic represented by arsenic (8.2 milligrams/kilogram [mg/kg]). A buffer zone to either the nearest sample location below the SRS Background 95th percentile for arsenic or 100 ft outside the ash deposition area was used to bound the extent.

Summary of Costs

Capital Cost $61,391
O&M $1,642,528
Total Present-Worth Cost $1,703,918

Alternative A-3: Excavation and Disposal

Alternative A-3 would include excavation of all ash to an average depth of 5 ft with an estimated volume of ~565,006 m^3 (739,000 yd^3). The ash would then be dried to meet the acceptance criteria of the receiving permitted receiving disposal facility. The ash would be hauled to a disposal facility. Excavation work would be performed in accordance with an approved stormwater pollution prevention plan. Verification sampling would be performed per an approved sampling and analysis plan to ensure all ash is removed. After ash removal, DABW would be contoured with clean fill and topsoil for proper drainage and the wetland restored. This alternative would not require LUCs or five-year remedy reviews.

Summary of Costs

Capital Cost $80,421,391
O&M $0
Total Present-Worth Cost $80,421,391

VIII. EVALUATION OF ALTERNATIVES

This section summarizes the results of the evaluation of the remedial alternatives in the DABW FCMS/FS (SRNS 2025).

The NCP [40 CFR 300.430(e)(9)] requires that potential remedial alternatives undergo detailed analysis using relevant evaluation criteria that will be used to select a final remedy. USEPA has established nine evaluation criteria to address the statutory requirements under CERCLA. The criteria fall into categories of threshold criteria, primary balancing criteria, and modifying criteria. The nine evaluation criteria are detailed in Table 2.

Comparative Analysis of Alternatives

The potential remedial alternatives have been evaluated against the threshold and primary balancing criteria. Modifying criteria (i.e., state or support agency acceptance and community acceptance) will be evaluated after the public comment period on the SB/PP. Provided below is a summary of the comparison of the alternatives against the CERCLA evaluation criteria. Key advantages and disadvantages for each alternative relative to one another and in relation to the two threshold criteria and five primary balancing criteria are discussed below and summarized in Table 3.

Overall Protection of Human Health and the Environment

Alternative A-1 would not be protective of human health or the environment. Alternatives A-2 and A-3 are protective of human health and the environment. Alternative A-2 limits human exposure to contaminated ash/soil through the implementation of LUCs. Contaminated ash/soil would be left in place, but exposure pathways will be broken. Alternative A-3 will prevent human exposure to all contaminated ash/soil via excavation and removal which permanently breaks the exposure pathway.

Compliance with ARARs

There are no chemical-specific ARARs for any of the alternatives. Location-specific ARARs associated with the excavation of the ash/soil media in the wetland area are considered for Alternative A-3. Alternative A-3 achieves the location-specific ARARs by avoiding, minimizing, or mitigating the destruction, loss, or degradation of wetlands. Excavation within any wetland area may require restoration upon completion of the excavation to comply with the applicable ARARs. Action-specific ARARs associated with Alternative A-3 are achieved by employing best management practices to minimize erosion of ash/soil and management of storm water runoff during excavation activities. There are no ARARs identified for Alternative A-2.

Short-Term Effectiveness

Alternative A-1 is not effective in the short-term since exposure is not prevented and therefore, ranked lowest of all the alternatives. Alternative A-2 poses no risk to the IOU onsite worker or surrounding community during implementation of the remedial action. These activities are minimally invasive and will result in no injury to a natural resource. Under Alternative A-3, remedial workers would have the greatest risk of exposure during excavation activities. The time to implement Alternative 2 is less than 6 months. In comparison, Alternative A-3 would take a significantly longer time to implement (approximately 18 months). For these reasons, Alternative A-3 is ranked lower than Alternative A-2 for short-term effectiveness.

Long-Term Effectiveness and Permanence

Alternative A-1 does not provide long-term effectiveness. Alternatives A-2 and A-3 provide excellent long-term effectiveness. For Alternative A-2, LUCs will remain in place until hazard risk levels no longer require controls. LUCs will ensure that the exposure pathways remain broken. For Alternative A-3, after the ash is excavated and removed to an approved offsite disposal facility and the DABW is clean closed, the exposure pathway will be eliminated. While both Alternatives A-2 and A-3 provided long-term effectiveness, Alternative A-3 is ranked higher because the contaminated media is permanently removed.

Reduction of Toxicity, Mobility, or Volume through Treatment

None of the alternatives employ any treatment to reduce the toxicity, mobility, or volume of the contaminated media. As such, all alternatives are given an equally low ranking.

Implementability

No implementation is required of Alternative A-1; therefore, this alternative was ranked highest. Alternative A-2, LUCs have been implemented successfully at other waste units within SRS. There are

no administrative or technical impediments for implementing LUCs at SRS. Alternative A-3 can also be readily implemented using standard construction techniques for excavation and hauling the contaminated ash/soil and contaminated soil to an approved offsite disposal facility. However, there will likely be difficulty associated with the construction because of working in the wetlands (groundwater table is near the ground surface), more controls required to minimize damage from construction, and more work needed to restore damage caused by the construction. Permitting for Alternative A-3 may be difficult and costly to obtain. For these reasons, Alternative A-3 is ranked lower than Alternatives A-1 and A-2 for implementability.

Cost

Alternative A-3 has high cost due mainly to excavating ash in a wetland, drying the ash, hauling to a landfill and disposal tipping fees. Alternative A-2 requires minimal work, with only warning sign installations and access controls. Alternative A-1 has no cost. For these reasons, Alternative A-3 is ranked lower than Alternatives A-1 and A-2 for cost.

Alternative A-1 No Action: $0

Alternative A-2 Land Use Controls: *$1,703,918*

Alternative A-3 Excavation & Disposal: *$80,421,391*

IX. PREFERRED ALTERNATIVE

A comparative alternative analysis, provided in Table 4 for the DABW, was developed to quantitively evaluation the alternatives as they relate to the CERCLA criteria. This analysis does not necessarily select the preferred alternative, although it does attempt to rank the remedies in order of superiority when compared to the CERCLA criteria.

The preferred alternative for the DABW is identified below:

Alternative A-2, LUCs, is the preferred remedy to prevent human exposure to arsenic and coal-related radionuclides that are present in surface ash/soils that present an unacceptable risk to the IOU onsite worker. Alternative A-2 was chosen as the preferred remedy at the DABW primarily due to the short-term effectiveness, ease of implementability and significantly lower cost as compared to Alternative A-3.

LUCs for the DABW include the following:

- Warning/no trespassing signs posted around the waste unit boundaries to alert IOU onsite workers to the presence of hazardous substances and to prevent unknowing entry and unrestricted use. Operations and maintenance of the signage.

- Administrative/Worker Access Controls: Includes SRS administrative controls and land use restrictions for onsite workers as implemented under the Site Use/Site Clearance Program and other controls that are in place to ensure worker safety, including work controls/work packages that include worker training, and health and safety requirements and pre-work briefings.

- Engineering controls: SRS access controls that limit and inform SRS workers and inadvertent trespassers as described in the

2023 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 preferred remedy for the DABW leaves hazardous substances in place that pose a potential future risk and will require land use restrictions for an indefinite period of time. As negotiated with USEPA, and in accordance with USEPA - Region 4 Policy (*Assuring Land Use Controls at Federal Facilities*, April 21, 1998), SRS has developed a Land Use Control Assurance Plan (LUCAP) (WSRC 1999) to ensure that land use restrictions are maintained and periodically verified. The unit-specific LUCIP that will be referenced in the ROD for the DABW will provide details and specific measures required for the LUCs selected as part of this preferred remedy. The USDOE is responsible for implementing, maintaining, monitoring, reporting upon, and enforcing the LUCs described in this SB/PP. The LUCIP, developed as part of this action, will be submitted as required in the FFA for review and approval by USEPA and SCDES. Upon final approval, the LUCIP will be appended to the LUCAP and is considered incorporated by reference into the DABW ROD, establishing LUC implementation and maintenance requirements enforceable under CERCLA. The approved LUCIP will establish implementation, monitoring, maintenance, reporting, and enforcement requirements for the unit. The LUCIP will remain in effect until modified as needed to be protective of human health and the environment. LUCIP modification will only occur through another CERCLA document. Approval by USEPA and SCDES is required for any modification or termination of the LUCs.

The Preferred Alternative can change in response to public comment or new information obtained before the remedial action is implemented at the individual subunits. Provide a descriptive paragraph that thoroughly details the logic behind selecting the preferred alternative. This should compare the preferred alternative to each of the other alternatives and point out the most decisive considerations for making the selection. The argument should be convincing and not leave questions as to why some other alternative was not preferred.

The preferred remedy for the DABW was selected based on the following:

Alternative A-2, LUCs was selected as the preferred alternative over Alternative A-1, No Action, because Alternative A-1 does not achieve the RAOs identified at the subunit. Individuals would not be provided protection from potentially being exposed to arsenic and coal-related radionuclides under Alternative A-1. While both Alternatives A-2 and A-3 are considered protective of human health and the environment, Alternative A-2 is more effective in the short term as exposure to contaminants during implementation is less and the amount of time to achieve the RAO is significantly less. In addition, Alternative A-2 has a significantly lower cost of $1.7M versus $80.4M for Alternative A-3. Alternative A-2 cost is nearly all O&M costs, while Alternative A-3 cost is all capital costs.

Based on information currently available, the lead agency believes that Alternative A-2 provides the best balance of tradeoffs among the other alternatives with

respect to the evaluation criteria. The USDOE expects the Preferred Alternative to satisfy the statutory requirements in CERCLA Section 121(b) to: (1) be protective of human health and the environment, (2) comply with ARARs, (3) be cost-effective.

X. POST-ROD SCHEDULE

Deliverable	Submittal Date
Submit Rev. 0, ROD	July 13, 2026
Submit Rev. 0, LUCIP	January 10, 2027
ROD Issuance	March 24, 2027
Remedial Action Start	March 24, 2028

XI. REFERENCES

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

SRNS, 2022. *Preferred Remedial Action and Regulatory Strategy for Remaining Savannah River Site's Coal Ash and Coal Fines Operable Units (U)* (IACD-22-166), July 2022, Savannah River Nuclear Solutions, LLC, Savannah River Site, Aiken, SC.

SRNS, 2023. *Environmental Compliance and Area Completion Projects Regulatory Document Handbook,* SRNS-RP-2022-00330, Revision 0, Savannah River Nuclear Solutions, LLC, Savannah River Site, Aiken, SC

SRNS, 2025. *Focused Corrective Measures Study/Feasibility Study for D-Area Ash Basin Wetlands (NBN) in Support of the Savannah River and Floodplain Swamp Integrator Operable Unit (U),* SRNS-RP-2024-01034, Revision 1, May 2025, Savannah River Nuclear Solutions, LLC, Savannah River Site, Aiken, SC

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

WSRC, 2002a. *Ecological Sampling and Analysis Plan for the D-Area Wetlands Operable Unit*, ERD-SAP-2002-00014, Revision 0, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC.

WSRC, 2002b. *Resource Conservation and Recovery Act (RCRA) Facility Investigation/Remedial Investigation/Baseline Risk Assessment (RFI/RI/BRA) for the D-Area Expanded Operable Unit*, WSRC-RP-2001-4162, Revision 1, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC

WSRC, 2006. *Background Soils Statistical Summary Report for the Savannah River Site*, ERD-EN-2005-0223 Revision 1, Washington Savannah River Company, Savannah River Site, Aiken, SC.

WSRC, 2011. *Savannah River Site Federal Facility Agreement Community Involvement Plan (U),* Revision 7, WSRC-RP-96-120, Savannah River Nuclear Solutions, LLC, Savannah River Site, Aiken, SC

XII. GLOSSARY

Administrative Record File: A file that is maintained and contains all information used to make a decision on the selection of a response action under the Comprehensive Environmental Response, Compensation and Liability Act. This file is to be available for public review, and a copy is to be established at or near the Site, usually at one of the

information repositories. Also, a duplicate file is held in a central location, such as a regional or state office.

Applicable, or Relevant and Appropriate Requirements (ARARs): Federal and more stringent, promulgated State environmental or facility siting requirements in a law or regulation that a selected remedy must attain, which vary from site to site.

Baseline Risk Assessment: Analysis of the potential adverse health effects (current or future) caused by hazardous substance release from a site in the absence of any actions to control or mitigate these releases.

Characterization: The compilation of all available data about the waste units to determine the rate and extent of contaminant migration resulting form the waste site, and the concentration of any contaminants that may be present.

Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 1980: A federal law passed in 1980 and modified in 1986 by the Superfund Amendments and Reauthorization Act.

Corrective Action: A USEPA requirement to conduct remedial procedures under RCRA 3004(u) at a facility when there has been a release of hazardous waste or constituents into the environment. Corrective action may be required beyond the facility boundary and can be required regardless of when the waste was placed at the facility.

Exposure: Contact of an organism with a chemical or physical agent. Exposure is quantified as the amount of the agent available at the exchange boundaries of the organism (e.g., skin, lungs, digestive tract, etc.) and available for absorption.

Federal Facility Agreement (FFA): The legally binding agreement between regulatory agencies (USEPA and SCDES) and regulated entities (USDOE) that sets the standards and schedules for the comprehensive remediation of the SRS.

Land Use Controls: Legal and/or administrative mechanisms as well as physical installations that modify or guide human behavior at operable units where residual contamination remains in place. Institutional controls and engineering controls are types of land use controls.

Media: Pathways through which contaminants are transferred. Five media to which a release of contaminants may occur are groundwater, soil, surface water, sediments, and air.

National Priorities List : USEPA's formal list of the nation's most serious uncontrolled or abandoned waste sites, identified for possible long-term remedial response, as established by CERCLA.

Operable Unit (OU): A discrete action taken as one part of an overall site cleanup. The term is also used in USEPA guidance documents to refer to distinct geographic areas or media-specific units within a site. A number of operable units can be used in the course of a cleanup.

Operation and Maintenance (O&M): Activities conducted at a site after a response action occurs to ensure that the cleanup and/or systems are functioning properly.

Overall Protection of Human Health and the Environment: The assessment against this criterion describes how the alternative, as a whole, achieves and maintains protection of human health and the environment.

Proposed Plan: A legal document that provides a brief analysis of remedial alternatives under consideration for the site/operable unit and proposes the preferred alternative. It actively solicits public review and comment on all alternatives under consideration.

Reasonable Maximum Exposure (RME): This is the value that the average concentration will fall below 95 percent of the time.

Record of Decision (ROD): A legal document that explains to the public which alternative will be used at a site/operable unit. The record of decision is based on information and technical analysis generated during the remedial investigation/ feasibility study and consideration of public comments and community concerns.

Resource Conservation and Recovery Act (RCRA), 1976: A Federal law that established a regulatory system to track hazardous substances from their generation to disposal. The law requires safe and secure procedures to be used in treating, transporting, storing, and disposing of hazardous substances. RCRA is designed to prevent the creation of new, uncontrolled hazardous waste sites.

Responsiveness Summary: A summary of oral and/or written comments received during the proposed plan comment period and includes responses to those comments. The responsiveness summary is a key part of the ROD, highlighting community concerns.

Statement of Basis: A report describing the corrective measures/remedial actions being conducted pursuant to South Carolina Hazardous Waste Management Regulations, as amended.

Superfund: The common name used for CERCLA; also referred to as the Trust Fund. The Superfund program was established to help fund cleanup of hazardous waste sites. It also allows for legal action to force those responsible for the sites to clean them up.

Target Risk Range: USEPA guidance for carcinogenic risk due to exposure to a known or suspected carcinogen between one excess cancer in an exposed population of ten thousand (1E-04) and one excess cancer in an exposed population of one million (1E-06). Risks within this range require risk management evaluation of remedial action alternatives to determine if risks can be reduced below one excess cancer in one million (1.0×10^{-6}). Risks greater than 1.0×10^{-4} indicate that remedial action is generally warranted.

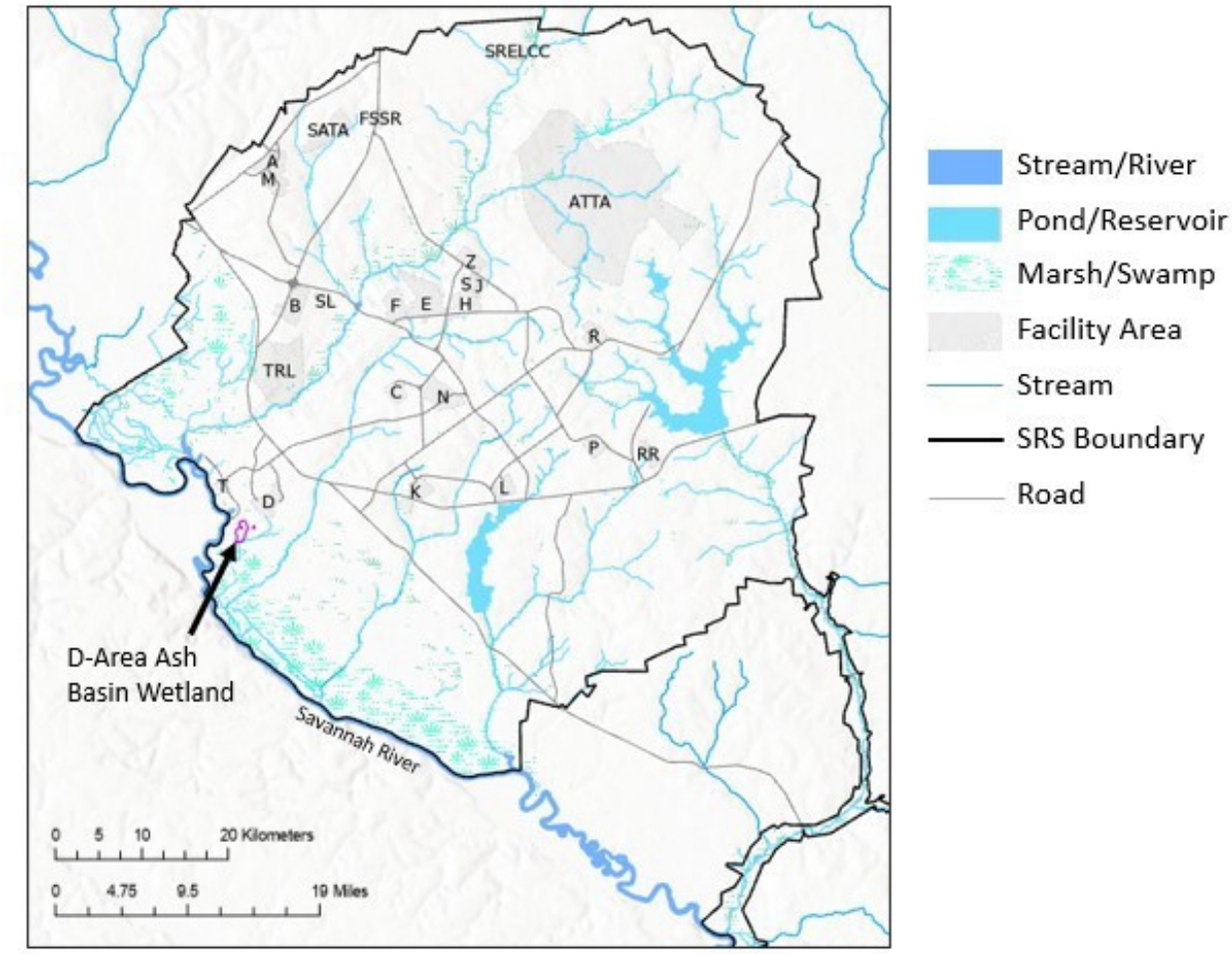

Figure 1. Location of the D-Area Ash Basin Wetlands within the Savannah River Site

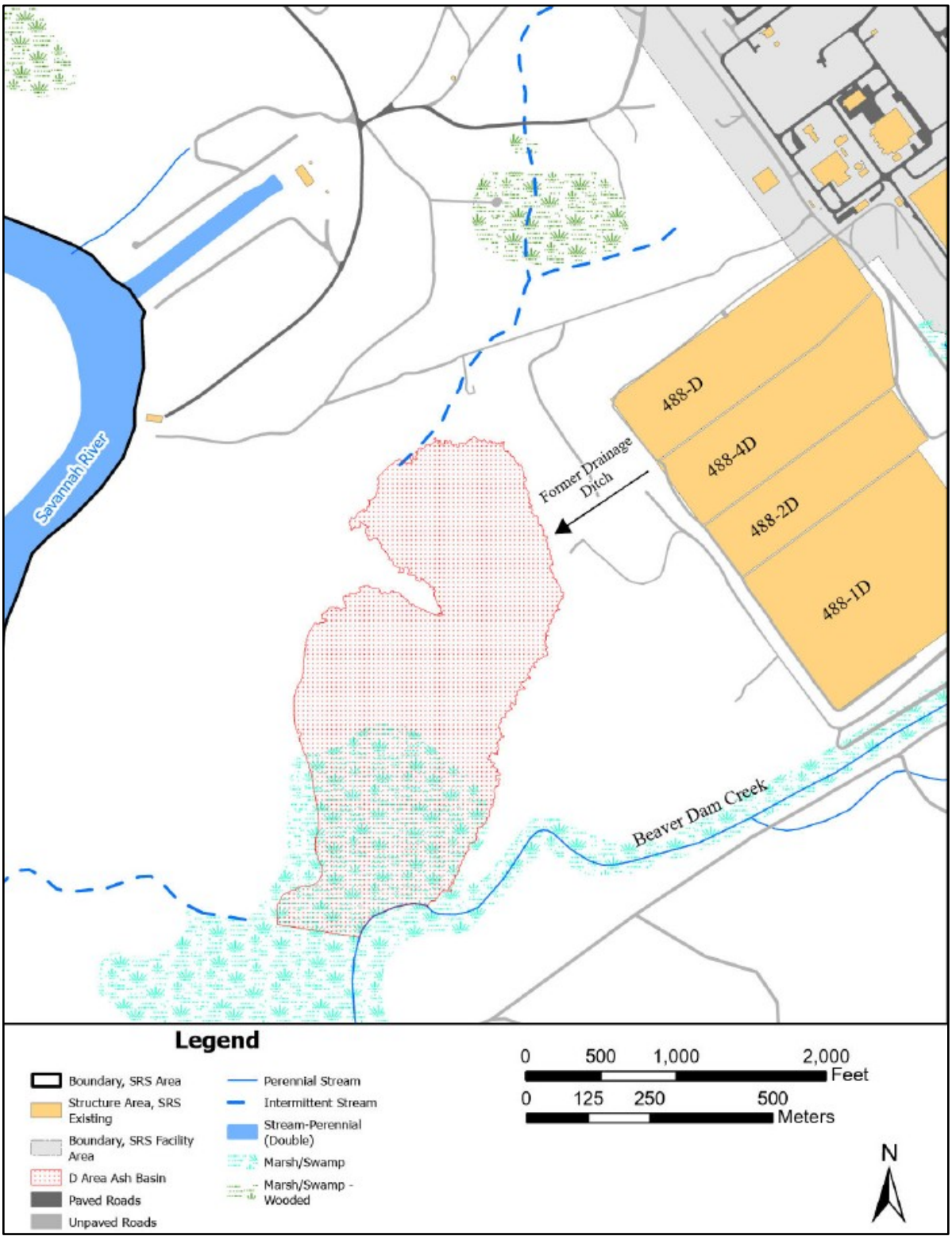

Figure 2. Layout of the D-Area Ash Basin Wetlands

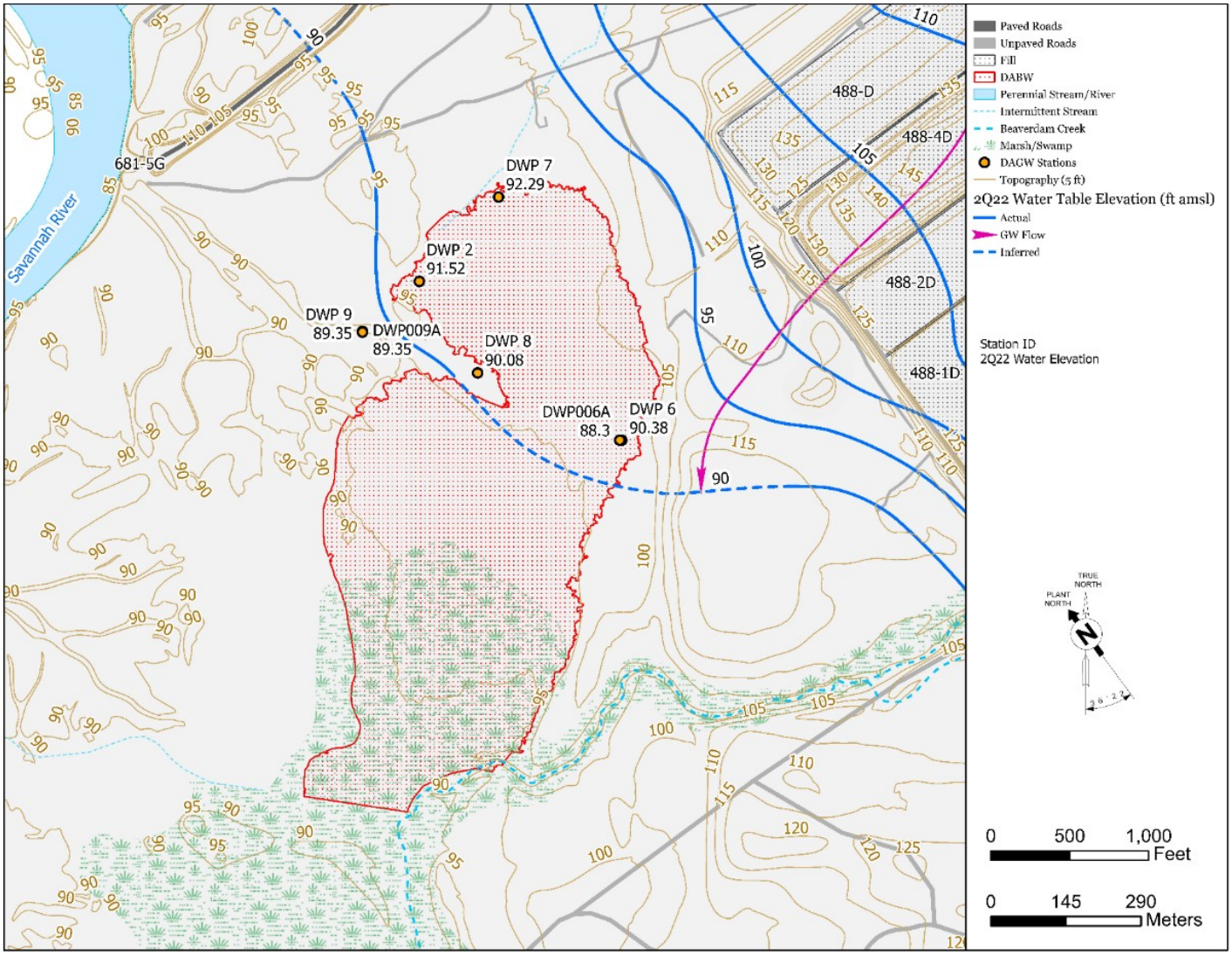

Figure 3. D-Area Ash Basin Wetlands Topography and Water Table Contours

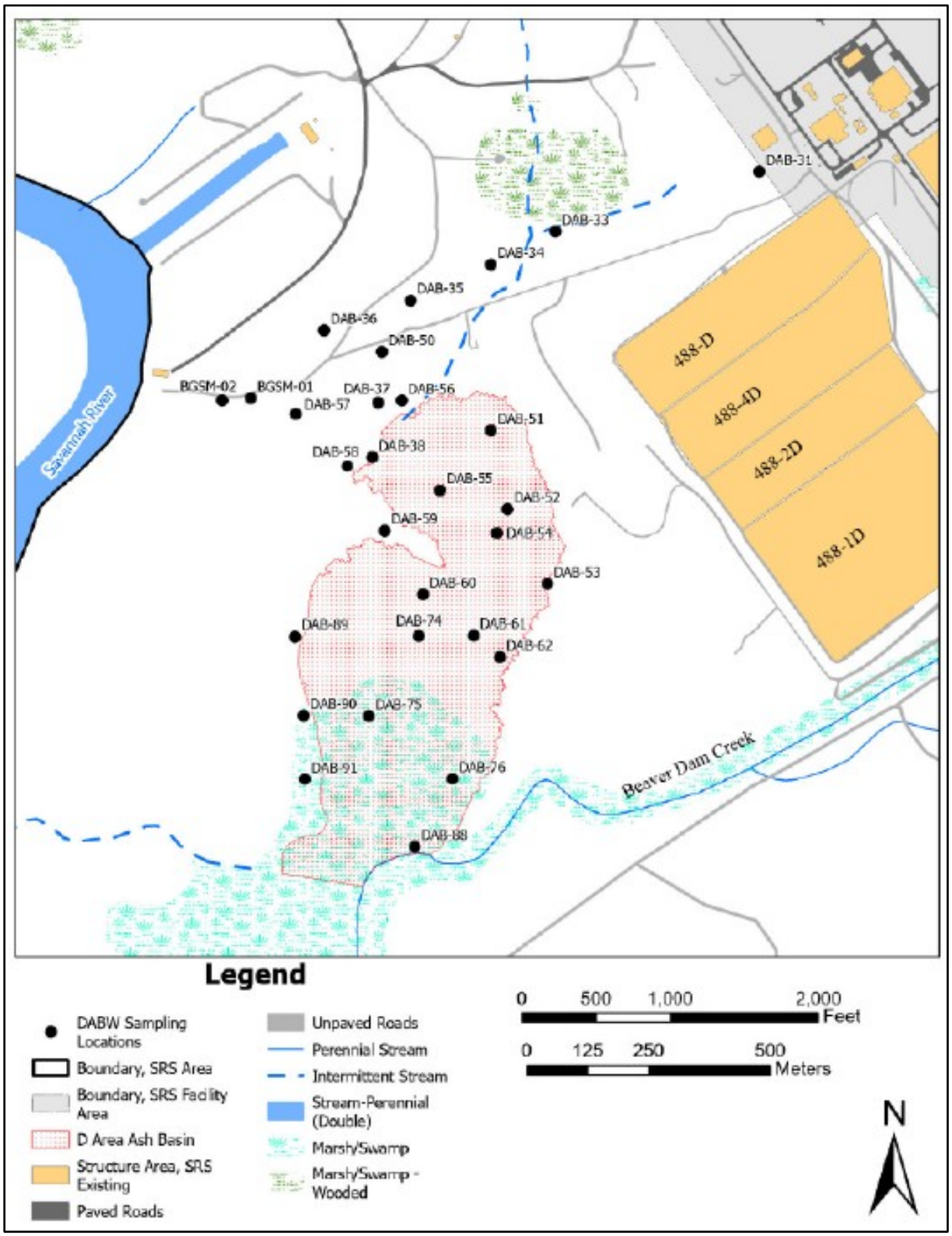

Figure 4. D-Area Ash Basin Wetlands Sampling Locations

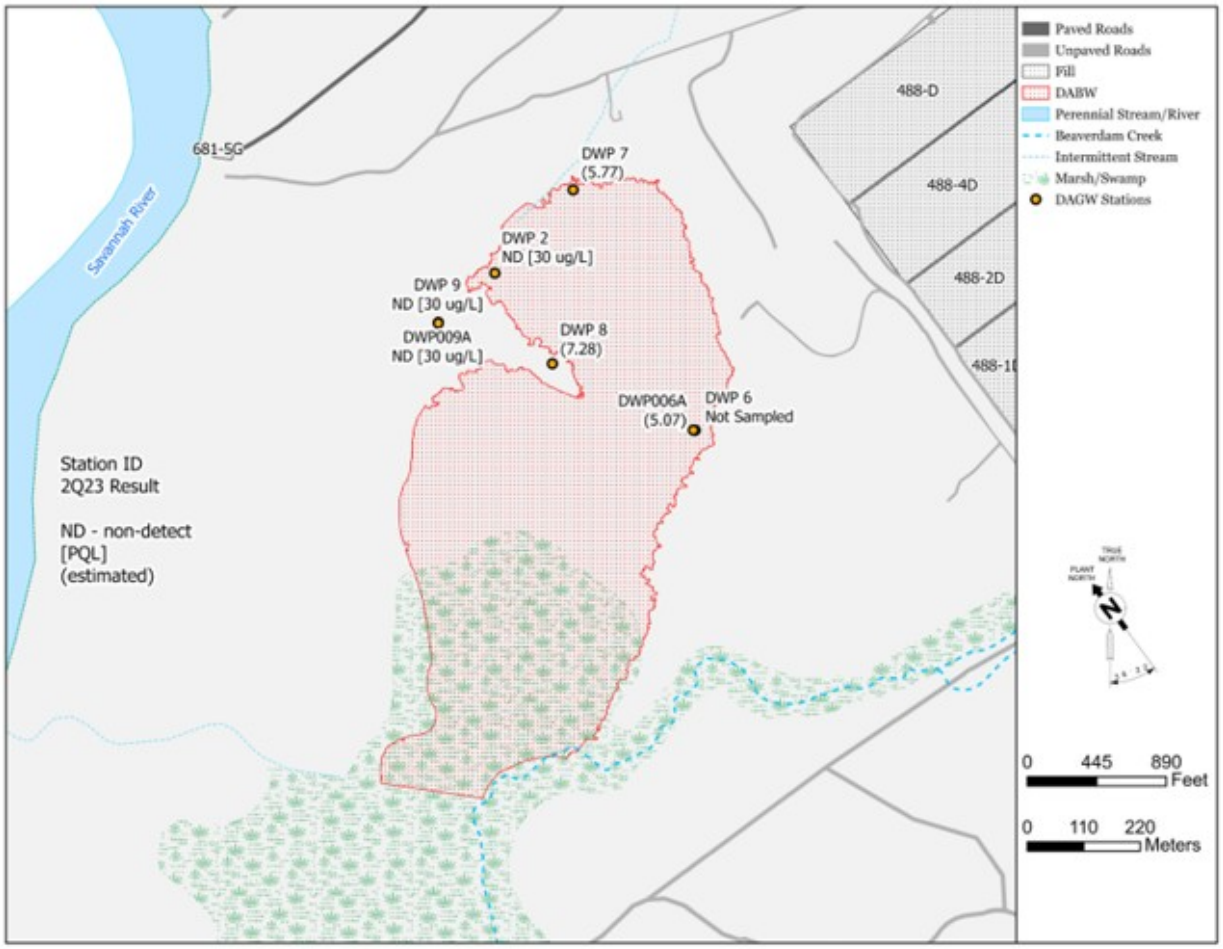

Figure 5. D-Area Ash Basin Arsenic Results for Groundwater (2Q2023)

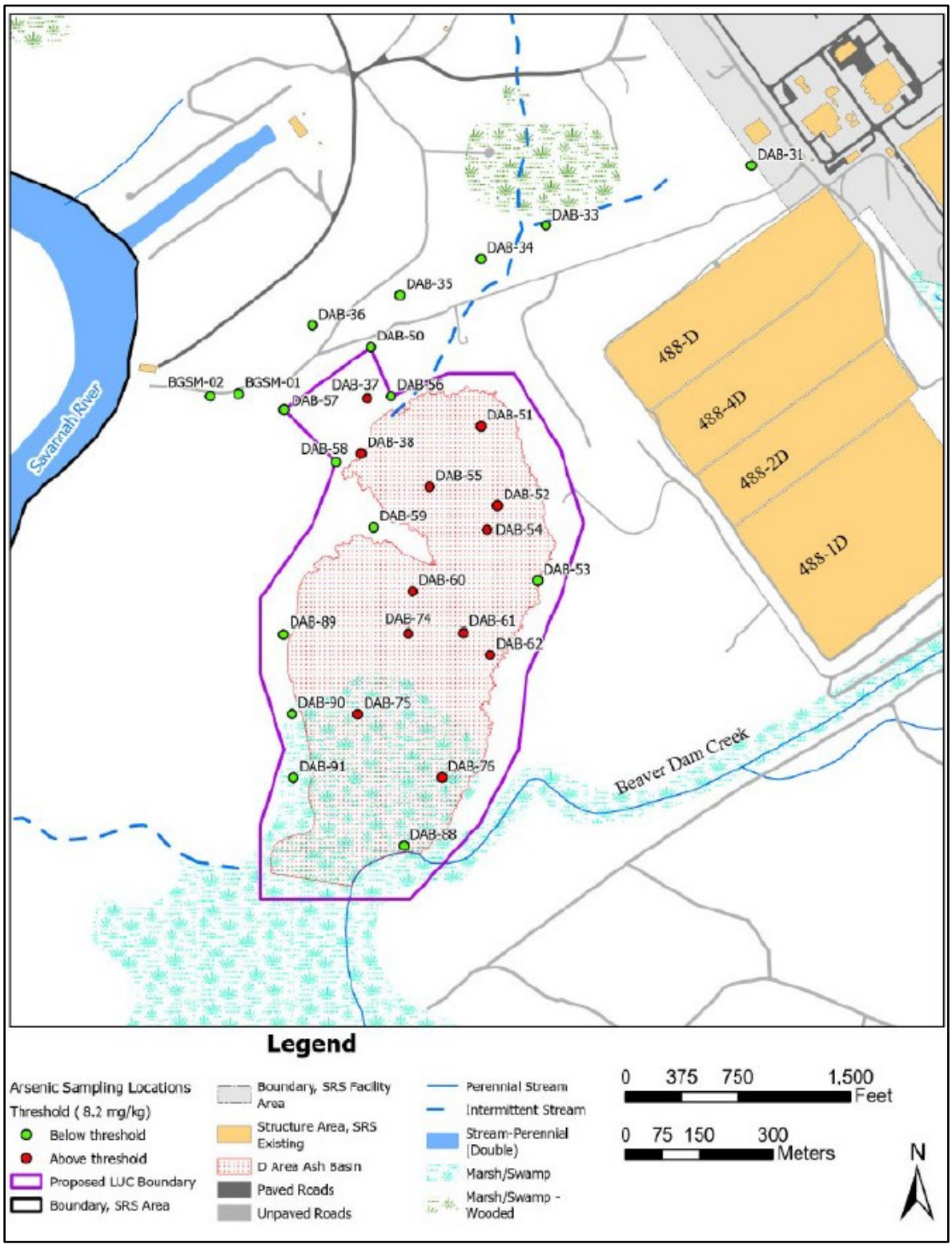

Figure 6. **Proposed Land Use Control Boundary for the D-Area Ash Basin Wetlands Based on Ash Extent (represented by Arsenic and background cleanup level of 8.2 mg/kg)**

Table 1. Summary of the Cleanup Levels (PRGs) for the D-Area Ash Basin Wetlands

Unit (media)	RCOC	Units	ARAR	CM	HH Residential[1]	HH Industrial[1]	HH IOU Worker[1]	ERA	PTSM	Most Restrictive Cleanup Level	SRS Background Maximum[2]	SRS Background 95th Percentile	Most Likely PRG[3]
DABW (ash)	Arsenic	mg/kg	---	---	0.68	3.0	6.24	---	---	0.68	22.9	*8.2*	8.2
	Potassium-40	pCi/g	---	---	0.144	0.219	0.446	---	---	0.144	8.53	*3.3*	3.3
	Thorium-232	pCi/g	---	---	0.00985	0.0153	0.0318	---	---	0.00985	2.79	*1.94*	1.94
	Uranium-238	pCi/g	---	---	0.0125	0.020	0.0416	---	---	0.0125	1.9	*1.22*	1.22

[1] Resident, Industrial Worker and IOU Onsite Worker 1E-06 regional screening level or PRG from Appendix B, Table B-1, of the FCMS/FS (SRNS, 2025).
[2] SRS Background concentrations from the *Background Soils Statistical Summary Report for the Savannah River Site* (ERD-EN-2005-0223) (WSRC 2006).
[3] Most likely PRG is the lesser of the risk-based levels and SRS 95th percentile background concentration. Source of the most likely cleanup level is identified in italics.
ARAR = applicable or relevant and appropriate requirement
CM = contaminant migration
DABW = D-Area Ash Basin Wetlands
ERA = ecological risk assessment
HH = human health
IOU = Integrator Operable Unit
PRG = Preliminary Remedial Goal
PTSM = principal threat source material
RCOC = refined constituents of concern from RFI/RI/BRA (WSRC 2002b)

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Table 2. Description of CERCLA Evaluation Criteria

Threshold Criteria:
• *Overall Protectiveness of Human Health and the Environment* determines whether an alternative eliminates, reduces, or controls threats to public health and the environment through institutional controls, engineering controls, or treatment. • *Compliance with ARARs* evaluates whether the alternative meets Federal and State environmental statutes, regulations, and other requirements that pertain to the site. ARARs may be waived under certain circumstances. ARARs are divided into chemical-specific, location-specific, and action-specific criteria.
Primary Balancing Criteria:
• *Long-Term Effectiveness and Permanence* considers the ability of an alternative to maintain protection of human health and the environment over time. It evaluates magnitude of residual risk and adequacy of reliability of controls. • *Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment* evaluates an alternative's use of treatment to reduce the harmful effects of principal contaminants, their ability to move in the environment, and the amount of contamination present. • *Short-Term Effectiveness* considers the length of time needed to implement an alternative and the risks the alternative poses to workers, residents, and the environment during implementation. • *Implementability* considers the technical and administrative feasibility of implementing the alternative, including factors such as the relative availability of goods and services. • *Cost* includes estimated capital and annual operations and maintenance costs, as well as present worth cost. Present worth cost is the total cost of an alternative over time in terms of today's dollar value. Cost estimates are expected to be accurate within a range of +50 to -30 percent.
Modifying Criteria:
• *State Support/Agency Acceptance* considers whether USEPA and SCDES agree with the analyses and recommendations by the USDOE. Approval of the Record of Decision constitutes approval of the selected alternative by the regulatory agencies. • *Community Acceptance* considers whether the local community agrees with the Preferred Alternative. Comments received on the Statement of Basis/Proposed Plan during the public comment period are an important indicator of community acceptance. Comments from the public are considered in the final remedy selection in the Record of Decision.

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Table 3. Comparison of Alternatives against the CERCLA Evaluation Criteria

	A-1	A-2	A-3
Criterion	No Action	LUCs	Excavation and Disposal
Overall Protection			
Human Health	Not protective of the IOU onsite worker because there are no controls or remediation.	Meets the requirement by limiting exposure of IOU onsite worker to the contaminated media through the use of administrative and engineering controls.	More protective of IOU on-site worker because contaminated media is removed.
Environment	Not protective because contaminants remain in place	Protective of the environment because no ECO/CM/PTSM RCOCs	Protective of the environment because no ECO/CM/PTSM RCOCs
Compliance with ARARs			
Chemical-Specific	No ARARs exist	No ARARs exist	No ARARs exist
Location-Specific	No ARARs exist	No ARARs exist	Various federal and South Carolina regulations are applicable for protection and mitigation of damage to wetlands
Action-Specific	No ARARs exist	No ARARs exist	ARARs for control of the minimization of sediment erosion, management of storm water and transportation of solid waste can be achieved.
Long-Term Effectiveness and Performance			
Magnitude of Residual Human Health Risk	Residual human health risk remains above 1E-06 or SRS background concentrations	Residual human health risk remains above 1E-06 or SRS background concentrations; five-year remedy reviews and LUCs required.	No residual human health risk because contaminated media removed.
Adequacy of Controls	None	Effective in preventing exposure to human receptors and breaking the exposure pathway. Leaves contaminants in place. LUCs required as long as contaminants are present.	No controls are required because contaminated media removed.
Permanence	Not permanent.	LUCs are permanent as long as LUCs are maintained.	Excavation of contaminated media will be permanent.

Table 3. Comparison of Alternatives against the CERCLA Evaluation Criteria (*Continued/End*)

	A-1	A-2	A-3
Criterion	No Action	LUCs	Excavation and Disposal
Reduction of Mobility, Toxicity, or Volume Through Treatment			
Type of Reduction	No reduction	No reduction	No reduction
Degree of Expected Reduction in Toxicity, Mobility, or Volume	No reduction via treatment	No reduction via treatment	No reduction via treatment
Short-Term Effectiveness and Performance			
Amount of Hazardous Material Destroyed or Treated	No reduction	No reduction	No reduction
Risk to Remedial Worker	None	None	Minimal; Health and Safety Plan will be implemented to protect remedial workers
Risk to Community	None	None	None
Risk to Environment	None	None	None
Time to Implement and achieve RAO	Never	6 months	18 months
Implementability			
Availability of Materials, Equipment, Contractors	Not Applicable	Readily Available	Readily Available
Ability to Construct and Operate the Technology	Not Applicable	Proven technology at SRS	The implementation of this large-scale removal in a wetland environment would be very challenging. Typically, not performed at SRS.
Ability to Obtain Permits/Approvals from Other Agencies	Not Applicable	Prior history with similar permits/approvals at SRS	Prior history with similar permits/approvals at SRS
Estimated Cost*			
Total Capital Cost	$0	$61,391	$ 80,421,391
Present Worth O&M Cost	$0	$1,642,528	$0
Total Cost	$0	**$1,703,918**	**$** 80,421,391

*-for itemized costs of the Preferred Alternative see Appendix A. For all itemized costs see Appendix F of the DABW FCMS/FS (SRNS 2025)

Table 4. Summary of the Comparative Analysis

Alternatives	Overall Protection of Human Health and the Environment	Compliance with ARARs	Long-term Effectiveness	Reduction of Toxicity, Mobility, and Volume through Treatment	Short-term Effectiveness	Implementability	Cost	Overall Ranking
Alternative A-1	No	NA	1	1	1	5	$0	8
Alternative A-2	Yes	NA	4	1	5	4	$1,703,918	14
Alternative A-3	Yes	Yes	5	1	4	2	$80,421,391	12

Note: Numeric range 1 through 5, where 1= worst and 5 = best

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APPENDIX A

DETAILED COST ESTIMATES FOR THE PREFERRED ALTERNATIVES

LIST OF TABLES

(Appendix A)

Table **Page**
Table A-1. Alternative A-2: Institutional Controls Estimate..... A-3

Institutional Controls Estimate
Alternative A-2
D-Area Ash Basin Wetlands

Item	Quantity	Units	Unit Cost	Total Cost
Direct Capital Costs				
DABW				
Institutional Controls				
Posting of Warning Signs	26	ea	$500	$13,000
Land Use Control Implementation Plan	1	ea	$5,000	$5,000
Deed Restrictions	1	ea	$5,000	$5,000
Subtotal - Direct Capital Cost				$23,000
Mobilization/Demobilization	9%	of subtotal direct capital		$2,070
Site Preparation/Site Restoration	9%	of subtotal direct capital		$2,070
Total Direct Capital Cost				**$27,140**
Indirect Capital Costs				
Engineering & Design	14%	of direct capital		$3,800
Project/Construction Management	25%	of direct capital		$6,785
Health & Safety	6%	of direct capital		$1,628
Overhead	30%	of direct capital + indirect capital		$11,806
Contingency	26%	of direct capital + indirect capital		$10,232
Total Indirect Capital Cost				**$34,251**
Total Estimated Capital Cost				**$61,391**
Direct O&M Costs	2.2%	3 Year Discount Rate [1]		
Annual Costs (Existing System during Post-ROD Design & Const)	2	years O&M		*Years 2027-2028*
Access Controls	1	ea	$500	$500
Maintenance	1	ea	$36,248	$36,248
Subtotal - Annual Costs				$36,748
Present Value Cost				**$71,140**
	2.5%	30 Year Discount Rate [1]		
Annual Costs	30	years O&M		*Years 2028-2057*
Access Controls	1	ea	$500	$500
Annual Inspection/Maintenance	1	ea	$36,248	$36,248
Subtotal - 30 Year Annual Costs				$36,748
Present Value Cost				**$769,146**
Five Year Costs	6			
Remedy Review	1	ea	$15,000	$15,000
Subtotal - Five Year O&M Costs				$15,000
Present Value Cost				**$59,729**
Total Present Value Direct O&M Cost				**$900,015**

Institutional Controls Estimate
Alternative A-2
D-Area Ash Basin Wetlands

Indirect O&M Costs		
Project/Admin Management	14% of direct O&M	$126,002
Health & Safety	19% of direct O&M	$171,003
Overhead	30% of direct O&M + indirect O&M	$270,005
Contingency	20% of direct O&M + indirect O&M	$175,503
Total Present Worth Indirect O&M Cost		$742,512
Total Estimated Present Worth O&M Cost		**$1,642,528**
TOTAL ESTIMATED COST		**$1,703,918**

[1] Interest rates for costs with 3-year and 30-year durations are based on SRNS Technical Memorandum ERTEC-2017-00002.
Real Interest Rates for OMB Circular No. A-94 (12/28/23)
Treasury Notes and Bonds of Specified Maturities