



**Department of Energy**  
Savannah River Operations Office  
P.O. Box A  
Aiken, South Carolina 29802

ARF-023796

JUL 21 2022

Ms. Susan B. Fulmer, P. G., Manager  
Federal Remediation Section  
Division of Site Assessment, Remediation and Revitalization  
Bureau of Land and Waste Management  
South Carolina Department of Health and Environmental Control  
2600 Bull Street  
Columbia, South Carolina 29201

Mr. Jon Richards  
Savannah River Site Remedial Project Manager  
Superfund Division  
U. S. Environmental Protection Agency, Region 4  
61 Forsyth Street, SW  
Atlanta, Georgia 30303

Dear Ms. Fulmer and Mr. Richards:

**SUBJECT:** Preferred Remedial Action and Regulatory Strategy for Remaining Savannah River Site's Coal Ash and Coal Fines Operable Units (U)

The U. S. Department of Energy (DOE) is proposing a comprehensive remedial approach to address several of the remaining coal ash and coal fines operable units at the Savannah River Site (SRS). Over the last several years, remedial decisions for several units containing coal ash and residual coal have been implemented at SRS. Many of the units have been closed in accordance with their individual remedial decisions and schedules. To address the remaining units more cost effectively and efficiently, SRS proposes a comprehensive remedial approach for the remaining units. The proposed strategy was presented at a Core Team meeting held on April 19, 2022, at the South Carolina Department of Health and Environmental Control (SCDHEC) Aiken Office along with the follow-up Microsoft Teams meeting held on May 23, 2022. The purpose of the meetings was to reach a Core Team agreement on an end state vision for the remaining coal/ash operable units at SRS. Enclosure 1 contains the presentation from the April 19, 2022, Core Team meeting.

The objectives achieved at the April 19, 2022, meeting are as follows:

- Agreed on a preferred remedial strategy for the remaining coal/ash operable units/groupings.
- Agreed on an administrative strategy for each of the remaining coal/ash operable units/groupings.
- SRS agreed to develop a preliminary schedule/sequence for the remaining coal/ash operable units based on those preferred strategies including identifying the decision documents and necessary supporting documents (Refer to Enclosures 2, 3, and 4).

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Table 1 summarizes the preferred approaches for each of the remaining coal/ash units and describes the operating strategy for the 288-F Ash Landfill as agreed to at the May 23, 2022, meeting. Tables 2 and 3 identify the proposed Federal Facility Agreement (FFA) milestones as shown on the enclosed implementation schedules.

**Table 1: Preferred Option Summary**

Selected Preferred Remedial Alternative	Administrative Strategy <sup>1</sup>	Unit(s)
Land Use Controls (LUCs) with Beneficial Reuse  (NOTE: Must meet South Carolina Class 2 waste characterization criteria.)	<ul style="list-style-type: none"> <li>• Focused EA CMS/FS</li> <li>• EA SB/PP</li> <li>• EA ROD</li> </ul>	<ul style="list-style-type: none"> <li>• A-Area Ash Pile (AAP), 788-A (SRS Index No. 236)</li> <li>• A-Area Coal Pile Runoff Basin (ACPRB), 788-3A (SRS Index No. 47)</li> <li>• F-Area Ash Landfill (FAL), 288-F (SRS Index No. 276)<sup>2</sup></li> <li>• H-Area Ash Basin (HAB), 288-H (SRS Index No. 292)</li> <li>• K-Area Ash Basin (KAB), 188-K (SRS Index No. 300)</li> <li>• L-Area Ash Basin (LAB), 188-L (SRS Index No. 148)</li> </ul>
LUCs	<ul style="list-style-type: none"> <li>• ESD to existing ROD</li> </ul>	<ul style="list-style-type: none"> <li>• Wetland Area at Dunbarton Bay (WADB) – Phase II (SRS Index No. 509)</li> </ul>
No Action (or LUCs)	<ul style="list-style-type: none"> <li>• Focused CMS/FS</li> <li>• SB/PP</li> <li>• Final ROD</li> </ul>	<ul style="list-style-type: none"> <li>• D-Area Ash Basin Wetland (DABW), (NBN) (SRS Index No. 569)</li> </ul>
Defer Remedial Decision (no changes to current FFA remedial dates)	N/A	<ul style="list-style-type: none"> <li>• H-Area Coal Pile Runoff Basin (HCPRB), 289-H (SRS Index No. 79)</li> <li>• D-Area Effluent Discharge Canal [NBN] (SRS Index No. 508)</li> <li>• Ash Area Adjacent to and Easterly of D-Area Ash Basins 488-1D and 488-2D) [NBN] (SRS Index No. 508)</li> </ul>

1 Acronyms are as follows:  
EA – Early Action  
CMS/FS – Corrective Measures Study / Feasibility Study  
SB/PP – Statement of Basis / Proposed Plan  
ROD – Record of Decision  
ESD – Explanation of Significant Difference  
N/A – Not Applicable

2 As an outcome from the 5/23/2022 meeting (SRNS-J2600-2022-00251), SCDHEC agreed that 288-F Class 2 ash landfill will remain an operating landfill until beneficial reuse is initiated (refer to *Meeting Minutes: F-Area Ash Landfill Permitting in Support of the Regulatory Strategy for the SRS Ash / Coal Fines Waste Units, May 23, 2022* (SRNS-J2600-2022-00251, dated May 24, 2022). “Operation” per the permit will require maintaining a vegetation cover over the ash to prevent ash runoff into surface waters. When ready to use the material, (inside and around basin) for beneficial reuse, the 288-F closure plan will be revised (to reflect the planned clean closure instead of in-place closure with a cover/cap.) for approval by SCDHEC. The area will be clean closed with all ash relocated for beneficial reuse at an SRS Class 3 landfill. Upon removal of all ash, post-closure monitoring requirement will be determined for the groundwater. Closure documentation for 288 F will be completed consistent with end state.

The on-SRS Class 3 landfill that will be using the ash as fill material will require a revision to the Class 3 Landfill closure plan only. The operating permit for FAL 288-F will not require any revisions.

**Table 2: Beneficial Reuse Coal and Coal Ash Units Proposed FFA Milestones (see Enclosure 2)**

Document / Milestone	(Upper Three Runs) A-Area CPRB 788-3A		(Upper Three Runs) A-Area Ash Pile 788-A		(Pen Branch) K-Area Ash Basin 188-K		(Pen Branch) L-Area Ash Basin 188-L		(Fourmile Branch) H-Area Ash Basin 288-H		(Upper Three Runs) F-Area Ash Landfill 288-F**	
	Current*	Proposed	Current*	Proposed	Current	Proposed	Current	Proposed	Current	Proposed	Current	Proposed
SEA	NA	NA	NA	NA	NA	NA	NA	NA	Dec 2034	NA	Dec 2024	NA
Field Start	NA	NA	NA	NA	Sept 2024	NA	Sept 2025	NA	NA	NA	NA	NA
EA Focused CMS/FS, Rev. 0	NA	Oct 2, 2024	NA	Oct 2, 2024	NA	Oct 2, 2024	NA	Oct 2, 2024	NA	Oct 2, 2024	NA	Oct 2, 2024
EA SB/PP, Rev. 0	Jun 20, 2023	Nov 3, 2025	Jun 20, 2023	Nov 3, 2025	NA	Nov 3, 2025	NA	Nov 3, 2025	NA	Nov 3, 2025	NA	Nov 3, 2025
EA ROD, Rev. 0	Feb 5, 2024	Jun 14, 2026	Feb 5, 2024	Jun 14, 2026	NA	Jun 14, 2026	NA	Jun 14, 2026	NA	Jun 14, 2026	NA	Jun 14, 2026
Issue EA ROD	Oct 28, 2024	Feb 23, 2027	Oct 28, 2024	Feb 23, 2027	Sept 2027	Feb 23, 2027	Aug 2028	Feb 23, 2027	NA	Feb 23, 2027	NA	Feb 23, 2027
EA CMI/RAIP, Rev. 0	Jan 23, 2025	TBD	Jan 23, 2025	TBD	NA	TBD	NA	TBD	NA	TBD	NA	TBD
EA LUCIP, Rev. 0	Jan 23, 2025	Dec 2, 2026	Jan 23, 2025	Dec 2, 2026	NA	Dec 2, 2026	NA	Dec 2, 2026	NA	Dec 2, 2026	NA	Dec 2, 2026
RA Start***	Jan 30, 2026	Feb 23, 2028	Jan 30, 2026	Feb 23, 2028	Dec 2028	Feb 23, 2028	Nov 2029	Feb 23, 2028	NA	Feb 23, 2028	NA	Feb 23, 2028
EA PCR, Rev. 0	Jun 22, 2027	TBD	Jun 22, 2027	TBD	NA	TBD	NA	TBD	NA	TBD	NA	TBD

SEA: Site Evaluation Area

EA: Early Action

CMS / FS: Corrective Measures Study/Feasibility Study

NA: Not Applicable

SB/PP: Statement of Basis / Proposed Plan

ROD: Record of Decision

CMI/RAIP: Corrective Measures Implementation / Remedial Action Implementation Plan

TBD: To Be Determined

LUCIP: Land Use Control Implementation Plan

RA: Remedial Action

PCR: Post Construction Report

\* Dates are based on the latest regulatory approved implementation schedule for A-Area Ash Pile/A-Area CPRB OU. Milestones have changed from 'Final' to 'Early'.

\*\* Facility will remain operational under the Class 2 Landfill Permit with a vegetative cover until beneficial reuse is implemented.

\*\*\* Proposed date is specific to Land Use Controls Start Date. Beneficial Reuse is projected to start in Calendar Year 2038 and will be defined within the EAROD.

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**Table 3: Land Use Control Units Proposed FFA Milestones**

Document/Milestone	(Steel Creek IOU) Wetland Area at Dunbarton Bay (See Enclosure 3)		(SRFS IOU) D-Area Ash Basin Wetland (See Enclosure 4)	
	Current	Proposed	Current	Proposed
Site Evaluation Area	NA	NA	NA	NA
Field Start	NA	NA	Dec 2059	NA
Focused Corrective Measures Study/Feasibility Study, Rev. 0	NA	NA	Not Established	Oct 30 2024
Statement of Basis / Proposed Plan, Rev. 0	NA	NA	Not Established	Dec 2 2025
Record of Decision, Rev. 0	NA	Jan 24, 2023 (NOTE: ESD Only)	Not Established	Jul 13, 2026
Issue ROD	NA	Sept. 5, 2023 (NOTE: ESD Only)	Jun 2064	Mar 26, 2027
CMI/RAIP, Rev. 0	NA	NA	Not Established	NA
LUCIP, Rev. 0	NA	Jun 7, 2023 (NOTE: Addendum Only)	Not Established	Jan 4 2027
RA Start	NA	NA	Sept 2065	Mar 25, 2028
PCR, Rev. 0	NA	Mar 18, 2024 (NOTE: Addendum Only)	Not Established	TBD

Acronyms are as follows:

ROD – Record of Decision

ESD – Explanation of Significant Difference

CMI/RAIP – Corrective Measures Implementation / Remedial Action Implementation Plan

LUCIP – Land Use Control Implementation Plan

RA – Remedial Action

PCR – Post Construction Report

NA – Not Applicable

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Please review the information contained in this strategy and provide your comments or approval by August 25, 2022. All changes will be reflected in the next revision to the FFA. The effort and time that U.S. Environmental Protection Agency and the SCDHEC have given on this ash strategy is greatly appreciated. Questions from you or your staff may be directed to me at (803) 952-8365.

Sincerely,

**Brian T. Hennessey**

Digitally signed by Brian T.  
Hennessey  
Date: 2022.07.20 16:03:55 -04'00'

Brian T. Hennessey  
SRS Remedial Project Manager  
Infrastructure and Area Completion Division

IACD-22-166

Enclosures:

1. Proposed Remedial Actions and Regulatory Strategy for Remaining SRS Ash/Coal Fines Waste Units (U), April 19, 2022, SRNS-RP-2022-00205, Revision 1 Redline
2. SRS Ash Basin Closure Program Implementation Schedule – Beneficial Reuse (A-Ash Pile, ACPRB, F-Area Landfill, H/K/L-Ash Basin)
3. SRS Ash Basin Closure Program Implementation Schedule – Wetland Area Dunbarton Bay (Phase 2)
4. SRS Ash Basin Closure Program Implementation Schedule – D-Area Ash Basin Wetland

cc w/o encl:

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R. H. Pope, EPA-Atlanta

cc w/ encl:

M. McRae, TechLaw, Inc.

# Proposed Core Team Remedial Actions and Regulatory Strategy for Remaining SRS Ash/Coal Fines Waste Units (U)

April 19, 2022 (revised post Core Team meeting)

SRNS-RP-2022-00205 Rev. 1 Redline

# Agenda

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- **Purpose and Objectives**
- **Overview of SRS Ash and Coal Fines Waste Units**
- **Waste Unit Groupings**
- **Recommended Remedial Action Strategy**
  - Beneficial Reuse
    - *Justification*
    - *Uncertainties & Associated Management Actions*
    - *Alternatives to Beneficial Reuse*
  - Land Use Controls (LUCs)
    - *Justification*
    - *Uncertainties/Considerations*
    - *Alternatives to LUCs*
- **Recommended Administrative Strategies**
- **Summary**
- **Recommended Schedule for 2022**
- **Action Items**

# Purpose and Objectives

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- **Purpose:**

- Reach Core Team agreement on an end state vision for the remaining ash waste units at SRS

- **Objectives**

- Agree on preferred remedial strategy for waste units/groupings.
- Agree on administrative strategy for each waste unit/groupings.
- Develop preliminary schedule/sequence for field starts of remaining waste units based on preferred strategy including decision documents and necessary supporting documents.

# Ash/Coal Fines Waste Unit History/Background

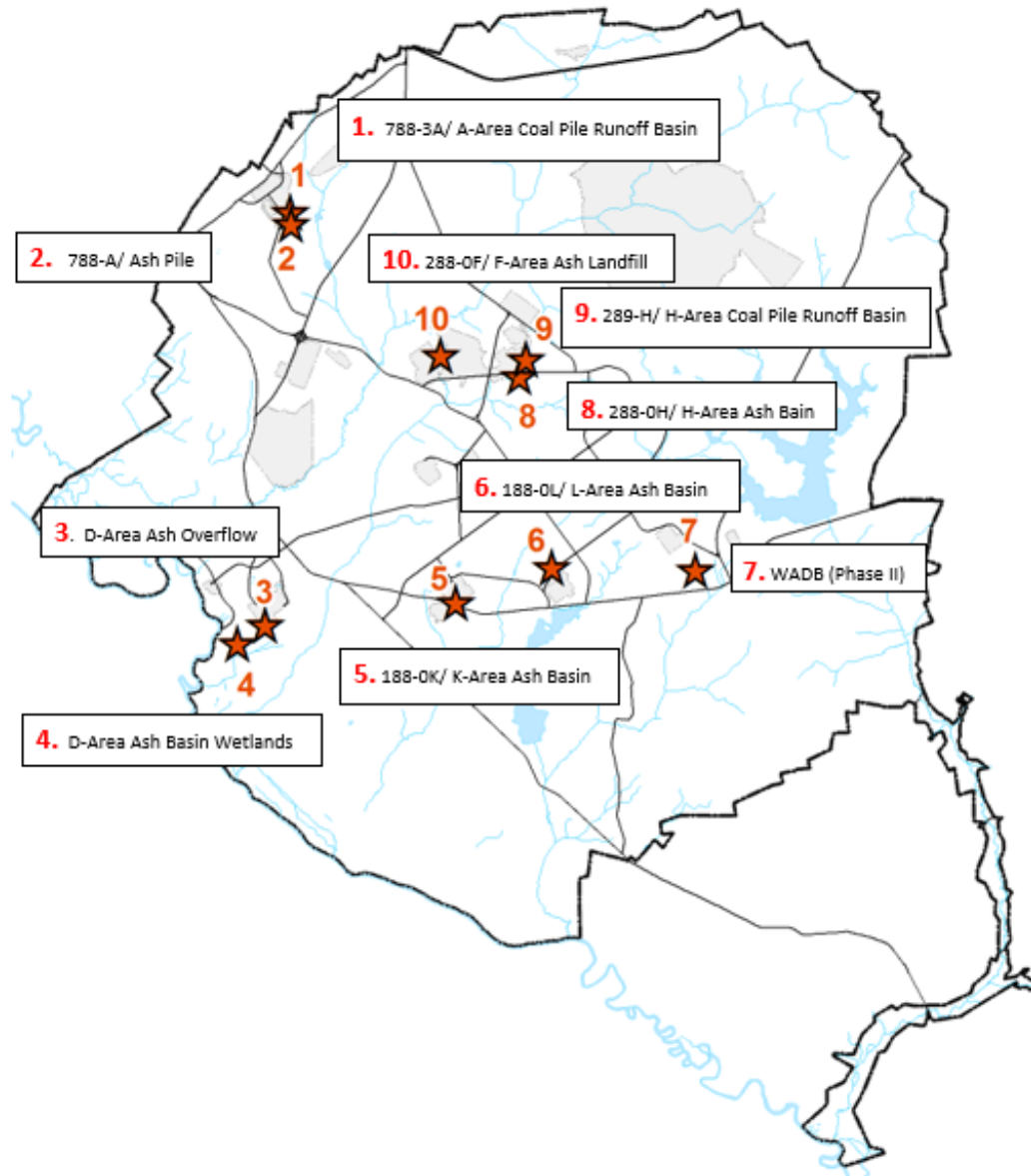
- Completed remedial actions for SRS ash and coal fines waste site closures

Remediation	Waste Unit	Regulatory Program
Class II Soil Cover	P-Area Ash Basin, R-Area Ash Basin, A-Ash Pile (788-2A)	NTC Removal Action/EA ROD, ROD
Class III Geosynthetic Cover System	D-Area Ash Basins	IWT/NTC Removal Action/EA ROD
Excavate and Haul	Coal Pile Runoff Basins (C-, K-, L-, P- and F-Areas), WADB (Phase I), C-Area Ash Piles	NTC Removal Action/ROD
LUCs	WADB (Dunbarton Bay and Buffer Area)	ROD

- 10 additional units have a presumed similar problem warranting action(s)

# Remaining Ash and Coal Fines Waste Units

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# Remaining Ash and Coal Fines Waste Units

Ash/Coal Fine Unit	Depth to Groundwater	Area	Estimated Volume	FFA Appendix E RA START	Comments
	(ft)	(ac)	(yd <sup>3</sup> )		
A-Area Coal Pile Runoff Basin, 788-3A	100-110	2.62	10,000 <sup>a</sup>	Mar 2026	Inactive. Coal fines present – not ash.
A-Area Ash Pile 788-A	100-110	2.55	70,000 <sup>b</sup>	Mar 2026	Ash was trucked from the power plant and piled from 1950-1980 (approx.). Draft Proposed Plan to consolidate in Coal Pile Runoff Basins (CPRB).
D-Area Ash Overflow (DAO) Savannah River Floodplain Swamp Integrated Operable Unit (IOU) (D-Area SRFP IOU)	0-15	33	>50,000 (ROM)	Sep 2065	Part of IOU. Overflow from previous operations prior to ash basin closure (probably >25 % moisture content).
D-Area Ash Basin Wetlands (DABW) D-Area SRFP IOU	0-15	90	739,000	Sep 2065	Ash was sluiced from powerhouse. Overflow from previous operations prior to ash basin closure.
K-Area Ash Basin, 188-K	61	11.16	273,000	Dec 2028	Ash was sluiced into this basin from 1950-1990. Currently, the basin is heavily vegetated with no standing water. Potential Consolidation location. Active IWT.
L-Area Ash Basin, 188-L	17-50	18	323,000	Nov 2029	Ash was sluiced into this basin from 1950-1968. Currently, the basin is heavily vegetated and holds some standing water in the northeast portion of the basin. Potential consolidation location.
Wetland Area at Dunbarton Bay (WADB) – Phase II	17	4.5	22,000	TBD	Phase II includes the South Ash Remediation Area, south of the powerline road. WADB Phase I included excavate and haul to TRL for non-wetlands and LUCs for Dunbarton Bay wetlands and buffer area. The SARA was >30% moisture and exceeded the capacity of the TRL ash cell.
H-Area Ash Basin, 288-H	22	13	259,000	Dec 2034 (SER) <sup>d</sup>	Ash was sluiced into this basin from 1950-1990. Some standing water on the east and south sides of the basin. Active IWT.
H-Area Coal Pile Runoff Basin, 289-H	10	1.27	7,000 <sup>c</sup>	Apr 2043	Coal fines present – not ash. Currently active industrial stormwater permit.
F-Area Ash Landfill, 288-F	70-80	7	358,000	Dec 2024 (SER) <sup>d</sup>	Ash is currently being moved from the periphery into an unlined landfill. Active SCDHEC Solid Waste Landfill Permit.

**Notes:**

- a) SRNS 2012b (AAP/ACPRB RI/BRA)
- b) Ash volume calculated from preliminary design (drawings: C-CG-A-00063, -00064, -00066, -00068) – is slightly higher than volume calculated in Appendix C.
- c) Assumed based on ratio of operating times and volume in ACPRB as calculated in SRNS 2012b
- d) SER – Site Evaluation Report – will determine if this site is moved to Appendix E in the FFA

# Likely Response Actions Evaluated for Remaining Ash Waste Units

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- **In situ Alternatives**

- Land Use Controls (LUCs)
- Individual Cover in Place with SCDHEC Class II Landfill Cover System for Eventual Beneficial Reuse
- In-situ Stabilization with Soil Cover
- Individual Cover in Place with SCDHEC Class III Landfill Cover System

- **Ex situ Alternatives**

- Consolidation at Locations with SCDHEC Class II Landfill Cover System until Eventual Beneficial Reuse
- Consolidate at One Location and Closure with Class III Landfill Cover System
- Excavation and Shipment for Encapsulated Beneficial Reuse
- Excavation and Entombment into 186 Basins with Class III Landfill Cover System
- Excavation and Disposal at TRL

# Ash and Coal Fines Waste Unit Groupings

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**Waste units that contain similar characteristics or permit challenges are grouped for a logical flow for engineering design, cost efficiency, and regulatory approval.**

- **KAB, LAB, HAB, FAL**

- These are basins that received ash via sluicing and have similar remedial benefits and challenges
- FAL has an active SCDHEC Solid Waste Landfill Permit

- **WADB, DAO, DABW**

- Wetlands or near wetland ash depositional areas

- **AAP, ACPRB**

- Location and administrative ties/remedial action schedule pair these units

- **HACPRB**

- Coal fines only
- Active industrial stormwater permit in place and in use.

## Recommended Strategy – Beneficial Re-use (Plan A)

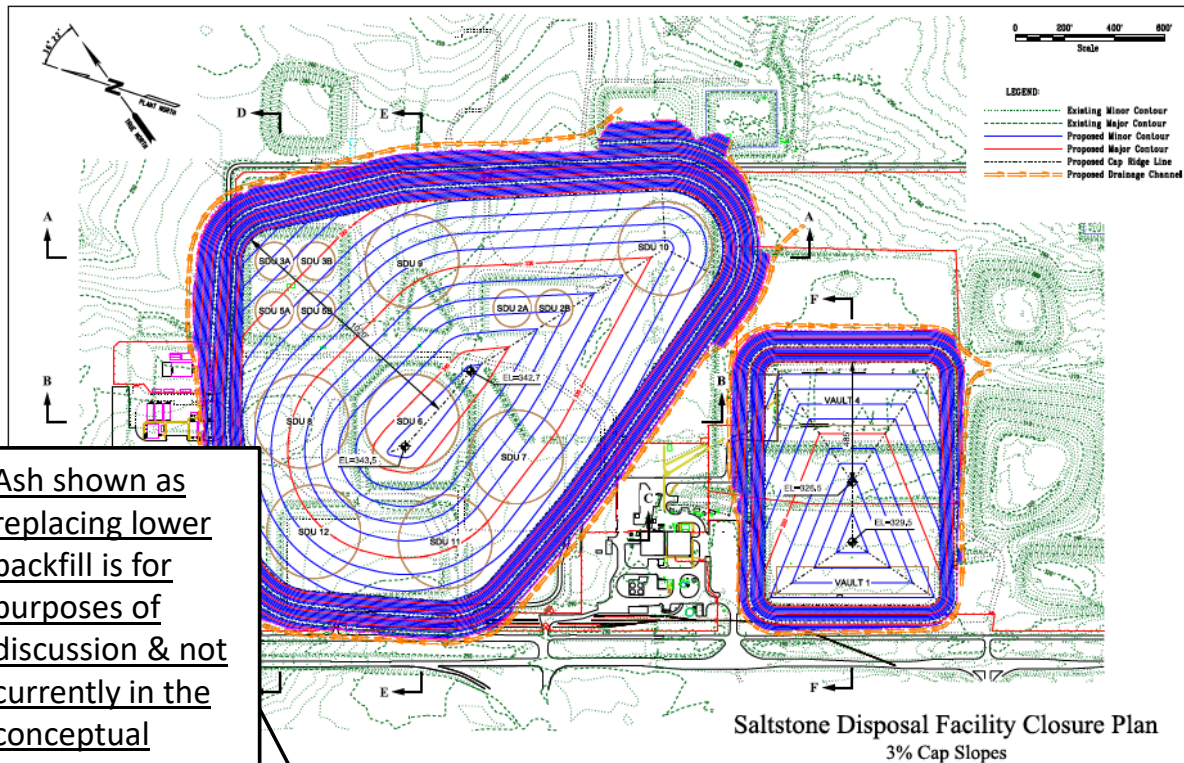
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- **Candidate Ash/Coal Fines Waste Units: FAL\*, HAB, KAB, LAB, AAP, ACPRB**
- **Excavation of ash/coal fines to NFA levels and beneficial reuse of excavated materials**
- **Beneficial Re-Use Opportunity**
  - Use ash and coal fines as lower backfill under a final closure cap – (e.g., Saltstone Disposal Units (SDUs), Burial Grounds, F&H Tank Farms)
  - Use coarser material (i.e., bottom ash) as light weight aggregate for onsite applications (e.g., asphalt paving)
- **Program Efficiencies**
  - Schedule efficiency
  - Less regulatory documentation
  - Significantly decreased design, engineering and construction costs
  - Significant reduction in footprint of ash/coal fines waste units realized, resulting in less surveillance and maintenance (S&M) costs.
  - Reduced need for borrow material
  - Disposal cost avoidance

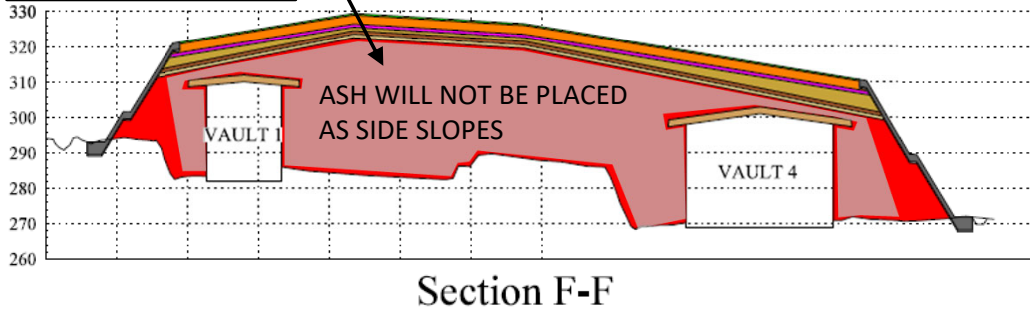
\* FAL currently under a SW Permit and requires modification/suspension to proceed with re-use option

# Beneficial Re-Use Justification: Possible Applications and Why Appropriate

## Use of Ash as Lower Backfill for SDU – Conceptual Design



Ash shown as replacing lower backfill is for purposes of discussion & not currently in the conceptual design



ASH WILL NOT BE PLACED AS SIDE SLOPES

Total Lower Backfill North 3% Cap	4,237,550	CY
Minus Tanks	-944,893	CY
Minus Structures Sand Layer	-88,505	CY
<b>Net Total</b>	<b>3,204,152</b>	<b>CY</b>

Total Lower Backfill South 3% Cap	1,002,109	CY
Minus Vaults	-197,681	CY
Minus Structures Sand Layers	-20,274	CY
<b>Net Total</b>	<b>784,154</b>	<b>CY</b>

**LEGEND:**

- RIPRAP
- STONE BEDDING LAYER
- TOPSOIL
- UPPER BACKFILL
- EROSION BARRIER
- MIDDLE BACKFILL
- LATERAL DRAINAGE LAYER
- FOUNDATION LAYER
- LOWER BACKFILL
- LOWER SAND DRAINAGE LAYER
- APPROXIMATE PRE-CLOSURE GRADE

## Beneficial Re-Use Justification: Possible Applications and Why Appropriate (cont'd)

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- **On-Site Beneficial Uses**

- SDUs, F&H Tank Farms, and Burial Grounds - preliminary design for final cover systems calls for millions of cubic yards of lower backfill.
- Large space between SDUs make stability and chemistry issues for lower backfill less of a concern than tanks with steel liners; some SDUs (1 and 4) will also be ready for closure sooner than either tank farm.
- DOE-HQ providing funding opportunities for research involving beneficial reuse of ash

- **Commercial industry (Duke Energy, SEFA, RPM Solutions, etc.) has investigated and is implementing beneficial reuse.**

- Reductions in Coal Fired Power Plants will reduce the availability of fly ash used as a supplemental concrete material (SCM)
- Long history of ponded ash use as structural fill materials for the construction of highway embankments, backfilling of abutments/trenches, etc.

# Beneficial Re-Use – Uncertainties and Associated Management Actions

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- **DESIGN: Current Performance Assessment/Preliminary Design for SDU Cover System did not Consider Ash as the Lower Backfill**
  - SRMC Engineering supports use of ash/coal fines as backfill
  - Testing of material (chemical [i.e., SPLT] and geotechnical) will be needed to make the necessary design changes for the cover systems
  - Organic material will need to be removed from ash to be used as lower backfill
- **EXECUTION: SRNS and SRMC have drafted a functional agreement to use the ash material as practical for SRMC closure missions**
  - SRMC (current contractor) for SDUs is interested in utilizing the ash as lower backfill that is on site, inert, abundant, available for future SRMC closure missions and a significant cost avoidance
- **SCHEDULE: Ash Basin Closure will be tied to Liquid Waste closure schedule and budget**
  - Uncertainty in the Liquid Waste Program timing of Final Cover Construction dictates the schedule for excavation of ash units. Management of uncertainty achieved through land use control of ash units until needed.
- **REGULATORY: Solid Waste regulations, Permits and Closure Plans for receiving facilities**

# Alternatives to Beneficial Re-Use (Plan B)

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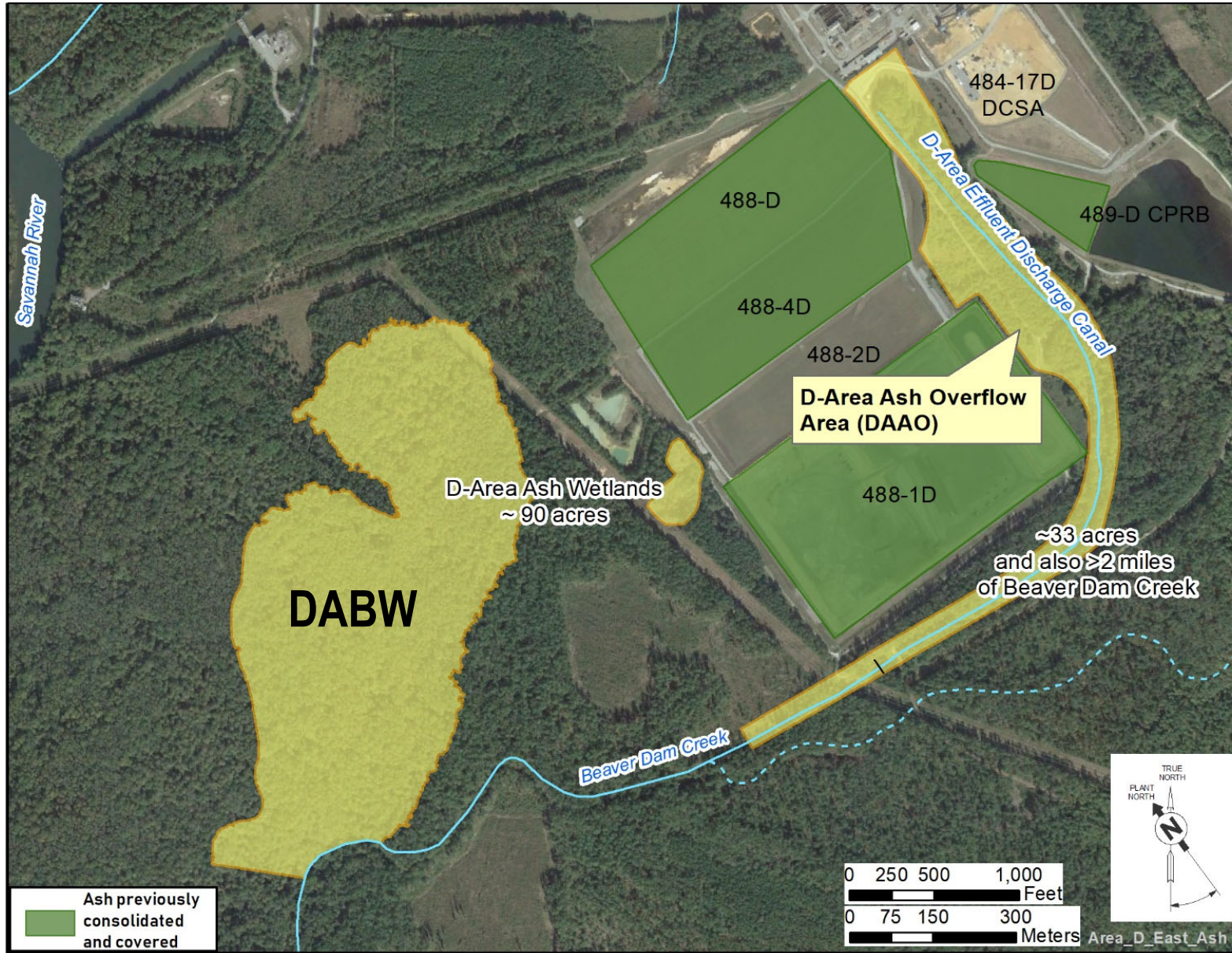
- **What are the Alternatives to Beneficial Reuse if the Uncertainties are Deemed Unmanageable?**
  - Consolidate HAB and LAB into KAB site and cover with Class III Cover system (or keep these waste units separate in FFA with RA start dates of 2034, 2028 and 2029 and revisit consolidation strategy in 5 years)
    - *Allows HAB and LAB to be closed as NFA, eliminating O&M costs*
  - Pursue acceptance of Proposed Plan for placing AAP into ACPRB and cover with Class III Cover System
    - *Allows near term ash removal at AAP*
    - *Liner in ACPRB not required; this is a remedy within an AOC, not disposal*
  - Keep FAL under current landfill permit, close per the approved closure plan (Class II Cover System) outside of FFA/CERCLA framework.

## Recommended Strategy - Wetlands/Overflow Ash Depositional Areas – NFA and LUCs (Plan A)

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- **No Further Action or LUCs as Final Actions** for remote units with sensitive ecological settings that have no or little potential for future development and would benefit from avoidance of construction/excavation activities
  - Candidate Ash Waste Units: DABW and WADB (Phase II)
- **D-Area Ash Basin Wetlands (DABW)**
  - DABW is within the Savannah River floodplain and construction activities would cause extensive harm to the ecosystem if 90+ vegetated acres have ash removed.
  - Ecosystem has been studied by SREL and shows typical species composition for the area.
  - A similar decision left ash in place within and adjacent to Dunbarton Bay (WADB) to protect the sensitive wetlands ecosystem
  - Risk to the IOU worker is expected to be minimal. Verification of risk to be completed to support No Further Action or LUCs if risk exceeds free release criteria.

# Wetlands/Overflow Ash Depositional Areas

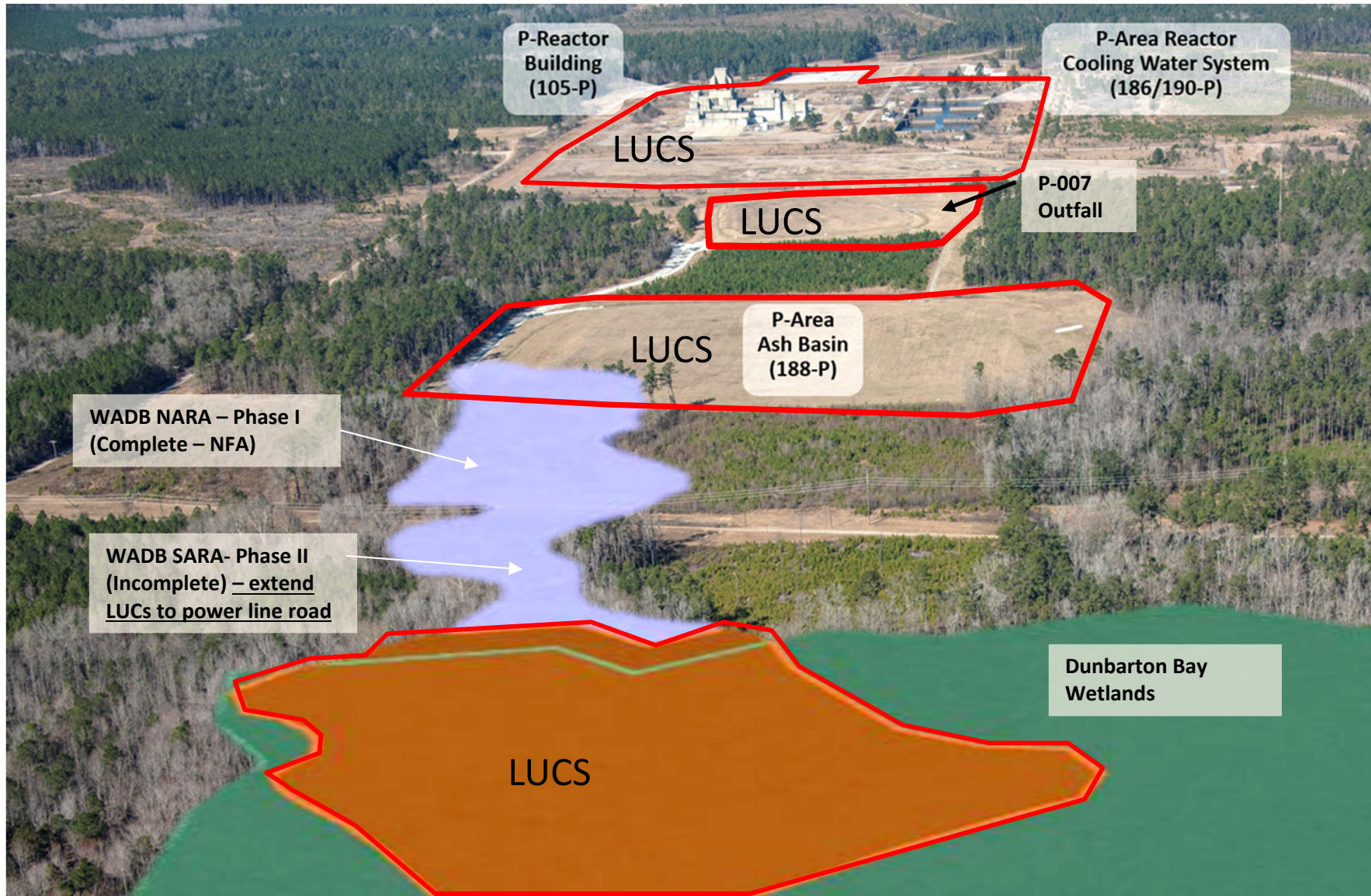


## Recommended Strategy- Wetlands/Overflow Ash Depositional Areas – NFA and LUCs (cont'd).....

### Wetlands Area at Dunbarton Bay (WADB) – Phase II

- Borders on a wetland area and contains areas of saturated subsoils
- Excavation in Zone 1 required specialized equipment and site prep to handle the unstable (with respect to vehicle travel) conditions.
- WADB lies a few hundred yards south of P-Ash Basin (12 acres) and immediately north of Dunbarton Bay (26 acres), both of which leave ash in place and are subject to LUCs.
- Expanding LUCs boundary to include the Phase II area eliminates need to manage excavation problems encountered during excavation of Zone 1 and is within the approved remedy for the unit.

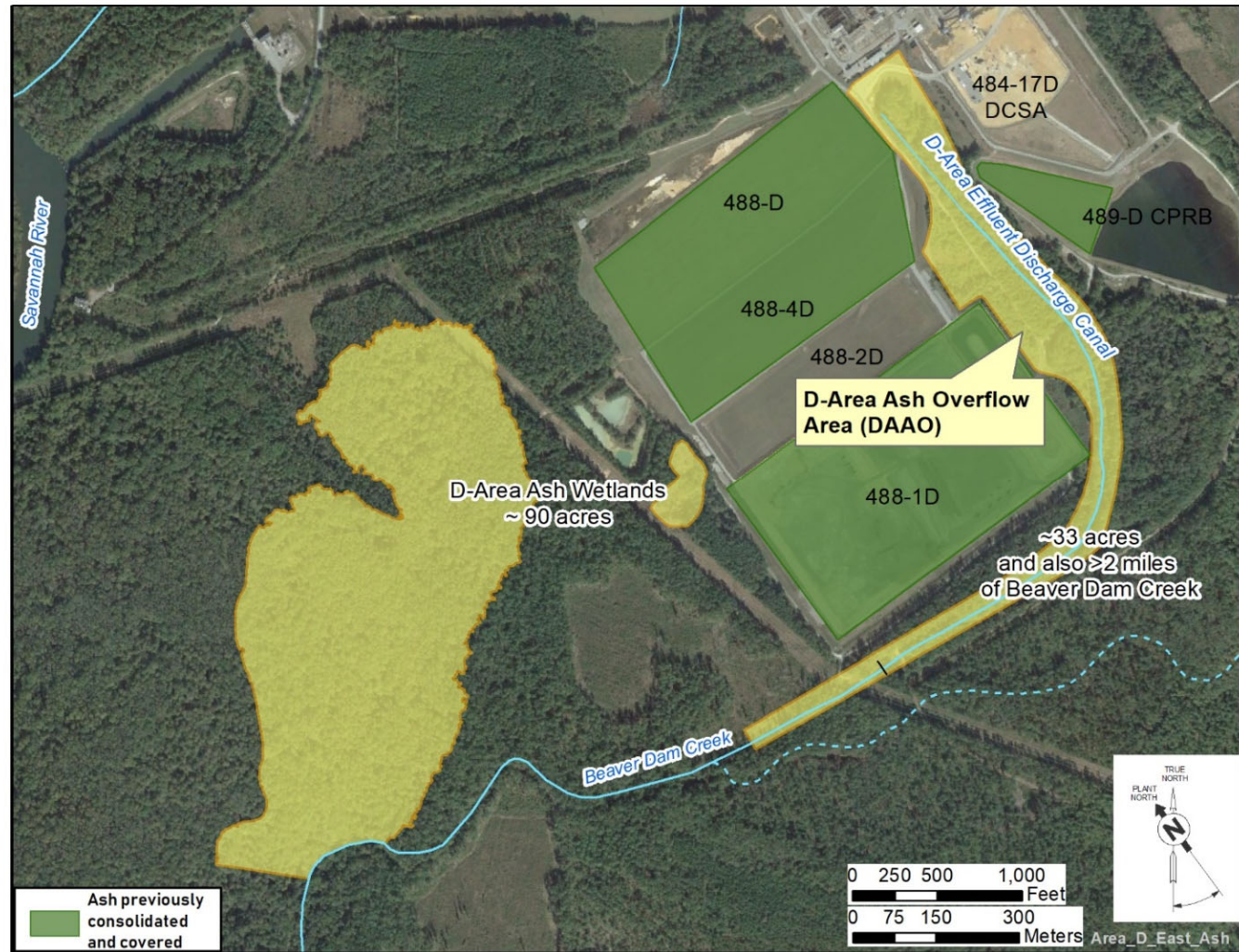
# Recommended Strategy - Wetlands/Overflow Ash Depositional Areas - LUCs (cont'd)



## Recommended Strategy- Wetlands/Overflow Ash Depositional Areas – NFA or LUCs (cont'd)

- The D-Area Overflow (DAO) should be addressed with the Savannah River Floodplain Swamp IOU for final action:

- The DAO is primarily within wetland/saturated areas
- The lateral extent of ash has not been defined. Will be characterized and delineated during SRFS IOU RI process.
- Potential impacts of ash along Beaver Dam Creek are being assessed.



# Justification for NFA or LUCs as a Final Action- Wetland Areas

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## *Protective of Human Health and the Environment*

- Projected risk to the IOU worker is expected to be within acceptable thresholds allowing for NFA
- LUCs are well established at SRS and are not destructive to sensitive ecological environments when compared to excavation/disposal alternatives
- Studies by SREL of chronic exposure to coal combustion wastes has shown ecological affects associated with the highest level of contaminants only within aquatic basins
- SREL research at depositional areas indicate that the bioavailability of metals is reduced in aged/weathered depositional ash deposits (attenuated)
  - Depositional areas at WADB and DABW have not been shown to be a threat to wildlife receptors.
- Long-term empirical groundwater monitoring data and source term modeling at SRS ash units show no current or future groundwater degradation

## **Program Efficiencies**

- More cost effective than excavation and disposal or cover system alternatives
- Schedule efficiencies with streamlined regulatory documentation
- 5 Year ROD review process will ensure LUCs are maintained and remain protective

# LUCs as a Final Action for Wetland Areas – Uncertainties/Considerations

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- **DABW**

- Uncertainty in risk to IOU worker

- Uncertainty to be managed by calculating risk based on current soil data.

- Ecological impacts of ash deposition have not been determined – SREL activities continue

- Uncertainty is managed by using proxy and future data to support NFA or LUCs if necessary

- **WADB – Phase II**

- Regulator/community acceptance of LUCs for completion of Phase II

- Existing ROD states that ash would be excavated and transported to “an approved ex situ containment facility located off-SRS property” and applies LUCs in Dunbarton Bay and buffer area just south of Phase II site.

- **Lessons learned from WADB Phase I:**

- Uncertain what volume, criteria, and schedule will be imposed on SRS by local landfill.
    - Excavation in Zone 1 demonstrated the need for specialized equipment and site prep to handle the unstable (with respect to vehicle travel) conditions.
    - Saturated conditions require drying via windrows to meet disposal facility criteria
    - Excavation would be significantly hampered during high rainfall events

## Alternatives to LUCs as a Final Action for Wetland Areas (Plan B)

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- **What are the Alternatives to LUCs as a Final Action if the Uncertainties are Deemed Unmanageable?**
  
- **DABW**
  - Leave DABW in the SRFS IOU with a ROD date of 2064
  
- **WADB – Phase II**
  - Implement excavation and disposal alternative from approved WADB ROD

## Recommended Strategy – Active Coal Pile Runoff Basin

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- **Manage H-Area Coal Pile Runoff Basin (HCPRB) as a separate unit as listed in the FFA:**
  - Currently has an active industrial stormwater permit needed for stormwater runoff – drainage from former H-Area coal yard;
  - This coal fines waste unit is not administratively tied to an ash unit like ACPRB with AAP

# Recommended Administrative Strategies

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## Plan A

- **Final [EA\*] ROD (Beneficial Reuse Units)**
  - HAB, LAB, KAB, AAP, ACPRB, FAL (after permit modification as needed)
- **ESD – if needed (LUCs for Phase II)**
  - WADB
- **Final ROD (SRFS IOU)**
  - DABW
- **Defer remedial decision**
  - HCPRB
  - DAO (SRFS IOU)

\* EAROD for AAP and ACPRB

# Summary of Recommended Strategy Path Forward

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## • Primary Considerations

- Combining units for maximum efficiency in regulatory document preparation, engineering design, project planning, construction execution and cost
- Decision document(s) (i.e., [EA]ROD and ESD) will be used to prioritize/revise FFA milestones for cost effective remedy implementation
- Addressing FAL under CERCLA provides for comprehensive strategy that will allow for use of existing SRS resources for future SRS closure projects including beneficial reuse (consolidation) as practical
- Beneficial reuse as a long-term decision strategy
- LUCs only for WADB and NFA or LUCs for DABW (under IOU program) is most rational path with benefits to schedule, natural resources, habitat protection, and cost efficiency.
- Recommended path maximizes the reduction of the footprint of the ash/coal fines units site-wide
- Stability of ash units will be verified (and ensured, if necessary) until excavated for beneficial reuse.

# Summary of Preferred and Alternative Paths by Waste Unit

Unit	Preferred	Alternative	Description
AAP, ACPRB	LUCs until beneficial reuse (e.g., lower backfill at SDUs)	Consolidate at ACPRB with Class III Cover System	A-Area Ash Pile (788-0A) and A-Area Coal Pile Runoff Basin (788-3A) are currently planned to be addressed through one set of FFA documentation (FFA). ROD issuance Oct 2024, RA Start Jan 2026. <b>Proposed Documentation:</b> <u>Focused RI/FS, SB/PP, Final EA ROD for beneficial reuse units</u>
FAL	Move unit into FFA. LUCs until beneficial reuse (e.g., lower backfill at SDUs)	Modify permit to allow additional ash and close FAL per the approved closure plan in the permit.	Currently, FAL permit allows acceptance of only ash from around the FAL (associated with FAL). Ash has been accepted previously from other units (AAP). <b>Proposed Documentation:</b> FFA Mod/Permit mod, <u>Focused RI/FS, SB/PP, Final ROD for beneficial reuse units</u>
HAB, KAB, LAB	LUCs until beneficial reuse (e.g., lower backfill at SDUs)	Consolidate ash at KAB close with a Class III cover (or keep separate in FFA - revisit after 5 yrs)	Fill material will be needed to support future SRS Closures. Fill material needed far exceeds volume of SRS ash unit ash. Intent to use SRS ash as fill material. <b>Proposed Documentation:</b> <u>Focused RI/FS, SB/PP, Final ROD for beneficial reuse units.</u>
DABW, WADB	<u>NFA or LUCs (DABW) and LUCs (WADB) as Final Actions.</u>	Pursue final action for DABW as part of SRFS IOU; WADB <u>excavation/disposal</u>	Units addressed in IOUs. DABW part of SRFS IOU. WADB part of Steel Creek IOU. WADB Phase I (North Ash Remediation Area & South Ash Remediation Area [SARA] Zone 1) complete. Phase 2 (SARA Zones 2, 3, 3a, and 4) addressed under the SC IOU (RA Dec 2064). <b>Documentation:</b> <u>ESD if required for WADB; Focused RI/FS, SB/PP, Final ROD for DABW</u>

Note: HCPRB is not included. This is an active unit (Industrial Stormwater Permit, operating); FFA RA Start April 2043  
 DAO is not included. Final decision will be based on SRFP IOU remedy.

## Recommended Schedule for 2022

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- Core Team Meeting – April 19, 2022 (complete)
- Follow Up Core Team Meeting to be scheduled as Teams meeting in mid-May
- Submit Program Strategy Agreement Letter to Core Team – July 11, 2022
- EPA/SCDHEC Review and Approval – August 12, 2022

## Identified Action Items (Short and Long-Term) from April 19<sup>th</sup> Meeting

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- Teams meeting in mid-May to identify path forward for FAL SW permit and follow-up with Core Team on Rev. 1 Redline and any new concerns/issues
- Resolve permit considerations for the FAL SW permit to allow for beneficial re-use
- Coordinate with SCDHEC SW permit conditions for allowing ash/coal fines waste to be used for beneficial re-use as base fill in the identified closures (i.e., SDUs).
- Perform testing of ash prior to beneficial re-use as a lower backfill in closure projects which includes both chemical (specifically SPLT testing) and geotechnical analysis.
- Within EAROD for beneficial reuse units provide dates for when beneficial re-use would begin for each unit.
- Provide a risk calculation for the IOU worker given existing data within the DABW to determine if NFA or LUCs is appropriate final response.
- For beneficial reuse units discuss with Core Team the appropriateness of a single Focused RI/FS prior to a combined ROD
- Define a specific nature of beneficial re-use within the RODs (i.e., backfill for SRS liquid waste closure projects, etc.)

#	Activity ID	Activity Name	Original Duration	Start	Finish	2023	FY2024	FY2025	FY2026	FY2027	FY2028	FY2029
						A	A	A	A	A	A	A
1	<b>1-Early Action Focused Corrective Measures Study/Feasibility Study (EA CMS/FS)</b>		395d	03-Apr-2023	31-Mar-2025	[Summary bar]						
2	ABPBR1000	SRS Develop Early Action Focused Corrective Measures Study/Feasibility Study (EA CMS/FS) Revision 0	300d	03-Apr-2023	02-Oct-2024	[Green bar]						
3	ABPBR1010	SRS Submit Early Action Focused Corrective Measures Study/Feasibility Study (EA CMS/FS) Revision 0	0d		02-Oct-2024							
4	ABPBR1020	EPA/SCDHEC Review of EA CMS/FS Revision 0	90d	03-Oct-2024	31-Dec-2024							
5	ABPBR1025	EPA/SCDHEC Submit Comments on Rev 0 EA CMS/FS	0d		31-Dec-2024							
6	ABPBR1030	SRS Incorporate EPA/SCDHEC Comments	60d	01-Jan-2025	01-Mar-2025							
7	ABPBR1040	Submit EA CMS/FS Comment responses and Revision 1 to EPA/SCDHEC	0d		01-Mar-2025							
8	ABPBR1050	EPA/SCDHEC Review and Approval of EA CMS/FS Revision 1	30d	02-Mar-2025	31-Mar-2025							
9	ABPBR1060	Approval of EA CMS/FS Revision 1	0d		31-Mar-2025							
10	<b>2-Early Action Statement of Basis/Proposed Plan (EA SB/PP)</b>		238d	01-Apr-2025	11-Jun-2026	[Summary bar]						
11	ABPBR1070	SRS Develop Early Action Statement of Basis/Proposed Plan (EA SB/PP) Revision 0	120d	01-Apr-2025	03-Nov-2025							
12	ABPBR1080	SRS Submit Early Action Statement of Basis/Proposed Plan (EA SB/PP) Revision 0 to EPA/SCDHEC	0d		03-Nov-2025							
13	ABPBR1090	EPA/SCDHEC Review of EA SB/PP Revision 0	60d	04-Nov-2025	02-Jan-2026							
14	ABPBR1095	EPA/SCDHEC Submit Comments on Rev 0 EA SB/PP	0d		02-Jan-2026							
15	ABPBR1100	SRS Incorporate EPA/SCDHEC Comments on Revision 0	60d	03-Jan-2026	03-Mar-2026							
16	ABPBR1110	SRS Submit EA SB/PP Comment Responses and Revision 1 to EPA/SCDHEC	0d		03-Mar-2026							
17	ABPBR1120	EPA/SCDHEC Review and Approval of EA SB/PP Revision 1	30d	04-Mar-2026	02-Apr-2026							
18	ABPBR1130	SRS Submit EA SB/PP Comment Responses and Revision 1 to EPA/SCDHEC	0d		02-Apr-2026							
19	ABPBR1140	Notification of Public Comment on Proposed Plan	14d	03-Apr-2026	16-Apr-2026							
20	ABPBR1150	Public Comment Period	45d	17-Apr-2026	31-May-2026							
21	ABPBR1160	Develop Responsiveness Summary	11d	01-Jun-2026	11-Jun-2026							
22	<b>3-Early Action Record of Decision (EA ROD)</b>		191d	04-Mar-2026	20-Feb-2027	[Summary bar]						
23	ABPBR1170	SRS Develop Early Action Record of Decision (EA ROD) Revision 0	56d	04-Mar-2026	11-Jun-2026							
24	ABPBR1180	SRS Submit EA ROD Revision 0 to EPA/SCDHEC	0d		11-Jun-2026							

█ Remaining Level of Effort    ◆ Milestone    ▼ Summary  
█ Actual Level of Effort    █ Remaining Work  
█ Actual Work    █ % Complete  
█ Actual Work Crit    ▲ Baseline Milestone



SRS Ash Basin Closure Program Implementation Schedule - Wetland Area Dunbarton Bay (Phase II)

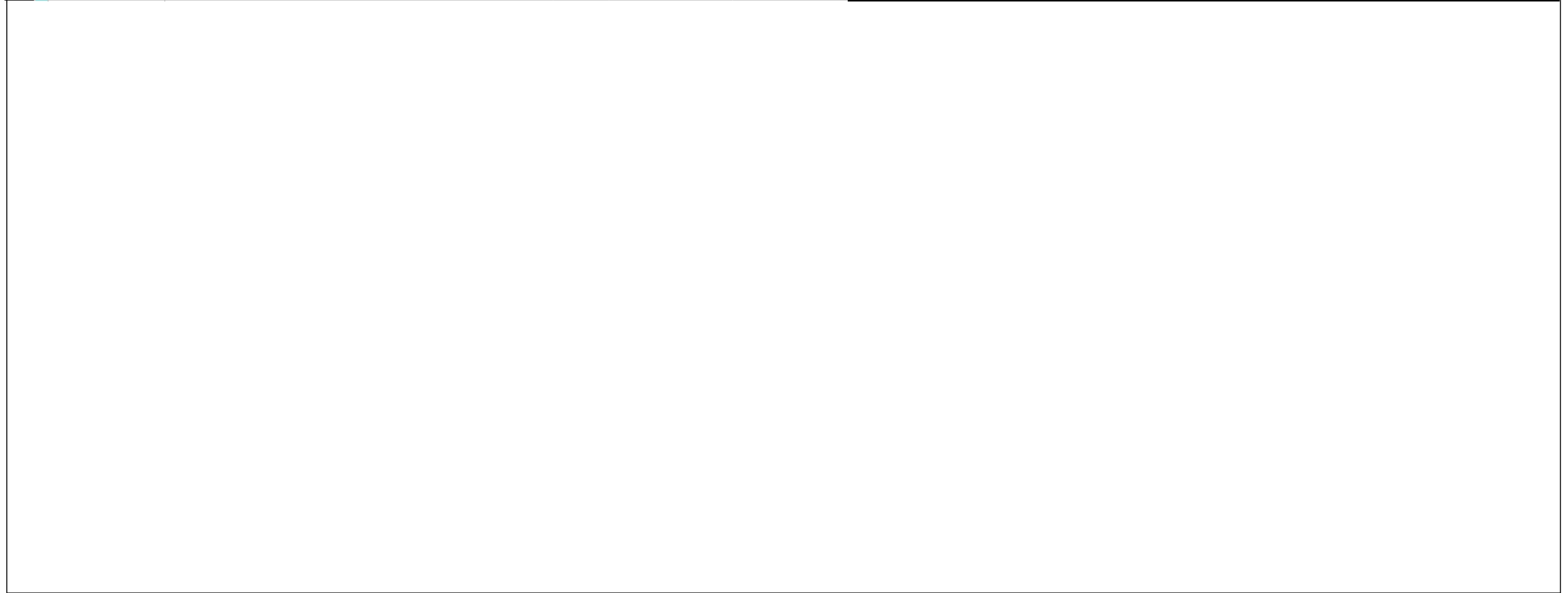
19-May-2022 09:28

#	Activity ID	Activity Name	Original Duration	Start	Finish	FY2023												FY2024											
						F	FM1	FM2	FM3	FM4	FM5	FM6	FM7	FM8	FM9	F	F	F	FM1	FM2	FM3	FM4	FM5	FM6	FM7	FM8	FM9	F	F
1	<b>1-ESD to Record of Decision (ROD)</b>		183d	03-Oct-2022	05-Sep-2023																								
2	ABPWADB1000	SRS Develop Record of Decision (ROD) Explanation of Significant Difference (ESD)	60d	03-Oct-2022	24-Jan-2023																								
3	ABPWADB1010	SRS Submit Rev. 0 ESD	0d		24-Jan-2023																								
4	ABPWADB1020	EPA/SCDHEC Review Rev. 0 ESD	45d	25-Jan-2023	10-Mar-2023																								
5	ABPWADB1025	EPA/SCDHEC Submit Comments on the Rev. 0 ESD	0d		10-Mar-2023																								
6	ABPWADB1030	SRS Incorporate EPA/SCDHEC Comments on the Rev. 1 ESD	45d	11-Mar-2023	24-Apr-2023																								
7	ABPWADB1035	SRS Submit Rev. 1 ESD	0d		24-Apr-2023																								
8	ABPWADB1037	EPA/SCDHEC Review Rev. 1 ESD	30d	25-Apr-2023	24-May-2023																								
9	ABPWADB1039	EPA/SCDHEC Submit Comments on the Rev. 1 ESD	0d		24-May-2023																								
10	ABPWADB1040	DOE Obtain Signature on ESD	30d	25-May-2023	23-Jun-2023																								
11	ABPWADB1050	SCHDEC Obtain Signature on ESD	30d	24-Jun-2023	23-Jul-2023																								
12	ABPWADB1060	EPA Obtain Signature on ESD	30d	24-Jul-2023	22-Aug-2023																								
13	ABPWADB1070	Prepare Environmental Bulletin	14d	23-Aug-2023	05-Sep-2023																								
14	ABPWADB1080	Issue Explanation of Significant Difference (ESD)	0d		05-Sep-2023																								
15	<b>2-Land Use Controls Implementation Plans (LUCIP)</b>		142d	13-Mar-2023	24-Nov-2023																								
16	ABPWADB1090	SRS Develop Land Use Controls Implementation Plan (LUCIP) Addendum	60d	13-Mar-2023	27-Jun-2023																								
17	ABPWADB1100	SRS Submit LUCIP Revision 0 to EPA/SCDHEC	0d		27-Jun-2023																								
18	ABPWADB1110	EPA/SCDHEC Review LUCIP Revision 0	60d	28-Jun-2023	26-Aug-2023																								
19	ABPWADB1115	EPA/SCDHEC Submit Comments on the Rev. 0 LUCIP	0d		26-Aug-2023																								
20	ABPWADB1120	SRS Incorporate EPA/SCDHEC Comments on Revision 0	60d	27-Aug-2023	25-Oct-2023																								
21	ABPWADB1130	Submit LUCIP Comment responses and Revision 1 to EPA/SCDHEC	0d		25-Oct-2023																								
22	ABPWADB1140	EPA/SCDHEC Review and Approval of LUCIP Revision 1	30d	26-Oct-2023	24-Nov-2023																								
23	ABPWADB1150	Approval of LUCIP	0d		24-Nov-2023																								
24	<b>3-Post Construction Report (PCR)</b>		144d	27-Nov-2023	15-Aug-2024																								

Remaining Level of Effort   
 Milestone   
 Summary  
 Actual Level of Effort   
 Remaining Work  
 Actual Work   
 % Complete  
 Actual Work Crit   
 Baseline Milestone

SRS Ash Basin Closure Prog Implementation Schedule - Wetland Area  
Dunbarton Bay (Phase II)

#	Activity ID	Activity Name	Original Duration	Start	Finish	FY2023									FY2024											
						F	FM1	FM2	FM3	FM4	FM5	FM6	FM7	FM8	FM9	F	F	F	FM1	FM2	FM3	FM4	FM5	FM6	FM7	FM8
25	ABPWADB1160	SRS Develop Post Construction Report (PCR) Addendum	60d	27-Nov-2023	18-Mar-2024																					
26	ABPWADB1170	SRS Submit PCR Revision 0 to EPA/SCDHEC	0d		18-Mar-2024																					
27	ABPWADB1180	EPA/SCDHEC Review PCR Revision 0	60d	19-Mar-2024	17-May-2024																					
28	ABPWADB1190	EPA/SCDHEC Submit Comments on the Rev. 0 PCR	0d		17-May-2024																					
29	ABPWADB1200	SRS Incorporate EPA/SCDHEC Comments on Revision 0 PCR	60d	18-May-2024	16-Jul-2024																					
30	ABPWADB1210	Submit PCR Comment responses and Revision 1 to EPA/SCDHEC	0d		16-Jul-2024																					
31	ABPWADB1220	EPA/SCDHEC Review and Approval of PCR Revision 1	30d	17-Jul-2024	15-Aug-2024																					
32	ABPWADB1230	Approval of PCR	0d		15-Aug-2024																					



	Remaining Level of Effort		Milestone		Summary
	Actual Level of Effort		Remaining Work		% Complete
	Actual Work		Baseline Milestone		
	Actual Work Crit				

**SRS Ash Basin Closure Prog Implementation Schedule - Wetland Area**  
Dunbarton Bay (Phase II)



