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

APR - 7 2020

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

Mr. Jon Richards
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: Savannah River Site's Responses to the Regulatory Comments on the 2018 Groundwater Monitoring Report for the D-Area Groundwater Operable Unit (U) (SRNS-RP-2019-00454, Revision 0, July 2019) SEMS Number 63

In accordance with the terms of the Federal Facility Agreement, the U. S. Department of Energy (DOE) is submitting the subject comment responses for your review and approval. The South Carolina Department of Health and Environmental Control (SCDHEC) and the U. S. Environmental Protection Agency (EPA) provided comments on the Revision 0 report on November 25, 2019 and January 13, 2020, respectively. This report will not be revised; however, all comment responses will be included in the next monitoring report, as applicable. Please review these responses and provide your approval thirty (30) days from receipt. The effort and time that the SCDHEC and the EPA have given on the subject operable unit are greatly appreciated.

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

Sincerely,

BRIAN HENNESSEY Digitally signed by BRIAN HENNESSEY
Date: 2020.04.06 14:17:38 -04'00'

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

IACD-20-137

Enclosures:
1. SRS Responses to EPA Comments on the 2018 Groundwater Monitoring Report for the D-Area Groundwater Operable Unit (U) (SRNS-RP-2019-00454, Revision 0, July 2019) SEMS Number 63
2. SRS Responses to SCDHEC Comments on the 2018 Groundwater Monitoring Report for the D-Area Groundwater Operable Unit (U) (SRNS-RP-2019-00454, Revision 0, July 2019) SEMS Number 63

cc w/o encl:
D. Scaturo, SCDHEC-Columbia
S. French, SCDHEC-Columbia
M. Reece, SCDHEC-Columbia
G. K. Taylor, SCDHEC-Columbia
T. R. Fuss, SCDHEC – Aiken Environmental Affairs Office
G. O'Quinn, SCDHEC - Aiken Environmental Affairs Office
B. Cameron, SCDHEC–Aiken Environmental Affairs Office
R. Pope, EPA-Atlanta

cc w/ encl:
D. Lloyd, EPA-Atlanta
M. McRae, TechLaw, Inc.

Comments Received: November 25, 2019

GENERAL COMMENTS

1. On August 29, 2019, USDOE, USEPA, and SCDHEC conducted a Core Team meeting to discuss the development of the RFI/RI Work Plan. During the meeting, the topic of adding PFAS analytes to the analyte list was discussed. Please include the sampling results for these analytes (PFAS and AFFF) in the next applicable annual report (either groundwater letter report or groundwater report). Also, the findings should be discussed; and figures indicating the sampling locations should be included in the report.

   Response: Agree. The sampling for PFAS is currently being planned as discussed during the August 2019 Work Plan Scoping meeting. Sampling locations and sample data results will be included in the subsequent groundwater monitoring reports as appropriate. Additionally, as requested during the August 2019 Scoping Meeting, SRS will provide SCDHEC and USEPA the initial PFAS sampling results via email.

   Responsible Party: William Jolin, 803-952-6122, william.jolin@srs.gov

2. There are several discrepancies between sections of the document that discuss analyte exceedances for various screening values. Specifically, the following discrepancies were noted:

   a) Thallium is listed in Section 3.0 for exceeding its MCL; yet, according to the results provided in Tables C-1 through C-4, all sampling results were below the MCL.

      Response: Agree. Thallium did not exceed the MCL. Future groundwater monitoring reports will be reviewed for consistency when information is discussed in multiple sections.

      Responsible Party: William Jolin, 803-952-6122, william.jolin@srs.gov

   b) The first paragraph of Section 3.1 does not include selenium as an analyte exceeding its MCL; although, it is included in Section 3.0 and indeed does exceed the MCL according to Table C-2.

      Response: Agree. Selenium did exceed the MCL. Future groundwater monitoring reports will be reviewed for consistency when information is discussed in multiple sections.

      Responsible Party: William Jolin, 803-952-6122, william.jolin@srs.gov

   c) Arsenic and selenium are left out in the discussion on metals associated with the coal leachate plume which exceed a MCL, NSDWS, or RSL at the bottom of page 9.

      Response: Agree. Arsenic and selenium would be considered part of the coal leachate plume as their exceedances are in wells near the coal storage area and within the low pH

plume. Arsenic and selenium will be included with the metal discussion of the coal leachate plume in future groundwater monitoring reports as appropriate.

Responsible Party: William Jolin, 803-952-6122, william.jolin@srs.gov

d) The last paragraph of Section 3.1 discusses surface water exceedances for beryllium, cobalt, aluminum and manganese but does not include sulfates.

Response: Agree. Sulfate did exceed the NSDWS (250 µg/L) at 23 locations. Sulfate exceedances in surface water will be discussed in future groundwater monitoring reports as appropriate.

Responsible Party: William Jolin, 803-952-6122, william.jolin@srs.gov

e) The contaminant migration discussion for metals in Section 4.2 does not include arsenic or selenium.

Response: Agree. Future groundwater monitoring reports will include arsenic and selenium in the contaminant migration discussion as appropriate.

Responsible Party: William Jolin, 803-952-6122, william.jolin@srs.gov

f) The second paragraph of Section 5.0 includes fluoride and chloride as analytes that exceed their respective MCLs. These are not included in any of the data tables nor are they mentioned anywhere else in the document. Additionally, arsenic and selenium are not listed in this group.

Response: Agree. Fluoride and chloride were incorrectly included as exceeding MCLs, and arsenic and selenium were incorrectly omitted. Section 5.0 Summary and Recommendations will reflect the correct summary information in future groundwater monitoring reports.

Responsible Party: William Jolin, 803-952-6122, william.jolin@srs.gov

g) The first sentence of page 18 lists total dissolved solids as exceeding its NSDWS, and hexavalent chromium as exceeding its RSL. These are not mentioned in the last paragraph of page 8.

Response: Agree. Total dissolved solids were incorrectly listed in section 5.1, it will be removed on future reports. Hexavalent chromium will be included, if appropriate, in Section 3.0 in future reports.

Responsible Party: William Jolin, 803-952-6122, william.jolin@srs.gov

h) Hexavalent chromium is listed as a metal exceeding a MCL, NSDWS, or RSL in the first paragraph of Section 5.1.1; yet, it is not listed in the metal exceedances discussion in the

first paragraph of Section 3.1. Additionally, arsenic and selenium are not listed in this group.

Response: Agree. Hexavalent chromium will be included, if appropriate, in Section 3.1 in future reports. Arsenic and selenium will be included, if appropriate, in section 5.1.1 in future reports.

Responsible Party: William Jolin, 803-952-6122, william.jolin@srs.gov

i) The first paragraph on page 19 in Section 5.1.1 indicates two source wells at which threshold exceedances were recorded for beryllium, chromium, copper, and selenium. According to Tables C-1, C-3 and C-4, there were threshold exceedances for chromium (estimated) at DCB 34C, copper at DCB 21B, and uranium at DCB 21C, respectively. These exceedances were not shaded orange in their respective tables, nor were the chromium exceedance at DCB 34C or uranium exceedance at DCB 21C discussed in Section 5.1.1.

Response: Clarification. Highlights were not shown for copper at DCB 21B or uranium at DCB 21C but both contaminants will be highlighted in the matrix tables and included in the Summary and Recommendation sections in future groundwater monitoring reports as appropriate. The chromium exceedance at DCB 34C was not highlighted since it was an estimated value. However, both uranium and chromium are discussed as metals that exceed in the source area which encompassed DCB34C and DCB21C and will be discussed in the summary discussion of specific wells for the metals plume in future groundwater monitoring reports as appropriate.

Responsible Party: William Jolin, 803-952-6122, william.jolin@srs.gov

The report should be revised to address these discrepancies and also ensure that the Executive Summary is accurate.

Response: Agree. Future groundwater monitoring reports will be reviewed for accuracy and consistency. No change to the 2018 Groundwater Monitoring Report is proposed.

Responsible Party: William Jolin, 803-952-6122, william.jolin@srs.gov

SPECIFIC COMMENTS

1. Section 1.4, D-Area Comprehensive Environmental Response, Compensation and Liability Act Related Activities, page 4. It should be noted that the powerhouse soils around and below the structure have not been investigated. Per the RFI/RI Work Plan letter, wells have been added to the groundwater monitoring network to determine if the powerhouse is a source for groundwater contamination. These results, if significant, should be included in the next groundwater letter report or full report.

   Response: Agree. The *RCRA Facility Investigation/Remedial Investigation (RFI/RI) Letter Work Plan in Support of the D-Area Groundwater Operable Unit (D-Area Upgradient Sources)* (IACD-19-185, submitted October 1, 2019) proposed eight new wells in the Upper Three Runs Aquifer and nine new wells in the Gordon Aquifer in order to bound the VOC, tritium, and metals plumes vertically and horizontally. The six wells proposed to be sampled to determine if the 484-D Powerhouse is a contaminant source to groundwater are previously installed wells (DCB 41A, DCB 41C, DCB 43A, DCB 43C, and DCB 26AR) that have been infrequently sampled in more recent years and the newly installed monitoring well (DCB026D). This includes analyses for tritium, TCL/TAL full suite (no pesticides or dioxins/furans; includes PCBs), and diesel range organics (DRO). Data from the existing wells and new wells will be reported in future groundwater monitoring reports when available. No change to the 2018 Groundwater Monitoring Report is proposed.

   Responsible Party: William Jolin, 803-952-6122, william.jolin@srs.gov

Comments Received: January 12, 2020

EPA GENERAL COMMENTS

1. Section 5.2 (Recommendations), Page 20 of 24 states the continued monitoring ensures that any additional loading from the vadose zone will be detected. It is noted the 484-D Powerhouse began operation in 1952, ceased operation in April 2012, and is currently used for military training exercises. However, it does not appear the 484-D Powerhouse unit has been adequately investigated to determine whether unacceptable impacts to the vadose zone or groundwater have occurred as result of powerhouse operations. It is noted the 488-D-Area Ash Basin (DAB), 489-D Coal Pile Runoff Basin (CPRB), and the 431-D DRP surface units received waste from operation of the coal-fired 484-D Powerhouse. As such, it is uncertain whether the powerhouse area is currently a contributing source to the vadose zone and groundwater regarding volatile organic compounds (VOCs), metals, and polychlorinated biphenyl (PCB) contamination.

   a. Please include data and modify figures for the upcoming 2020 D-Area Groundwater OU Report to demonstrate that the D-Area Powerhouse has a basement area, as discussed during the last core team meeting when this area was discussed. The text and figure should include information about the depth below surface of the basement area and what may have been stored in the basement along with brief outline of the basement's overall dimensions.
   b. Please revise the 2018 Groundwater Monitoring Report for D-Area Groundwater Operable Unit (U), SEMS Number: 63; SRNS-RP-2019-00454, dated July 2019 (the Report) to address this issue to ensure the 484-D Powerhouse unit is adequately assessed to determine whether the powerhouse area is a contributing source of contamination to vadose zone and/or groundwater.

   Response: Clarification. The *RCRA Facility Investigation/Remedial Investigation (RFI/RI) Letter Work Plan in Support of the D-Area Groundwater Operable Unit (D-Area Upgradient Sources)* (IACD-19-185, submitted October 1, 2019) proposed six wells to be sampled to determine if the 484-D Powerhouse is a contaminant source to groundwater. These wells include previously installed wells (DCB 41A, DCB 41C, DCB 43A, DCB 43C, and DCB 26AR) that have been infrequently sampled in more recent years and the newly installed monitoring well (DCB026D). Sampling includes analyses for tritium, TCL/TAL full suite (no pesticides or dioxins/furans; includes PCBs), and diesel range organics (DRO). Data from the existing wells and new wells will be reported in future groundwater monitoring reports when available.

   Further, a Core Team meeting is currently planned in 2020 to discuss known and potential sources of contaminants to groundwater in support of the D-Area Groundwater OU Work Plan. Uncertainties associated with the 484-D Powerhouse as a contributing source of contamination to groundwater will be addressed during Core Team scoping and documented in the D-Area Groundwater OU Work Plan. Identification of the 484-D Powerhouse as a source of groundwater contamination in the annual groundwater monitoring report is dependent on the investigation results.

Finally, the basement of the 484-D Powerhouse is a misnomer and actually refers to the first floor (at grade). The below grade structure of the 484-D Powerhouse is referred to as the cable room, as it housed a network of power cables. The cable room is approximately 209 ft long, 32 ft wide and 10.5 feet deep. Details about the 484-D Powerhouse including operation/storage activities will be discussed at the 2020 Core Team meeting. No change to the 2018 Groundwater Monitoring Report is proposed.

Responsible Party: William Jolin, 803-952-6122, william.jolin@srs.gov

2. Based on the horizontal extent and geometry of the various metals, trichloroethylene (TCE) and tritium contaminant plume(s), the current monitoring well network installed in the Gordon Aquifer is not adequate to monitor potential Gordon Aquifer groundwater contamination. For example, according to Figure D-8 Potentiometric Surface of the Gordon Aquifer Unit, 2Q2018, Appendix D, Page D-17 of D-76, no Gordon Aquifer wells are located downgradient of the former 489-D CPRB and 488-D DAB or within the Powerhouse Subunit, the Moderator Processing Subunit or the Bubble Tower Subunit historic operational source areas. Revise the Report to address this issue to ensure the Gordon Aquifer is adequately delineated and monitored in the future.

Response: Clarification. The *RCRA Facility Investigation/Remedial Investigation (RFI/RI) Letter Work Plan in Support of the D-Area Groundwater Operable Unit (D-Area Upgradient Sources)* (IACD-19-185, submitted October 1, 2019) proposed eight new wells in the Upper Three Runs Aquifer and nine new wells in the Gordon Aquifer in order to bound the VOC, tritium, and metals plumes vertically and horizontally. The Letter Work Plan was approved by the USEPA on 11/6/2019 and SCDHEC on 1/7/2020. The wells have just been installed (March, 2020) and will expand the existing understanding of the nature and extent of contamination for the D-Area Groundwater OU. Data from these wells will be reported in subsequent groundwater reports when available. No change to the 2018 Groundwater Monitoring Report is proposed.

Responsible Party: William Jolin, 803-952-6122, william.jolin@srs.gov

3. Based on the contaminant plume maps and cross-section maps, metals, TCE and Tritium plumes are poorly defined vertically and horizontally. For example, as seen in the figures, the horizontal and vertical extent of aluminum (Figure D-8, no cross-section), beryllium (Figure D-10, D-11 and D-12), cobalt (Figure D-16, D-17 and D-18), manganese (Figure D-20, no cross-section), sulfate (Figure D-26, Figure D-27 and Figure D-28), TCE (Figure D-30, Figure D-31 and Figure D-32) and tritium (Figure D-33, Figure D-34 and Figure D-35) are inferred. Please revise the Report to address this issue to ensure the full horizontal and vertical extent of all contaminant plumes exceeding applicable regulatory limits is adequately defined.

Response: Clarification. Please see the response to General Comment 2.

Responsible Party: William Jolin, 803-952-6122, william.jolin@srs.gov

EPA SPECIFIC COMMENTS

4. **Section 1.4 Comprehensive Environmental Response, Compensation and Liability Act Related to Activities, Page 3 of 24:** The text states the D-Area Operable Unit (DAOU) consists of the following three main facility areas: the 484-D Powerhouse (Powerhouse Subunit), the D-Area Heavy Water Facility (Bubble Tower Subunit), and the Moderator Processing Facility (Moderator Processing Subunit). However, the three main facility areas were not clearly identified in a figure. As such, the relative boundary relationship between the three main facility areas is not known. Revise the Report to address this issue.

Response: Agree. In Figure D-2, the facilities that made up each subunit are identified. In subsequent reports the subunits will also be identified. No change to the 2018 Groundwater Monitoring Report is proposed.

Responsible Party: William Jolin, 803-952-6122, william.jolin@srs.gov

5. **Section 1.4 Comprehensive Environmental Response, Compensation and Liability Act Related to Activities, Pages 3 and 4 of 24:** The text states the Bubble Tower Subunit is no longer a source of trichloroethylene (TCE) contamination to groundwater. However, according to the Appendix A, Table A-4 Summary of Remedial Actions with Operating Equipment at SRS of the Sixth Five-Year Review Remedy Report for SRS OUs with Native Soil Covers and/or LUCs (U), dated June 2019, MicroBlower™ operations are ongoing at the D-Area Operable Unit (Bubble Tower). As such, it is unclear if there is currently a vadose source of TCE contamination to groundwater at the Bubble Tower. Revise the Report to address this issue.

Response: Clarification. Table A-4 in Appendix A of the Sixth Five-Year Review Remedy Report for SRS OUs with Native Soil Covers and/or LUCs (U) referenced in the comment shows the cumulative volume removed for all remedial actions with operating equipment and includes the D-Area Operable Unit (DAOU) Bubble Tower subunit. Please note that the last remedy review for the D-Area Operable Unit (Bubble Tower) operations is documented in Appendix G of the approved *Fifth Five-Year Remedy Review Report for Savannah River Site Operable Units with Operating Equipment*, SRNS-RP-2017-00567, July 2018. As documented in the Data Review section of the Fifth Five-Year Remedy Review (FYRR), the MicroBlower™ system has been operating near 100% for the last five years (2012 through 2016) and has removed approximately 18 kg (39.6 lbs) of PCE, 3.8 kg (8.3 lbs) of trichloroethylene (TCE), and 118 kg (260 lbs) of other contaminants mainly found in

petroleum products. Most contaminants were removed between 2011 and 2013 with minimal removal amounts for the last few years. Recommendations and follow-up actions were documented in Table G-5 of the Fifth FYRR as follows:

Table G-5. Recommendations and Follow-up Actions for DAOU

Issue	Recommendations/ Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness? (Y/N)	
					Current	Future
Contaminant removal from the DAOU Bubble Tower MicroBlower™ SVE wells has greatly diminished or ceased since 2012 and operation of the SVE system may no longer be needed for future protectiveness if the soil RG has been achieved.	Due to the DAOU Bubble Tower Subunit MicroBlower™ SVE system's minimal removals of contaminants for at least the last four years (Figure G-2-2, Attachment G-2), SRS proposes to shut down the MicroBlower™ SVE system and collect a confirmation soil sample to determine if the PCE soil RG has been met (20 µg/kg). If the RG has been achieved, the results will be submitted to the Core Team for consensus to justify discontinuing operation of the SVE and/or monitoring.	USDOE	SCDHEC/ USEPA	June 2018	N	N

Review of the SVE data as documented in the most recent FYRR for the DAOU supports that the Bubble Tower Subunit is no longer a source of trichloroethylene (TCE) contamination to groundwater. Please note that the status of all potential sources of contamination to groundwater will be discussed with the Core Team at the planned in 2020 meeting in support of the D-Area Groundwater OU Work Plan.

The time series plot provided in the 2018 DAG OU monitoring report for DCB 62 (Appendix E, page E145), located directly downgradient of the bubble tower SVE units shows a slightly decreasing trend, supporting that the vadose zone source has been depleted. VOC analysis is being added to the upper screened DCB 63 well. Additionally, downgradient well clusters DCB 44 (Appendix E, page E135) and DCB 45 (Appendix E, page E136) also display decreasing trends. No change to the 2018 Groundwater Monitoring Report is proposed.

Responsible Party: William Jolin, 803-952-6122, william.jolin@srs.gov

6. **Section 3.0 Monitoring Results, Page 7 of 24:** The text identifies several monitoring sampling stations (i.e., DWP 1, DWP 2, DWP 3, DWP 6, DWP 7, DWP 8 DWP 9, DVSM 2, SVSM-5) that were not sampled during the 2017 and/or 2018 monitoring period. As noted, the monitoring stations were primarily dry and could not be sampled. Additionally, most of these wells are located downgradient and monitor the leading edge of the contaminant plume(s). Since the data needs are not being met at these downgradient sampling stations, the horizontal extent of the contaminant plumes is poorly defined and inferred in most cases. Revise the Report to address this issue to ensure the groundwater monitoring data needs are met at these locations.

Response: Clarification. Many of the wetland wells (DWP series) are screened less than 10 feet below ground surface. Difficulties in sampling occur as a result of water elevation fluctuations associated with the wetland area and issues with pumping dry due to tight geologic formations and/or clay layers. If a station was dry during a sampling event, then the well was revisited during the next sampling event to attempt to collect a sample.

As listed in Appendix B, *Groundwater and Surface Water Samples Analyte List and Sample Frequency*, the wetland stations (DWP series) are sampled either semiannually or annually. Wells scheduled for sampling in the second quarter (2Q2018) that were dry (i.e., DWP 7 and DWP 9) were sampled in 4Q2018 to provide data for the reporting period. Wells DWP 2 and DWP 8 scheduled for semiannual sampling were sampled 2 to 3 times over the reporting period to provide data for trend analysis and plume maps. Well DWP 3 is only used for water elevations. DWP003A was installed slightly deeper to provide more reliable sampling. Wells DWP 1 and DWP 6 were dry during all sampling events.

Surface water stations (DSWM series) are sampled annually. In general, SRS collects samples from surface water stations during the 2Q. In 2Q2018, DSWM-2 and DSWM-5 were dry, but samples were collected for these two surface water stations during 4Q2018.

The RCRA Facility Investigation / Remedial Investigation (RFI/RI) Letter Work Plan in Support of the D-Area Groundwater Operable Unit (D-Area Upgradient Sources) (IACD-19-185, submitted October 1, 2019) proposed new wells on the leading (southern) edge of the plumes in order to better bound the VOC, tritium, and metals plumes. These wells are currently being installed, and data from these wells will be reported in subsequent reports when available. No change to the 2018 Groundwater Monitoring Report is proposed.

Responsible Party: William Jolin, 803-952-6122, william.jolin@srs.gov

7. **Appendix A, Well Construction Summary, Table A-1 Well Construction Summary, Page A-3 of A-6:** The table indicates DCB23D is a piezometer well screened in the Upper Three Runs Aquifer (UTR). However, DCB-23D was utilized in the construction of the water table surface of the Gordon Aquifer. For example, a review of Figure D-8 Potentiometric Surface of the Gordon Aquifer Unit, 2Q2018, Appendix D, Page D-17 of D-76 shows the location of DCB-23D and a groundwater level of 111.18 feet (ft) mean sea level (msl) is depicted in the figure. Revise the Report as appropriate to ensure the aquifer zone of the screened well interval at DCB-23D is clearly defined and documented.

Response: Agree. Well DCB23D was mistakenly identified as being screened in the UTRA. Table A-1 will be revised in future groundwater reports to show DCB23D as a GA well. No change to the 2018 Groundwater Monitoring Report is proposed.

Comments Received: January 12, 2020

Responsible Party: William Jolin, 803-952-6122, william.jolin@srs.gov