



Department of Energy
Savannah River Operations Office
P.O. Box A
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JAN 18 2018

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 Effectiveness Monitoring Report for the Monitored Natural Attenuation (MNA) at the Chemicals, Metals, and Pesticides (CMP) Pits Operable Unit (OU) (U), March 2016 through March 2017 (SRNS-RP-2017-00163, Revision 0, June 2017) CERCLIS Number: 24

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 on October 12, 2017 and the U. S. Environmental Protection Agency (EPA) provided comments on the report on October 30, 2017. The report will not be revised; however, all comment responses will be included and/or addressed in the next EMR, 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 Federal Project Director, Ms. Karen Adams, at (803) 952-7871.

Sincerely,

A handwritten signature in blue ink, appearing to read "B. Hennessey", written over a horizontal line.

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

JAN 18 2018

Ms. Susan Fulmer
Mr. Jon Richards

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Enclosure:

SRS Responses to the United States Environmental Protection Agency (US EPA) Comments on the Effectiveness Monitoring Report for the Monitored Natural Attenuation (MNA) at the Chemicals, Metals, and Pesticides (CMP) Pits Operable Unit (OU) (U), March 2016 through March 2017, CERCLIS Number: 24 (SRNS-RP-2017-00163, 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. H. Pope, EPA-Atlanta

cc w/ encl:

D. Lloyd, EPA-Atlanta
M. McRae, TechLaw, Inc.

**SRS Responses to
United States Environmental Protection Agency (US EPA) Comments on the Effectiveness Monitoring
Report for the Monitored Natural Attenuation (MNA) at the Chemicals, Metals, and Pesticides (CMP) Pits
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EPA Comments:

- 1) It is not clearly understood whether the decreasing contaminant trends observed in the Transmissive Zone (TZ) and Middle Aquifer Zone (MAZ) are related to mass destruction of the contaminants or due to plume migration and expansion. For example, in Section 2.2.2.1, PCE and TCE, Pages 9 and 10 of 104 of the Effectiveness Monitoring Report (EMR) for the Monitored Natural Attenuation (MNA) at the Chemicals, Metals, and Pesticides (CMP) Pits Operable Unit (OU) March 2016 through March 2017, CERCLIS Number 24, the text states the “Vertical movement of the plumes are occurring as is shown by overall high proportions of decreasing concentrations in the MAZ, and a higher proportion of increasing trends in portions of the LAZ (Appendix B and Figures 14, 15, and 31).” As such, it appears the plumes are not contracting but expanding under non-steady conditions as the plume center mass migrates horizontally and vertically downgradient away from the source zone through the MAZ and into the Lower Aquifer Zone (LAZ). Unstable and/or expanding plume behavior is not consistent with a Monitored Natural Attenuation (MNA) remedy implemented consistent the EPA guidance *Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites*, OSWER Directive Number 9200.4-17P, dated April 21, 1999 (MNA Guidance). Currently, the EMR monitoring data indicate sporadic VOC detections which are typically less than respective maximum contaminant levels (MCLs) detected in Pen Branch and indicate MNA is not occurring at a rate that prevents cross-media transfer of contaminants discharging from the MAZ and LAZ to surface waters of Pen Branch. Please provide clarification and/or additional information that will definitively answer the issue outlined above.

Response: Clarification.

The approved ROD has MNA selected for groundwater after the bulk source remedial action via ERH/SVE for VOCs. SRS understands that the VOC plumes at CMP Pits do not exhibit all the potential characteristics that are traditionally accepted as part of a MNA remedy. However, the plume behavior has not deviated from expectations that were described during the ROD remedy selection process (e.g., some plume expansion including LAZ increases in concentration, discharges above MCLs, no contaminant buildup downstream in Pen Branch, etc.). With completion of the updated model (SRNS-TR-2017-00312, submitted December 2017) a comparison with the previous model and evaluation of the plume expectations is available. After the core team has reviewed and discussed the results of the updated modeling effort, the results will be discussed as it relates to contamination trends and remedial goals. Pen Branch was originally expected to be impacted by mass discharges from groundwater in excess of MCLs as stated in the original modeling report and ROD. However, contamination is localized as presented by the South Carolina State University data, and there is no discernable buildup of contaminants downstream. VOC degradation in the wetlands has been shown to be occurring, especially with the ongoing studies of surface water, groundwater, and vegetation conducted by SC State University. This degradation should be acknowledged as preventing contaminants from discharging to Pen Branch on a consistent basis. No changes to the 2017 EMR are proposed.

Contact: Ashley Shull (ashley.shull@srs.gov) (803)-952-7090

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- 2) The horizontal extent of the PCE and trichloroethylene (TCE) plumes are poorly defined in the MAZ east of monitoring wells CMP 39D and CMP 65BU and in the LAZ east of monitoring wells CMP 64BU and CMP 65B. Considering the uncertainty in the horizontal extent of the PCE/TCE plume at the eastern boundary, it is not clear how the planned groundwater model will be updated if the plume(s) have not been adequately defined without additional well installation in the MAZ and LAZ to address the data gap(s). Revise the EMR to address this issue to ensure the updated groundwater model is adequate for predicting cleanup timeframes and determining how the MNA remedy is progressing.

Response: Clarification.

There are currently no plans to install additional monitoring wells to the east of the wells mentioned above. Overall, the plumes are moving to the north and northwest discharging into Pen Branch. The updated model included sufficient data for calibration of the model. Additional side gradient monitoring wells are unlikely to provide extremely beneficial data. Discussions of potential well installations and limitations due to the location of streams, wetlands, and/or topography and possibilities for revisions to the updated model can be made with the Core Team after review of the Rev 0 of the updated model (SRNS-TR-2017-00312, Rev 0, submitted December 2017). No changes to the 2017 EMR are proposed. A summary of the results of the updated model and any forthcoming agreements made will be included in the upcoming EMR to be submitted in June 2018.

Additionally, data from two new surface water stations located east of CMP-SW-06 in the southern tributary to Pen Branch will be included in the 2018 EMR. These locations will help quantify any potential impacts of the plumes in the eastern section into Pen Branch. Historically, concentration levels in this stretch of the stream have been minimal.

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- 3) The anticipated, updated groundwater model that will be used to evaluate how the MNA remedy is progressing and is expected to also include new predictions for cleanup timeframes should also be used to:
- a. decide when and where to transition between technologies based on contaminant levels may be necessary,
 - b. address anticipated plume migration/expansion; and
 - c. to optimize remediation technology performance in accordance with *The DNAPL Remediation Challenge: Is There a Case for Source Depletion?* EPA/600/R-03/143 (USEPA 2003).

Please revise the EMR to address this issue to ensure the appropriateness of MNA passive remedy in attaining remedial goals within a reasonable timeframe as compared with active remediation.

Response: Agree/Clarification.

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Discussions on the appropriate triggers or trigger levels for additional actions, etc can be discussed after the Core Team has thoroughly reviewed the updated model. No changes to the 2017 EMR are proposed. The upcoming EMR to be submitted in June 2018 will include a discussion on how the most recent monitoring results compare to the predictions from the recent updated model.

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- 4) Section 2.2.3, Surface Water Sampling Results, Page 20 of 104: Section 2.2.3 states, “1,4-Dioxane was analyzed at all five required surface water stations (CMP-SW-01 through CMP-SW-10) during 4Q2016 and all results were non-detect.” Additionally, the second paragraph of Section 4.0, Page 23 of 104 states, “All surface water station samples were non-detect for 1,4-dioxane;” however, the sample quantitation limit for 1,4-dioxane for the four (4) surface water samples collected for laboratory analysis was 3.0 µg/L, which is greater than the regional screening level (RSL) for 1,4-dioxane of 0.46 µg/L. Although, the analytical results for the surface water station samples were non-detect, it is unclear if 1,4-dioxane concentrations in surface water were greater or less than the RSL. Revise Section 2.2.3 and Section 4.0 to provide clarity on this issue.

Response: Agree/Clarification.

The June 2018 EMR will include discussions on detection limit limitations associated with 1,4-dioxane in all sections where 1,4-dioxane is discussed, including Section 2.2.3, *Surface Water Sampling Results* and Section 4.0, *Summary*. No changes to the June 2017 EMR are proposed.

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- 5) Figures 18, 21, 22, and 23, Pages 61, 65, 67, and 69 of 104: Plume maps for 1,4-dioxane are depicted based on groundwater analytical data collected during two sampling events in 2016 utilizing a solid 0.46 µg/L 1,4-dioxane contour line; however, as stated in Section 2.2.2.6, “...the current USEPA tapwater RSL of 0.46 µg/L is available. The detection limits were not able to meet the RSL of 0.85 µg/L, while the sample quantitation limit was 3 µg/L.” Because the sample quantitation limit is greater than the RSLs for 1,4-dioxane, it is unclear if the plumes drawn in Figures 21, 22, and 23 are accurate. Revise Figures 18, 21, 22, and 23 to address this issue.

Response: Agree/Clarification.

Figures depicting 1,4-dioxane in the June 2018 EMR will include a footnote identifying the detection limits and sample quantitation limits for 1,4-dioxane for the reporting period. Contoured plume maps will continue to be made based on the best information available as well as professional expertise. No changes to the June 2017 EMR are proposed.

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- 6) Figure 17, 2016 TCE Plume and Groundwater Results for the LAZ and GA, Page 59 of 104: The text in the figure legend indicates “2015 TCE Plume ($\mu\text{g/L}$)”. Revise the text in the figure legend to indicate “2106 TCE Plume ($\mu\text{g/L}$).”

Response: Agree.

The text was not updated in the figure to reflect the correct year. No changes to the June 2017 EMR are proposed. Corrections will be incorporated into the June 2018 EMR.

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