Department of Energy
Savannah River Operations Office
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JUL 13 2020

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: Second Early Action Record of Decision Remedial Alternative Selection for the D-Area Operable Unit (U) (SRNS-RP-2018-00461, Revision 1 Redline, July 2020) and Savannah River Site's Responses to the Regulatory Comments on the Revision 0 Document, SEMS Number: 63

In accordance with the terms of the Federal Facility Agreement, the U.S. Department of Energy (DOE) is submitting the subject document for your review and approval. The South Carolina Department of Health and Environmental Control (SCDHEC) approved the Revision 0 document on April 13, 2020 and U.S. Environmental Protection Agency (EPA) provided comments on the Revision 0 document on June 1, 2020. This submittal includes the Savannah River Site's responses to the EPA's comments on the Revision 0 report and the incorporation of the responses into the Revision 1 Redline document.

Please review the enclosures and provide your approval within fifteen (15) days of receipt. The effort and time that the SCDHEC and EPA have given on the subject operable unit are greatly appreciated.

Questions from you or your staff may be directed to me at (803) 952-8365, or the DOE Federal Project Director, Ms. Karen Adams, at (803) 952-7871.

Sincerely,

BRIAN HENNESSEY Digitally signed by BRIAN HENNESSEY
Date: 2020.07.08 10:19:22 -04'00'

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

IACD-20-168

Enclosures:
1. Second Early Action Record of Decision Remedial Alternative Selection for the D-Area Operable Unit (SRNS-RP-2018-00461, Revision 1 Redline, July 2020) SEMS Number: 63
2. SRS Responses to U.S. Environmental Protection Agency Comments on the Second Early Action Record of Decision Remedial Alternative Selection for the D-Area Operable Unit (SRNS-RP-2018-00461, Revision 0, February 2020) SEMS Number: 63

cc w/o encl:
J. Blalock, SCDHEC-Columbia
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cc w/encl:
D. Lloyd, EPA-Atlanta
M. McRae, TechLaw, Inc.

EPA GENERAL COMMENT

1. The Second Early Action (EA) Record of Decision (ROD) Remedial Action Selection for the D-Area Operable Unit (U), SEMS Number: 63, SRNS-RP-2018-00461, Revision 0, dated February 2020 (EA ROD) presents conflicting information regarding the unrestricted land use designation proposed for the 489-D Coal Pile Runoff Basin (CPRB) (Southern 75%) and the Inlet Basins portion of the 488-1D Ash Basin. For example, the EA ROD indicates in their current state the 489-D CPRB (Southern 75%) and the Inlet Basins subunits pose no unacceptable risk requiring a response action to human health and the environment and support unrestricted land use. However, the EA ROD also indicates although groundwater is not included as part of this operable unit (OU), the use of groundwater will continue to be restricted until the final ROD for the D-Area Groundwater (DAGW) OU is completed. As such, while it is noted the results of confirmatory samples collected from the inlet basins and the Southern 75% of the CPRB were below residential soil cleanup goals, the subunits would not be eligible for unlimited land use (i.e., residential) due to the presence of underlying contaminated groundwater that is part of the DAGW OU. The unlimited land use/unrestricted exposure (UU/UE) use designation is generally applicable to the level of cleanup for which all pathways present an acceptable risk for all land uses. As such, under a hypothetical future residential exposure scenario, the use of D-Area Groundwater at the inlet basins and the Southern 75% of the CPRB subunits would be limited and exposure restricted for as long as the groundwater is contaminated.
   a. Revise the EA ROD to address this issue and ensure the preferred remedy will be protective of human health and the environment for all land uses and exposure scenarios for the DAOU subunits being addressed.

   Response: Agree with Clarification. The Second EA ROD for the DAOU is consistent with the FFA strategy to address final cleanup decisions for the DAOU surface units prior to assessment of the groundwater media. Throughout the Second EAROD the text states that the media associated with this OU is soil and that groundwater will be addressed separately (see excerpts below).

   - **Declaration, second paragraph: "…The media associated with this operable unit (OU) are coal, coal-combustion waste (ash) and contaminated soil. Groundwater is not part of the DAOU. Groundwater is being addressed separately under the D-Area Groundwater OU."**
   - **Section II. Site and Operable Unit Compliance History, Operable Unit (OU) Operational and Compliance History: "…Groundwater is not part of the DAOU. Groundwater is currently being addressed separately under the DAG OU."**

- **Section VI. Current and Potential Future Site and Resources Uses, Groundwater Uses/Surface Water Uses: "Groundwater is not part of the DAOU. Groundwater is being addressed separately under the DAG OU."**
- **Section IX. Description of Alternatives, Alternative 2, Land Use Controls, second paragraph (in its entirety): "Groundwater monitoring will be performed to evaluate the long-term effectiveness of the cover systems and the results will be documented in the *Groundwater Monitoring Report for the D-Area Groundwater Operable Unit* (which is a full report issued in the even years), and the *D-Area Groundwater Operable Unit Letter Report* (which is an abbreviated report issued in the odd years). The groundwater sampling and monitoring requirements (including final remedial decisions) will be addressed by the DAG OU; therefore, costs associated with groundwater monitoring and reporting are not included in the estimate for Alternative 2. Any remedial groundwater actions, including land use restrictions, will be selected in the remedial assessment for DAG OU."**
- **Section XI. The Selected Remedy, Estimated Outcomes of Selected Remedy: "…Although groundwater is not included as part of this OU, the use of groundwater will continue to be restricted until the final ROD for the DAG OU is completed."**

The last paragraph in Section I. Savannah River Site and Operable Unit Name, Location, and Description will be revised as follows:

"The DAOU was evaluated through an investigation process that integrates and combines the RCRA corrective action process with the CERCLA remedial process to determine the actual or potential impact to human health and the environment of releases of hazardous substances to the environment. Groundwater is not part of the DAOU. Groundwater is being addressed separately under the D-Area Groundwater (DAG) Operable Unit (OU). Groundwater use will continue to be restricted until the final ROD for the DAG OU is completed."

Responsible Party: Doug Martinson, (803) 952-6043, douglas.martinson@srs.gov

EPA SPECIFIC COMMENTS:

2. **Figure 3 Layout of the DAOU, Page 55 of 70 and Figure 4 D-Area Project Site Phase 1 and Phase 2, Page 56 of 70:** The D-Area Coal Storage Area (484-17D) subunit where coal was excavated and placed into the 488-4D Ash Landfill for disposal is discussed in EA ROD; however, the location of the subunit is not defined in any of the site figures. Revise the figures as appropriate to ensure the location of the D-Area Coal Storage Area subunit relative to the

Ash Basin 488-D, Ash Landfill 488-4D, Ash Basin 488-2D, Ash Basin 488-1D and the CPRB is clearly documented and understood.

Response: Agree. Figure 3. Layout of the DAOU and Figure 4. D-Area Project Site, Phase 1 and Phase 2 will be revised to show the location of the D-Area Coal Storage Area (484-17D). The revised figures are attached to these comment responses (Attachment 1 and Attachment 2).

Responsible Party: Doug Martinson, (803) 952-6043, douglas.martinson@srs.gov

3. **Figure 5. D-Area Ash Basins Waste Water Flow Pattern During Operations, Page 57 of 70:** The northern and southern D-Area inlet basins are not defined in the figure. Revise the figure as appropriate to ensure the flow patterns depicted relative to the location of the inlet basins are clearly documented and understood.

   Response: Agree. Figure 5. D-Area Ash Basins Waste Water Flow Pattern During Operations will be revised to identify the northern and southern D-Area Inlet Basins. The revised figure is attached to these comment responses (Attachment 3).

   Responsible Party: Doug Martinson, (803) 952-6043, douglas.martinson@srs.gov

4. **Page 11 and Page 22, first full para, states that:** *"In 2010, characterization of the coal ash from the 484-4D Powerhouse indicated that arsenic levels would exceed the regulatory threshold for a Class Two Solid Waste Landfill."* Please identify where the coal ash from "484-4D Powerhouse" was disposed of if the levels were above the regulatory threshold? Was it placed in the class Two solid waste 488-4D Ash Landfill?

   Response: Agree with clarification. The 2010 coal ash characterization samples from the 484-4D Powerhouse that are referenced in the text were taken from the 488-1D Inlet Basins. Ultimately the coal ash waste was disposed at the 488-4D Ash Landfill. The text in Section II. Site And Operable Unit Compliance History, Operable Unit (OU) Operational and Compliance History, will be revised as follows:

   "488-4D Ash Landfill

   …In 2010, characterization of the coal ash from the 484-4D Powerhouse indicated that arsenic levels would exceed the regulatory threshold for a Class Two Solid Waste Landfill. In 2011, the USDOE, USEPA, and SCDHEC agreed to add the 488-4D Ash Landfill to the FFA to satisfy substantive technical objectives of the Solid Waste Closure

Plan requirements for the Class Two Solid Waste Landfill permit. The coal ash was placed in the 488-4D Ash Landfill."

The second part of the comment references the information provided in Section V. Operable Unit Characteristics and is a summary of the characterization information that pertains to the 488-4D Ash Landfill. The second paragraph under subsection "488-4D Ash Landfill" correctly states that the D-Area Powerhouse ash and the waste material from the D-Area Coal Storage Area (484-17D) and the D-Area Surge Basin (483-6D) exceeded the regulatory threshold for a Class Two Solid Waste Landfill and were placed in the 488-4D Ash Landfill. As noted in the next paragraph, the RSER/EE/CA for the 488-4D Ash Landfill (SRNS 2014d) provides the sampling results for each of these areas. No change to Section V. is proposed.

Responsible Party: Doug Martinson, (803) 952-6043, douglas.martinson@srs.gov

5. **Pages 20 to 25**, **Summary of characterization/confirmation sampling in the following subunits: Inlet Basins, Ash landfills, CPRB and surface water:** Page 20 begins with discussion of the potential COCs as including 24 metals and 6 radionuclides. The following pages then go on to summarize characterization/confirmation sampling results for TCLP testing of metals and, in some subunits also for VOCs and pesticides/PCBs.
   a. Please identify what subunits and media included sampling of radionuclides and what standards the radionuclides results were compared against.
   b. Summarize the results for radionuclides.
   c. If a particular subunit, or specific media within a particular subunit, was not sampled for radionuclides, please indicate why radionuclide sampling was not necessary.

Response: Agree. The six radionuclides (potassium-40, radium-226, radium-228, thorium-228, uranium-235 and uranium-238) were evaluated using the same acceptance criteria as the 24 nonradiological constituents, i.e., unrestricted land use standards. The human health and ecological evaluations for confirmation sampling, including the six radionuclides, were performed on all of the subunits where excavations occurred, i.e., 488-1D Ash Basin western end (soil media), Inlet Basins (soil media), 488-2D Ash Basin (soil media) and the 489-D Coal Pile Runoff Basin (sediment media). All of the radionuclides met the unrestricted use acceptance criteria. Additional text will be provided in the third paragraph of Section V. Operable Unit Characteristics regarding the six radiological constituents of concern as follows:

"The removal actions for three of the DAOU subunits (488-1D Ash Basin, 488-2D Ash Basin and 489-D CPRB) involved excavation of ash or coal media. Confirmation sampling was performed at the completion of the excavation/removal activities as an

additional line of evidence to support visual inspection of coal and /or ash removal and to confirm that coal/ash related constituents do not remain in sediment/soil. The *Confirmation Sampling and Analysis Plan for Coal and/or Ash Removal at the Savannah River Site* (SRNS 2014a) outlined the project data quality objectives and human health risk-based threshold levels for the historical constituents of concern at SRS as well as potential constituents of concern (COCs) that may be associated with coal ash media from the draft document *Human and Ecological Risk Assessment of Coal Combustion Wastes* (USEPA 2010). The historical COCs at SRS included arsenic, potassium-40, radium-226, radium-228, thorium-228, uranium-235 and uranium-238. In addition to arsenic, these potential COCs also included aluminum, antimony, barium, beryllium, boron, cadmium, chromium, hexavalent chromium, cobalt, copper, iron, lead, magnesium, manganese, mercury, molybdenum, nickel, selenium, silver, strontium, thallium, vanadium and zinc (USEPA 2010). Human health risk based threshold levels for an unrestricted land use scenario (i.e., residential) were developed for each of these 30 (total) constituents (24 metals and 6 radionuclides). The residual concentrations of all 30 analytes were evaluated using the cleanup levels documented in the *Confirmation Sampling and Analysis Plan for Coal and/or Ash Removal at the Savannah River Site* for unrestricted land use (SRNS 2014a). Ecological risk based thresholds were also developed and are presented in each technical evaluation document (SRNS 2016c, SRNS 2017b and SRNS 2019b)."

Responsible Party: Doug Martinson, (803) 952-6043, douglas.martinson@srs.gov

6. **Page 24, second paragraph, and page 28, first paragraph** both state that the residential threshold for hexavalent chromium is "0.3" mg/kg.
   a. Page 25 states an RSL = 0.29 mg/kg, presumably also for hexavalent chromium? Is this correct?
   b. EPA recommends not rounding the number, so the standard is identified in a consistent manner throughout the document, (e.g., "0.29" instead of "0.3").

Response: Agree. The text in Section V. Operable Unit Characteristics will be revised to consistently use the residential RSL for hexavalent chromium of 0.29 mg/kg and to clarify that this RSL is for hexavalent chromium as follows:

"488-1D Ash Basin and Inlet Basins Confirmation Sampling (Soil)

…The concentration of hexavalent chromium (maximum = 1.94 mg/kg) does not exceed the threshold level for an industrial use scenario (RSL = 6.3 mg/kg). The residential threshold for hexavalent chromium is 0.329 mg/kg."

"488-2D Ash Basin Confirmation Sampling (Soil)

…results included in the confirmation sampling dataset for the formal evaluation. The technical evaluation concluded that the basin soil results were indeterminate with regard to meeting the acceptance criteria for unrestricted land use because the residential threshold level for hexavalent chromium (RSL = 0.29 mg/kg) is at (or very near) the method detection limit and there is a potential for analytical interferences resulting in false positives at these trace levels. Consequently…"

Text will be revised in Section VII. Summary of Operable Unit Risks, Baseline Risk Assessment, 488-1D Ash Basin (including Inlet Basins) as follows:

"*488-1D Ash Basin (including Inlet Basins)*

Summary of Human Health Risk Assessment

…The maximum concentration of hexavalent chromium (1.94 mg/kg) did not exceed the threshold level for an industrial use scenario (6.3 mg/kg). The residential threshold for hexavalent chromium is 0.329 mg/kg."

Responsible Party: Doug Martinson, (803) 952-6043, douglas.martinson@srs.gov

7. **Page 25 states:** "The technical evaluation concluded that the basin soil results were indeterminate with regard to meeting the acceptance criteria of unrestricted land use because the residential threshold level (RSL = 0.29 mg/kg) is at (or very near) the method detection limit . . . ." This sentence should identify the COC for which the RSL has been identified.
   a. Should this be for hexavalent chromium? Please provide the requested information and make the requested revisions to this document.

   Response: Agree. See response to Specific Comment #6.

   Responsible Party: Doug Martinson, (803) 952-6043, douglas.martinson@srs.gov

8. **Page 25**: Section subheading currently reads: 489-D "CPRP" and needs to be corrected to read 489-D "CPRB"

   Response: Agree. The typographical error will be corrected as follows:

"489-D CPRB~~P~~ (Southern 75%) Confirmation Sampling (Sediment)"

Responsible Party: Doug Martinson, (803) 952-6043, douglas.martinson@srs.gov

9. **Page 32**: Section subheading currently reads: 489-D "CBRB" and needs to be corrected to read 489-D "CPRB"

Response: Agree. The typographical error will be corrected as follows:

"489-D CP~~B~~RB (Southern 75%)"

Responsible Party: Doug Martinson, (803) 952-6043, douglas.martinson@srs.gov

10. **Page 35:**
    a. EPA's recommends revising 488-1D Ash Basin RAO to include the human health and ecological risk thresholds as was done in the other RAOs. For example, include the following added underlined text: *"Maintain the engineered cover system (eastern end) to eliminate or control all routes of exposure to contaminants beneath the cover exceeding 1E-06 risk to future industrial workers and exceeding HQ> 1 to ecological receptors and/or presenting a CM concern."*

Response: Agree. The RAO statement for the 488-1D Ash Basin will be revised in Section VIII. Remedial Action Objectives and Remedial Goals, Remedial Action Objectives (RAOs) to include the human health and ecological risk thresholds as follows:

"488-1D Ash Basin

- **Maintain the engineered cover system (eastern end) to eliminate or control all routes of exposure to contaminants beneath the cover ~~that pose a~~ exceeding 1E-06 risk to future industrial workers and exceeding HQ > 1 to ecological receptors and/or presenting a CM concern."**

Responsible Party: Doug Martinson, (803) 952-6043, douglas.martinson@srs.gov

11. **Page 39, last paragraph:**
    a. EPA recommends revising this paragraph to include the added underlined text: *"LUCs, in combination with the previously implemented removal actions in D-Area OU, meet the threshold and balancing criteria requirements."*

Response: Clarification. The removal actions were previously evaluated against the three broad criteria of effectiveness, implementability, and cost in a series of removal action documents to support an accelerated cleanup strategy. As discussed in Section X. Comparative Analysis of Alternatives, the evaluation of remedial action alternatives using the nine evaluation criteria apply to post-removal action conditions. Because the removal actions were not part of this final remedy and the alternative evaluation for Alternative 2. Land Use Controls is based on post-removal action conditions, no change to the document is proposed.

Responsible Party: Doug Martinson, (803) 952-6043, douglas.martinson@srs.gov

12. **Page 41, first paragraph:**
    a. EPA recommends revising this paragraph to include the added underlined text: *"Alternative 2 (LUCs), in combination with the previously implemented removal actions in D-Area OU, is protective of human health and the environment and address the buried coal-related contamination and residual contamination at the DAOU subunits with land use restrictions."*

Response: Clarification. Please see the response to EPA comment #11. The first paragraph in Section X. Comparative Analysis of Alternatives states that "This section summarized the evaluation of alternatives that apply to post-removal action conditions. Note that a range of alternatives were evaluated for each of these subunits through a series of removal action documents…". Because the removal actions were not part of this final remedy and the alternative evaluation for Alternative 2. Land Use Controls is based on post-removal action conditions, no change to the document is proposed.

Responsible Party: Doug Martinson, (803) 952-6043, douglas.martinson@srs.gov

13. **Page 41:**
    a. Please add statement describing how LUCs aid in achieving "short-term" and "long-term" remedy protectiveness. For example, describe how LUCs protect remedy integrity, prevent or minimize exposure, eliminate pathways, etc.
    b. Please include a statement describing how LUCs can be readily implemented.

Response: Agree. The Short-Term Effectiveness, Long-Term Effectiveness and Permanence, and Implementability text in Section X. Comparative Analysis of Alternatives will be revised as follows:

Short-Term Effectiveness

"Alternative 2 (LUCs) achieves RAOs whereas short-term effectiveness is not applicable to Alternative 1 (No Action) since it does not involve any remedial activities. LUCs are effective in the short-term because the time needed to implement the remedy is minimal and the LUCs will prevent/limit exposure."

Long-Term Effectiveness and Permanence

"Alternative 2 (LUCs) is effective in the long term and protects human health. This alternative is effective in reducing exposure to contaminated media by limiting access. LUCs will eliminate the exposure pathway and will remain in place until the contaminated media is below levels that allow unrestricted use. Alternative 1 (No Action) has no long-term effectiveness or permanence since no action is taken to mitigate the residual risk."

Implementability

"Alternative 2 ~~can be~~ is readily ~~implemented~~ ~~due to its simplicity~~ implementable by installation of warning signs and site inspections at SRS." Alternative 1 (No Action) involves no implementation."

Responsible Party: Doug Martinson, (803) 952-6043, douglas.martinson@srs.gov

14. **Page 43, LUC objectives:** Please include a LUC objective to prevent construction of facilities or structures on/above the engineered cover systems.

Response: Agree. A LUC objective will be added to Section XI. The Selected Remedy, Detailed Description of the Selected Remedy, as follows:

- **"…Prevent construction of inhabitable buildings without an evaluation of indoor air quality to address vapor intrusion.**
- **Prevent construction of facilities or structures on/above the engineered cover systems."**

In addition, the Description of the Selected Remedy in the Declaration will be revised for consistency as follows:

- **"…Prevent construction of inhabitable buildings without an evaluation of indoor air quality to address vapor intrusion.**

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

Responsible Party: Doug Martinson, (803) 952-6043, douglas.martinson@srs.gov

15. **Page 44, last paragraph:** Revise to state that "land use restrictions are required as long as waste remains in place at levels above those allowing unrestricted use to keep the selected remedy fully protective of human health and the environment."

Response: Agree. The requested text in XI. The Selected Remedy, Detailed Description of the Selected Remedy, will be revised as follows:

"The selected remedy for the 488-1D Ash Basin, 488-2D Ash Basin and 488-4D Ash Landfill subunits of the DAOU leaves hazardous substances in place that pose a potential future risk and will require land use restrictions for as long as ~~necessary~~ waste remains in place at levels above those allowing unrestricted use to keep the selected remedy fully protective of human health and the environment. As agreed on March 30, 2000, …"

Responsible Party: Doug Martinson, (803) 952-6043, douglas.martinson@srs.gov

Attachment 1

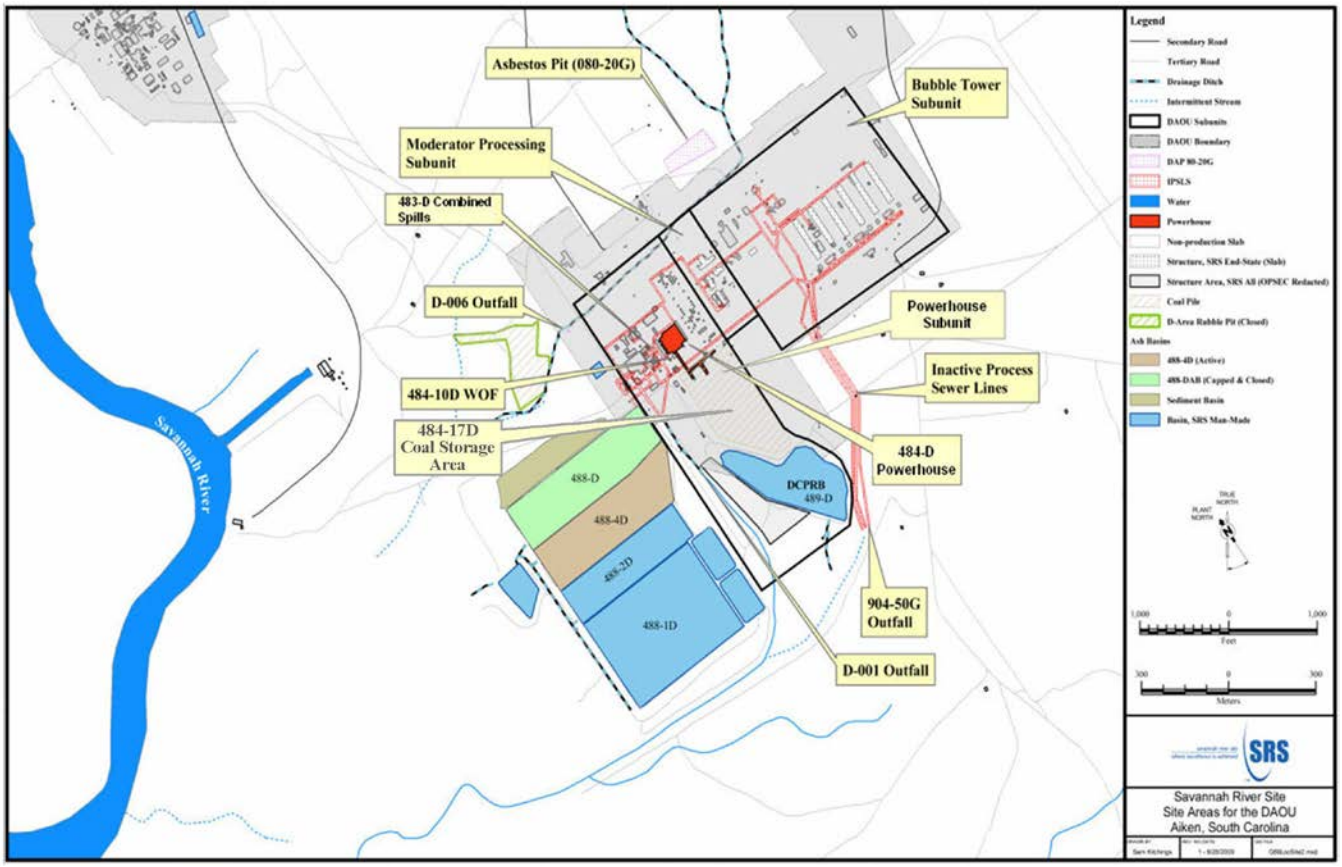

Figure 3. Layout of the DAOU

Attachment 2

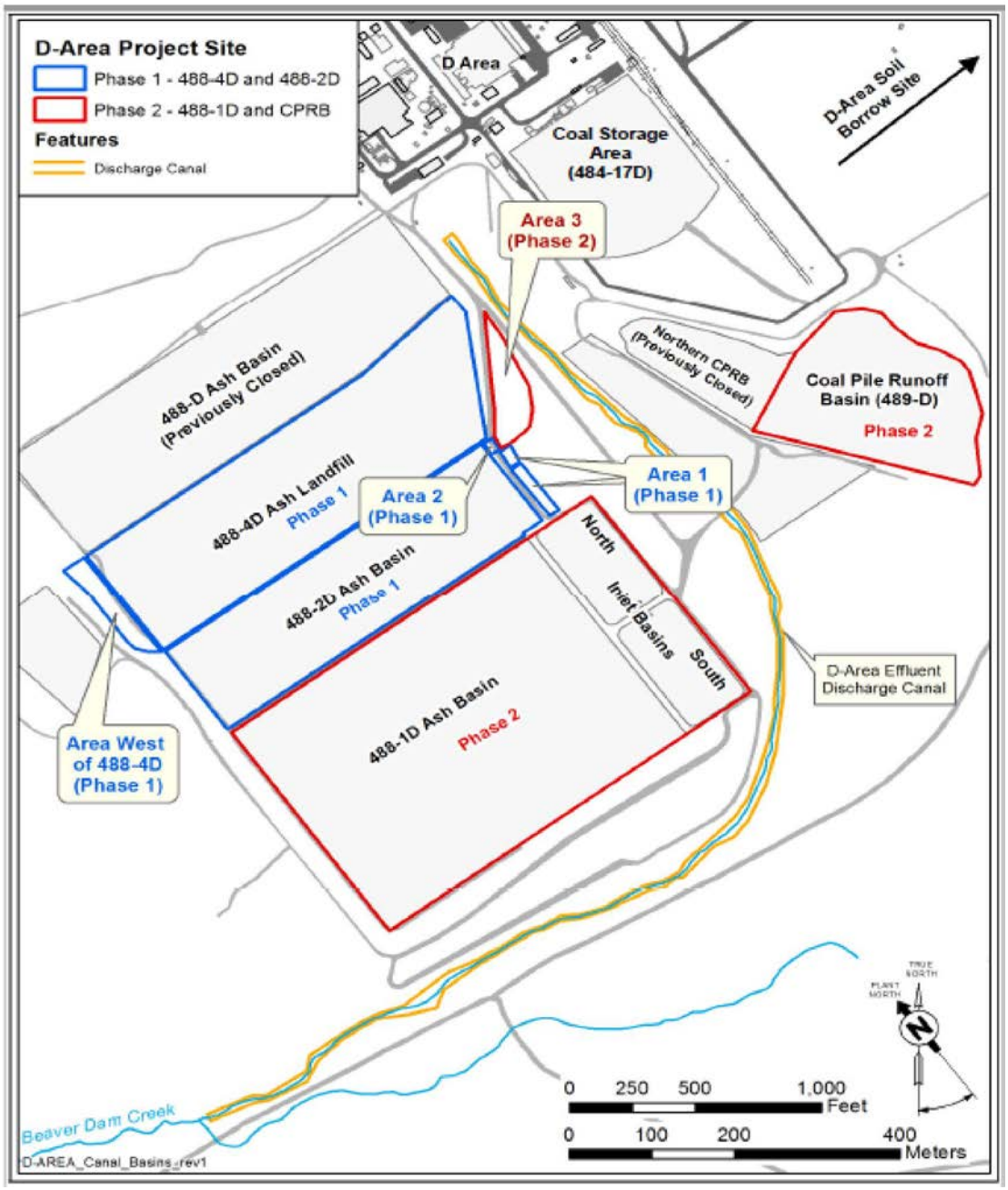

Figure 4. D-Area Project Site, Phase 1 and Phase 2

Attachment 3

Figure 5. D-Area Ash Basins Waste Water Flow Pattern During Operations