UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
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ATLANTA, GEORGIA 30303-8960

January 24, 2022

Mr. Brian T. Hennessey
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EPA Comments of the RCRA FACILITY INVESTIGATION/REMEDIAL INVESTIGATION REPORT WITH BASELINE RISK ASSESSMENT AND CORRECTIVE MEASURES STUDY/FEASIBILITY STUDY FOR THE EARLY CONSTRUCTION AND OPERATIONAL DISPOSAL SITE N-1 (NBN), CENTRAL SHOPS SCRAP LUMBER PILE (631-2G), AND BUILDING 690-N, PROCESS HEAT EXCHANGER REPAIR FACILITY (AKA FORD BUILDING) OPERABLE UNIT (U) SEMS NUMBER: 93 SRNS-RP-2021-00548, REVISION 0 OCTOBER 2021, SAVANNAH RIVER SITE AIKEN, SOUTH CAROLINA

Dear Mr. Hennessey:

The U.S. Environmental Protection Agency, Region 4 (EPA), has reviewed the reports on the RFI/RIP with BRA and CMS/FS for the ECODS N-1, 631-2G, 690-N. Attached are our comments.

If you have any questions or if you require additional information, please contact me at (404) 562-8648.

Sincerely,

JON RICHARDS Digitally signed by JON RICHARDS Date: 2022.01.24 16:54:27 -05'00'

Jon Richards
FFA Remedial Project Manager
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ec: C.L. Bergren, SRNS-ACP Susan Fulmer, SCDHEC

GENERAL COMMENT

1. It is unclear why the engineered concrete cover installed over the Ford Building remnant slab was not identified as a containment response action component to land use controls (LUCs) in remedial Alternative C-2. As noted in Section 5.3.6.2 (Alternative C-2: Land Use Controls) Page 5-36 of 5-70, LUCs would include operations and maintenance (O&M) costs for the concrete cover installed over the Ford Building remnant slab where polychlorinated biphenyls (PCBs) (i.e., Aroclors 1254 and 1260) and cesium-137 plus daughters (+D) previously presented an unacceptable risk to human health. LUCs would also include annual inspections and required maintenance to maintain the integrity of the existing concrete cover system. The text further states the cover system must remain in place to be protective of the industrial worker and/or future resident, and Five-year remedy review would be required. As such, it appears the engineered cover system is an integral component of the remedial alternative C-2, particularly since it is necessary to achieve the remedial action objective (RAO) to "Prevent residential and industrial exposure to PCBs and cesium-137 at the Ford Building remnant slab that exceed 1E-06 risk and PCB applicable, relevant and appropriate requirement (ARAR) of 1 milligram per kilogram (mg/kg) for free release." As such, the concrete cover should be considered as a remedy component in the Corrective Measures Study/Feasibility Study (CMS/FS) for the Ford Building subunit and included in the preferred remedial alternative(s) that will be presented in the Statement of Basis/Proposed Plan made available for public review. According to the Resource Conservation and Recovery Act Facility Investigation/Remedial Investigation Report with Baseline Risk Assessment and Corrective Measures Study/Feasibility Study for the Early Construction and Operational Disposal Site (ECODS) N-1 (NBN), Central Shops Scrap Lumber Pile (CSSLP) (631-2G), and Building 690-N, Process Heat Exchanger Repair Facility (aka Ford Building) Operable Unit (OU) (U), SEMS Number: 93, SRNS-RP-2021-00548, Revision 0, October 2021 (the Report), the post-decommissioning facility remnants (including the building slab) will be closed as part of the ECODS N-1, CSSLP, and Ford Building OU (see Appendix B, Contaminant Fate and Transport, Page B-11 of B-64). *Please revise the Report to include the engineered concrete cap as a containment response action component to include land use controls (LUCs) in remedial Alternative C-2.*

SPECIFIC COMMENTS

1. **Executive Summary, Page ES-1 & ES-2 and Section 1.3.2, Central Shops Scrap Lumber Pile (631-2G), Page 1-5 of 1-18:** The timeframe reported for the burning of treated lumber and creosote-treated wood at the CSSLP subunit is unclear. For example, the text in the Executive Summary states the CSSLP burning area remained active until the mid-2000s; however, the last sentence on Page ES-1 states burning operations at the CSSLP were limited to untreated wood products some-time prior to 1998. Additionally, the text in Section 1.3.2 states that sometime after the closure of the Central Shops Burning/Rubble Pits (CSBRP) in 1985 burning operations at the CSSLP were limited to untreated wood products. *Please revise the text to provide a consistent timeframe for when burning of treated lumber and creosote-treated wood took place at the CSSLP.*

2. **Figure 1-6, Ford Building 2020-2021, Page 1-16 of 1-18:** The Ford Building concrete cover/remnant slab is not identified on the figure. Additionally, a small green circle located just to the east of the assumed building slab has not been identified. *Please revise the figure to clearly identify the Ford Building concrete cover/remnant slab and the small green circle on the figure.*

3. **Section 2.1.2, Surface Features, Page 2-3 of 2-24:** A topographic map is not presented to support the assertions in the text that the Ford Building subunit is located on a topographic ridge between the Pen Branch and Fourmile Branch watersheds. For example, the text states the Ford Building is in the southeastern portion of the Central Shops Area on a topographic ridge between Pen Branch and Fourmile Branch with the surface elevation and the land gently sloping radially downgradient from the Ford

Building. The text references Figure 2-2 (Central Shops [N Area] Surface Water Run-Off, Page 2-12 of 2-24]); however, no topographic contours of the ground surface elevation are depicted. *Please revise the Report to include a figure with topographic contours illustrating the groundwater surface elevation and topographic ridge between Pen Branch and Fourmile Branch.*

4. **Section 2.2.1 Geology, Page 2-4 of 2-24:** The text incorrectly references Figure 2-2 (Central Shops [N Area] Surface Water Run-Off, Page 2-12 of 2-24]) as depicting the shallow geologic units associated with the ECODS N-1, CSSLP, and Ford Building OU. The shallow geologic units associated with the ECODS N-1, CSSLP, and Ford Building OU are depicted in Figure 2-3 (Lithostratigraphic and Hydrostratigraphic Unit Comparisons, Page 2-13 of 2-24). *Please revise the text to reference Figure 2-3 (Lithostratigraphic and Hydrostratigraphic Unit Comparisons) Page 2-13 of 2-24.*

5. **Section 2.2.2, Groundwater Hydrogeology, Page 2-5 of 2-24:** The text incorrectly references Figure 2-2 (Central Shops [N Area] Surface Water Run-Off, Page 2-12 of 2-24]) as depicting the Floridan Aquifer System consisting of, in ascending order, Gordon Aquifer, the Gordon Confining Unit and the Upper Three Runs. *Please revise the text to reference Figure 2-3 (Lithostratigraphic and Hydrostratigraphic Unit Comparisons).*

6. **Section 2.3.3, Secondary Sources of Contamination and Section 2.3.5 Exposure Media, Page 2-9 of 2-24:** It is unclear why contaminated concrete was not included in these sections. For example, the Report (i.e. last bullet of the Executive Summary, Page ES-2 of ES-6) indicates at the Ford Building subunit, PCBs (i.e., Aroclors 1254 and 1260) and cesium-137(+D) previously presented an unacceptable risk to human health at the Ford Building remnant slab prior to placement of the engineered concrete cover. Additionally, the last sentence of Section 2.3.1 (Primary Sources of Contamination) states the primary sources of contamination for the Ford Building subunit are primarily associated with the remnant building slab. *Please revise the Report to clarify why PCB and cesium-137 contaminated concrete was not discussed as a secondary source of contamination.*

7. **Section 2.3.6, Exposure Routes, Page 2-10:** The sections for receptors (Section 2.3.7, Receptors (Human and Ecological)) should be placed before the section on exposure routes. *Revise Section 2 to rearrange these sections.*

8. **Figure 2-4, Soil Series in the Central Shops (N Area), Page 2-15 of 2-24:** The soil types depicted in this figure are not easily identifiable. For example, the color coding used to define the different soil types depicted in the figure legend are too similar. *Please revise the figure to clearly depict soil types using colors that can be easily distinguished from one another.*

9. **Section 3.2.2, Central Shops Scrap Lumber Pile (631-2G), Page 3-4:** It is uncertain why surface water was not collected at all four targeted locations at the Central Shops Scrap Lumber Pile (631-2G)(CSSLP) Surface Water Impoundment Area. This section states that surface water samples were collected at three of the four location within the CSSLP, but no justification is provided. *Revise this section to state why surface water samples were only collected from three of the four locations.*

10. **Section 3.2.3, Ford Building, Page 3-6 of 3-42 and Section 3.9.2, Ford Building Subunit Characterization and Data Summary, Page 3-27 of 3-42:** The unit of measurement (i.e., picocuries per gram [pCi/g]) reported for the Aroclor 1254 maximum detection in concrete is incorrect. The correct unit of measurement for Aroclor 1254 results is reported in milligrams per kilograms (mg/kg). Additionally, the 5.5 mg/kg maximum detection in concrete reported for Aroclor 1254 is incorrect. The 5.5 mg/kg maximum detection in concrete result is for the PCB Aroclor 1260. *Please revise these sections to address the noted discrepancies in the text.*

11. **Section 3.9.2, Ford Building Subunit Characterization and Data Summary, Page 3-27 of 3-42:** The text does not indicate the concrete cover installed at the Ford Building remnant slab was also necessary due to unacceptable risk to human health due to cesium-137 (+D) exposure. For example, the text states an engineered concrete cover was installed over the entire Ford Building remnant slab area to prevent exposure to PCB contamination; however, no mention of unacceptable risk to human health due to cesium-137 (+D) exposure. *Please revise the text to indicate the engineered concrete cover was installed to prevent exposure to PCB and cesium 137(+D) contamination.*

12. **Section 3.11, Applicable or Relevant and Appropriate Requirements Evaluation, Page 3-34 of 3-42:** The statement that the maximum detected PCB concentration was for Aroclor 1252 at 15 mg/kg is incorrect. The maximum detected PCB concentration of 15 mg/kg in concrete is for Aroclor 1254. *Please revise the text to address this discrepancy.*

13. **Figure 3-3, ECODS N-1 Sample Locations, Page 3-37 of 3-42:** The figure is incorrectly titled as "ECODS N-1 Sample Locations". *Please revise the figure title to state "Ford Building Sample Locations".*

14. **Figure 2-7 Preliminary Conceptual Site Model for the Ford Building, Page 2-19 of 2-24 and Figure 3-6 Revised Conceptual Site Model for the Ford Building Subunit, Page 3-41 of 3-42:** The human health remedial action objective (RAO) for subunit is to prevent residential and industrial exposure to PCBs and cesium-137 at the Ford Building remnant slab that exceed 1E-06 risk and the PCB ARAR of 1mg/kg for free release. However, these risk exposures are not documented on the preliminary conceptual site model (CSM) (Figure 2-7) or on the refined CSM (Figure 3-6). It is understood per Section 5.2.1 (Development of Alternatives) Page 5-8 of 5-70, that an engineered concrete cover was installed over the remnant slab thereby breaking the exposure pathway; however, this condition must be maintained in order to achieve the RAO. The text also states the concrete cover is the current baseline condition of the Ford Building subunit and the alternatives have been developed with this condition in place. *As such, for a clear understanding of the CSM please revise the CSM figures as necessary to document the concrete cover baseline condition.*

GENERAL COMMENTS (APPENDIX C – HUMAN HEALTH RISK ASSESSMENT)

1. The conceptual site models (CSMs) shown in Figures 2-5, 2-6, and 2-7, for Early Construction and Operational Disposal Site (ECODS) N-1 (no building number [NBN]), Central Shops Scrap Lumber Pile (631-2G) (CSSLP), and Building 690-N, Process Heat Exchanger Repair Facility (also known as [aka] Ford Building) Operable Unit (OU) [ECODS N-1, CSSLP, and Ford Building OU], respectively, have several deficiencies, as follows:
   a. All three figures show a secondary release mechanism of Volatilization (from surface soil), followed by an exposure medium of "Air Vapor". While this might be a complete exposure pathway, it is conditional based on the presence of volatile constituents. To be wholly correct, a footnote should be provided to indicate that if volatile constituents are present, the inhalation pathway would be complete and quantitatively evaluated for industrial workers and residents. A novel shading or shape could also be used;
   b. The exposure route of "External Exposure" is too similar to "Dermal Contact" and should be relabeled as, "External Radiation Exposure" or footnoted to distinguish between the two;
   c. The CSM for CSSLP (Figure 2-6) shows that surface water will be evaluated by comparison to Maximum Contaminant Levels (MCLs), however, the circle for Residential Receptors is open, indicating only a qualitative evaluation will be performed (and note that the text in the legends box is

cut off by the border). First, comparisons of media concentrations to an MCL is a quantitative evaluation, and secondly, there are other potentially complete exposure pathways related to domestic use of water besides ingestion, including dermal contact, and inhalation of vapors (if volatile constituents are present); and,

d. Subsurface soil (1-4 feet) represents a part of the soil horizon that could be accessed by both industrial workers and residents if the whole soil column is excavated. This is usually handled by calculating two exposure point concentrations (EPCs) for constituents of concern (COCs), one for the surface, and one for subsurface. However, all three CSMs show incomplete exposure pathways (shown as a dash) for subsurface soil pathways. As such, the designation, "Deep Soils (all depths)" shows a complete pathway for industrial workers only, and is counterintuitive; if subsurface soil is an incomplete pathway, then "Deep Soil (all depths)" should also be complete.

Thus, *revise the CSMs in Figures 2-5, 2-6, and 2-7 as follows: 1) provide either a footnote or new shading/shape to show that the volatilization pathway is conditional; 2) add "radiation" to the "External Exposure" route to distinguish between dermal contact of chemical constituents and radionuclides; 3) add Inhalation of vapors (also conditional, and designated as above) to the surface water-based pathways in Figure 2-6, and include filled circles for the Ingestion, Dermal Contact and External "Radiation" Exposure" pathways; and 3) include filled circles for all the subsurface pathways for both Industrial Workers and Residents, and a filled circle for Residents, for Deep Soil (all depths). Note that any additional pathways determined to be complete should also be included in the human health risk assessment (HHRA) calculations.*

2. The baseline HHRA, contained in Appendix C, is insufficiently comprehensive. For example:
   a. The guidance document upon which this HHRA is predicated is not clearly stated. It appears, based on the tables prepared, that the guidance document used is the Department of Energy (DOE) guidance document called, *Environmental Compliance and Area Completion Projects Regulatory Document Handbook*, ERD-AG-003, Revision 17, June 2012, for the Savannah River Site (referred to herein as the SRS Guidance), which is intended to govern the preparation of site evaluation reports, including risk assessments, but this is not explicitly mentioned in text. Note that the DOE guidance is out of date with respect to current United States Environmental Protection Agency EPA risk assessment methodology;
   b. The calculation of EPCs with respect to how data are evaluated is not detailed. This includes the following:
      i. Although it is assumed that EPA's ProUCL v.5.1 was used to calculate the reasonable maximum exposure (RME) 95% upper confidence limit (UCL) on the arithmetic mean concentrations, it is not stated or referenced;
      ii. If ProUCL was used, the model outputs were not provided; and,
      iii. The manner in which non-detected constituent concentrations (i.e., NDs) and field duplicate samples were handled is not specified, and therefore, data sensitivity cannot be determined.
   c. The uncertainty evaluation provided for each COC is incomplete;
   d. The specific Regional Screening Levels (RSLs) used to determine the COCs is not stated (i.e., carcinogenic risk of 10^{-6}/ hazard quotient of 0.1 or 10^{-6}/1.0).

Suggest revising Appendix C as follows: 1) Clearly state which guidance document is being followed; 2) Add additional detail regarding the calculation of EPCs with respect to software reference/data handling procedures and provide ProUCL (or other software) output as an attachment; 3) Discuss uncertainties and respective biases in the context of the overall risk assessment, not by constituent, including potential deficiencies in sampling, data analysis, etc.; and 4) State which RSLs are being used for screening purposes.

3. It is uncertain how screening of concrete data was performed for samples collected from the Ford Building. According to the SRS Guidance, Page 2, although it is acknowledged that concrete is an impervious medium for which human health exposure is negligible, weathering could change the physical properties of concrete to allow for some exposure through the ingestion pathway. Further,

"…The Risk Assessment Design Team determined that approximately 1/10th of the

standard exposure of non-radiological constituents in soil would be a reasonable assumption for the available fraction of concrete due to weathering. This is considered a conservative approach since the ingestion, inhalation, and dermal contact pathways are all taken into consideration in the soil preliminary remedial goal (PRG) calculation. A value of ten times (10x) the soil PRG shall be used in the risk estimate of non-radiological constituents for concrete media."

Section C-1.1.3 (Ford Building), discusses concrete and soil sampling and analysis at the Ford Building, and presents the human health screening results, but not the manner in which the screen was performed. *Revise this Appendix C section to include the screening method for the concrete samples and state the criteria against which the data were screened.*

4. There are two potential exposure pathways that were omitted without justification. First, as described in Section C-1.4 (Sources of Risk-Based Threshold Values, Page C-17), fruit and vegetable consumption pathways were removed from the residential exposure scenario being evaluated in this HHRA. Secondly, because "Air Vapor" is shown as a potential exposure medium on all the CSMs, as discussed previously, it is uncertain why residential vapor intrusion (VI) is not mentioned, even if it is incomplete by virtue of the non-volatile COCs present in site media. *Revise Appendix C to include justification for not including produce consumption and discuss why VI is or isn't an exposure pathway of concern.*

5. There are several instances where recommendations are given for no additional remedial evaluation of a COC, which constitute a risk management decision that, per standard guidance, should not be included in a HHRA. For example, Section C-2.3.1.1, Soil Media (ECODS N-1 (NBN Subunit), states that arsenic is not recommended for further remedial evaluation as a human health COC in soil for any receptor scenario because: arsenic unit concentrations are below background soil concentration ranges; arsenic is considered a naturally-occurring constituent that is common in SRS background soils; and it does not appear to be unit- or site-related. While these statements may be true, it is not within the purview of the risk assessment to determine whether remedial evaluations should be discontinued. *Revise Appendix C accordingly, and reword to state the lines of evidence as conclusions, and not recommendations.*

6. There is a great deal of redundancy in the results presented for each subunit addressed by this HHRA. For example, Section C-2.3.1.1, Soil Media (Subsection of C-2.3.1, ECODS N-1 (NBN) Subunit, Page C-22 of C-104) describes the properties, the distribution in soils, and the industrial uses of arsenic. The same text is repeated for arsenic results in CSSLP, in Subsection C-2.3.2.1 (Soil Media, Pages C-24 to C-25 of C-104). A similar discussion on chromium is also provided in both CSSLP soils and sediments. It should also be noted that these qualitative constituent discussions should not be included with numerical results. *Revise Appendix C to reduce the redundancy by removing repetitive text, and if desired, create one section where qualitative discussions may be placed.*

SPECIFIC COMMENTS (APPENDIX C – HUMAN HEALTH RISK ASSESSMENT)

1. **Appendix C, Section C-1.1.3, Ford Building, Page C-12:** It is not explained in the second paragraph why the maximum detection of Aroclor 1254 in concrete is presented in the units picocuries per gram (pCi/g) as well as kilograms per kilogram (kg/kg), with two accompanying sets of risk results. The acronym "CM", as used in the term, "No CM COCs were identified…" should also be defined. *Revise Section C-1.1.3 to provide these two clarifications.*

2. **Appendix C, Section C-1.3, Receptors, Page C-16:** As written, this section states that the future residential scenario was evaluated for surface water, with no qualifier. It should be specifically noted that surface water was evaluated only for CSSLP, and not the other subareas within the OU. *Revise Section C-1.3 accordingly.*

3. **Appendix C, Section C-1.4, Sources of Risk-Based Threshold Values, Page C-17:** The name of the PRG calculator should be given in this section, rather than "website calculator" and the access date reference. *Revise Section C-1.4 to name EPA's "Preliminary Remediation Goals for Radionuclide Contaminants at Superfund Sites" calculator.*

4. **Appendix C, Section C-1.4, Sources of Risk-Based Threshold Values, Page C-17:** November 2021 RSLs have recently been published, and therefore, *RSL values from February 2021 used herein for screening should be checked to ensure that no substantive changes have occurred.*

5. **Appendix C, Section C-1.4, Sources of Risk-Based Threshold Values, Page C-18:** There are two sections that discuss the screening of surface water data: Section C-1.4, and Section C-2.2.1, Comparison of MCL or PRG/RSL or AWQC. *Revise either section to remove this redundancy.*

COMMENTS (APPENDIX D – ECOLOGICAL RISK ASSESSMENT)

1. Appendix D, the Ecological Risk Assessment (the ERA) of the Report does not appear to follow standard or site-specific guidance for conducting risk assessments nor does it cite any guidance or standard methods. The *Environmental Compliance and Area Completion Projects Regulatory Document Handbook* (ERD-AG-003, June 2012) outlines site-specific formatting and technical protocols to guide risk assessments conducted for the Savannah River Site (SRS). *Revise the ERA to cite and follow site-specific SRS or standard EPA guidance. Note that some of the comments provided herein point out major departures from respective guidance.*

2. The ERA does not consider potential risks to threatened and endangered (T&E) species or their habitat to be present at the three exposure units. There is some discussion regarding T&E species in Section 2.1.1 (Habitats and Ecological Setting) within the Report, but it is not complete and only considers plants. Per site-specific and standard guidance, the ERA should evaluate the potential for T&E species to occur at each of the three exposure units. It is recommended that the U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) tool be used to supplement current sources to determine presence/absence of T&E species at the site. Per 16 U.S. Code §1536, the USFWS is the lead agency to ensure that actions authorized, funded, or carried out by any other department, agency or instrumentality of the United States is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of designated critical habitat of such species. The IPaC tool is the USFWS-recommended method for use in identifying the potential occurrence of T&E species and respective critical habitats. *Revise Appendix D to include an evaluation of the IPaC tool results and identify surrogate T&E species receptors and critical habitats as necessary.*

3. It is not apparent how hexavalent chromium (Cr+6) is a suspected constituent of potential concern (COPC) COPC from historical burning activities conducted at the ECODS N-1 exposure unit. Little information is provided on what was burned at ECODS N-1 and "burning activities" of "creosote-treated wood" is not a commonly known source of Cr+6. *Revise the ERA to include more information to support the statement that burning activities is a suspected source of Cr+6 in ECODS N-1 soils, sediments, and surface water.*

4. It appears that the presence of dioxins and furans (D/Fs) has not been evaluated in ECODS N-1 soils where historical burning activities of creosote-treated wood occurred. The burning of organic materials such as treated wood at ambient temperatures has the potential to produce D/Fs, which are highly recalcitrant and toxic compounds. As such, a screening evaluation of burn areas should include sampling and analysis of D/Fs. *Revise Appendix D to either include exposure and risk analyses of D/Fs, or discuss the justification of the omission of D/Fs and include as an uncertainty.*

5. Neither Appendix A (Investigation Data) nor Appendix D, provides a full list of metals or chemicals that were sampled for and analyzed. Only detected constituents appear to be summarized. Without knowing the full list of analytes, it is not possible to determine what site media were analyzed for which contaminants. Detection limits also appear to be missing. Detection limits are needed to verify whether analytical methods were sensitive enough to measure constituents in site media at levels at or below toxicity benchmarks. This cannot be done unless all constituents are listed with respective detection limits. Revise the Data Summary Tables in Appendix A and Appendix D Screening Level Evaluation tables to include all constituents and respective detection limits. Standard ERA guidance documents provide examples on what information should be included in screening-level risk assessment COPC selection tables.

6. It appears that the ERA uses detection frequency criteria to exclude contaminants during the COPC selection process. This procedure is neither justified nor supported by general or site-specific guidance. Excluding constituents at the screening-level step of an ERA greatly inhibits risk managers' ability to

understand whether hotspots may pose risks to sensitive receptors and determine whether sampling was sufficient in characterizing an exposure unit. The use of detection frequency information should only be considered during uncertainty analyses. *Revise the ERA Screening Level Evaluation so that COPCs are selected without consideration of detection frequencies.*

7. The ERA does not provide enough information to understand how EPCs were derived for use in the Refinement Level Evaluation. Missing information includes descriptions on how duplicate and non-detected results were handled and what software was used to generate EPCs. Without this information it is not possible to evaluate whether data were handled per standard guidance. Ideally, EPA-approved software (ProUCL) should be used to generate average and 95UCL EPCs using Kaplan-Meier derivation methods that consider non-detected values. *Revise the Draft ERA to provide a description on how data were handled and EPCs generated.*

8. Plant communities, rabbit, shrew, mouse, American robin, bats, American kestrel, fox are identified as representative receptors to be evaluated (Section D-1.3, Habitats/Receptors/Preliminary Assessment and Measurement Endpoints, Page D-15 of D-234)), but the ERA does not evaluate any of them on an individual level. Therefore, it is not possible to address the assessment and management endpoints identified in Section D-1.3. This is important given that each receptor would likely have different exposures and sensitivities (toxicity) to site contaminants. It also precludes risk managers form identifying potential risks and remediation strategies for special status or otherwise valuable species. *Revise the ERA to include receptor-specific exposure and effects evaluations. Note that this often occurs during refinement steps after COPCs are selected using the lowest (among all receptors) media-specific no-effect ecological screening values (ESVs).*

9. It is not readily apparent how the lowest observable adverse effect level (LOAEL)-based refinement screening values (RSVs) used during the refinement evaluation were selected. Additionally, the process of selecting RSVs is unnecessarily complicated and difficult to follow. For example, Attachment D-1 Tables I.B, II.B, and III.B contain a mix of ESVs and RSVs for soils and sediment. There is only one ESV or RSV cited for each analyte. The source of Los Alamos National Laboratory (LANL) RSVs in Attachment D-1 is cited as Attachment D-3. Attachment D-3 still only lists one Ecological Screening Level (ESL) for each analyte with no reference to the receptor to which they pertain. Attachment D-7 (not cited) is a screen shot of all ESLs available on LANL's ECORISK Database. This attachment lists no- and low-effect ESLs for multiple receptors and media for a given analyte. When Attachment D-3 LANL RSVs are cross referenced to Attachment D-7 values, final RSV selection appears to be somewhat random. For example, when we cross reference which RSVs are selected for arsenic in soil, the Attachment D-3 RSV of 33 mg/kg was selected. However, this does not match the low effect ESL for soil (68 mg/kg) listed in Attachment D-3. Both of these values are found in Attachment D-7 for arsenic. However, 33 mg/kg is a sediment-based low effect ESL for aquatic communities and 68 mg/kg is a soil low effect ESL for earthworms. Neither are the lowest low effect ESL listed in Attachment D-7 which is for shrew (31 mg/kg). Note that all of these receptors are identified in Section D-1.3. Revise the first paragraph in Section D-3 to clearly state how RSVs were selected and how this selection relates to each ecological receptor that is identified in Section D-1.3. *Revise RSV text and tables to succinctly and accurately summarize RSVs and respective sources. The tables should only include contaminants that are relevant to the ERA; note that the tables are hard to find and should be included in the Table of Contents of Appendix D.*

10. According to Section D-3.3 (RSV Screening – Surface Water Media, Page D-29 of D-234)), LOAEL ESLs are used to calculate wildlife hazard quotients (HQs) for surface water but this fails to recognize that wildlife would be concurrently exposed to contaminants in surface water, sediment, and soils at ECODS N-1 exposure unit. LANL surface water ESLs (i.e., RSVs) only consider water consumption risk from this one exposure route and ignores exposure risks from incidental soil/sediment ingestion and bioaccumulation in dietary items. It should be noted that the Refinement Level Evaluation used in the ERA is not a common ERA refinement procedure when assessing risks to wildlife (see for reference EPA's Step 3a). Refinement is often conducted using receptor-specific food chain modeling that can estimate exposure from different sources (e.g., incidental soil ingestion, surface water ingestion, and dietary items that have accumulated contaminants in their tissues). *Revise the ERA Refinement Level*

Evaluation to include food chain modeling to estimate and evaluate risks to each wildlife receptor and COPC. This is the correct and most complete way to evaluate risks to wildlife when exposed to multiple contaminated media. Note that this will require obtaining toxicity reference values and food chain modeling parameters for each receptor. The use of food chain modeling has many benefits that include additional refinement steps such as incorporating area use factors (AUFs) and ranges of model exposure parameters.

11. Attachment D, text table references do not match was is actually reported in attachments and the table numbering/identification format is not consistent. This makes cross checking text references to attachment and table content very difficult. Format inconsistences might be the result of copy/pasting screen shots from toxicity benchmark source documents into Draft ERA tables. The Draft ERA also references sections and figures that are in other sections of the Report without distinction. *Revise Appendix D to consistently reference tables. If the primary Report sections, figures, or tables are being cited, they should be clearly identified as such.*

12. Attachment D D-2 (EPA Region 4 Screening Tables for Soil, Sediment, and Surface Water [March 2018], Pages D-127 to D-146 of D-234) and D-7 (Los Alamos National Laboratory Receptor-Specific ESLs [2017], Pages D-179 to D220 of D-234) tables are of poor quality, which makes them very difficult to read. They appear to be screen shots that are copied and pasted into the ERA. They also contain more toxicity benchmarks than those that were used to conduct the ERA, which makes it unnecessarily complicated and difficult to use when validating the ERA. *Revise respective tables so that they are in the same format as all other ERA tables, and legible.*

13. Appendix D, Section D-3.4 (Results/Refinement of Constituents of Concern) makes risk management decisions that effectively eliminate all COPCs for additional study. It is against EPA and site-specific guidance to make risk management decisions in an ERA. It is the responsibility of risk managers to use all the information on risks and uncertainties when evaluating site remediation needs. Interjecting risk management decisions in an ERA undermines the objectivity of the assessment. *Revise Appendix D to exclude all risk management decisions so that only factual information is presented that is supported by risk characterization results and other lines of evidence. Information on refined risks and associated uncertainties should be summarized in the Report (Section 3) so that risk management decisions made therein are sufficiently justified.*

14. It is not clear why the ERA uses RESidual RADioactivity (RESRAD) Biota database concentration guides (BCGs) as a line of evidence and not as COPC ESVs (Section D-3.4, Results/Refinement of Constituents of Concern). BCGs are appropriate screening values for use in identifying radionuclide COPCs. *Revise the Draft ERA to include BCGs during the COPC Screening Level Evaluation.*

15. There are two or possibly three sources of background data that could be used to screen COPCs but only one source (WSRC [not defined], 2006) is described as being used in the ERA. Section D-1.2 (Data, page D-12 of D-34)), subsections specifically state that background locations were sampled outside of the unit boundaries. These samples were collected in 2020, which is well after the 2006 WSRC publication date. *Revise the Draft ERA to include a detailed description of which background data were used, why one was used over another (if applicable), and provide a table of background summary statistics with respective sources. If multiple sources of background data are used, any discrepancies in concentrations of COPCs between respective datasets should be identified and discussed as an uncertainty.*

16. It is not clear whether surface water ESVs for select metals were adjusted for site-specific water hardness. South Carolina Department of Health & Environmental Control (SCDHE) Regulation 61-68 water quality numeric criteria for cadmium, chromium, copper, lead, nickel, silver, and zinc are all normalized for water hardness using provided equations and equation parameters. *Revise the ERA to state whether respective ESVs were normalized to site-specific hardness. If the criteria were used without hardness normalization, then the ERA should include an uncertainty analysis on how site-specific hardness compares to what was used to derive the values on the SCDHE Regulation 61-68 table and describe any biases.*

17. The Draft ERA is hard to follow and contains grammatical errors and acronym issues throughout. The introduction should outline the rest of the ERA, internal inconsistencies removed or fixed, and all acronyms should be defined when first used and consistently reported thereafter. Also, commonly used technical terminology should be consistently used so not to confuse the reader (e.g., exposure units, subunits vs. AOUs). *Revise Draft ERA to perform a thorough technical review before finalizing.*

SPECIFIC COMMENTS (APPENDIX D – ECOLOGICAL RISK ASSESSMENT)

1. **Appendix D, Section D-1.1.2 Central Shops Scrap Lumber Pile (631-2G), Page D-10:** This section states that the "U.S. Department of Energy (USDOE), the U.S. Environmental Protection Agency (USEPA) and the South Carolina Department of Health and Environmental Control (SCDHEC) agreed to address the surface water impoundment area and upland soil together as the CSSLP subunit," however no reference or citation is provided. *Revise this section to include a reference as to when this decision was made.*

2. **Appendix D, Attachment D-2 EPA Region 4 Screening Tables for Soil, Sediment, and Surface Water (March 2018), Page D-136, D-139, D-141, and D-146:** The embedded links to listed websites do not work. *Revise links to working websites.*

3. **Appendix D, Section D-1.3 Habitats/Receptors/Preliminary Assessment and Measurement Endpoints, Page D-18 and D-19:** The assessment/measurement summaries for sediment dwelling and aquatic organisms state that HQ calculations will be performed at the ECODS N-1 and Ford Building; however, these two subunits do not contain aquatic habitats. *Revise the ERA to remove ECODS N-1 and the Ford Building from discussions of surface water and sediment-based discussions.*

4. **Appendix D, Table D-8, Refinement Level Evaluation for CSSLP Subunit (Soil 1-4 ft), and Table D-9, Screening Level Evaluation for CSSLP Surface Water Impoundment Area (Sediment 0-1 ft), Pages D-91 and D-92:** These tables appear to be missing concentration measurement units. *Revise the tables to include measurement units.*

1. **Appendix D, Attachment D-5, Table 6, Uncertainty Evaluation for CSSLP Surface Water Impoundment Area (Surface Water, Unfiltered) and Table 7, Uncertainty Evaluation for CSSLP Surface Water Impoundment Area (Surface Water, Filtered):** Identified tables are missing footnotes. *Revise respective tables to defince 690-N is added to Appendix C.4 of the FFA.*