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

AUG 30 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: Remedial Action Implementation Plan for the Lower Three Runs Integrator Operable Unit Upper Subunit (U) (SRNS-RP-2022-00011, Revision 1 Redline, August 2022), Land Use Control Implementation Plan (LUCIP) for the Lower Three Runs Integrator Operable Unit (Upper Subunit) (U) (SRNS-RP-2022-00017, Revision 1 Redline, August 2022), and Monitored Natural Recovery Effectiveness Plan for the Lower Three Runs Integrator Operable Unit – Upper Subunit (U) (SRNS-RP-2022-00085, Revision 1 Redline, August 2022) SEMS Number: 35

In accordance with the terms of the Federal Facility Agreement, the U. S. Department of Energy (DOE) is submitting the subject documents for the Lower Three Runs Integrator Operable Unit. The South Carolina Department of Health and Environmental Control's (SCDHEC) and the U.S. Environmental Protection Agency's (EPA) comments on the Revision 0 documents were received on June 28, 2022 and July 8, 2022, respectively. Please review the enclosures and provide your response within thirty (30) days of receipt. The effort and time that the EPA and SCDHEC 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.

Sincerely,

Brian T. Hennessey

Digitally signed by Brian T. Hennessey
Date: 2022.08.23 17:09:25 -04'00'

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

IACD-22-168

Enclosures:

1. Remedial Action Implementation Plan for the Lower Three Runs Integrator Operable Unit Upper Subunit (U) (SRNS-RP-2022-00011, Revision 1 Redline, August 2022) SEMS Number: 35
2. Land Use Control Implementation Plan (LUCIP) for the Lower Three Runs Integrator Operable Unit (Upper Subunit) (U) (SRNS-RP-2022-00017, Revision 1 Redline, August 2022) SEMS Number: 35
3. Monitored Natural Recovery Effectiveness Plan for the Lower Three Runs Integrator Operable Unit – Upper Subunit (U) (SRNS-RP-2022-00085, Revision 1 Redline, August 2022) SEMS Number: 35
4. SRS Responses to USEPA Comments on the Remedial Action Implementation Plan for the Lower Three Runs Integrator Operable Unit Upper Subunit (U) (SRNS-RP-2022-00011, Revision 0, March 2022) SEMS Number: 35
5. SRS Responses to South Carolina Department of Health and Environmental Control Comments on the Remedial Action Implementation Plan for the Lower Three Runs Integrator Operable Unit Upper Subunit (U) (SRNS-RP-2022-00011, Revision 0, March 2022) SEMS Number: 35
6. SRS Responses to USEPA Comments on the Land Use Control Implementation Plan (LUCIP) for the Lower Three Runs Integrator Operable Unit (Upper Subunit) (U) (SRNS-RP-2022-00017, Revision 0, March 2022) SEMS Number: 35
7. SRS Responses to South Carolina Department of Health and Environmental Control Comments on the Land Use Control Implementation Plan for the Lower Three Runs Integrator Operable Unit (U) (SRNS-RP-2022-00017, Revision 0, March 2022) SEMS Number: 35
8. SRS Responses to USEPA Comments on the Monitored Natural Recovery Effectiveness Plan for the Lower Three Runs Integrator Operable Unit – Upper Subunit (U) (SRNS-RP-2022-00085, Revision 0, March 2022) SEMS Number: 35
9. SRS Responses to South Carolina Department of Health and Environmental Control Comments on the Monitored Natural Recovery Effectiveness Plan for the Lower Three Runs Integrator Operable Unit – Upper Subunit (U) (SRNS-RP-2022-00085, Revision 0, March 2022) SEMS Number: 35

cc w/o encl:
J. Blalock, SCDHEC-Columbia
S. French, SCDHEC-Columbia
M. Reece, SCDHEC-Columbia
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H. L. Herlong, SCDHEC-Aiken Environmental Affairs Office

cc w/encl:
R. H. Pope, EPA-Atlanta
M. McRae, TechLaw, Inc.

SRS Responses to South Carolina Department of Health and Environmental Control Comments on the Remedial Action Implementation Plan for the Lower Three Runs Integrator Operable Unit Upper Subunit (U)
SRNS-RP-2022-00011, Revision 0, March 2022, SEMS Number: 35
Savannah River Site NPL Site, South Carolina

Comments Received: 6/28/22

Specific Comments

1. Section 1.3, Nature and Extent of Contamination, page 6; RAIP, Appendix A, page A-4. These sections of the document state that no "PTSM RCOCs" were identified for the IOU, although locations in EA1, EA3, and EA5 had Cs-137 levels above the PTSM threshold. Please clarify what the phrase "PTSM RCOCs" refers to in this context.

Response: Agree/clarification.

The paragraph under the second set of bullets in Section 1.3 will be modified as follows to clarify what the phrase PTSM RCOCs refers to in this context.

> **"A principal threat source material (PTSM) evaluation was conducted and summarized in Appendix D of the RI/BRA (SRNS 2017). The source material from all depth intervals is preliminarily considered to be PTSM if the cumulative risk exceeds one of the following toxicity threshold criteria:**
>
> - **Carcinogens: greater than (>) 1.0E-03 IOU onsite worker risk, and**
> - **Non-carcinogens: IOU onsite worker hazard index >10.**
>
> **As determined via a screening process using the maximum detected concentration of all constituents, a cumulative analysis using the exposure point concentrations of constituents that exceeded the screening process, and a refinement/uncertainty analysis as presented in the approved RI/BRA, neither of the criteria listed above was exceeded for the onsite worker receptor scenario. Therefore, no ~~No~~ PTSM RCOCs were formally identified for any EA within the LTR IOU~~; however~~ even though, EA1, EA3 and EA5 had specific locations where Cs-137 levels were above the PTSM threshold (144 pCi/g) (Figure 5)."**

Responsible Party: Monique Rabin, (803) 952-6695, monique.rabin@srs.gov

2. Section 2.1.3 Design Strategy for Maintain Water in Ponds, page 13, first paragraph. Please add a sentence that explains that the level of water in EA9 Pond C is controlled by the water level in EA 6 PAR Pond. Section 1.5.3 Maintain Water in Ponds, page 10, does an excellent job of describing how the water level is maintained Pond C, but a sentence should be added to other areas.

Response: Agree.

The following underlined sentence will be added to the end of the first paragraph in Section 2.1.3:

"Water is currently maintained and has been historically maintained at consistent levels in EA3, EA6 and EA9 by existing infrastructure. The infrastructure used to maintain the water includes an earthen dam with a sand toe drain system for Pond B (EA3), and an earthen dam with emergency spillway for PAR Pond (EA6). A reverse riser structure associated with Pond C (EA9) allows water to flow from Pond C (EA9) into PAR Pond (EA6) using hydraulic pressure to stabilize water elevation between the two ponds. Therefore, the water level in Pond C will be maintained through implementation of this RA at PAR Pond (EA6)."

Responsible Party: Monique Rabin, (803) 952-6695, monique.rabin@srs.gov

3. Appendix A Fact Sheet, Remedial Action, page A-5, last paragraph. Please add a sentence that explains that the water level in Pond C is controlled by the water level in PAR Pond. The first paragraph in this section explains the 'Maintain Water' in the three ponds and could be confusing to the public.

Response: Agree.

The following underlined sentence will be added to the Fact Sheet in the last paragraph on page A-5.

"The Maintain Water in Ponds remedy selected for EA3 (Pond B) and EA6 (PAR Pond), will minimize access and limit exposure to submerged, contaminated sediment/soil within the ponds. A reverse riser structure associated with Pond C (EA9) allows water to flow from Pond C (EA9) into PAR Pond (EA6) using hydraulic pressure to stabilize water elevation between the two ponds. Therefore, the water level in Pond C will be maintained through implementation of this remedial action at PAR Pond (EA6). This remedy consists of maintaining dam structures for water retention, allows for natural fluctuation of water levels, and controls sediment movement downstream of the PAR Pond Dam. Annual inspections and periodic maintenance of the physical attributes (i.e., dams, weirs, control gates, etc.) that make water retention viable are already in place per SRS procedures and the Federal Energy Regulatory Commission guidelines."

Responsible Party: Monique Rabin, (803) 952-6695, monique.rabin@srs.gov

SRS Responses to U.S. Environmental Protection Agency Comments on the Remedial Action Implementation Plan for the Lower Three Runs Integrator Operable Unit Upper Subunit (U)
SRNS-RP-2022-00011, Revision 0, March 2022, SEMS NUMBER: 35
Savannah River Site NPL Site, South Carolina

Comments Received: 7/8/22

GENERAL COMMENTS

1. Except for the identification of Pond A on Figure B4 (Sampling Results from Locations within R-Area Discharge Canal, Page B-22 of B-28) of Appendix B [Field Sampling Plan (FSP) for Field Sampling Plan [sic] for Pre and Post PTSM Excavation for the R-Area Discharge Canal of Exposure Area 1 (EA1)], the location of Pond A included in exposure area (EA) 1 and Pond 2 included in EA7 are not identified on any figure prepared for the RAIP. Furthermore, the location of Pond A is misidentified on Figure 4 (Sample Locations that Exceed the Cleanup Levels in the Upper Subunit of the LTR IOU, Page 30 of 42) as being included in EA7. Please revise the figures as appropriate so the location of Pond A is clearly identified in EA1, as well as the location of Pond 2 in EA7.

Response: Agree.

The document will be modified to properly identify Pond A on figures 4, 5, 6, 7, 9, and B4. Pond 2 will be correctly labeled on Figure 4.

Responsible Party: Monique Rabin, (803) 952-6695, monique.rabin@srs.gov

2. There is a discrepancy between the cesium (Cs)-137 data presented on Figure 7 (PTSM Location for EA1 in the Upper Subunit of the LTR IOU, Page 33 of 42) and the Cs-137 data presented on Figure B4 (Sampling Results from Locations within R-Area Discharge Canal, Page B-22 of B-28) of Appendix B [Field Sampling Plan (FSP) for Field Sampling Plan [sic] for Pre and Post PTSM Excavation for the R-Area Discharge Canal of Exposure Area 1 (EA1)]. As such, the data sets used for the principal threat source material (PTSM) characterization are unclear. For example, the text box on Figure 7 showing the location of PTSM indicates four results were greater than 400 picocuries per gram (pCi/g) with 2013 being the highest most recently. However, on Figure B4, the text box "Exceeds PTSM" indicates seven results were greater than 400 pCi/g with the most recent result of 526.183 pCi/g on 1/1/2017. Furthermore, Figure 7 shows sample LTROU-01 with a detection of 2.13 pCi/g located and adjacent to the PTSM; however, on Figure B4, the location of the 2.13 pCi/g result is depicted further to the south along the first transect line. Please revise the RAIP as appropriate to address the discrepancy in the reported data results between Figure 7 and Figure B4.

Response: Agree.

Figure 7 of the RAIP will be revised to provide the data for the PTSM location, as well as other sampling points within the R-Area Discharge Canal as presented in Figure 3-10 of the Rev. 1 RI/BRA (SRNS-RP-2017-00139). Figure B4 will be revised to show the correct location and data for the sampling points directly across from the PTSM location and directly below that location, consistent with Figure 7. A note will be added to both figures to explain that the 1/1/2017 data is the calculated decay-corrected value.

Responsible Party: Monique Rabin, (803) 952-6695, monique.rabin@srs.gov

3. It is unclear whether there is a minimum surface water level elevation in feet relative to mean sea level that will be required for the selected remedy for EA3 (Pond B) and EA6 (PAR Pond) to maintain water levels in Pond B, PAR Pond, and Pond C. The RAIP states water levels need to be maintained to reduce exposure and mitigate sediment/soil migration; however, a minimum water level elevation is not defined to ensure the locations of the sediment/soil preliminary remediation goal (PRG) exceedances shown on Figure 4 (Sample Locations that Exceed the Cleanup Levels in the Upper Subunit of the LTR IOU, Page 30 of 42) are not exposed and remain covered. Please revise the text to state the minimum water level elevation that needs to be maintained in Pond B and PAR Pond to ensure exposure is reduced and sediment/soil migration is mitigated.

Response: Clarification.

A specific water level is not necessary to protect human health and the environment or minimize sediment movement downstream of the dam and, therefore, is not a defined requirement as part of the remedy. The purpose of the *Maintain Water in Ponds* remedy is to minimize access to submerged PTSM locations in Pond B (EA3), limit exposure to submerged, contaminated sediment/soil within PAR Pond (EA6) and Pond C (EA9) by providing protection of human health and the environment through shielding, and control sediment movement downstream of PAR Pond dam. The human health (HH) decay-corrected risk levels due to exposure to Cs-137 ($3.3x10^{-4}$ for Pond B, $2.9x10^{-5}$ for PAR Pond, and $6.7x10^{-5}$ for Pond C), as calculated in the RI/BRA, assumed no shielding from the water.

Although no PTSM COCs were identified in any of the Ponds, Cs-137 concentrations were found to be above the PTSM threshold value (144 pCi/g) in Pond B, at two locations with depths of 17 ft and 30 ft below the water surface. PTSM sediments identified in Pond B would likely only be exposed due to a dam failure. Implementation of the *Maintain Water in Ponds* includes the monitoring of dam structures and water levels, annual inspections, and periodic maintenance of physical attributes that make water retention viable.

As with the contamination in the canals, Cs-137 contamination may become exposed at the pond edges as the water level drops during natural fluctuations. The *LUCs with MNR* remedy includes access controls to prevent exposure Cs-137 contamination and, through monitoring, will identify any PTSM not discovered during characterization that may become exposed. Monitoring data will be assessed during the 5-year remedy review.

If conditions change that warrant the need to address the water level in the ponds, this action can be implemented through recommendations made as a result of the 5-year remedy review.

No change to the document is recommended.

Responsible Party: Monique Rabin, (803) 952-6695, monique.rabin@srs.gov

SPECIFIC COMMENTS

1. **Section 1.5.1, LUCs with MNR, Page 9 of 42:** It is unclear whether more robust land use controls (LUCs), including extra signage and/or fencing, will be applied to EA3 due to the two PTSM locations. For example, the text states that to address the PTSM in two locations in EA5, more robust LUCs will be applied in the form of additional signage along the bank near the PTSM locations and the installation of barrier gates across roads leading to the two PTSM locations. However, the text does not discuss if more robust LUCs will also be implemented for the two PTSM locations in EA3. Please revise the text to state if more robust LUCs, including, but not limited to, additional signage and fencing, will be applied at EA3 to prevent exposure to PTSM sediment/soil, or explain why implementation of additional LUCs are not necessary in EA3 to be protective.

Response: Agree/clarification.

During Scoping Summary discussions, the Core Team agreed that more robust LUCs were only required at EA5 because the location of these PTSM results, although in a remote location of SRS, are associated with the shallow water/wetlands of the incised Joyce Branch system. The two PTSM locations within EA3, Pond B, are interior to the pond and are below 17 and 30 ft of water. More robust LUCs, in the form of additional signage or gates, were not considered necessary to prevent exposure to the PTSM in Pond B. To address this point, the first paragraph under the last bullet in Section 1.5.1 will be modified as follows:

> **"For Joyce Branch (EA5), PTSM is present in two locations (Figure 9). EA5 is located interior to the site ~7.2 km (4.5 mi) from the SRS boundary, remotely located from site operations, and is not accessible to the public (i.e., trespassers). To address the PTSM in these locations, more robust LUCs will be applied at EA5 in the form of additional signage along the bank near the PTSM locations and the installation of barrier gates across roads leading to the two PTSM locations. <u>For Pond B (EA3), the two PTSM locations (Figure 5) are covered by 5.2 m (17 ft) and 9.1 m (30 ft) of water; therefore, no additional signage or barrier gates are needed to prevent exposure.</u>"**

Responsible Party: Monique Rabin, (803) 952-6695, monique.rabin@srs.gov

2. **Section 2.5, Design Criteria, Page 15 of 42:** Surface water management, including testing requirements for disposal, during remedial action implementation is not clearly defined in Section 2.5. For example, the text does not discuss if there are any testing requirements for surface water disposal if dewatering the limits of excavation (LOE) is performed instead of mechanical dredging. As another example, the text states for mechanical dredging the water will be allowed to drain from the specialized equipment by pausing with the bucket just above the water surface; however, it is unclear whether the water will be allowed to drain back into the LOE. Finally, the text states the design criteria will include efforts to reduce the amount of water that is removed from the canal; however, the controls that will be used to reduce the amount of water removed from the canal are not defined. Please revise the text to discuss the management of surface water and whether there are any testing requirements for disposal during the remedial action implementation.

Response: Agree/clarification.

Testing of surface water is not considered necessary because there were no COCs identified for the surface water and controls will be in place to prevent sediment migration back into the canal or from the limits of excavation (LOE) to other parts of the canal. Because a design/execute implementation using a subcontractor with expertise in sediment excavation is planned, the RAIP provided the option for two excavation methods, 1) dewatering of the area prior to excavation or 2) subaqueous excavation. Additionally, the size of the excavation, to be determined as part of the implementation, may impact the method of excavation. If dewatering is selected, a cofferdam or similar type of containment system will be constructed around the LOE. Water will be pumped from the interior side of the structure to the exterior back into R-Area Discharge Canal minimizing any disturbance to the sediment. Measures to mitigate the migration of sediment from the LOE (e.g., floating pumps or filters) will be implemented. If mechanical dredging is used, pausing of the excavation bucket just above the water surface is intended to allow the water to drain back into the canal within the excavation zone. Sediment tubes or an equivalent super sack may be used at the bank, in a shallow area, or on an elevated platform to minimize sediment release and allow only the water to drain back within the LOE.

The second paragraph in section 2.5 will be modified as follows to make these clarifications:

> **"Excavation within the LOE will be performed either by mechanical dredging of the submersed sediment/soil or by dewatering the LOE and excavating the sediment/soil. Containment of the sediment/soil will be required to mitigate migration of PTSM to other parts of the R-Area Discharge Canal. Sediment control will require the use of silt curtains or other SRNS approved silt barrier. Barrier controls, such as cofferdams made of wood, sandbags, water-filled tubes, etc., will be used to divert water around the LOE. If necessary, water will be pumped from within the LOE to another portion of the canal implementing ~~Other~~ other engineering controls (e.g., pump flotations, filters, etc.) to mitigate the migration of sediment within the canal ~~will be implemented if pumping is required to dewater the LOE. Barrier controls, such as cofferdams made of wood, sandbags, water-filled tubes, etc., will be used to divert water around the LOE~~. If mechanical dredging is used, specialized equipment and controls will be specified in the SOW to methodically excavated the sediment/soil with overlapping cuts. Controls using specialized equipment to minimize resuspension will be required. Water will be allowed to drain back into the LOE from the specialized excavating equipment by pausing with the bucket just above the water surface and sediment tubes or filtering sacks may also be used at the boundary of the LOE to minimize sediment release and allow only water to drain back to the canal. The design criteria will include efforts to reduce the amount of water that is removed from the canal. Free liquids within the excavated sediments will be treated with a**

drying agent prior to shipment within SRS boundaries to the E-Area LLWF for disposal."

Responsible Party: Monique Rabin, (803) 952-6695, monique.rabin@srs.gov

3. **Figure 4, Sample Locations that Exceed the Cleanup Levels in the Upper Subunit of the LTR IOU, Page 30 of 42:** The figure identifies Pond A as included in EA7; however, Pond A is the surface water body included in EA1 and Pond 2 is the surface water body included in EA7. Please revise the figure to identify the correct locations of Pond A and Pond 2.

Response: Agree.

See the response to General Comment #1.

Responsible Party: Monique Rabin, (803) 952-6695, monique.rabin@srs.gov

4. **Figure 5, PTSM Locations for the Upper Subunit of the LTR IOU, Page 32 of 42:** The PTSM location in EA1 shown on Figure 5 is the previously mis-plotted and incorrect R-1, Downstream of R-Area location; however, this fact is not reflected in the figure legend. Please revise the Figure 5 legend to clarify the PTSM location shown on the figure is the previously depicted mis-plotted location R-1, Downstream of R-Area.

Response: Agree.

A note will be added to Figure 5 to clarify that the correct PTSM location for EA1 is shown in Figure 7.

Responsible Party: Monique Rabin, (803) 952-6695, monique.rabin@srs.gov

5. **Figure 7, PTSM Location for EA1 in the Upper Subunit of the LTR IOU, Page 33 of 42:** The figure shows green squares for the locations where sediment/soil and surface water samples were collected north of the discharge canal; however, no blue shading is illustrated to indicate the presence of a surface water body (i.e., Pond A). Please revise the figure to include the blue shading to indicate the presence of a surface water body (i.e., Pond A) north of the discharge canal.

Response: Agree.

Figure 7 will be modified to properly shade all water bodies as blue.

Responsible Party: Monique Rabin, (803) 952-6695, monique.rabin@srs.gov

6. **Figure 7, PTSM Location for EA1 in the Upper Subunit of the LTR IOU, Page 33 of 42:** The figure does not depict the locations of existing wells RPC-12DU and RPC-12C that are installed near the PTSM excavation area in EA1. In Attachment 1-3 (Preliminary Design Sketch for Excavation of

PTSM Sediments, Page Att1-5 of Att1-6) of Appendix B [Field Sampling Plan (FSP) for Field Sampling Plan [sic] for Pre and Post PTSM Excavation for the R-Area Discharge Canal of Exposure Area 1 (EA1)], existing wells RPC-12DU and RPC-12DL are shown installed to the east of the access road and proposed PTSM excavation area. Please revise Figure 7 to include the locations of existing monitoring wells RPC-12DU and PPC-12DL.

Response: Clarification.

The locations of RPC-12DU and RPC-12DL were included in Attachment 1-3, Preliminary Design Sketch for the Excavation of PTSM Sediments, to show potential interferences for equipment laydown and maneuverability for excavation activities. Adding just monitoring wells RPC-1DU and RPC-12DL to figure 7 would be an incomplete representation of monitoring wells in the LTR study area and is inconsistent with figures provided in previous documents. A note will be added to Attachment 1-3 explaining that the monitoring wells are shown for potential interferences for equipment mobility.

Responsible Party: Monique Rabin, (803) 952-6695, monique.rabin@srs.gov

7. **Figure B4, Sampling Results from Locations within R-Area Discharge Canal, Appendix B, Page B-22 of B-28:** According to Figure B4, sediment/soil samples were collected on 1/1/2017 for Cs-137 analysis with results reported on the figure; however, the 2017 sampling event is not discussed in the RAIP, and it is unclear how this data set relates to the PTSM characterization. Please revise the RAIP to address this issue by clarifying the use of the 2017 data set for PTSM characterization.

Response: Agree.

The PTSM evaluation used decay corrected values to calculate the exposure point concentration. The 1/1/2017 data in Figure B4 represents the calculated decay value. A note will be added to Figure B4 and Figure 7 to explain the 1/1/2017 data. In addition, the text in Appendix B, Section 2.3, will be modified as follows:

> ***Section 2.3, Summary of Existing Data Compared to Risk-Based Thresholds (from Appendix B)***
>
> **"Figure B4 summarizes the Cs-137 concentrations that have been detected (and calculated decay-corrected values) in the R-Area Discharge Canal as compared to the preliminary remedial goal (PRG) of 0.144 pCi/g and the PTSM threshold (144 pCi/g). Table B1 provides a summary of the results from all samples collected in EA1 which includes the R-Area Discharge Canal and Pond A. Contaminant concentrations were compared to USEPA Preliminary Remediation Goals (PRGs) for radiological contaminated media. Decay-corrected values were used to develop the exposure point concentrations for the PTSM uncertainty evaluation."**

Responsible Party: Monique Rabin, (803) 952-6695, monique.rabin@srs.gov

8. **Table B2, Data Quality Objectives Worksheet for Sediment/Soil Media, Appendix B, Page B-25 of B-28:** The Pathway (Media) identified in Table B2 is sediment only; however, the selected remedial action is for excavation, treatment and disposal of PTSM sediment/soil. Please revise Table B2 to address this issue.

Response: Agree.

Table B2 will be modified to include "soil" after sediment as follows:

Table B2. Data Quality Objectives Worksheet for Sediment/Soil Media

Pathway (Media)	Probable Conditions	Exposure Pathway and/or Release Mechanisms	Data Needs and DQOs Including Engineering/ Physical Processes	Field Activities Including Removal and Characterization	Parameters	Selected Remedial Action
Sediment/ Soil	Sediment/soil may be contaminated from previous effluent discharges	Ingestion, inhalation, or dermal contact with contaminated sediment/soil in the canal	Determine the linear extent of impacted sediment/soil Evaluate effectiveness of RA by ensuring that residual sediments/soil, post excavation, are below the PTSM threshold for Cs-137 (144 pCi/g)	Sediment/soil sampling to be conducted at the sample location where results from previous events have been above the PTSM threshold for Cs-137 (144 pCi/g) Use linear-judgmental sampling design to collect sediment samples. Collect sediment/soil samples working from down-gradient to up-gradient so subsequent samples will not be contaminated from stream flow	Screening–level data will be used to select sample locations beyond initial excavation boundary. 5% splits 5% field duplicates Confirmation sampling will be a composite sample	Excavation, Treatment, and Disposal of PTSM Sediment/ Soil.

Responsible Party: Monique Rabin, (803) 952-6695, monique.rabin@srs.gov

Revised Figures

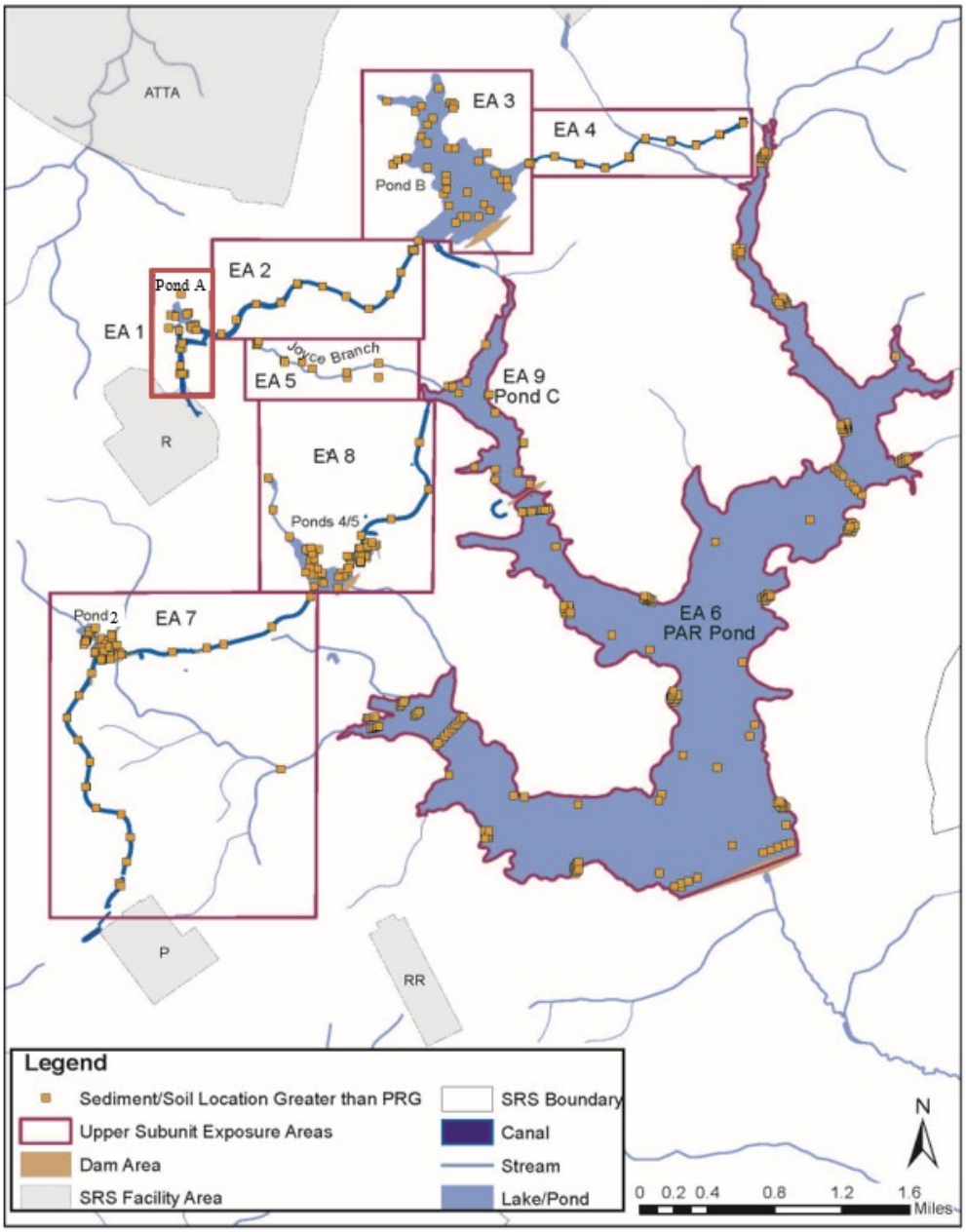


Figure 4. Sample Locations that Exceed the Cleanup Levels in the Upper Subunit of the LTR IOU

Revised Figures, *cont'd*

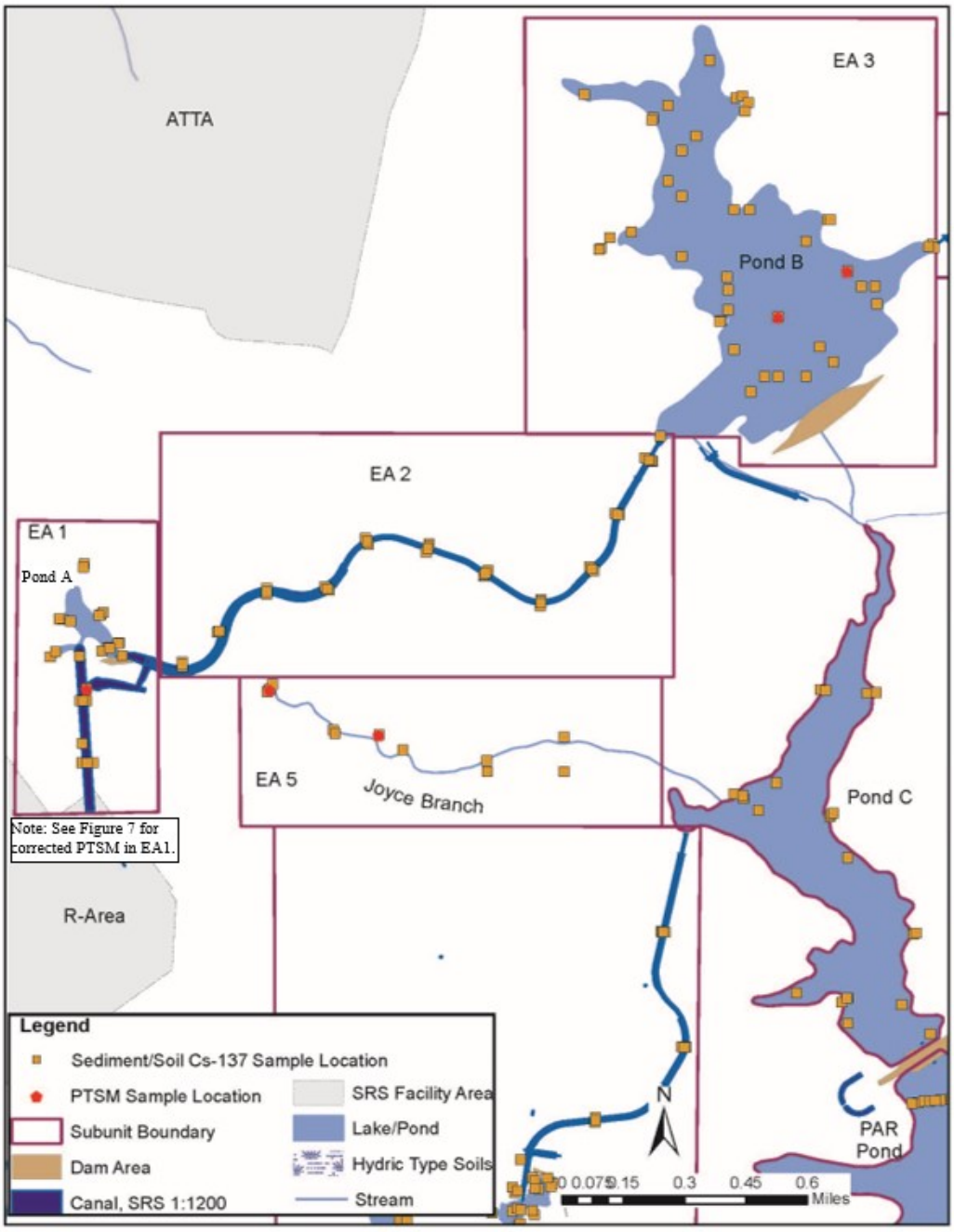


Figure 5. PTSM Locations for the Upper Subunit of the LTR IOU

Revised Figures, *cont'd*

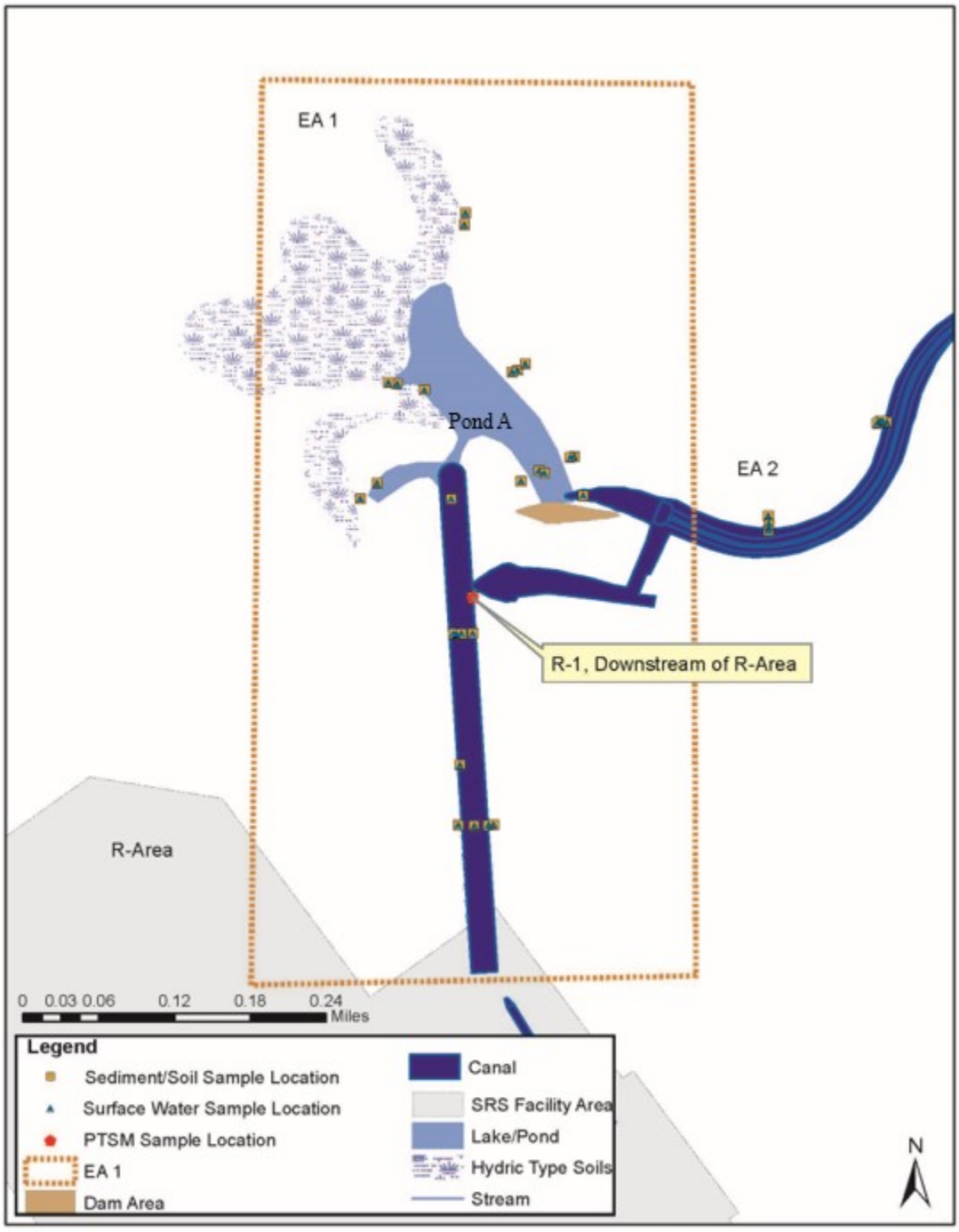


Figure 6. Previously Depicted PTSM Location for EA1 in the Upper Subunit of the LTR IOU

Revised Figures, *cont'd*

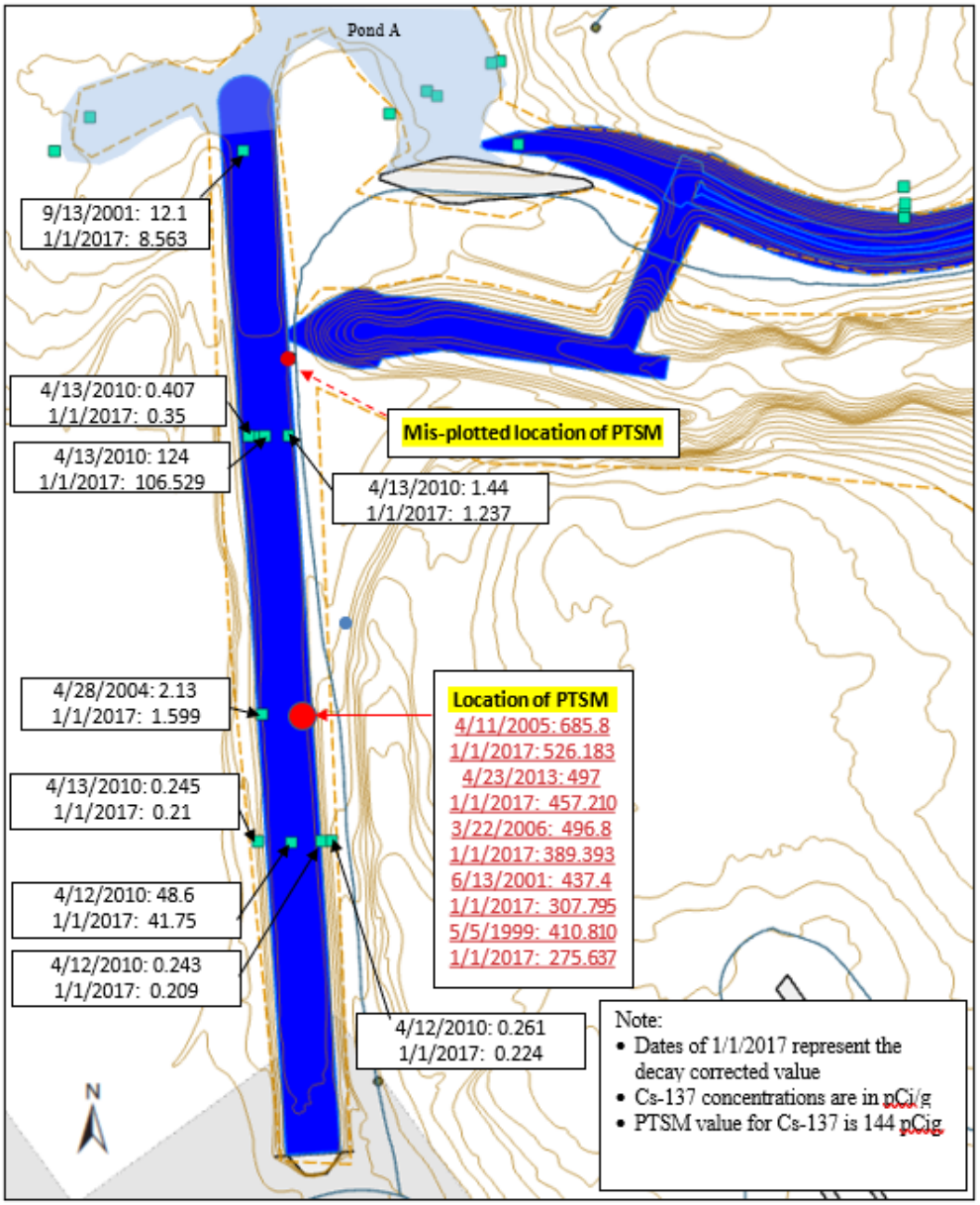


Figure 7. PTSM Location for EA1 in the Upper Subunit of the LTR IOU

Revised Figures, *cont'd*

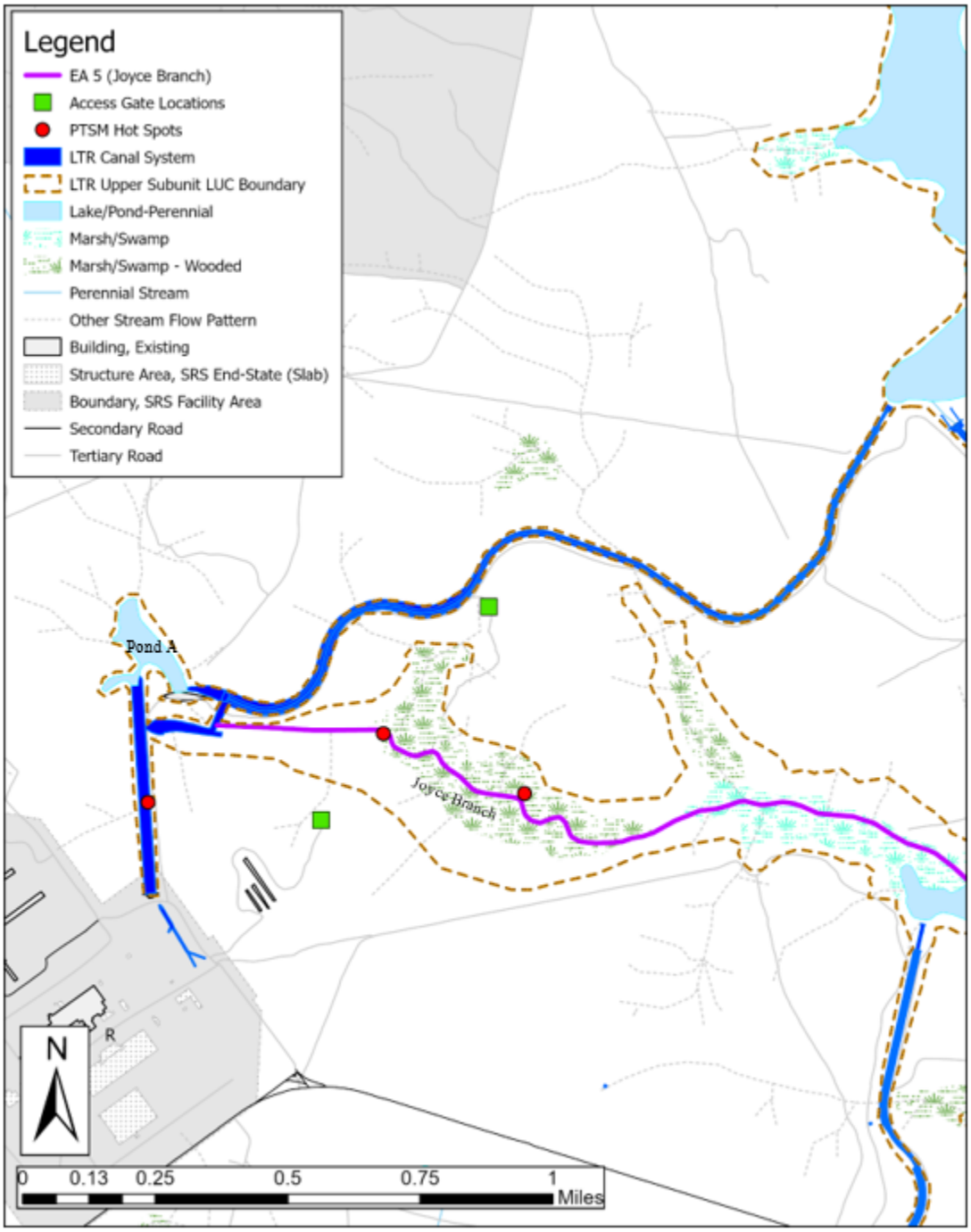


Figure 9. PTSM Locations for Joyce Branch (EA5) in the Upper Subunit of the LTR IOU

Revised Figures, *cont'd*

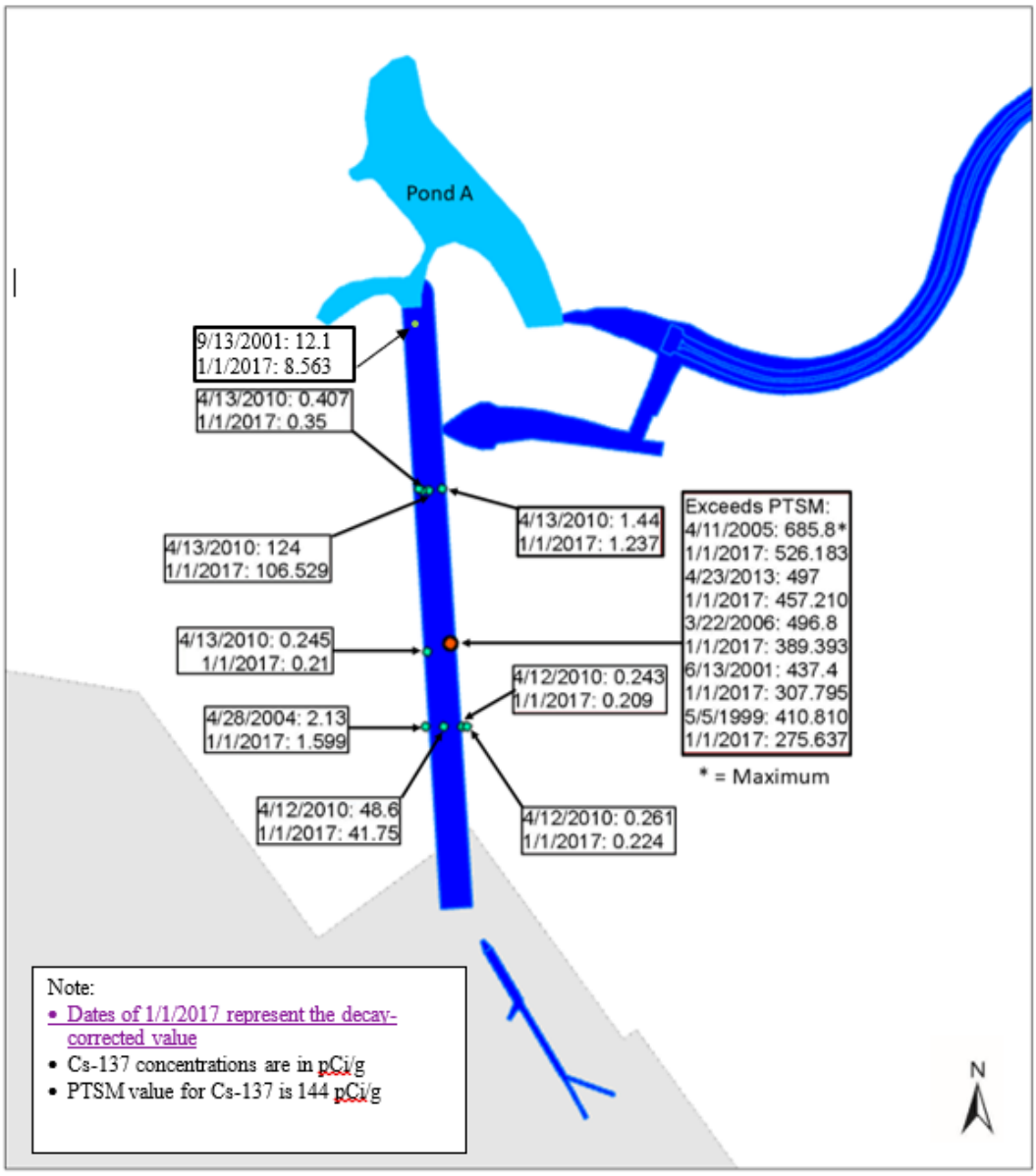
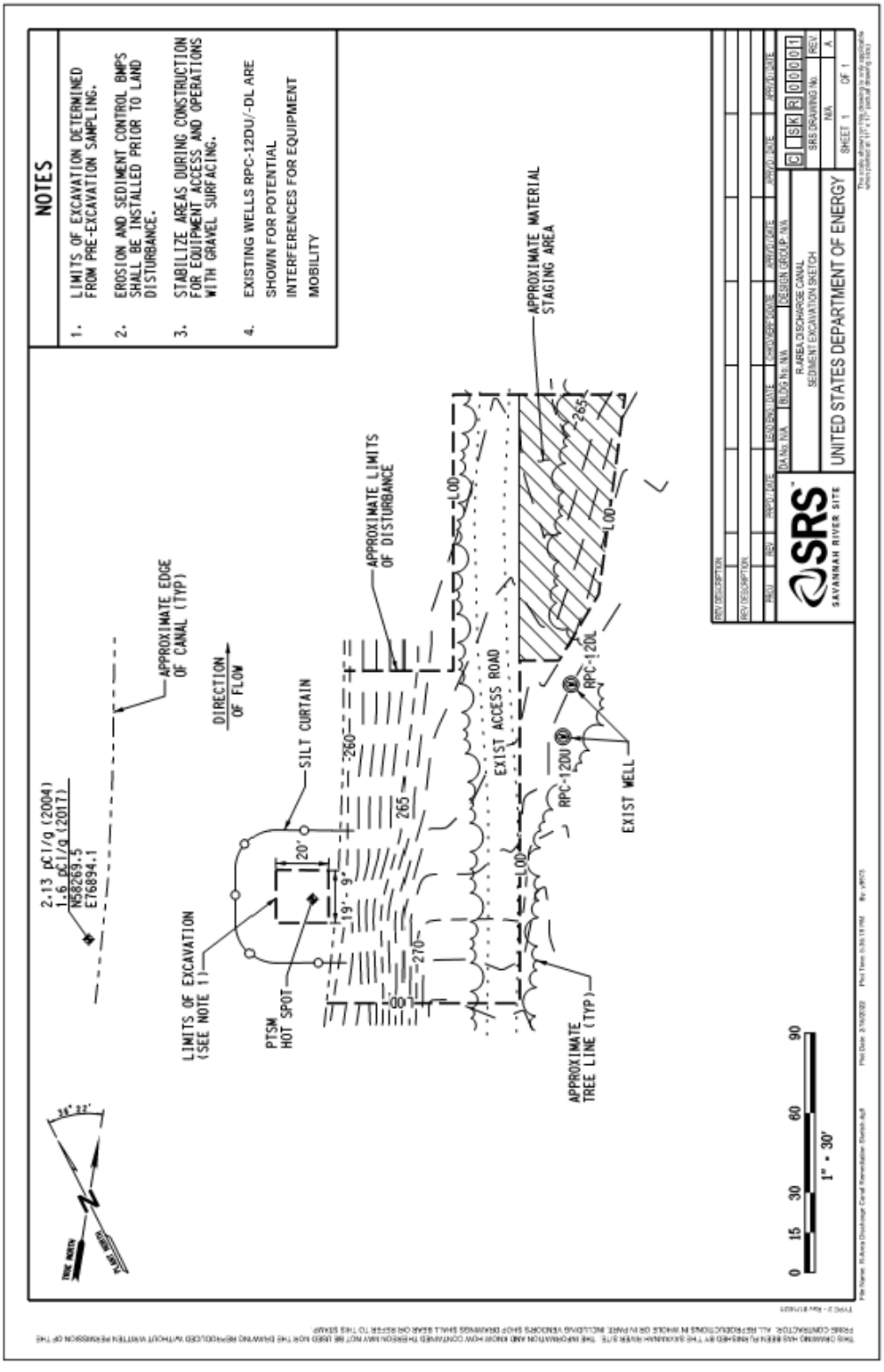


Figure B4. Sampling Results from Locations within R-Area Discharge Canal

Revised Figures, *end*



3. Preliminary Design Sketch for Excavation of PTSM Sediments

SRS Responses to the
South Carolina Department of Health and Environmental Control Comments on the Land Use Control Implementation Plan for the Lower Three Runs Integrator Operable Unit Upper Subunit (U), SRNS-RP-2022-00017, Revision 0, March 2022
SEMS Number: 35
Savannah River Site NPL Site, South Carolina

Comments Received March 30, 2022

Specific Comments

1. Section 4.0, Implementation of Land Use Controls, page 6. Please include "monitoring" in the list of land use control activities that USDOE is responsible for at the LTR IOU to be consistent with the first sentence of the last paragraph of Section 1.0.

Response: Agree.

Monitoring will be included as an additional statement at the end of section 4.0 as follows:

"A monitoring program will be initiated as defined by the *Monitored Natural Recovery Effectiveness Plan for the Lower Three Runs Integrator Operable Unit – Upper Subunit (U)* (SRNS 2022) SEMS Number: 35 (SRNS-RP-2022-00085, Revision 1, August 2022)."

Responsible Party: Jim Kupar, 803-507-8072, james.kupar@srs.gov

2. Section 4.5, Warning Signs, page 10. The document states, "Soil contamination signs may also be posted…" Please clarify this sentence to indicate that soil contamination signs will be posted only in applicable areas if this is what the sentence is meant to indicate.

Response: Clarification.

Soil contamination signs are posted in applicable areas of concern by the Radiological Protection Department to meet SRS program requirements, as necessary.

Section 4.5 will be revised as follows: "Soil contamination area signs may also be posted, at the discretion of the Radiological Protection Department, where applicable, in accordance with…"

Responsible Party: Jim Kupar, 803-507-8072, james.kupar@srs.gov

SRS Responses to U.S. Environmental Protection Agency Comments on the Land Use Control Implementation Plan for the Lower Three Runs Integrator Operable Unit Upper Subunit (U) SRNS-RP-2022-00017, Revision 0, March 2022, SEMS Number: 35 Savannah River Site NPL Site, South Carolina

Comments Received: July 8, 2022

GENERAL COMMENT

1. It is unclear why additional land use controls (LUCs) (e.g., extra signage, fencing) are not implemented at exposure area EA3 since principal threat source material (PTSM) was identified in two locations in Pond B. For example, the text in Section 4.4 (Physical Access Controls, Page 10 of 24) describes the LUCs that will be applied to the two locations in EA5 (Joyce Branch) where PTSM has been identified; however, a discussion of why additional LUCs will not be applied at EA3 due to presence of PTSM is not presented. Also, according to Table 1 (Land Use Controls for the Lower Three Runs Integrator Operable Unit, Page 23 of 24), to address the PTSM locations in Joyce Branch and EA5, physical access controls (e.g., fences and gates) will be implemented at access points. A review of Figure 7 (Warning Signs and Gate Locations of Upper Subunit, Page 21 of 24) shows an access road leading to or near one of the two PTSM locations in Pond B; however, no sign or gate location is shown on the figure at this access point. Please revise the LUCIP to clarify if additional LUCs will be applied at EA3 to prevent exposure to PTSM sediment/soil, or provide an explanation why implementation of additional LUCs is not necessary to be protective at Pond B.

   Response: Clarification.

   During Scoping Summary discussions, the Core Team agreed that more robust LUCs were only required at EA5 because the location of these PTSM results, although in a very remote location of SRS, are in the shallow water/wetlands of Joyce Branch. The two PTSM locations within EA3, Pond B, are interior to the pond and are below several feet of water. More robust LUCs, in the form of additional signage or gates, were not considered necessary to prevent exposure to the PTSM in Pond B.

   Responsible Party: Jim Kupar, 803-507-8072, james.kupar@srs.gov

SPECIFIC COMMENTS

1. **Section 2.3, Remedial Action Selected, Page 5 of 24:** It is unclear whether there is a minimum surface water level elevation in feet relative to mean sea level that will be required for the selected remedy for EA3 (Pond B) and EA6 (PAR Pond) to maintain water levels in Pond B, PAR Pond, and Pond C. The text states water levels need to be maintained; however, a minimum water level elevation is not defined. Please revise the text to provide the minimum water level elevation in feet to relative mean sea level that needs to be maintained in Pond B and PAR Pond to ensure exposure is reduced and sediment/soil migration is mitigated. While this level is set in the early Par Pond IROD (through reference to a NEPA document), EPA requests it be clearly stated in the post-ROD documents for OU35 for clarity in monitoring and in future 5-year review documents.

Response: Clarification.

As agreed to in the scoping summary meetings and in the comments to the Feasibility Study, water levels will be maintained by annual inspections and maintenance of the dam structures for each pond. However, a specific water level is not part of the remedy because it is not necessary to protect human health and the environment or minimize sediment movement downstream of the dam due to the depth of PTSM identified in Pond B and protections that will be provided through the implementation of the *LUCs with MNR* remedy. Natural groundwater springs and rainfall conditions have been shown to keep the levels at all ponds at reasonable elevations through the last several decades. If over time there are significant changes in water levels, appropriate actions will be taken to notify regulators to the changing condition.

The third paragraph in Section 2.3 will be revised as follows:

"…. Maintain Water in Ponds is the selected alternative for EA3 (Pond B) and EA6 (PAR Pond) to maintain water levels in Pond B, PAR Pond, and Pond C to reduce potential exposure and mitigate sediment/soil migration. Water levels in Pond B, PAR Pond, and Pond C will be maintained by performing inspections and necessary maintenance on the individual dams for each pond system. Inspections will note any significant water level drops and will be reported in the five-year remedy reviews or earlier as conditions warrant. In addition, appropriate signage will be posted at viable surface water bodies within the Upper subunit that maintain fishable fish populations, i.e., Pond B, Pond C, and PAR Pond."

Responsible Party: Jim Kupar, 803-507-8072, james.kupar@srs.gov

2. **Section 4.7, Field Inspection and Maintenance for Land Use Controls, Page 11 of 24:** It is unclear whether the LTR IOU field inspections will be conducted such that evidence of trespassing can be observed to ensure no additional follow-on inspections will be necessary outside of the five-year review frequency. For example, the text states the LTR IOU will be inspected per the Field Inspection Checklist in Appendix B (Field Inspection Checklist For Lower Three Runs IOU, Page B-3 of B-4) and completed every five years. However, the field inspection checklist form did not include an entry to verify that no evidence of trespassing (e.g., cans, bottles, fishing-line, -bobbers or -weights) was observed. EPA requests such an entry be added to the form. Please revise the LUCIP to address this issue to ensure that evidence of trespassing will be verified during the field inspections.

Response: Agree.

The Field Inspection Checklist in Appendix B will be revised to add an additional line of inspection that includes identifying any evidence of trespassing. The updated checklist is attached.

In addition, text will be added to Section 4.7 which clarifies that evidence of trespassing will be reported as follows:

"The LTR IOU will be inspected per the Field Inspection Checklist in Appendix B. Field inspections will be completed every five years. Additional inspections may be necessary in the event of unusual weather or any other condition warranting inspection. For the LTR IOU, inspections will be performed to ensure that access signs are in place and are legible, ~~and~~ all gates are in place and in working order, and any evidence of trespassing is documented and reported."

Responsible Party: Jim Kupar, 803-507-8072, james.kupar@srs.gov

FIELD INSPECTION CHECKLIST FOR LOWER THREE RUNS IOU

☐ **SCHEDULED** ☐ **UNSCHEDULED**

A= Satisfactory **X**= Unsatisfactory (Explanation required)	A or X	Observation of Corrective Action Taken
1. Verify that the roads are accessible.		
2. Verify that signage [55] are in acceptable condition, have the correct information, and are legible from a distance of 25 feet.		
3. Verify that gates are closed, secure and in good condition.		
4. Verify that there are no unauthorized excavation, digging, or construction activities that are disturbing the contaminated soil/sediment within the LUC boundary		
5. Verify that there is no evidence of trespassing within the LUC boundary (e.g., cans, bottles, fishing-tackle)		

Inspected by:

(Print Name)	(Signature)	(Date)

Post-Closure Manager:

(Print Name)	(Signature)	(Date)

CAUTION:

The inspector shall notify the Post-Closure Manager (PCM) and Environmental Compliance Authority (ECA) **IMMEDIATELY** if there has been a breach or compromise of the land use controls of this waste unit. The notification shall be in accordance with SRS post-closure inspection procedures.

SRS Responses to South Carolina Department of Health and Environmental Control Comments on the Monitored Natural Recovery Effectiveness Plan (MNREP) for the Lower Three Runs Integrator Operable Unit – Upper Subunit (U) SRNS-RP-2022-00085, Revision 0, March 2022, SEMS Number: 35 Savannah River NPL Site, South Carolina

Comments Received 6/28/22

Specific Comment

1. Section 3.3, Fish and Sediment/Soil Monitoring, page 8. For the fish tissue sampling, please clarify if samples will include whole fish tissue for ecological receptors or fish filets for the recreational fisherman.

Response: Agree.

Beginning with the fifth sentence of the second paragraph of Section 3.3, the text will be revised to state, "Each composite sample will consist of a minimum of three fish of the same species for a total of at least 300 grams (the minimum acceptable for laboratory analysis). Each sample will be analyzed as a whole fish composite. Fish will be collected by angling…"

Responsible Party: Susan Blas, (803) 952-6904, susan.blas@srs.gov.

SRS Responses to U. S. Environmental Protection Agency Comments on the Monitored Natural Recovery Effectiveness Plan (MNREP) for the Lower Three Runs Integrator Operable Unit – Upper Subunit (U) SRNS-RP-2022-00085, Revision 0, March 2022, SEMS Number: 35 Savannah River Site NPL Site, South Carolina

GENERAL COMMENTS

1. EPA requests that the MNREP clearly state that initial sampling for all media will be conducted concurrently with the RA Start scheduled in 2023 to set a post-ROD baseline for current contamination levels as much of the data used in the RI and decision documents is dated.

   Response: Agree/Clarification.

   The RI/BRA documented the baseline of the system while providing the justification for remedial action (RA) and included fish data from 1993-2010, sediment/soil data from 1991-2016, and aerial survey data for Cs-137 from 2013, 2014, and 2016. The primary consideration for the MNREP is associated with the 30-year half-life of Cs-137 that requires a longer timeframe to provide meaningful data and observe trends. The plan supports a long-term monitoring program that will evolve and mature over time with Core Team input. The first round of sampling is planned for 2024 (with the first aerial survey) with sediment/soil and fish collections to follow in 2025. The data collected will be reported in the first 5-year remedy review.

   It is proposed that data for all sampling media (fish, sediment/soil, gamma aerial survey) be collected on a 5-year cycle. Please note, due to the large size of the PAR Pond/canal system, the gamma survey will take three aerial campaigns to complete the entire Upper subunit.

   To address this comment, the first paragraph of Section 3.1 will be revised to state, "The MNREP encompasses the Upper subunit of the LTR IOU. The boundaries of the three aerial gamma survey campaigns, as well as the location of the fish sampling that will be conducted (EA3, EA6, EA9) are shown in Figure 4. Gamma aerial surveys will be initiated in 2024 as discussed in Section 3.2. Sampling for fish and sediment/soil (Section 3.3) will be initiated in 2025. The data collected for all media will support the first five-year remedy review. Additional sampling will be conducted on a 5-year cycle to support future five-year remedy reviews."

   Responsible Party: Susan Blas, (803) 952-6904, susan.blas@srs.gov.

2. EPA requests that the MNREP clearly state that aerial surveys will also commence with the RA Start in 2023 in order to set a post-ROD baseline.

   Response: Clarification.

Aerial surveys are coordinated with various entities on site and require coordination to acquire helicopter usage, health physicist instrumentation, and personnel. Aerial surveys for portions of the LTR IOU were conducted in 2013, 2014, and 2016. Aerial surveys for MNREP monitoring will be initiated in 2024 in order to have adequate time for data acquisition/analysis prior to collection of sediment/soil samples. For revisions to the document based on this comment, please see the response to Comment #1.

Responsible Party: Susan Blas, (803) 952-6904, susan.blas@srs.gov.

3. It is unclear if ongoing sediment deposition will be monitored and evaluated as a naturally occurring process to reduce the bioavailability or toxicity of contaminants in sediment/soil as part of the MNR remedy. EPA requests that SRS conduct an evaluation of ongoing sediment deposition to further support the MNR remedy. The text in Section 1.1 (Purpose and Scope, Page 2 of 22) states, "MNR is a remedy that uses ongoing, naturally occurring processes to reduce the bioavailability or toxicity of contaminants in sediment/soil (e.g., radiological decay and ongoing deposition);" however, the Effectiveness Plan does not discuss the monitoring and evaluation of ongoing deposition. Please revise the Effectiveness Plan to discuss if monitoring ongoing sediment deposition will be performed as part of the MNR remedy for LTR IOU Upper Subunit with results reported in the five-year remedy reviews.

   Response: Agree/Clarification.

   Due to the heterogeneity of sediment/soil activities and depositional variability, Cs-137 levels and depositional rates can vary widely between samples collected at the "same location" over time. Thus, SRS is proposing to use gamma overflight data as the principal indicator for demonstrating reducing Cs-137 trends over time. The purpose of the targeted sediment/soil sampling is to supplement the results of the aerial gamma surveys targeting areas where activities have changed appreciably.

   To address this comment, the second sentence of the second paragraph in Section 1.1 will be revised to state, "MNR is a remedy that uses ongoing, naturally occurring processes to reduce the bioavailability or toxicity of contaminants in sediment/soil (e.g., radiological decay ~~and ongoing deposition~~). In addition…"

   Responsible Party: Susan Blas, (803) 952-6904, susan.blas@srs.gov.

4. Sampling periodicity for fish is unclear in the MNREP. EPA requests that fish sampling be conducted annually in order to report trends in the 5-year review report.

   Response: Clarification.

The MNREP was intended to reflect a data collection and reporting cycle appropriate for assessing long-term trends. With Cs-137 having a physical half-life of 30 years, and variable effective half-lives depending on species/size/age, a 5-year data collection cycle was developed. Also, please note that fish monitoring at the mouth of LTR, where the stream system enters the Savannah River, will continue as part of the Annual SRS Environmental Report monitoring program to assess levels of Cs-137 in fish where a recreational fisherman scenario is more appropriate. Results of this monitoring will be included, as appropriate, in the five-year remedy reviews.

To address this comment, the third sentence of the first paragraph of Section 3.3 will be revised to state, "Fish data will be collected every 5 years under this MNREP and will follow the *Area Completion Projects Quality Assurance Project Plan for Environmental Data Collection and Management* (SRNS 2012)."

Responsible Party: Susan Blas, (803) 952-6904, susan.blas@srs.gov.

5. Likewise, sampling periodicity is for soil/sediment is unclear in the MNREP. EPA requests that sampling periodicity be clearly stated, such as: annual, every 3 years, or every 5 years. Sampling must be conducted at least often enough for trend analysis reporting purposes in the 5-year review reports.

   Response: Agree/Clarification.

   Sampling for sediment/soil will be conducted on a 5-year basis and will be initiated in 2025 as noted in Comment #1. Due to the heterogeneity of Cs-137 activities within the LTR system, the sediment/soil sampling will primarily be used to ground-truth aerial survey data targeting areas where activity levels are evaluated.

   To address this comment, the third paragraph of Section 3.3 will be revised to state, "Sediment/soil sampling for Cs-137 will be conducted on a ~~15~~-5-year schedule for ground-truthing to confirm areas where aerial gamma surveys indicate elevated Cs-137 levels (e.g., two elevated areas in Joyce Branch as indicated in Figure 5), in addition to areas where gamma signatures may indicate sediment transport."

   Responsible Party: Susan Blas, (803) 952-6904, susan.blas@srs.gov.