



ARF-023057

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

JAN 27 2021

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

Mr. Jon Richards  
Savannah River Site Remedial Project Manager  
Superfund Division  
U. S. Environmental Protection Agency, Region 4  
61 Forsyth Street, SW  
Atlanta, Georgia 30303

Dear Ms. Fulmer and Mr. Richards:

**SUBJECT:** Savannah River Site's Responses to the Regulatory Comments on the 2019 Annual Comprehensive TNX Area Groundwater Monitoring and Remedial Action Effectiveness Interim Report (U) (SRNS-RP-2020-00326, Revision 0, June 2020) SEMS Numbers: 21, 29

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. The South Carolina Department of Health and Environmental Control (SCDHEC) approved the report and the U. S. Environmental Protection Agency (EPA) provided comments on the report on October 22, 2020 and November 9, 2020, respectively. The report will not be revised; however, all comment responses will be included and/or addressed in the next report, as applicable. Please review these responses and provide your approval thirty (30) days from receipt. The time and effort that the SCDHEC and the EPA have given on the subject operable unit are greatly appreciated.

Questions from you or your staff may be directed to me at (803) 952-8365, or the DOE Program Manager, Mr. Philip Prater, at (803) 952-9333.

Sincerely,  
**Brian T. Hennessey** Digitally signed by Brian T. Hennessey  
Date: 2021.01.26 10:29:32 -05'00'

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

IACD-21-119

JAN 27 2021

Ms. Susan Fulmer  
Mr. Jon Richards

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Enclosure:

SRS Responses to the EPA Comments on the 2019 Annual Comprehensive TNX Area Groundwater Monitoring and Remedial Action Effectiveness Interim Report (U) (SRNS-RP-2020-00326, Revision 0, June 2020) SEMS Numbers: 21, 29

cc w/o encl:

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2019 Annual Comprehensive TNX Area Groundwater Monitoring and Remedial Action  
Effectiveness Interim Report (U), SEMS Number 21, 29, SRNS-RP-2020-00326, Revision 0, Dated  
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**EPA COMMENTS:**

1. Section 3.5 (Radiologically Contaminated Groundwater) of the 2019 Annual Comprehensive TNX Area Groundwater Monitoring and Remedial Action Effectiveness Interim Report (U), SEMS Numbers: 21, 29, SRNS-RP-2020-00326, Revision 0, dated June 2020 (2019 Annual Report) states well, XSB006R, was installed in April 2019 and was sampled during 2019 for both radiological and volatile organic compound (VOC) constituents; however according to Table 4–2. Summary of the Groundwater Sampling and Analyses Plan at TNX (2<sup>nd</sup> and 4<sup>th</sup> Quarters), this well was also sampled for mercury and nitrate-nitrite as Nitrogen.

**Response: Agree. The new monitoring well, XSB006R, is sampled for multiple constituents as defined in Table 4-2. The text limiting sampling at XSB006R to only radiological and VOC constituents is an error and will be removed from the next annual report.**

- a. According to Section 5.4 (Analytical Results), mercury exceeded the Maximum Contaminant Level (MCL) in the fourth quarter of 2019. Please revise the report to include discussion of this Mercury Exceedance.

**Response: Clarification. Discussion about the mercury exceedance at XSB006R is presented in Section 6.6 of the 2019 annual report. This was the initial sampling year at this well. The first two sampling events at this well had results below the EQL for mercury with the third result (November 2019) showing an exceedance of the mercury MCL. As stated in the Section 6.6. text, continued monitoring will help determine if this is a onetime detection or the start of a trend. As samples continue to be collected at XSB006R, a more extensive interpretation of the mercury results will be made. No change to the current document is proposed.**

- b. The 2019 Annual Report does not provide information about what data gap was identified which warranted adding this well. Please revise the report to provide information to support installation of this well for the purposes of clarity/documentation.
- c. A discussion is not presented with regard to how the data from this well will be used in facilitating evaluation of groundwater conditions and the interim remedial action effectiveness. Please revise the report to include this information.

**Response: Agree with Clarification. In 2015, the USEPA mentioned installing a new well to help define the TCE plume near the Old TNX Seepage Basin (OTSB) during a field visit to SRS. SRS wrote a white paper to summarize historical TCE results from abandoned wells near the OTSB, which was originally submitted in October 2015 and revised and resubmitted in August 2016. The USEPA also mentioned the need to fill a potential gap in monitoring near the OTSB in a comment on the 2014 annual report but this time in response to radionuclide detections in a series of wetland wells (i.e., TCM 5, TIR 1U, and TNX 30D) located downgradient of the OTSB. SRS's recommendation in the white paper and response to the USEPA's comment was that a walk down of the area of concern would be conducted to identify potential locations for a new well. In April 2017, the Core Team (i.e., USEPA, SCDHEC, and DOE) conducted a walk down and agreed on the location of new well near abandoned well XSB 6. It was also agreed to that**

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this well would bound the eastern edge of the TCE plume and help to determine if there are any radiological sources emanating from the OTSB. The new well, XSB006R, was installed in 2019.

Section 4.0 of the next annual report will be revised to provide a reference to the white paper, 2014 comments, and Core Team meeting leading to the installation of XSB006R. A discussion summarizing the purpose of XSB006R will also be added. No change to the current document is proposed.

**Responsible Party:** Branden Kramer, (803) 952-6378, branden.kramer@srs.gov

2. Section 5.4 (Analytical Results) of the 2019 Annual Report indicates that the Dissolved Oxygen (DO) 4<sup>th</sup> quarter 2019 (4Q2019) measurements of 14.38 milligrams per Liter (mg/L) at well TVM 1M and 16.4 mg/L at well TNX 3D are higher than the maximum solubility in freshwater and are therefore suspect. However, Section 4.1.1 (Sampling Issues) does not mention that any sampling issues were identified for the collection of DO readings at wells TVM 1M or TNX 3D and does not provide an explanation for possible reasons the DO appeared to be erroneous.
  - a. Please revise the 2019 Annual Report to discuss the potential causes for the suspect DO results for wells TVM 1M and TNX 3D and to ensure consistent information about these anomalies are presented throughout the report.

**Response:** Agree with Clarification. It is currently unknown what caused the DO results at TVM 1M and TNX 3D to be elevated. All meters used to measure DO are calibrated properly with respect to the manufacturer's recommendations. A discussion about acceptable ranges in DO measurements was held with the groundwater samplers to identify suspect measurements and take corrective action before measurements are recorded (i.e., check for low power which could return variable DO measurements, etc.). When identified, any sampling issues will be reported in future reports.

**Responsible Party:** Branden Kramer, (803) 952-6378, branden.kramer@srs.gov

3. Section 5.4 (Analytical Results) describes the exceedances of gross alpha at wells TBG 3, TBG 5, TCM 5, and TIR 1U, noting the MCL exceedance at TBG 3 occurred for the first time in 2019 since Edible Oil injections started, and for the first time since 2011 in TBG 5. This section also lists the uranium exceedances above the MCL for wells TBG 3 and TCM 5.
  - a. Section 5.4 does not present the results for adjusted gross alpha (with the total recoverable uranium results subtracted) such that it is clear how the uranium MCL exceedances in wells TBG 3 and TCM 5 are correlated to the gross alpha results. Please revise Section 5.4 to include the results of the adjusted gross alpha values for MWs TBG 3, TBG 5, TCM 5 and TIR 1U.

**Response:** Agree with Clarification. Adjusted gross alpha was not included in Section 5.4 of this report. During 2019, the adjusted gross alpha results for TBG 3 and TCM 5 were less than the MCL (15 pCi/L) while the gross alpha results exceeded the MCL (15 pCi/L) at these wells. Uranium concentrations at TBG 3 and TCM 5 exceeded the MCL (30 µg/L) or had elevated detections during 2019 indicating uranium at these two wells is a major contributor to the gross

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alpha activity. At TIR 1U, the adjusted gross alpha result exceeded the MCL (15 pCi/L) in the first half of 2019 while having detect but low concentrations of uranium. This is an indication the gross alpha activity at TIR 1U is likely sourced from another alpha emitter. TIR 1U was dry during the second half of 2019.

In the next annual report, text discussing the adjusted gross alpha will be added to Sections 5.4 and 6.4 (see response to EPA comment 3b). No change to the current document is proposed.

- b. While Section 6.5 (Combined Radium, Uranium, Gross Alpha, and Adjusted Gross Alpha) does provide a discussion of the gross alpha versus adjusted gross alpha results in light of the high uranium concentrations in 2019 in well TBG 3, Section 6.5 does not discuss the MCL exceedance for uranium in well TCM 5. The 2019 Annual Report does not provide consistent and complete information about how the gross alpha results, uranium results, and adjusted gross alpha results are correlated for well TCM 5. Please revise Section 6.5 to reference the detection of uranium above the MCL in well TCM 5 and discuss how the gross alpha results, uranium results and adjusted gross alpha results are correlated for TCM5.

**Response: Agree with Clarification. Adjusted gross alpha was not included in Section 6.4 of this report. In the next annual report, text discussing adjusted gross alpha will be added to Sections 5.4 and 6.4. No change to the current document is proposed.**

**Responsible Party: Branden Kramer, (803) 952-6378, branden.kramer@srs.gov**

4. Section 6.3 (VOC Constituents [i.e., PCE, TCE, Cis-1,2-DCE, VC, Ethylene, and CCl<sub>4</sub>]) states in the second paragraph that as source TCE concentrations declined, distal TCE concentrations concurrently declined. However, from review of the graphs in Appendix E, Time-Series Plots, the following inconsistencies with this statement were noted:
  - In Appendix E, Page E-253 of E-292, the graph depicts well TCM 5 TCE concentrations exhibiting stable-steady trend.
  - In Appendix E, Page E-269 of E-292, the graph depicts well TNX 28 TCE concentrations exhibiting a potentially increasing rather than decreasing trend.
  - In Appendix E, Page E-278 of E-292, the graph depicts TCE concentrations in TRW 2 as variable but overall not decreasing, with fluctuations above and below the MCL.

Please revise Section 6.3 to provide a more detailed description of the TCE trends in wells TRW 2, TNX 28D, and TCM 5 and address the above noted inconsistencies. This information is of particular importance in assessing the interim remedial effectiveness with respect to Wells TRW 2 and TNX 28D which still continue to exhibit fluctuations in TCE concentrations above and below the MCL.

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**Response: Clarification.** The statement in the second paragraph of Section 6.3 is referring to a comparison of average TCE concentrations in eight source wells to average TCE concentrations in seven distal wells, as depicted in Figure A-27. Therefore, it is accurate to state that when comparing the two averages with time, both have declined concurrently. Figure A-27 is included in the report as a visual representation of the destruction of VOC mass at the source via edible oil injections and is representative of the majority of wells in the TNX monitoring network. SRS recognizes that TCE concentrations at individual wells have and will fluctuate over time. The third paragraph of Section 6.3 describes the changing TCE concentrations at TRW 2 and TNX 28D and provides an interpretation of these changes. These two trends are discussed because TCE concentrations at these wells do not follow the average TCE concentrations compared in Figure A-27. No detailed discussion of the TCE trends at TCM 5 was included in Section 6.3 because TCE concentrations in this well have fluctuated above and below the MCL since 2013, steadily declining below the MCL (5 µg/L) in the fourth quarter of 2019. The fact that concentrations at TCM 5 have not rebounded is a testament to the destruction of VOC mass at the source and the lack of VOC mass migrating to the distal monitoring wells. Fluctuations in TCE concentrations will continue to be monitored and discussed accordingly in future annual reports. No change to the current document is proposed.

**Responsible Party: Branden Kramer, (803) 952-6378, branden.kramer@srs.gov**

5. Section 6.4 (Edible Oil Parameters) states wells TNX 3D, TV 1M and TVR 1A had DO concentrations that were background DO concentrations; however, Section 5.4 does not discuss the potentially suspect DO result for well TVR 1A. For completeness and consistency, please revise Section 5.4 to include a discussion of the DO results for well TVR 1A.

**Response: Agree with Clarification.** Since TVR 1A was not previously discussed in Section 5.4, the suspect DO concentration at TVR 1A was inadvertently omitted from Section 5.4. In the next annual report, all suspect results will be discussed in their appropriate sections. No change to the current document is proposed. Refer to the response to the USEPA's comment #2, for a more detailed discussion of elevated DO measurements.

**Responsible Party: Branden Kramer, (803) 952-6378, branden.kramer@srs.gov**

6. EPA notes that the 2019 TNX EMR identified trichloroethylene (TCE) concentrations at well TNX 28D that continue to fluctuate with an exceedance of EPA's Maximum Contaminant Level (MCL) being reported for the fourth quarter of 2019 (4Q2019). Based on the recent history of TCE concentrations exceeding the MCL at well TNX 28D since 2016, it has been noted and requested by SCDHEC that a monitoring well between TNX 28D and the TNX 72 well cluster be installed. EPA supports and agrees that the requested MW installation would provide valuable information. The SRS agreed to evaluate the TCE concentrations at TNX 28D for three consecutive years until 2019. The agreement indicated if TNX 28D TCE concentrations continued to be elevated above the MCL, the possibility of installing a new monitoring well would be discussed with the federal facility agreement (FFA) parties. However, in the 2019 Annual Report, SRS proposes to extend the period of evaluation at TNX 28D for another three years, to 2022 and to postpone scheduling a meeting to

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discuss the possible installation of a new monitoring well between TNX 28D and TNX 72 until after the submittal of the 2022 Annual Comprehensive TNX Area Groundwater Monitoring and Remedial Action Effectiveness Interim Report.

EPA agrees to another 3 year period of evaluation however, reserves the option for future discussion if the TCE values continue to be consistently elevated to be of concern, especially when considering the GW plume is migrating towards an area without monitor well coverage and levels remain above MCL.

**Response: Agree. Monitoring results for TNX 28D will continue to be evaluated and discussed in the annual reports and discussed with the Core Team as needed.**

**Responsible Party: Branden Kramer, (803) 952-6378, branden.kramer@srs.gov**

7. Section 5.4, page 38 states “Ethylene was detected in three monitoring wells (TBG 3, 4, and 5) during 2Q 2019 and 4Q 2019. The detections ranged from 0.26 to 1.4. Please ensure the MCL is included when stating detected COCs.

**Response: Clarification. Ethylene is the final degradation product of trichloroethylene (TCE) and is used as an indicator parameter for the degradation of TCE. Ethylene is not a COC for the TNX Area groundwater and is considered nonhazardous; therefore, there is no MCL or regional screening level for ethylene in drinking water. No change to the current document is proposed.**

**Responsible Party: Branden Kramer, (803) 952-6378, branden.kramer@srs.gov**