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

DEC 28 2017

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
Acting 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 Investigation / Baseline Risk Assessment for the Lower Three Runs Integrator Operable Unit (U) (SRNS-RP-2017-00139, Revision 1 Redline, December 2017) and Savannah River Site's Responses to the Regulatory Comments on the Revision 0 Document, CERCLIS Number: 35

In accordance with the terms of the Federal Facility Agreement, the U. S. Department of Energy (DOE) is submitting the subject information for your review. 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 document were received on September 25, 2017 and October 3, 2017, 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
SRS Remedial Project Manager
Infrastructure and Area Completion Division

IACD-18-116

DEC 28 2017

Enclosures:
1. Remedial Investigation / Baseline Risk Assessment for the Lower Three Runs Integrator Operable Unit (U) (SRNS-RP-2017-00139, Revision 1 Redline, December 2017)
2. SRS Responses to EPA's Comments on the Remedial Investigation / Baseline Risk Assessment for the Lower Three Runs Integrator Operable Unit (U) (SRNS-RP-2017-00139, Revision 0, June 2017)
3. SRS Responses to SCDHEC Comments on the Remedial Investigation / Baseline Risk Assessment for the Lower Three Runs Integrator Operable Unit (U) (SRNS-RP-2017-00139, Revision 0 June 2017)

cc w/o encl:
D. Scaturo, SCDHEC-Columbia
S. French, SCDHEC-Columbia
M. D. Wilson, SCDHEC-Columbia
G. K. Taylor, SCDHEC-Columbia
T. Fuss, SCDHEC–Aiken Environmental Affairs Office
R. Pope, EPA-Atlanta

cc w/ encl:
M. McRae, TechLaw, Inc.

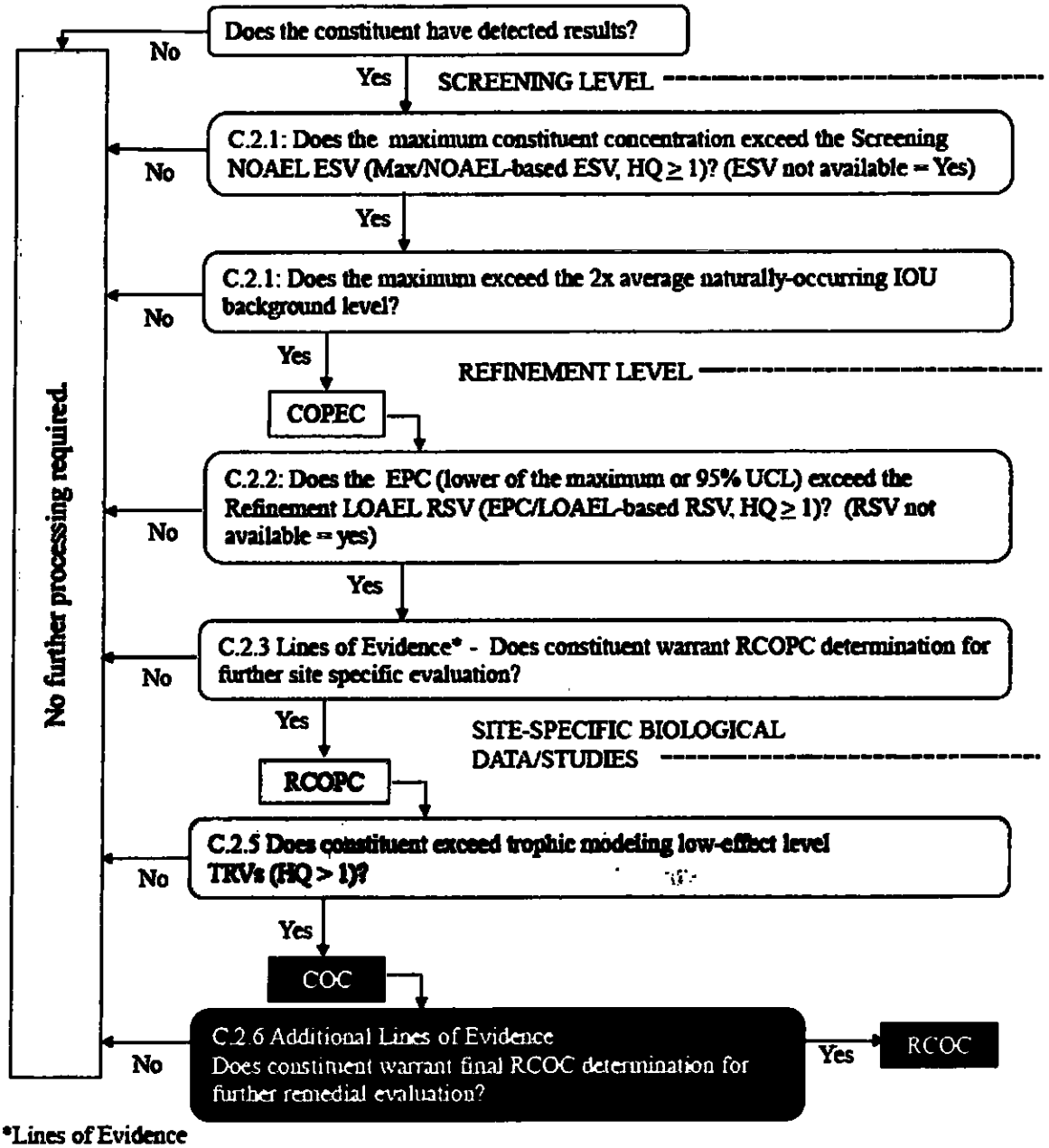
SRS Responses to EPA Comments on:
Remedial Investigation / Baseline Risk Assessment for the Lower Three Runs Integrator Operable Unit (U), CERCLIS Number: 35 (SRNS-RP-2017-00139, Revision 0, June 2017)
Comments received October 3, 2017

SPECIFIC COMMENTS

1. **Appendix C, Section C.2, Ecological Risk Assessment (ERA) Process, beginning on page C-22 of C-376 and additionally on Page 3-30 of 3-114 of the Report,** outlines the ERA process and identifies Constituent of Potential Ecological Concern (COPECs), followed by Constituents of Potential Concern (COPCs), followed by Refined Constituents of Potential Concern (RCOPCs), followed by Constituents of Concern (COCs), followed by refined COCs (RCOCs). Each step in the process involves comparing sequentially less conservative exposure concentrations (or doses) to less conservative toxicity values and different Lines of Evidence (LOEs). The current explanation of the step-wise process in Section C.2 is wordy and potentially confusing. It is recommended to augment the existing text by adding a flowchart that shows the five sequential COC-selection steps, starting with the COPECs, together with the decision points after each step to determine if a constituent is removed from further consideration or continues down the ERA process. *Please amend the report by including the requested flow chart.* It is anticipated that this new figure will provide a helpful tool to support future risk management decision making by the Agencies.

Response: Agree. The second sentence of Section C.2 will be revised to state, "The ERA for the LTR IOU includes a background comparison and a screening-level ecological effects evaluation..." Additionally, the following text will be incorporated as the last sentence of the last paragraph of Section C.2, "The ecological risk assessment process for LTR is outlined in the Figure C-2." Figure C-2 is shown below.

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



*Lines of Evidence

1. Unit Related Uncertainty
   - nature and extent of contamination, consistency with history of use, presence in background
2. Data Quality Uncertainty
   - analytical data quality, physical characteristics
3. Risk Assessment Uncertainty
   - toxicity data, radioactive decay

Figure C.2 Lower Three Runs Ecological Risk Assessment Process

2. **The first paragraph of Section 3.2.5, PAR Pond Characterization (2016), on page 3-18 of 3-114 in the Report** states that surface water samples were collected from 14 locations in PAR Pond. The second paragraph in Section 3.12.2, Exposure Area 6 Characterization and Data Summary on Page 3-63 of 3-114 in the Report mentions that 11 surface water samples were collected from PAR Pond in 2016. Figure 3-6 appears to show up to 18 surface water sampling locations in PAR Pond. Table A.1.6.2 presents analytical data for between 8 and 52 surface water samples collected from PAR Pond. The report is confusing and unclear on the number of actual surface water samples obtained from PAR Pond in 2016 and earlier for use in the ERA. *Please amend the text to clarify this issue.*

Response: Agree with clarification. There were 14 samples taken from PAR Pond during the 2016 characterization effort as correctly noted in Section 3.2.5 (page 3-18). Table A.1.6.2 (and Figure 3-6) presents the investigation data for surface water for all the data collected for PAR Pond that were compiled for the BRA including the 2016 sampling event. The rows Table A.1.6.2 with "14" samples listed indicates that those samples were collected during the 2016 sampling event for those particular analytes.

The number of PAR Pond surface water samples described in Section 3.12.2 should be fourteen. The first sentence of the second paragraph of Section 3.12.2 will be revised as follows: "Fourteen ~~Eleven~~ surface water samples were also taken at EA 6 during the May – June 2016 sampling event." Also, Appendix A of the RI/BRA and Attachment A of the DUR will be revised to state 14 surface water samples and the Analytical column will be revised to add pesticides/PCBs, semi-volatiles, and volatiles.

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

3. The report uses soil screening activities obtained from the Residual Radioactivity (RESRAD) Biota database to determine if a radionuclide present in sediment/soil should be retained for further evaluation if it lacks a screening value or measured background concentration. However, this approach does not appear to have been systematically applied in the refinement-level uncertainty discussions across all the radionuclides and exposure areas. For example, a radionuclide detected in sediment/soil but lacking a screening value or background concentration may be eliminated from further consideration because of its short half-life, with no mention of an acceptable soil screening activity. *Please amend the text to consistently apply the RESRAD soil screening activities. The report should also clarify upfront why the RESRAD soil screening activities were not retained as separate screening values, but instead are only presented in the uncertainty analysis and yet are used extensively to eliminate COPECs.*

Response: Agree. The fifth paragraph of Section C.2.3 will be revised to state, "Also, where ESLs were unavailable for radionuclides, toxicity uncertainty is addressed by comparing unit activity concentrations to Tier 3 Biota Concentration Guides (BCGs) found in the RESidual RADioactivity (RESRAD) BIOTA database (ANL 2006), which ~~is~~ are provided in Attachment C-7.

The RESRAD screening values are used in uncertainty discussions to determine the significance of detected radionuclides when typical risk screening values are not available, and the radionuclide may be expected to be present based on the data and physical half-life. The RESRAD screening and other lines of evidence are used, applying best professional judgement, in Section C.2 to determine whether the constituent requires further consideration."

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

4. The refinement-level uncertainty discussion for each Exposure Area (EA) describes the evidence to determine if a COC should be retained or not for further remedial evaluation. These discussions are thorough but quite wordy. The risk management decision-making process would be greatly helped by including a table for each EA that shows the EA-specific COCs to the left and, at the top, all of the LOEs presented in the discussion, with checkmarks that show what LOEs were applied to which COCs. These tables would provide a succinct summary of the uncertainty discussions and will provide a helpful tool to support future risk management decision making by the Agencies. *Please amend the report by including these requested tables.*

Response: Agree. Each Exposure Area (EA) will include a summary table of the constituents and the LOEs used for each COC for the Human Health Risk Assessment (Appendix B) and each COPC for the Ecological (Appendix C) Assessment.

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

5. Bird and mammal Toxicity Reference Values (TRVs; in units of mg/kg body weight per day) typically come in two varieties, namely no-effect TRVs and low-effect TRVs. Neither Appendix C, Ecological Risk Assessment, nor Attachment C-9, Trophic-level Modeling Report, in Appendix C clearly specifies whether the TRVs used to calculate the receptor-specific Hazard Quotients (HQs) represent no-effect or low-effect values. *Please amend the text to clarify this important issue.* Note that an easy way to resolve this ambiguity is to consistently use the notation $TRV_{no\text{-}effect}$ and/or $TRV_{low\text{-}effect}$ in the tables and the text.

Response: Agree. The TRVs for the refinement screening, including the site-specific trophic modeling, are conducted based on low-effect values. To address this comment, the flowchart (Comment #1) will include "Low-effect Level TRVs" for the Section C.2.5 referenced box. Also, Attachment C-9 (Trophic Level Modeling Report) will be revised to state, "low-effect TRVs" in the first and second paragraph of the Abstract, the last paragraph of the Introduction, in the second to last paragraph of the Contaminant Exposure Models subsection of the Materials and Methods section, and in the first, second, and third paragraph of the Results and Discussion section. Also, the headers of Attachment C-9 Tables 3, 5, 6, 7, and 8 will be revised to state, "Low-effect toxicity reference values."

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

6. The table numbering in the text does not match the actual table numbers (e.g., Table C-6 on Page C-49 and Table C-7 on Page C-43 in the text are actually Tables C-7 and C-8, respectively). *To avoid confusion, please ensure that all the table numbers in the text are made to correspond to the appropriate tables.*

Response: Agree. The callouts to Tables in the Appendix C text are correct as written. Some tables were mislabeled as new tables when they were in fact a continuation of a table from a previous page (e.g., Table C-6 in Revision 0 should have been *Table C-5 continued*). Table labels have been corrected in Appendix C accounting for second page continuations.

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

SRS Responses to South Carolina Department of Health and Environmental Control Comments on:

Remedial Investigation / Baseline Risk Assessment for the Lower Three Runs Integrator Operable Unit (U), CERCLIS Number: 35 (SRNS-RP-2017-00139, Revision 0, June 2017)
Comments received September 25, 2017

General Comments

1. In the Human Health Risk Assessment in Appendix B and the Ecological Risk Assessment in Appendix C, refined constituents of potential concern (RCOPCs) are further evaluated and discussed in an uncertainty analysis. Some of the RCOPCs state as a line of evidence that there was low frequency of detections; however, the limit for frequency of detections was not established nor discussed. The Region 4 Human Health Risk Assessment Supplemental Guidance (2014 Draft Final), page 2-6, states that frequency of detection should not be used as a means for constituent exclusion in a BRA without EPA Region 4 approval. The USEPA Region 4 Ecological Risk Assessment Supplemental Guidance Interim Draft (2015), Section 3.1.4 Frequency, Magnitude, and Pattern of Detected Chemicals, page 3-5, states that to consider a chemical a candidate for exclusion from a contaminant of concern based on infrequency of detection, the recommended limit is <5% of the samples. This threshold for frequency of detections has been used in many other areas of concern at the SRS. Please consider removing 'frequency of detection' as criteria for removing a constituent from further evaluation in the risk assessment process. Calculating the frequency of detection for most RCOPCs are > 5%. Furthermore, stating that "only 1 out of 5 samples..." as a line of evidence when sample sizes are extremely small does not offer sufficient justification for a RCOPC to be excluded.

Response: Clarification. The EPA guidance documents cited in the comment are based on the Risk Assessment Guidance for Superfund (RAGS) Part A (1989) which refers to whether a constituent can be eliminated in the initial screening because of low frequency of detection (i.e., <5%) and not be considered in the quantitative baseline risk assessment. Consistent with SRS protocols, the LTR IOU RI/BRA does not eliminate constituents upfront in the screening process based on frequency of detects (as allowed by the guidance), but conservatively carries all detected constituents through the quantitative BRA process.

No single line of evidence was used in the uncertainty evaluation for the LTR IOU RI/BRA to remove a constituent from further consideration. Rather, the uncertainty discussion used an overall weight of evidence approach that considers several lines of evidence, including relative abundance of detects in the total number of samples (as an indicator of extent of contamination), to provide a recommendation whether a constituent should be identified as a refined constituent of concern (RCOC) (for human health risk) or as a refined constituent of potential concern (RCOPC) (for ecological risk).

Consistent with the protocol for the *Constituents of Concern (COC) Refinement Process*, ERD-AG-003, Protocol P.1.9, the discussion of the data quality/quantity (i.e., number of samples, abundance of detects, whether the detect is an estimated (J-qualified), etc.), will remain to support the understanding of the nature and extent of contamination. However, the frequency of detection criteria will be removed as an independent line of evidence for

eliminating a constituent as a human health COC or ecological COPC in the LTR IOU/RI/BRA due to the limited sample size for each EA.

For example, the text in Section B.2.4.1.1 Sediment/Soil Media for Am-243(+D) will be revised as follows:

"Am-243(+D) **is identified as a COC for the resident (risk = 1.7E-06) and industrial worker (risk = 1.1E-06) scenarios. The risk to the onsite worker was < 1E-06 and was detected in 2/5 samples, with no results being estimated values ("J" qualified). Concentrations range from nondetect (ND) to 0.277 pCi/g. Sample location RDC002-001 (see Figure 3-1 in Section 3), collected on April 13, 2010, had the highest detected concentration. The EPC used in the risk calculations was 0.277 pCi/g, which is the maximum concentration. Using the maximum detected concentration tends to bias the risk calculation high. The mean activity concentration, 0.126 pCi/g, is below the residential PRG of 0.167 pCi/g and industrial worker PRG of 0.26 pCi/g.**

There are no background results for Am-243.

Am-243 (half-life of 7,370 years) and Am-241 (half-life of 432 years) are produced together in reactors and both behave the same in the environment. Am-243(+D) is not recommended for further remedial evaluation as a HH RCOC in sediment/soil for any receptor scenario based on the following lines of evidence:

- ~~**It was detected in 2/5 samples (not widespread).**~~
- **The risk estimate is biased high because the maximum detected concentration was used.**
- **The mean concentration is less than the PRG."**

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

2. In Appendix C, there are many references in the Refinement-Level Uncertainty Discussions for exposure areas that compare RCOPCs to IOU background concentrations as reported in Appendix A, pages 41-46, in an effort to justify the exclusion of a RCOPC. However, there are several analytes that do not have background concentrations listed in Appendix A. Examples of missing background concentrations are DDE, DDT, and cyanide in sediment/soil and pyrene in surface water. This list is not complete and the Project Team should review Appendix C to remove discrepancies or clarify where background concentrations originated and include results in Appendix A.

Response: Agree. Appendix A will be reviewed to ensure that the correct background concentrations are represented, and Appendix C will be reviewed to verify that appropriate comparisons to the IOU background concentrations are made. SRS acknowledges that there are several constituents that were not detected in background locations and were erroneously included in the background comparison discussion. The uncertainty discussions in Appendix C for the following constituents will be revised to

delete the comparison to a background concentration since they were not detected in IOU background:

EA2 surface water, C.2.3.2.6: fluoranthene, pyrene

EA3 surface water, C.2.3.3.6: anthracene, fluoranthene, pyrene

EA4 sediment/soil, C.2.3.4.3: americium-243, carbon-14, DDT
EA4 surface water, C.2.3.4.6: fluoranthene, pyrene

EA5 sediment/soil, C.2.3.5.3: americium-243, DDE, DDT

EA6 sediment/soil, C.2.3.6.3: barium-133
EA6 surface water, C.2.3.6.6: dibenz[a,h]anthracene, indeno[1,2,3-cd]pyrene

EA7 sediment/soil, C.2.3.7.3: americium-243, cyanide

EA8 sediment/soil, C.2.3.8.3: cyanide, DDD, DDE, DDT
EA8 surface water, C.2.3.8.6: 2,4,5-trichlorophenol, 2,4,6-trichlorophenol, 2-chloronaphthalene, 2-nitroaniline, 3,3-dichlorobenzidine, 3-nitroanaline, 4,6-dinitro-2-methylphenol, 4-bromophenyl phenyl ether, 4-chloro-m-cresol, 4-chlorophenylphenyl ether, 4-nitroaniline, acetophenone, anthracene, benzo[g,h,i]perylene, benzo[k]fluoranthene, biphenyl, bis[2-chloroethoxy]methane, bis[2-chloroethyl] ether, bis[2-chloroisopropyl]ether, bis[2-ethylhexyl]phthalate, carbazole, chrysene, dibenz[a,h]anthracene, dibenzofuran, dimethylphthalate, dioctylphthalate, fluoranthene, hexachlorobenzene, hexachlorocyclopentadiene, indeno[1,2,3-cd]pyrene, pyrene.

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

Specific Comments

1. Chapter 1 Introduction, Figure 1-5, Middle and Lower LTR IOU Subunits, page 1-15. The middle paragraph on page 1-6 discusses off-site discharges into Mary's Branch, a tributary of LTR. This tributary is not labeled on Figure 1-5; please include this tributary on the figure and expand as an inset, if necessary.

Response: Agree. Mary's Branch, entering Lower Three Runs downgradient of PAR Pond dam, will be labeled on Figure 1-5.

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

2. Chapter 3 Remedial Investigation, Section 3.2.1, Initial RI Work Plan, page 3-7, second paragraph. This paragraph states that the maximum concentration in sediments collected in 1995 for Cs-137 in PAR Pond was 56.7 pCi/g. The maximum concentration of Cs-137 in sediments that was collected in 1995 is 124 pCi/g per Figure 3-17, pages 3-64 and 3-105, and Appendix A, pages 19 and 21. Please revise.

Response: Agree with clarification. The text is the summary for the *Potential Ecological Effects of Contaminants in the Exposed PAR Pond Sediments* (WSRC-TR-96-0292) study noted on the previous page. The result of 56.7 pCi/g is referring to the maximum detected concentration reported in the SRTC study. For clarity, the sentence in question will be revised to state, "From the data collected in early 1995 for the SRTC study, ~~T~~the geometric mean of Cs-137 was 7.2 pCi/g; the maximum was 56.7 pCi/g (Paller and Wike 1996b)."

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

3. Chapter 3 Remedial Investigation, Section 3.2.4, Periodic Report 3, page 3-17. The beginning of this section discusses fish tissue data needs identified in the PR3, but the 2009/2010 characterization summary for the 2009 SAP for LTR that begins on page 3-12 and ends on page 3-17 does not include fish sampling activities at EAs 3, 6, 8 and 9. Please include a summary for these field activities following the Surface Water field activities discussion.

Response: Agree. The following text will be included after the Surface Water subsection of Section 3.2.4:

"Fish

Fish were collected for the 2009/2010 characterization effort from the LTR pond/canal system from Pond B, Pond 5, Pond C, and PAR Pond as well as the upgradient portion of the north arm of PAR Pond. The upgradient location was collected to serve as an unimpacted background location. This background location was supplemented by fish collected from Tinker Creek (the main tributary of the Upper Three Runs), Meyers Branch (the main tributary of Steel Creek), and the Crackerneck WMA (part of the Savannah River and Floodplain Swamp IOU upgradient of SRS discharges).

At each of these sampling locations, the sampling plan was to acquire three (3) composite fish samples. Each composite sample consisted of a minimum of three fish with a total mass of at least 150 grams to meet the minimum acceptable mass requirement for laboratory analysis. Fish were collected by backpack electrofishing. Optimally, each location would consist of three species representing a benthic feeder (B), a regional species (R) such as redbreast sunfish, or a predator (P). The particular species of fish or type of fish collected for analysis at each location was based on the amount of fish tissue obtainable, the size of the fish, and the representativeness of the fish species as compared to other fish sampling

locations. Fish samples were analyzed for total analyte list (TAL) inorganics, gross alpha, nonvolatile beta, tritium, uranium series, and gamma spectroscopy. These constituents were selected on the basis of their known or suspected occurrence in fish tissue from past sampling efforts.

Fish collected from the LTR-PAR Pond system included:

- **Pond B: largemouth bass (P), bluegill (R)**
- **Pond 5: largemouth bass (P)**
- **Pond C: largemouth bass (P), bluegill (R)**
- **PAR Pond: largemouth bass (P), lake chubsuckers (B), and bluegill (R)**

Fish collected from background locations consisted of the following.

- **LTR upgradient of the north arm of PAR Pond: largemouth bass (P), sunfish (R, various species), redfin pickerel (P)**
- **Tinker Creek: Spotted sucker (B), American eel (B), sunfish (R, various species)**
- **Meyers Branch: redfin pickerel (P), sunfish (R, various species), bluehead chub (B)**
- **Crackerneck WMA: bullhead catfish (B), redfin pickerel (P)"**

Additionally, the sentence prior to the Sediment/Soil subsection will be revised to state, "The biological data collection effort associated with the LTR characterization is described below as well as the Ffield activities ~~for the LTR characterization effort~~ that were documented in the *Field Summary Report for the Characterization of Lower Three Runs Steam, Floodplain, and Headwater* report (SRNS 2010b)~~ and are summarized below~~."

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

4. Chapter 3 Remedial Investigation, Section 3.2.5, PAR Pond Characterization (2016), page 3-18, first and second paragraph. This section states that fourteen (14) surface water locations were sampled; however, Section 3.12.2, Exposure Area 6 Characterization and Data Summary, page 3-63, second paragraph states that eleven (11) surface water samples were taken in 2016. Also, LTR IOU Data Usability Report, Attachment A, Page A-16 indicates that 3 surface water samples were taken in 2016. This same data table is included at the end of Appendix A. Please revise.

Response: Agree. The number of samples should be 14 at all locations described. To address this comment, the text in Section 3.12.2 will be revised to state, "Fourteen ~~Eleven~~ surface water samples were also taken..." Also, Appendix A of the RI/BRA and Attachment A of the DUR will be revised to state 14 samples and the Analytical column will be revised to add pesticides/PCBs, semi-volatiles, and volatiles.

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

5. Chapter 3 Remedial Investigation, Section 3.2.6, RI/BRA Data, page 3-20, last paragraph. This section states that "Figures 3-10 through Figures 3-23 depict the levels of Cs-137 and Co-60 in sediment/soil media for each Exposure Area (EA) 1 through EA 9. These figures show the maximum value from the most recent data..." Please remove "from the most recent data" from this sentence because this implies that only the maximum values from the 2009/2010 and 2016 characterization sampling are included in the figures. Also, please remove this phrase from sentences within each EA discussions.

Response: Agree. The first sentence of the last paragraph of Section 3.2.6 will be revised to state, "Figures 3-10 through ~~Figures~~ 3-23 depict levels of Cs-137 and Co-60 in sediment/soil media for the 0- to 0.3-m (0- to 1-ft) interval for EA 1 through EA 9. These figures show the maximum value ~~from the most recent data~~ for each sampling location along with..." Also, the second sentence of the second paragraph of Section 3.7.3 will be revised to state, Figures 3-10 and 3-11 depict the maximum detected result ~~most recent data~~ for each sampling location along with..." Similar edits will be made to Section 3.7.3, Section 3.7.4.1.1, Section 3.8.3, Section 3.8.4.1.1, Section 3.9.4.1.1, Section 3.10.4.1.1, Section 3.11.4.1.1, Section 3.12.4.1.1, Section 3.13.4.1.1, Section 3.14.4.1.1, and Section 3.15.4.1.1.

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

6. Chapter 3 Remedial Investigation, Section 3.3.1, Background Data, page 3-24. The last sentence of the third paragraph states that "blanks were collected at a rate of 10% or one blank per 40 samples." One into forty is 2.5%. Please clarify the discrepancy.

Response: Agree. The blanks were collected at a minimum rate of 5%. The text in Section 3.3.1, Data Sufficiency, last sentence of the third paragraph, will be revised to state, "Rinsate blanks were collected at a minimum rate of ~~10%~~ 5% or one blank per ~~40~~ 20 samples."

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

7. Chapter 3 Remedial Investigation, Section 3.7.3 Exposure Area 1 Nature and Extent of Contamination, page 3-34, first paragraph. This states that Cs-137(D+) was detected in 44 out of 45 sediment samples; however, Section 3.7.5 Exposure Area 1 Principle Threat Source Material Results, page 3-37 states that 5 out of 61 samples exceeded PTSM thresholds. Please clarify the differences in sediment sample numbers for Cs-137 in EA 1.

Response: Agree. The screening in Section 3.7.3 refers to 44 detects out of 45 analyses for the 0-1 ft depth interval. For the PTSM evaluation, there were a total of 61 samples considering all depth intervals (0-1 ft and 1-4 ft). To address this comment, the text in Section 3.7.3, second paragraph, will be revised to state, "44 out of 45 samples for the 0- to 0.3-m (0- to 1-ft) depth interval, with four results being estimated...". The text in Section

3.7.5, first paragraph, will be revised to state "Further, there are only five samples out of 61 (from all depth intervals) in which the activity...".

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

8. Chapter 3 Remedial Investigation, Section 3.9.3, Exposure Area 3 Nature and Extent of Contamination, page 3-46. The maximum Cs-137 concentration listed here for sediment/soil at EA 3 and throughout the document is 456.8 pCi/g. According to the EA 3 data set that was submitted last year, the highest Cs-137 concentration among the high- and medium-pedigree datasets is 930 pCi/g at Pond B – Main Body near Mouth of Outlet Bay: SCB-29-x from 1994 (dataset 3). The highest Cs-137 concentration among the other qualifying datasets is 31.8 pCi/g from the 2009/2010 characterization, so the origin of the 456.8 value is unclear. The document should be revised to include the correct maximum Cs-137 concentration in sediment/soil at EA 3, or else explain this discrepancy.

Response: Agree. Much of the historic data from Pond B were from centimeter (cm) core increments. The maximum of 930 pCi/g is from a 13-14 cm interval from data collected in 1994. To obtain an activity for Cs-137 from a distinct sampling location, the cm core incremental activities were combined and averaged to arrive at a concentration for the 0-1 ft interval and the 0-4 ft depth interval. This is noted on page 9 of 46 of Appendix A, "xy spatial grouping at 0 to 1 foot," from the Max Location column. The 456.8 pCi/g is the maximum of the averaged incremental activities from the location with the maximum reported activity (930 pCi/g).

To address this comment, the text in Section 3.9.3 (second paragraph) will be revised as follows:

"Figure 3-13 depicts the nature and extent of environmental impacts at EA 3 and provides an overview of the overall contamination based on activities of Cs-137(+D). The majority of historic data for Cs-137 (+D) from Pond B were obtained from incremental analyses of two-centimeter intervals from cores collected from discrete sampling locations. To obtain an activity for Cs-137 from a discrete sampling location, the activities were combined and averaged for the results from the 0- to 0.3-m (0- to 1-ft) interval and the 0.3- to 1.2-m (1- to 4-ft) interval. Cs-137(+D) was detected in 44 out of 44 sediment/soil samples, with none being an estimated value (i.e., "J" qualified). Concentrations ranged from 0.093 pCi/g to 456.8 pCi/g with the highest averaged concentration detected at location Main Body near Heron Island: SCB-34 ~~Pond B-Main Body near Mouth of Outlet: SCB-29-~~on 9/14/1994 as noted on Figure 3-13. The maximum cm incremental activity in Pond B was 930 pCi/g from the Main Body near Mouth of Outlet Bay: SCB-29-0 location collected from the 14 to 15 cm (5.5- to 5.9-in.) depth interval on 9/20/1994."

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

9. Chapter 3 Remedial Investigation, Section 3.9.4.1.1, Sediment/Soil, page 3-48. Cyanide is listed as a COPC for the onsite worker at EA 3 in this section as well as on page B-47 of Appendix B, but is not listed as a detected constituent in Appendix A nor is it included in the COPC screening in Table B-11 in Appendix B. Please correct this discrepancy.

Response: Agree. Cyanide was not detected in EA3, and will be deleted from the text in Chapter 3 and Appendix B as follows:

Section 3.9.4.1.1: "...Refer to Appendix B for a full presentation of the HHRA results. Results of each step of the process for the evaluation of the sediment/soil media are identified below:

- **COPCs: aluminum, arsenic, chromium, cobalt, ~~cyanide,~~ iron, vanadium, Cs-137(+D), thorium-232(+D) and uranium-238(+D)."**

Section B.2.4.3.1: "...Table B-11 presents the results of the sediment/soil screening for EA 3. Human health COPCs for sediment/soil include aluminum, arsenic, chromium, cobalt, ~~cyanide,~~ iron, vanadium, Cs-137(+D), ~~K-40,~~ Th-232(+D) and U-238(+D)."

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

10. Chapter 3 Remedial Investigation, Section 3.11.1.1, Exposure Area 5 Description, page 3-56, bottom paragraph. This section states that eleven (11) sediment samples were collected in EA 5 during the 2009/2010 investigation. Section 3.11.2 EA 5 Characterization and Data summary, page 3-57 first paragraph states that a total of five sediment samples and 10 sediment/soil samples were collected during the 2009/2010 sampling event. Please clarify.

Response: Agree. A total of 10 sediment/soil samples and 5 sediment samples were taken along Joyce Branch for the 2009/2010 characterization effort. The text in Section 3.11.1.1 will be revised to state, "<u>Fifteen (15)</u> ~~Eleven (11)~~ sediment <u>and sediment/soil</u> samples were collected...

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

11. Chapter 3 Remedial Investigation, Section 3.11.4.1 Human Health Risk Assessment, page 3-59, third bullet. Please include the decay-adjusted TCR for Cs-137 and Co-60 value of $9.4E^{-4}$ in the discussion.

Response: Agree. Decay-adjusted TCR for Cs-137 and Co-60 will be included in Section 3.11.4.1 as follows:

"RCOC for the onsite worker scenario for sediment/soil: Cs-137(+D) (risk = 1.3E-03) and Co-60 (risk = 9.1E-06) are identified as RCOCs with a TCR = 1.3E-03. Decay-adjusted Cs-137(+D) risk = 9.4E-04; decay-adjusted Co-60 risk = 1.7E-06 with a decay-adjusted TCR = 9.4E-04."

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

12. Chapter 3 Remedial Investigation, Section 3.12.4.1.1, Sediment/Soil, page 3-65. Chromium is listed as a COPC for the onsite worker at EA 6, but is not listed on page B-165 of Appendix B nor does it pass the COC screening in Table B-30. Please correct this discrepancy.

Response: Agree. The text in Section 3.12.4.1.1 that incorrectly identifies chromium as a COC for the onsite worker scenario will be revised as follows:

- **COCs for the onsite worker scenario; ~~chromium,~~ Cs-137(+D), Co-60, potassium-40, and thorium-232(+D)**

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

13. Chapter 3 Remedial Investigation, Section 3.12.4.1.1 Sediment/Soil, page 3-65, third bullet. Please correct the RCOC for the onsite worker with a TCR = 5.0E-5 for Cs-137 and Co-60, as reported in Appendix B.

Response: Agree. Section 3.12.4.1.1 will be corrected as follows:

- **"RCOC for the onsite worker scenario sediment/soil: Cs-137(+D) (risk = 4.9E-05) and Co-60 (risk = 1.2E-06) are identified as RCOCs with a TCR = ~~9.9~~5.0E-05. Decay-adjusted Cs-137(+D) risk = 2.9E-05, decay-adjusted Co-60 risk = 7.2E-08, and decay-adjusted TCR = 2.9E-05"**

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

14. Chapter 3 Remedial Investigation, Section 3.12.4.2.2 Surface Water, page 3-67, first sentence. Please change "sediment/soil media" to "surface water media".

Response: Agree. The term "sediment/soil" will be changed to "surface water" as noted.

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

15. Chapter 3 Remedial Investigation, Section 3.13.1 Exposure Area 7 Description, page 3-68, last sentence. This section states that 75 sediment or sediment/soil samples and 32

surface water samples were collected in EA 7. Please add "during the 2009/2010 sampling event" to this sentence for clarity.

Response: Agree. The sentence will be revised to state, "Seventy-five (75) sediment or sediment/soil samples and 32 surface water samples were collected in EA 7 during the 2009/2010 sampling event."

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

16. Chapter 3 Remedial Investigation, Section 3.13.3, Exposure Area 7 Nature and Extent of Contamination, page 3-70. The maximum concentration listed for Cs-137 here for sediment/soil at EA 7 and throughout the document is 149 pCi/g. According to the EA 7 data set that was submitted last year, the highest Cs-137 concentration among the high- and medium-pedigree datasets is 230 pCi/g at LTROU-10 from 2001 (dataset 2). The document should be revised to include the correct maximum Cs-137 concentration in sediment/soil at EA 7, or else explain this discrepancy.

Response: Agree with Clarification. The initial data pull for EA 7 included a 2001 result of 230 pCi/g (Cs-137) from an area near P-Area Operable Unit. Additional data were collected from the area in 2004 by the IOU program (LaBr survey) and finally for P-Area Operable Unit associated with PAOU06 and PAOU08 sampling events. Although this area was initially included in the LTR BRA database, the area was determined to require no further action as documented in the RCRA Facility Investigation/Remedial Investigation Report with Baseline Risk Assessment and Corrective Measures Study/Feasibility Study for the P-Area Operable Unit (WSRC-RP-2007-4032), and the data were removed from the LTR BRA database. No change to the document is proposed.

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

17. Chapter 3 Remedial Investigation, Section 3.15.4.1.3, Fish, page 3-84. According to page B-121 and Table B-48, chromium should be listed as a COC for fish at EA 9. Please include.

Response: Agree. Section 3.15.4.1.3 will be corrected as follows:

- **"COCs: chromium, Hg, Cs-137, potassium-40."**

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

18. Chapter 3 Remedial Investigation, Figures 3-10, 3-11, 3-15, 3-22, and 3-23. Please include the maximum detections in each EA for Cs-137 and Co-60, where appropriate, since these values were used in the screening process to identify constituents of potential concerns for human health and ecological receptors. Also, for EAs 1 and 5 (Figures 3-10

and 3-15) please include all samples that resulted in concentrations greater than PTSM. Due to the size font used in some of the figures, please use a special character so that the location and maximum concentration can be easily identified. Figure 3-23, Cobalt-60 Exceedances Exposure Area 9, page 3-111, data included in the figure is below the PRG for Co-60. Furthermore, the "Notes" boxes in some of the figures uses "Exceedance values" instead of "PRG" for the radionuclide referenced. Please use "PRG" for consistency.

Response: Agree. The maximum detected values for Cs-137 and Co-60 for Figures 3-10, 3-11, 3-15, 3-22, and 3-23 will be highlighted by a * symbol. Additionally, all sample locations greater than PTSM will be shown for Cs-137 and Co-60 by a circle. Finally, the term "PRG" will be used rather than "Exceedance" for the note boxes on the figures.

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

19. Chapter 3 Remedial Investigation, Figure 3-17, Cesium-137 Exceedances Exposure Area 6, page 3-105. This figure should be divided into separate figures focusing on smaller areas of EA 6 so that it can be more clearly labeled and understood.

Response: Agree. Figure 3-17 will be revised to show discrete sections of PAR Pond, along with the original overall map, on two separate figures to enhance the readability (Figure 3-17a, 3-17b, etc.) for EA 6.

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

20. Chapter 4 Remedial Action Objectives and Remedial Goal Options, Section 4.1.9 Exposure Area 9, page 4-7, second bullet. Please correct the maximum concentration of mercury in fish tissue to 0.244 mg/kg, as reported in Appendix A.

Response: Agree. The mercury concentration will be changed to 0.244 mg/kg.

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

21. Chapter 4 Remedial Action Objectives and Remedial Goal Options, Section 4.3, Most Likely Remedial Goal Options, page 4-10. Please include Co-60 in the discussion of most likely RGOs on this page.

Response: Agree. Section 4.3 will be revised to include cobalt-60 as follows:

"The SRS soil background two times (2x) the 95th percentile concentration is identified as the most likely RGO for Cs-137 in sediment/soil media <u>for the onsite worker</u> since this is the generally accepted concentration for "typical" anthropogenic fallout, and has been

accepted as the RG for other SRS projects, specifically the SRS Wetland Area at Dunbarton Bay In Support of Steel Creek Integrator Operable Unit project (SRNS 2014). For cobalt-60, the most-likely RGO is identified as the 1E-06 risk-based concentration (i.e., the PRG) for the onsite worker."

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

22. Chapter 5 Summary, Section 5.0, page 5-2. EA 2 should be included in the last paragraph of this page discussing the EAs with specific locations above the PTSM threshold.

Response: Agree. Section 5.0 will be revised to acknowledge a single location in EA2 where the Cs-137 level was equal to the PTSM threshold as follows:

"No PTSM RCOCs are identified for any EA within the LTR IOU. However, EA 1, EA 3, and EA 5 had specific locations where Cs-137 levels were above the PTSM threshold, and EA 2 had a single location that was equal to the PTSM threshold. The locations with higher Cs-137 activity concentrations will be re-evaluated in the Feasibility Study (FS) phase to ensure that a full range of alternatives is considered in the remedy selection process."

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

23. Chapter 5 Summary, Section 5.2.3, Uncertainties, page 5-4. The specific location at which the PTSM threshold is exceeded at EA 2 should be discussed in this section, consistent with the other EA uncertainty discussions.

Response: Agree. Section 5.2.3 will be revised to document the uncertainty associated with the single location in EA 2 that is equal to the PTSM threshold as follows:

~~"None.~~ Potential PTSM is present (see Appendix D) at one location in EA 2 (RDC-007-001) where the measured activity of Cs-137 equaled the PTSM threshold for the onsite worker. This result, including the decay corrected risk, will be taken into consideration in the remedy selection process documented in the FS phase of the project."

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

24. Chapter 5 Summary, Section 5.7.2, Remedial Action Objectives, page 5-8. Co-60 should be included in the first bullet of this section.

Response: Agree. Section 5.7.2 will be revised to include Co-60 as follows:

- **"Protect onsite workers from exposure to Cs-137 and Co-60 in sediment/soil that exceeds 1E-06 risk based threshold or background levels. The primary exposure route of concern is the external radiation pathway."**

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

25. Chapter 5 Summary, Section 5.9.2, Remedial Action Objectives, page 5-10. Co-60 should be included in the first bullet of this section.

Response: Agree. Section 5.9.2 will be revised to include Co-60 as follows:

- **"Protect onsite workers from exposure to Cs-137 and Co-60 in sediment/soil that exceeds 1E-06 risk based threshold or background levels. The primary exposure route of concern is the external radiation pathway."**

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

26. Appendix A Investigation Data, Tables A.1.3.1.1 and A.1.3.1.2, Statistical Summary Table: EA3 / Sediment and Soil Media (0-1 ft) and (All Depths), pages 9 and 10. The maximum concentration for mercury in sediment/soil at EA 3 is listed as 0.0731 mg/kg. According to the EA 3 data set that was submitted last year, the highest mercury concentration among the high- and medium-pedigree datasets is 0.102 mg/kg at LTR-004 from 2001 (dataset 2). This may not seem like a significant difference, but it appears that the max value of 0.102 mg/kg was used in the COPC screening for mercury in Table B-11 instead of the 0.0731 value, resulting in a YES for "Exceeds 2X Average Background?" column, since 0.0731 is less than 0.0992. Please include the correct value for mercury in Tables A.1.3.1.1, A.1.3.1.2 and B-11.

Response: Agree with clarification. The correct value for mercury is 0.0731 mg/kg as indicated in Tables A.1.3.1.1, A.1.3.1.2 and B-11; the value of 0.102 mg/kg was erroneously included in the LTR database and was not used in the data screening. The value of 0.102 mg/kg was discovered to be from Fourmile Branch and mistakenly included into the LTR IOU database. Table B-11 will be revised to correct the "Exceeds 2X Average Background?" column to "no". The revised Table B-11 is attached to these comment responses.

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

27. Appendix B, Human Health Risk Assessment, Section B.2.4 Refinement of Constituents of Concern/Results, page B-24, fourth paragraph, last sentence. This sentence states that a more thorough description of the background dataset is provided in Section 3. For consistency, please change the word "Section" to "Chapter." Please make this change throughout the entire document.

Response: Agree. Appendix B will be revised globally to change the word "Section" to "Chapter" when referring to the upfront text (Chapters 1-6) of the document.

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

28. Appendix B Section B.2.4.3.3, Fish Media, page B-53 and Table B-16, Human Health Fish Ingestion Screening for Exposure Area 3 Recreational Fisherman, page B-147. Co-60 is listed as a COC for fish media at EA 3; yet according to Table B-16, the max concentration of 0.0405 pCi/g is less than the screening value 0.0913 pCi/g. According to Appendix A, 0.0405 pCi/g is the correct max value; therefore, Co-60 should not be included in this section, and Table B-16 should list a "NO" for Co-60 as a COC. Please revise.

Response: Agree. Section B.2.4.3.3 will be revised as follows:

"Table B-16 identifies chromium, mercury, Cs-137(+D), ~~Co-60,~~ K-40, and strontium (Sr) 89/ 90 as COCs for fish media because the maximum detected concentrations and activity concentrations from fish samples collected from Pond B exceed their respective human health RSLs or PRGs."

In addition, Table B-16 will be revised to indicate that the "Exceeds Human Health Screening Value?" for Co-60 is changed to "no". The revised Table B-16 is attached to these comment responses.

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

29. Appendix B Human Health Risk Assessment, Section B.2.4.4.2 Surface Water, page B-60. The Bis[2-ethylhexyl] phthalate discussion, states that the COC was detected in 4 out of 11 samples. The second bullet under lines of evidence states that the COC was detected in one sample. Please clarify.

Response: Agree. Bis[2-ethylhexyl] phthalate was detected in 4 out of 11 samples. The text in Section B.2.4.4.2 will be deleted as follows:

~~"• It was only detected in one sample for the EA surface water."~~

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

30. Appendix B Human Health Risk Assessment, Section B.2.4.7.1 Sediment/Soil Media, page B-94 and 95. The Th-232(+D) discussion under the refinement/uncertainty evaluation for EA 7 is confusing. In Appendix A, the maximum activity concentration for Th-232 is 2.71 pCi/g and a RME of 1.33 pCi/g. The risk calculation was performed

using the most conservative approach by using the maximum activity concentration of a daughter product, Ra-224 with an activity concentration of 45.9 pCi/g and an EPC of 26.1 pCi/g. These activity concentrations are considerably higher than IOU background and SRS background activity concentrations for Ra-224 of 6.15 pCi/g and 6.75 pCi/g, respectively. The last paragraph on page B-95 states that Th-232(+D) is not a HH RCOC because activity concentration is within the SRS soil background activity range. Please further explain this justification for EA 7. This is also an issue for EA 8, pages B-106 and 107.

Response: Agree. The uncertainty discussion for EA 7 (B.2.4.7.1) and EA 8 (B.2.4.8.1) will be revised to incorporate the justifications presented in Appendix D (PTSM evaluation) as well as revising the confusing comparison to background statements as follows:

Section B.2.4.7.1: "*Th-232(+D)* is a COC for the resident (risk = 9.8E-04) ..... Data screening is performed using the highest detected concentration in the entire series and the risk calculation is performed using the highest EPC of the entire series. Th-232(+D) was conservatively assumed to be present at the activity concentration of Ra-224, a daughter of Th-232. ~~For this dataset, the~~ Ra-224 had the highest detected concentration (45.9 pCi/g) as well as the highest EPC (26.1 pCi/g). This is from sample location Pond 2 P25-019-01 (see Figure 3-7 in Chapter ~~Section~~ 3) collected on March 9, 2000. The daughter products are not evaluated separately since they are considered in the Th-232(+D) PRG.

Ra-224 is a short-lived daughter of the thorium series decay chain. Secular equilibrium should not be assumed for sediment in contact with natural waters.

~~Background comparisons for the Th-232 series includes consideration of the range of concentrations for the entire decay chain (i.e., includes daughter products). The IOU Background maximum activity concentration of the constituents in the Th-232 decay chain is 6.15 pCi/g (based on the Ra-224 result) and the SRS Soil background maximum detected activity concentration is 6.75 pCi/g (based on the Ra-224 result). Note that the Ra-228 result of 14.64 pCi/g from the IOU Background dataset was not used based on professional judgment. Sediment/soil concentrations from EA 7 are within the range of activity concentrations found in background soil.~~

Th-232 is a naturally occurring constituent of primordial origin with a half-life of 14 billion years. Primordial nuclides are those that are long-lived and have existed in the earth's crust throughout history. The main contributors to external exposure from primordial nuclides are K 40, U-238 and Th-232 (and their daughter products).

Thorium did have a very limited role in SRS reactor processes, but Th-232 is not a COC in the P-Area and R-Area waste units and EA 7 concentrations (3.5 pCi/g or less) are typical of natural thorium. The probable origin for the daughter product Ra-224 is dissolved Ra-228 in groundwater. Radium is soluble in groundwater and Ra-228, although not often

analyzed for, is known to be elevated in some SRS monitoring wells. Sediment exposed to groundwater flux can adsorb radium and its daughters, and accumulate elevated concentrations of natural radionuclides.

Th 232(+D) is not recommended for further remedial evaluation as a HH RCOC in sediment/soil for any of the receptor scenarios based on the following lines of evidence:

- ~~**Unit activities are within the SRS soil background activity range.**~~
- ~~**It is a naturally occurring constituent that is common in SRS background soils.**~~
- ~~**It does not appear to be unit related since it is indistinguishable from background.**~~
- **It is a naturally occurring constituent of primordial origin that is common in SRS background soils.**
- **It is not a COC for the P-Area and R-Area waste units and the concentrations are typical of natural thorium.**
- **Conservative risk screening assumed the Th-232 concentration to be equal to the highest concentration of the daughter products (Ra-224). This is an overly conservative approach since secular equilibrium should not be assumed for sediment in contact with natural waters.**
- **The probable origin for Ra-224 is dissolved Ra-228 in groundwater. Radium is soluble in groundwater and sediment exposed to groundwater flux can adsorb radium and its daughters, and accumulate elevated concentrations of natural radionuclides."**

Section B.2.4.8.1: "*Th-232(+D)* is a COC for the resident (risk = 1.1E-03).... Data screening is performed using the highest detected concentration in the entire series and the risk calculation is performed using the highest EPC of the entire series. Th-232(+D) was conservatively assumed to be present at the activity concentration of Ra-224, a daughter product of Th-232. ~~For this dataset, the~~ Ra 224 had the highest detected concentration (41.58 pCi/g) as well as the highest EPC (30.0 pCi/g). This is from sample location Pond 5 P25-042-01 collected on March 37, 2000. The daughter products are not evaluated separately since they are considered in the Th 232(+D) PRG.

Ra-224 is a short-lived daughter of the thorium series decay chain. ~~Background comparisons for the Th-232 series includes consideration of the range of concentrations for the entire decay chain (i.e., includes daughter products). The IOU Background maximum activity concentration of the constituents in the thorium-232 decay chain is 6.15 pCi/g (based on the Ra-224 result) and the SRS Soil background maximum detected activity concentration is 6.75 pCi/g (based on the Ra-224 result). Note that the Ra-228 result of 14.64 pCi/g from the IOU Background dataset was not used based on professional judgment. Sediment/soil concentrations from EA-8 are within the range of activity concentrations found in background soil.~~ Secular equilibrium should not be assumed for sediment in contact with natural waters. ~~Ra-224 are both short-lived members of the thorium decay chain. Thorium did have a very limited role in SRS reactor processes, but Th-232 is not a COC in P-Area and R-Area waste units, and concentrations in EA-8~~

~~**sediment/soils are 3.5 pCi/g or less, typical of natural thorium. The probable origin for Ra-224 is dissolved Ra-228 in groundwater. Radium is soluble in groundwater, and Ra-228, although not often analyzed for, is known to be elevated in some SRS monitoring wells. Sediment exposed to groundwater flux can adsorb radium and its daughters and accumulate elevated concentrations of natural radionuclides.**~~

~~**The concentrations of Th-232(+D) are regarded as having a natural origin because thorium concentrations in sediment are indicative of natural origin, thorium is not a COC in P Area and R Area, and Ra-224 was not used in SRS processes.**~~

Th-232 is a naturally occurring constituent of primordial origin with a half-life of 14 billion years. Primordial nuclides are those that are long-lived and have existed in the earth's crust throughout history. The main contributors to external exposure from primordial nuclides are K 40, U-238 and Th-232 (and their daughter products).

Thorium did have a very limited role in SRS reactor processes, but Th-232 is not a COC in the P Area and R-Area waste units and EA 8 concentrations (2.19 pCi/g or less) are typical of natural thorium. The probable origin for the daughter product Ra-224 is dissolved Ra-228 in groundwater. Radium is soluble in groundwater and Ra-228, although not often analyzed for, is known to be elevated in some SRS monitoring wells. Sediment exposed to groundwater flux can adsorb radium and its daughters, and accumulate elevated concentrations of natural radionuclides.

Th-232(+D) is not recommended for further remedial evaluation as a HH RCOC in sediment/soil for any of the receptor scenarios based on the following lines of evidence:

- ~~**Unit activities of all daughter products, with the exception of Ra-224, are within the SRS soil background activity range. The higher concentrations of Ra-224 are indicative of natural origin.**~~
- ~~**It is a naturally occurring constituent that is common in SRS background soils.**~~
- ~~**It does not appear to be unit related since it is indistinguishable from background.**~~
- **It is a naturally occurring constituent of primordial origin that is common in SRS background soils.**
- **It is not a COC on the P-Area and R-Area waste units and the concentrations are typical of natural thorium.**
- **Conservative risk screening assumed the Th-232 concentration to be equal to the highest concentration of the daughter products (Ra-224). This is an overly conservative approach since secular equilibrium should not be assumed for sediment in contact with natural waters.**
- **The probable origin for Ra-224 is dissolved Ra-228 in groundwater. Radium is soluble in groundwater and sediment exposed to groundwater flux can adsorb radium and its daughters, and accumulate elevated concentrations of natural radionuclides."**

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

31. Appendix B Human Health Risk Assessment, Section B.2.4.8.1, Sediment/Soil Media, page B-101. K-40 should be included as a COC for the onsite worker exposure scenario on this page.

Response: Agree. Section B.2.4.8.1 will be revised to include K-40 as a COC as follows:

"Table B-41 presents the total HI (0.1) and the total media risk (6.4E-04) for the onsite worker exposure scenario and the associated COCs chromium, Cs-137(+D), K-40, and Th-232(+D).

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

32. Appendix B Human Health Risk Assessment, Section B.2.5 Summary of the LTR IOU Human Health Risk Assessment, page B-126. Co-60 is incorrectly listed as a RCOC for EA 8; please remove.

Response: Clarification. Co-60 is identified as a COC for the residential and industrial worker scenarios because the risk is > 1E-06. However, Co-60 is not identified as a COC for the onsite worker scenario because the risk < 1E-06. The Summary of the LTR IOU Human Health Risk Assessment Table is correct. No change to the document is proposed.

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

33. Appendix B Human Health Risk Assessment, Table B-27, Human Health COPC Screening for Exposure Area 6 - Sediment/Soil Media, page B-160. According to Table A.1.6.1.1, hexavalent chromium was analyzed for and detected in sediment/soil in the 0-1 ft depth at EA 6 in addition to total chromium; however, only total chromium is included in the COPC screening table in Appendix B. Hexavalent chromium should be included in the COPC screening table and carried forward as a COPC in Appendix B.

Response: Agree. Hexavalent chromium will be added to Table B-27 and will be identified as a COPC. As such, Tables B-28, B-29 and B-30 will be revised to include the risk estimate for the resident, industrial worker, and onsite worker receptor scenarios, respectively. Note that hexavalent chromium is identified as a COC for the residential scenario only (risk = 2.0E-06); the risk for the industrial worker and the onsite worker are < 1E-06. The revised tables B-27, B-28, B-29 and B-30 are attached to these comment responses.

The text in Chapter 3 will also be revised to include hexavalent chromium as follows:

Section 3.12.4.1: "...Refer to Appendix B for a full presentation of the HHRA results. Results of each step of the process for the evaluation of the sediment/soil media are identified below:

- **COPCs: aluminum, antimony, arsenic, chromium, hexavalent chromium, cobalt, cyanide, iron, manganese, mercury, thallium, vanadium, barium-133, Cs 137(+D), Co-60, europium-152, potassium-40, strontium-89/-90, and thorium-232(+D)."**

Appendix B will be revised as follows:

Section B.2.4.6.1: "Table B-27 presents the results of the sediment/soil screening for EA 6. Human health COPCs for sediment/soil include aluminum, antimony, arsenic, chromium, hexavalent chromium, cobalt, cyanide, iron, manganese, mercury, thallium, vanadium, barium- (Ba) 133, Cs-137(+D), Co-60, europium (Eu) 152, K-40, strontium (Sr-)89/-90, and Th-232(+D) as these constituents had maximum detected concentrations or activity concentrations that exceeded human health (residential) risk based screening levels and exceeded two times IOU background concentrations.

Table B-28 presents the total HI (4.4) and the total media risk (2.3E-04) for the resident exposure scenario and the associated COCs: arsenic, chromium, hexavalent chromium, thallium, Cs-137(+D), Co-60, K-40, and Th-232(+D)."

"...*Hexavalent Chromium* is identified as a COC for the resident (risk = 2.0E-06) scenario only; the risk estimates were < 1E-06 for the industrial worker and the onsite worker receptor scenarios. Hexavalent chromium was detected in 3/3 samples sampled in 2016, with 2 results being estimated (i.e., "J" qualified). Concentrations range from 0.503 to 0.62 mg/kg. Since the 95%UCL was calculated to be greater than the maximum detected concentration due to a small number of samples, the maximum detected concentration of 0.62 mg/kg was used in the risk calculation. Use of maximum detected concentration tends to bias the risk estimate high.

There is not a SRS background value for hexavalent chromium. Hexavalent chromium occurs naturally in the environment from the erosion of natural chromium deposits found in rock and soil. Depending on conditions, hexavalent and trivalent forms of chromium can convert back and forth in the environment (and the human body). The transformations of chromium in the environment involve complicated geochemical processes that are dependent on a variety of conditions/factors. Oxidation and reduction reactions can convert trivalent chromium to hexavalent chromium and vice versa. Naturally-occurring chromium is likely to be oxidized to hexavalent chromium in the presence of abundant manganese oxides. The occurrence of non-anthropogenic hexavalent chromium in soil and groundwater is a recognized phenomenon. Detections of hexavalent chromium in the PAR Pond samples are not related to disposal practices or industrial activities, but are more likely due to changes in the valence state of the naturally-occurring chromium in the environment (and the laboratory).

Hexavalent chromium is not recommended for further remedial evaluation as a HH RCOC in sediment/soil for the residential scenario based on the following lines of evidence:

- **The risk estimation of 2.0E-06 for the residential scenario is biased high due to use of the maximum detected concentration in the calculation. The risk estimate for the industrial worker and on-site worker are < 1E-06.**
- **The USEPA 7196A colorimetric method is known to be prone to interferences and false-positives.**
- **Detections of hexavalent chromium are likely due to changes in the valence state of the naturally-occurring chromium in the environment (and the laboratory).**
- **Analysis of hexavalent chromium is a very complicated issue due to its vicissitude. Complex geochemical relationships, including interactions with other minerals (such as aluminum, iron, manganese), presence of organic matter, as well as biota (such as microbes in the soil), all influence reduction and oxidation of naturally-occurring chromium in the soil. The occurrence of non-anthropogenic hexavalent chromium in soil and groundwater is a documented phenomenon."**

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

34. Appendix B Human Health Risk Assessment, Table B-30, Human Health Risk/Hazard Calculation for EA 6 Sediment/Soil Media On-Site Worker Scenario, page B-165. The 1.32E+02 value for the RSL/PRG for chromium should be 1.32E+01 instead. Please correct and adjust the associated risk estimate value from 6.41E-08 to 6.41E-07.

Response: Agree. The PRG for hexavalent chromium for the onsite worker is 1.32E+01 mg/kg. The "Onsite Worker RSL/PRG" value in Table B-30 will be changed from 1.32E+02 to 1.32E+01, and the "Onsite Worker Risk Estimate" will be revised to read 6.41E-07. The revised Table B-30 is attached to these comment responses.

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

35. Appendix B, Human Health Risk Assessment, Section B.2.4.2.1. Sediment/Soil Media, page B-37, first paragraph. Please change the COPC K-232(+D) to Th-232(+D).

Response: Agree. Section B.2.4.2.1 will be corrected as follows:

"Table B-6 presents the results of the sediment/soil screening for EA 2. Human health COPCs for sediment/soil include aluminum, arsenic, chromium, iron, vanadium, bis[2-chloroethyl]ether, cesium-137(+D), K-40, Th~~K~~-232(+D), and U-238(+D)."

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

SRS Responses to South Carolina Department of Health and Environmental Control Comments on:
Remedial Investigation / Baseline Risk Assessment for the Lower Three Runs Integrator Operable Unit (U), CERCLIS Number: 35 (SRNS-RP-2017-00139, Revision 0, June 2017)
Comments received September 25, 2017

36. Appendix B Human Health Risk Assessment, Table B-38, Human Health COPC Screening for Exposure Area 8 – Sediment/Soil Media, page B-174. For Am-241, the "no" in the "Exceeds Human Health Screening Value?" and "COPC?" columns should be changed to a "YES", and Am-241 should be carried through as a COPC in Appendix B. Also, Section 3.14.4.1.1 should be revised to include Am-241 as a COPC at EA 8.

Response: Clarification. The residential PRG for Am-241 is 2.27 pCi/g (Att. B-3). Table B-38 incorrectly identifies the Human Health Screening Value of 2.27E-02 pCi/g. Table B-38 will be revised to show the correct value of 2.27 pCi/g; as such Am-241 is not identified as a COPC. The revised Table B-38 is attached to these comment responses.

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

37. Appendix B Human Health Risk Assessment, Section B.2.4.7.2 Surface Water Media, page B-97, first sentence. Please change the reference from Table B-35 to Table B-37.

Response: Agree. Section B.2.4.7.2 will be revised as follows:

"Table B-3735 identifies iron, manganese, Bi-214, and Pb-212, as human health surface water COCs because the maximum detected concentrations of these constituents exceed their surface water comparison values."

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

38. Appendix C Ecological Risk Assessment, Refinement-Level Uncertainty Discussions for many of the Exposure Area's. Several RCOPC results were determined to be false positives. How were the samples determined to be false positives? Please clarify and consider adding the explanation in the text.

Response: Agree with Clarification.

With the exception of EA8, several EAs that have constituents declared as false positives are incorrect. Constituents that are referred to as "false positives" within the description for EAs 1, 2, 6 and 9 will be deleted and text descriptions corrected as described below.

Specifically, the last sentence of the first paragraph of Section C.2.3.1.3 for Curium-245/246 that states "Upon further review, the two detections were determined to be false positives." will be deleted. Also, the first bullet of Section C.2.3.1.3 for Curium-245/246 that states "The only detects were false positives." will be deleted. In addition, an error was noted for the Curium-245/246 description in Section C.2.3.1.3. The maximum value will be changed to its' correct value of 0.33 pCi/g.

The last sentence of the first paragraph of C.2.3.2.3 for the Curium-245/-246 subsection that states, "Upon further review, the two detections were determined to be false positives" will be deleted. Also, the first bullet of the Curium-245/-246 subsection that states, "The only detects are false positives" will be deleted.

Section C.2.3.6.3 for Cobalt-58 will be revised to delete the sentence that states, "However, the 3 detections of 256 total samples are false positives." Also, the first bullet of the Cobalt-58 subsection will be revised to state, "The frequency of detection is very low ~~and the detects are false positives~~."

The first sentence of Section C.2.3.6.3 for Manganese-54 will be revised to state, "Figure 3-6), ~~but all detects are false positives~~." The first bullet of the Manganese-54 subsection will be revised to state, "~~All detects are false positive~~The mean is within background."

The last sentence of the first paragraph of Section C.2.3.6.3 pertaining to Promethium-146 that states, "However, the 3 detections of 254 total samples are false positives." will be deleted. Also, the last bullet pertaining to Promethium-146 ("All detects are false positives") will be deleted.

The second to last sentence of the Manganese-54 subsection of Section C.2.3.9.3 that states, "The five detects of seven total samples are all false positives." will be deleted. The first bullet of the Manganese-54 subsection will be revised to state, "The ~~detections are false positives~~ mean activity is within background."

As for EA 8, the following text will be inserted into the beginning of the discussion for RCOPC after the second paragraph of Section B.2.4.8.2 and after the second paragraph of Section C.2.3.8.6: "During the analysis of the data for EA 8, it was determined that several organic constituents were reported as detects in the LTR IOU database. All of the compounds in question were reported as detected in 1 of 9 samples, with the same maximum concentration (i.e., 0.00962 ug/L). These results are from the same sample location, LTR ERDMS IOULTR2 Sampling Event LTROU-06, collected on November 4, 2003 and all results had the "not qualified" (i.e., "NQ") data quality label. However, all of these results should have been identified as non-detect (i.e., flagged "U") and, therefore, should not be carried forward into the surface water screening step. As a result, all of the results for these compounds are considered "false positives" and are not carried forward as RCOPCs."

The false positive description will remain in the text for EA8.

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

39. Appendix C Ecological Risk Assessment, Section C.2.3.1.6 Refinement-Level Uncertainty Discussion for Exposure Area 1 for Surface Water, page C-37. Iodine-129, first sentence, please correct the maximum concentration for I-129 to 32.30 pCi/L.

Response: Agree. The maximum result will be changed to 32.30 pCi/L.

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

40. Appendix C Ecological Risk Assessment, Section C.2.3.2.2 Refinement-level Risk Results for Exposure Area 2 for Sediment/Soil, page C-43, first sentence. Reference to Table C-7 should be corrected to Table C-8. This table number error continues throughout the remainder of the text in Appendix C for remaining exposure areas. Also, beginning with Table C-30, page C-207, table numbers become out of sequence again.

Response: Agree. The callouts to Tables in the Appendix C text are correct as written. Some tables were mislabeled as new tables when they were in fact a continuation of a table from a previous page (e.g., Table C-6 in Revision 0 should have been *Table C-5 continued*). Table labels have been corrected in Appendix C accounting for second page continuations.

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

41. Appendix C Ecological Risk Assessment, Section C.2.3.4.3 Refinement-level Uncertainty Discussion for Exposure Area 4 for Sediment/Soil, page C-63, first sentence at the top of page. This sentence states that there is an IOU mean background activity of 0.11 pCi/g for Americium-243; however, there is no such background value listed for this COPC in Appendix A. Please revise pages C-63, C-74, C-101 where Am-243 is reported as having an IOU background activity concentration of 0.11 pCi/g. Other discussions of Am-243 in EAs (i.e. page C-44) state that there is no background data available.

Response: Agree. See response to General Comment #2. There is not an IOU background sediment/soil media detected result for amercium-243. The comparison to background will be deleted from the uncertainty discussion for EAs 4, 5, and 7 as follows:

Section C.2.3.4.3: "...While fish may take up americium-243, the amount that builds up in the flesh is very small (ATSDR, 2004). ~~In addition, the maximum detected activity (0.067 pCi/g) is within background activity levels; the IOU mean background activity is 0.11pCi/g.~~ Americium-243 is not recommended for further remedial evaluation...".

Section C.2.3.5.3: "... While fish may take up americium-243, the amount that builds up in the flesh is very small (ATSDR, 2004). ~~Additionally, the mean detected activity (0.097 pCi/g) is within the IOU mean background activity concentration (0.11 pCi/g).~~ Americium-243 is not recommended for further remedial evaluation...".

Section C.2.3.7.3: "...The one detection was "J" flagged (i.e., estimated). ~~The maximum detected activity (0.047pCi/g) is within background activity levels; the IOU mean background activity is 0.11 pCi/g.~~
Americium-243 is not recommended for further remedial evaluation as an ecological RCOPC in sediment/soil based on the following line of evidence:
- **It has a single detect with a low frequency of detection (1/20) ~~and is estimated.~~**
- **The single detection is an estimated result, i.e. "J" qualified.**
- ~~**Unit activities are within the background activity range.**~~**"**

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

42. Appendix C Ecological Risk Assessment, Section C.2.3.4.6 Refinement-level Uncertainty Discussion for Exposure Area 4 for Surface Water, Pyrene, page C-71. Please revise the last bullet for the single detection of pyrene to "(1/11)". Also, it is stated that the maximum detected concentration is below the IOU background mean of 2.23 ug/L; however, Appendix A does not include a background concentration for pyrene in surface water. Please revise.

Response: Agree. See response to General Comment #2. There is not an IOU background surface water media detected result for pyrene. The comparison to background and the number of samples will be revised in Section C.2.3.4.6 as follows:

"...Table 4.B shows one HQ exceedance (HQ > 1) for pyrene for aquatic community organisms (HQ = 12.2). However, pyrene is a ubiquitous combustion by-product.~~, and the maximum detected concentration is below the IOU background mean (2.23 µg/L).~~
Pyrene is not recommended for further remedial evaluation as an ecological RCOPC in surface water based on the following lines of evidence:
- **It is a ubiquitous combustion by-product.**
- ~~**It is within IOU background levels.**~~
- **It has a single detect ~~with a low detection frequency (1/12) and~~ that is an estimated value ("J" qualified).**
- **All recent data are non-detects."**

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

43. Appendix C Ecological Risk Assessment, Section C.2.3.9.3 Refinement-Level Uncertainty Discussion for Exposure Area 9 for Sediment/Soil, pages C-146 through C-148. Several of the RCOPCs state as a line of evidence for exclusion, "All detects are from an older sample collection with no recent detections." Samples were collected in 1995 and the ERA does not include any data beyond the 1995 sampling event. Specific RCOPCs are camphene, chloride, docosane, and phosphate that include this line of evidence. Please clarify.

Response: Agree/Clarification. There is only 1 sampling record each for camphene and docosane for the LTR IOU. These constituents are not part of analytical suites for CERCLA investigations. Chloride and (ortho)phosphate have several detects from EA 6 (PAR Pond), but these constituents are not monitored for CERCLA investigations and are viewed more as water quality parameters and not contaminants for SRS investigations.

The bullets identifying that the detects are from older sample collections with no recent detections will be deleted and replaced as follows:

For camphene and docosane the following bullet will be substituted.

- **This constituent is not part of analytical suites for CERCLA investigations.**

For chloride and (ortho) phosphate the following bullet will be substituted.

- **This constituent is not monitored for CERCLA investigations and is viewed as a water quality parameter.**

Reference to older 1995 data will be deleted for all other constituents as well.

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

44. Appendix C Ecological Risk Assessment, Section C.2.6.6.2 Trophic level Modeling Results for Exposure Area 6 for Surface Water, page C-165. Please replace 'sediment/soil' in the sentence to 'surface water'.

Response: Agree. "Sediment/soil" will be change to "surface water" in Section C.2.6.6.2.

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

45. Appendix C Ecological Risk Assessment, Section C.2.6.7.2 Trophic level Modeling Results for Exposure Area 7 for surface water, page C-166, DDT discussion. The text states that out of 151 analysis there were only 6 detections and that this represents a low frequency of detection = 3.9%. However, Appendix A states there were 24 samples used in the ERA. Please clarify. Also, the second bullet states a low frequency of detections (3 of 24) that calculates to 12.5% which is greater than the 5% frequency of detection the USEPA recommends for exclusion of a RCOPC. See general comment #1.

Response: Agree. The 151 analyses were from the entire canal/Par Pond System and the 24 samples are for EA7 only. To address this comment, the last sentence of the DDT section on page C-166 (Section C2.6.7.2) will be revised to state, "There are six detected results for DDT (all from a 2003 sampling event) ~~in~~ from the entire canal/PAR Pond system (EA 1 through EA 9) ~~(all from 2003)~~ out of 151...." Also, the last bullet will be revised to state, "It

~~has a low frequency of detections (~~was detected in 3 of 24~~) and one of the detects is estimated~~ samples from 2003 for EA7, one of the detects is estimated, and recent samples are all non-detects."

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

46. Appendix D Principle Threat Source Material Evaluation, Section 1.1 Background, page D-8, first bullet. Please correct the size of Pond B to 82.1 ha.

Response: Agree. Section D.1.1 will be revised to correct the size of Pond B as follows:

"• EA 3 includes Pond B and the overflow canal that was constructed to connect Pond B to Pond C as an emergency water release channel. The canal from Pond B to Pond C is approximately 547 m (1,794.6 ft) long. Pond B is approximately ~~32.1~~ 82.1 ha (202.8 ac)."

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

47. Appendix D Principle Threat Source Material Evaluation, Section 2.2.8 Exposure Area, page D-21, second bullet. Please correct the Th-232 activity concentration in EA 8 sediment/soils to 2.19 pCi/g as reported in Appendix A.

Response: Agree. The Th-232 value in Section D.2.2.8 will be revised to be consistent with Appendix A (Table A.1.8.1.1) as follows:

"Thorium did have a very limited role in SRS reactor processes, but Th-232 is not a COC in P- and R-Area waste units, as the activity concentration in EA 8 sediment/soils is ~~3.5~~ 2.19 pCi/g, which is typical of natural thorium."

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

SRS Responses to South Carolina Department of Health and Environmental Control Comments on:
Remedial Investigation / Baseline Risk Assessment for the Lower Three Runs Integrator Operable Unit (U), CERCLIS Number: 35 (SRNS-RP-2017-00139, Revision 0, June 2017)
Comments received September 25, 2017

Editorial Comments

The following comments were noted during the Department's review. No response is necessary.

1. Chapter 3 Remedial Investigation, Section 3.2.5, PAR Pond Characterization (2016), page 3-18. In the last paragraph, "sample analyzes" should be changed to "sample analyses".

Agree.

2. Chapter 3 Remedial Investigation, Section 3.3.1, Background Data, page 3-25. In the center of line 4 in the first paragraph on the page, the underscore in "for_analysis" should be removed and corrected to "for analysis".

Agree.

3. Chapter 3 Remedial Investigation, Section 3.8.3, Exposure Area 2 Nature and Extent of Contamination, page 3-40. There should be a period between "EA 2" and "Cs-137(+D) in the first paragraph.

Agree.

4. Chapter 3 Remedial Investigation, Section 3.12.4.1.1 Sediment/Soil, page 3-65, third bullet. The word "ae" should be "are" in the first sentence of the third bullet.

Agree.

5. Chapter 4 Remedial Action Objectives and Remedial Goal Options, Section 4.1, Remedial Action Objectives, page 4-1. The letter "e" should be deleted from the last sentence of the first paragraph.

Agree.

6. Appendix C Ecological Risk Assessment, Section C.2.6.1.2 Trophic level Modeling Results for Exposure Area 1 for Surface Water, page C-159, DDT discussion. Please identify the acronym 'BCF' in the text and add the acronym to the list on page xix.

Agree. Bioconcentration Factor will be added to the acronym list and Section C.2.6.5.2 at the first call-out.