



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

October 12, 2023

ENVIRONMENTAL COMPLIANCE &

Mr. Brian T. Hennessey, SRS Remedial Project Manager
Infrastructure and Area Completion Division
U.S. Department of Energy
Savannah River Operations Office
P.O. Box A
Aiken, South Carolina 29802

OCT 12 2023

AREA COMPLETION PROJECTS

EPA Comments on the BIENNIAL EFFECTIVENESS MONITORING REPORT (EMR) FOR MONITORED NATURAL ATTENUATION (MNA) AT THE C-AREA BURNING/RUBBLE PIT (131-C) AND OLD C-AREA BURNING/RUBBLE PIT (NBN) OPERABLE UNIT (U), JANUARY 2021 THROUGH DECEMBER 2022, SEMS NUMBER: 31, SRNS-RP-2023-00648, REVISION 0, DATED JUNE 2023

Dear Mr. Hennessey,

The U.S. Environmental Protection Agency, Region 4 (EPA), has reviewed the Effectiveness Monitoring Report (EMR) for the C-Area BRP 131-C and the old BPR NBN – Jan 2021 through Dec 2022, SEMS Number: 31, Revision 0, June 2023). EPA comments are attached.

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

Sincerely,

**JON
RICHARDS**

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JON RICHARDS
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Jon Richards
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ec: C.L. Bergren, SRNS-ACP
Susan Fulmer, SCDHEC

GENERAL COMMENTS

1. It is unclear whether the wells recommended for replacement of CRW 010 well cluster (i.e., CRW10CU, CRW10C and CRW 10A) are sufficient to monitor the southwest boundary of the C-Area Burning/Rubble Pit (CBRP). The text recommends removal of CRW 010 from the sampling program, as contamination observed in this well is likely from the C-Area Groundwater (CAGW) Operable Unit (OU), instead of the CBRP plume. The EMR recommends monitoring wells CRP 6DR and CRP 8D as replacement wells to delineate the plume; however, these two wells are located east of CRW 010 and north of the intermittent stream and are not sufficient to delineate and monitor the southwestern behavior of the plume. In order to remove CRW 010 from the monitoring plan, a new southwestern boundary well should be recommended to address the data gap, as the southern boundary of the trichloroethylene (TCE) plume in the Upper Aquifer Zone and Middle/Lower Aquifer Zone is currently not defined (see Appendix D, Figure D-3, 2022 TCE Concentrations in the Upper Aquifer Zone of the Upper Three Runs Aquifer, and D-4, 2022 TCE Concentrations in the Middle/Lower Aquifer Zone of the Upper Three Runs Aquifer). Please revise the text to recommend an additional well in the southwest as a replacement of CRW 010 boundary well cluster.
2. It is unclear whether any monitoring wells have been analyzed for emerging contaminant, 1,4-dioxane. 1,4-dioxane was used as a solvent stabilizer and is frequently associated with TCE; as such, any site with significant TCE releases should also be analyzed for 1,4-dioxane. Section 4.4 (Groundwater and Surface Water Compliance) indicates well samples are analyzed for seven constituents, including 1,1-dichloroethylene (1,1-DCE), cis-1,2-dichloroethylene (cis-1,2-DCE), trans-1,2-dichloroethylene (trans-1,2-DCE), vinyl chloride (VC), tetrachloroethylene (PCE), TCE, and dichloromethane (DCM); however, the text does not indicate whether 1,4-dioxane has been investigated. Please clarify whether the site has been investigated for 1,4-dioxane.
3. The EMR does not provide a figure that depicts all detections of site constituents of concern (COCs). Although Appendix D (TCE Plume Maps) contains TCE exceedance figures for each aquifer, it would be useful to also include a figure depicting all COC detections in support of the conceptual site model (CSM). Please revise the EMR to include a figure depicting all detections of COCs.
4. The text does not discuss the results of the monitored natural attenuation (MNA) parameters, e.g., dissolved oxygen (DO), oxidation reduction potential (ORP), and alkalinity, in terms of conditions favorable to biodegradation. It is noted the text indicates the wetlands provide conditions more favorable to biodegradation, and Table A-1 (CBRP OU Monitoring Results) includes MNA parameter results; however, the text should summarize the results of MNA parameters, including a discussion of the ranges of MNA parameter monitoring results and the wells that fall within optimal ranges to evaluate MNA efficacy at the site. Please revise the text to discuss the results of the MNA parameter monitoring.

SPECIFIC COMMENTS

1. **Section 2, Operable Unit Description and History, Page 2, and Section 4.6.1, Trichloroethylene, Page 13:** There is contradictory information presented regarding the detection of TCE contamination in the Gordon Aquifer. The text in Section 2 states,

“Contamination is vertically confined to the Upper Three Runs Aquifer (UTRA) and outcrops into the wetlands and surface water of Twin Lakes and Fourmile Branch;” however, as Section 4.6.1 indicates, TCE was detected in the Gordon Aquifer (GA) well CRP 22A at a concentration of 0.419 µg/L in 2022. Until further analysis confirms TCE contamination or non-detection in the GA, the text should include the potential for this unit to be contaminated. Please revise the statement to clarify that concentrations of TCE have been observed in the GA.

2. **Section 4.5, SVE Results, Page 8:** The EMR should provide supporting documentation for obtaining soil vapor extraction (SVE) rates. The text provides the 2021 and 2022 time weighted averages of the four MicroBlower™ SVE used to estimate the removal rate; however, the text should expand on the individual rates to show where significant removal is occurring and vice versa. Please revise the EMR to include the SVE rates for individual wells for 2021 and 2022.
3. **Section 4.6, Groundwater and Surface Water Results, Page 9:** The text in Section 4.6 contradicts the CSM regarding degradation contaminants. The CSM indicates that degradation products (e.g., VC) are expected to increase in the upper aquifer, as opposed to TCE, which is expected to have higher concentrations in the lower aquifer; however, the text indicates only TCE is provided in Appendix D (TCE Plume Maps) because other contaminants behave similarly. Without plume maps for degradation products, it is unclear whether plumes are behaving as indicated in the CSM or more similar to TCE plumes. Please revise the text to provide additional information to support the assertions in the text.
4. **Section 5, Summary, Page 18:** It is unclear whether the figures in Appendix C support the statement that concentrations of TCE continue to decrease overtime. Many of the time series plots depict relatively stable TCE concentrations trends for wells exhibiting detections (including CRW010, CRP 50, CRP 46, CRP 45B, CRP 20CU, CRP 18C, and CRP 48B and CRP 22 since 2010), and the majority of remaining wells are consistently non-detects, but very few wells actually show significant decreases in concentrations. Please revise the statement in support of the trend graphs provided.
5. **Section 5, Summary, Page 19:** The text states the Statement of Basis/Proposed Plan for the C-Area Burning Rubble Pit Operable Unit indicated natural attenuation would require 70 years for all areas of the volatile organic compound (VOC) plume to be below MCLs; however, it is unclear if the 2008 Record of Decision (ROD) provided remedial timeframes for groundwater restoration. Please revise the text to discuss remedial timeframes for groundwater restoration that are presented in the ROD.
6. **Section 5, Summary, Page 19:** The text should include the time to reach cleanup estimations as a separate section instead of as a discussion in the Summary. The Summary should provide only conclusions based on the main report and include recommendations, if any. Please revise the EMR to include a separate section that evaluates the estimated time to reach cleanup goals and whether the timeframe for restoration of groundwater is reasonable based on observed trends.
7. **Appendix D, TCE Plume Maps, Pages D-1 to D-8:** It is unclear why a figure depicting the 2021 TCE Results for the GA and the 2021 potentiometric contours for the GA were not presented. Appendix D contains figures for Upper Aquifer Zone (UAZ) and Middle/Lower Aquifer Zone for 2021 and 2022 but only provides a 2022 figure for the GA. Please revise the EMR to include a figure depicting TCE concentrations in 2021 in the GA.

8. **Appendix E, Figure E-5, 2022 TCE Results for the Gordon Aquifer (GA), Page E-7:** It appears Figure E-5 is mis-named. The figure title for E-5 is “2022 TCE Results for the Gordon Aquifer (GA);” however, the figure presents potentiometric contours for the GA. Please revise the figure title to address the discrepancy.