



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 4

ATLANTA FEDERAL CENTER

61 FORSYTH STREET

ATLANTA, GEORGIA 30303-8960

November 15, 2021

ENVIRONMENTAL COMPLIANCE &

Mr. Brian Hennessey, 730-B
SRS Remedial Project Manager
Area Completion Projects
Savannah River Operations Office
P.O. Box A
Aiken, South Carolina 29802

NOV 15 2021

AREA COMPLETION PROJECTS

Dear Mr. Hennessey:

The U.S. Environmental Protection Agency (EPA) has reviewed the Savannah River Site Effectiveness Monitoring Report (EMR) for the Monitored Natural Attenuation (MNA) at the Chemicals, Metals, and Pesticides (CMP) Pits Operable Unit (OU), April 2020 through March 2021, Revision 0, dated June 2021.

EPA can not provide approval for the above mentioned report until the below comments have been addressed. If you have questions or concerns, please contact me at (404) 229 -9500.

Sincerely,

A handwritten signature in cursive script that reads "Diedre Lloyd".

Diedre Lloyd
Remedial Project Manager
Restoration and Sustainability Branch
Region 4, Superfund & Emergency Management Division
61 Forsyth Street, S.W.
Atlanta, Georgia 30303

cc: Angelia Holmes, DOE-SRS, C. L. Bergren, SRNS-ACP (Signed Original), Phil Prater, DOE-SRS, C.L. Bergren SRNS-ACP (Signed Original), Susan Fulmer, SCDHEC

**EPA COMMENTS ON THE
EFFECTIVENESS MONITORING REPORT (EMR)
FOR THE MONITORED NATURAL ATTENUATION (MNA)
AT THE CHEMICALS, METALS, AND PESTICIDES (CMP) PITS OPERABLE UNIT
SEMS NUMBER: 24
APRIL 2020 THROUGH MARCH 2021
REVISION 0**

DATED JUNE 2021

**SAVANNAH RIVER SITE
AIKEN, SOUTH CAROLINA**

EPA GENERAL COMMENTS:

1. Based on the locations of wells CMP062D/C/B and CMP063D/C/B, it is uncertain whether it is appropriate to include the water level elevations and/or chemical analyses from these wells in determining relative flow directions, flow velocity, and/or aquifer quality in the transmissive zone (TZ), middle aquifer zone (MAZ), and lower aquifer zone (LAZ). For example, well clusters CMP062D/C/B and CMP063D/C/B are sited across a natural drainage swale located south of the Chemicals, Metals, and Pesticides (CMP) Pits and defined by the topographic contours presented on Figure 2 (CMP Pits OU Subunits), page 31 of 104. Water levels in well CMP062D/C/B are consistently higher than well CMP063D/C/B and higher than all of the other CMP Pits monitoring wells. Higher water levels in CMP062D/C/B are most likely due to the recharge occurring at topographic high and hill located immediately to the east of CMP062D/C/B, as shown on Figure 2. Currently, it is uncertain how the drainage swale impacts groundwater flow, i.e., limiting or preventing flow across this boundary and indicating separate watershed flow. Please revise the Effectiveness Monitoring Report for the Monitored Natural Attenuation (MNA) at the Chemicals, Metals, and Pesticides (CMP) Pits Operable Unit (OU) (U) April 2020 through March 2021, SEMS Number: 24, SRNS-RP-2021-03832, Revision 0, dated June 2021 (the EMR) to address this concern as this may impact the siting of the soil borings/monitoring wells proposed during the sampling effort planned to further characterize the current volatile organic compound (VOC) soil and groundwater concentrations within the vadose zone and aquifers.
2. It is uncertain whether a low permeability cap was installed at the CMP Pits that may retard infiltration as indicated in the EMR. For example, according to the Sixth Five-Year Remedy Review Report for Savannah River Site Operable Units with Groundwater Remedies (U) SEMS Number: 00 SRNS-RP-2019-00511, Revision 1, Aiken, South Carolina, July 2020, only a vegetative cover is installed at the CMP Pits. To support development of the conceptual site model (CSM), please revise the EMR to address this uncertainty in whether a low permeability engineered cap was installed over the CMP Pits.
3. The EMR currently speculates the Gordon Aquifer (GA) contamination at CMP010A is temporary and resulted from drilling activities at the well and is not representative of GA groundwater conditions. Considering the Gordon Aquifer Confining Zone (GACZ) overlies the GA, please revise the EMR to include a discussion of what mitigation efforts (e.g., double cased well) were implemented during soil boring/well installation to isolate the aquifer and prevent cross-contamination from the overlying LAZ, MAZ, TZ plumes and/or contaminated vadose zone soil.

4. According to the EMR it is unclear if soil samples will be collected for VOCs below the water table and within the aquifers. For example, the text in Section 3.0 (Additional Sampling Efforts), page 23 of 104, states, "...SRS will be conducting an additional sampling effort to further characterize the current VOC soil concentrations within the vadose zone and aquifers." Please revise the EMR to state, "SRS will be conduct additional sampling efforts to further characterize the current VOC concentrations of soil and groundwater within the vadose zone and aquifers, respectively."
5. It is uncertain whether the proposed soil borings and well installations siting locations will be adequate to further characterize the current VOC concentrations within the vadose zone and aquifers. For example, the text in Section 3.0 (Additional Sampling Efforts), page 23 of 104, states, "Due to increasing contaminant trends in source area wells (i.e., CMP 35D and CMP 34D) and the recent discovery of potential GA contamination at CMP010A, SRS will be conducting an additional sampling effort to further characterize the current VOC soil concentrations within the vadose zone and aquifers." The proposed soil boring and well installation locations are presented on Figure 34 (Additional Sampling Locations for 2021), page 95 of 105. However, as seen on Figure 5 (CMP Pits OU Monitoring Network, and Cross Section Lines), page 37 of 104, the lack of monitoring wells south of the CMP Pits between CMP 11D/B and CMP 10D/C/B/A results in a data gap in the downgradient extent of contamination in the TZ, MAZ, LAZ, and potentially the GA. Please revise the EMR to address this issue to ensure the downgradient extent of contamination in the TZ, MAZ, LAZ, and potentially the GA south of the CMP Pits is adequately defined.
6. It is noted toward the end of the CMP Pits OU Core Team Meeting on August 10, 2021, EPA contractor, Mac McRae made an observation about the groundwater flow direction and water level with respect to well cluster CMP062. As indicated in the email correspondence received from Brian Hennessey on August 18, 2021, in order to formally document the path forward to address Mac's concern, the CMP team has planned the following activities to further investigate well cluster CMP062:
 - Review lithologic data to discern any unusual occurrence(s) relative to well placement
 - Review well construction logs relative to surrounding wells within similar horizon
 - Review water level data
 - Evaluate, if available, sampler notes
 - Provide a cross section for well CMP062
 - Cation/anion analysis of well cluster CMP062

EPA notes that well cluster CMP063 is located within the same watershed boundary as the CMP062 well cluster. As such, it is recommended a cross section is provided and cation/anion analysis of well cluster CMP063 also is performed as an activity to further investigate well cluster CMP062.

EPA SPECIFIC COMMENTS:

1. **Section 1.2, Nature and Extent of Contamination, Page 2 of 104:** The second paragraph indicates the electrical resistance heating (ERH) treatment area included the extent of tetrachloroethylene (PCE) contamination above the dense non-aqueous phase liquid (DNAPL) threshold concentrations; however, the text does not state the PCE concentration that would indicate the DNAPL threshold. In consideration of the planned additional sampling effort to further characterize the current VOC concentrations within the vadose zone and aquifers, please revise the text to state the PCE threshold concentration indicating the presence of DNAPL.
2. **Section 1.3, Observed Hydrostratigraphy at the CMP Pits OU, Page 5 of 104, and Figure 3, CMP Pits Groundwater OU Conceptual Site Model (CSM), Page 33 of 104:** The text states,

“...the stratigraphy, aquifers and plumes are all, in general, gently sloping towards Pen Branch. However, the confining units appear to slope towards the south in some areas at the main CMP Pits area...” Additionally, the text states, “Although the TCCZ [tan clay confining zone] and the TCLC [tan clay lower confining] are depicted as continuous units in the cross-sections, the aquifer behavior in this area shows various elevation heads and contaminant pathways that indicate the confining horizons are discontinuous and/or intermixed with sandy clays in areas.” It is noted the CSM figure does not depict this description of the confining units sloping towards the south, and the TCCZ and TCLC are not shown to be discontinuous and/or intermixed with sandy clay in areas. Please revise the EMR as appropriate to address this discrepancy.

3. **Section 2.2.1, Groundwater Aquifers, Page 10 of 104:** Total dissolved mass estimates were not presented for each constituent of concern (COC) over time (e.g., 2008 through present) for each aquifer zone. As such, an evaluation could not be performed on whether the total estimated dissolved masses over time are declining for each COC (i.e., horizontally and vertically) or if the total mass is being reduced for each aquifer zone as a supporting line of evidence for natural attenuation, consistent with the EPA MNA Guidance. Please revise the EMR to include total dissolved mass estimates prepared for each COC over time (e.g., 2008 through present) for each aquifer zone so an evaluation of reduction in total contaminant mass over time in each aquifer zone can be assessed.
4. **Section 3.0, Additional Sampling Efforts, Page 23 Of 104:** The text states, “The vertical contaminant trends at the well cluster are not supportive of vertical migration and also concentration trends at the CMP010A are decreasing.” However, the text does not include graphics, discussion, or additional lines of evidence to support this statement. Please revise the text to address this issue.
5. **Figure 3, CMP Pits Groundwater OU Conceptual Site Model (CSM), Page 33 of 104:** The CSM figure does not extend the ground surface elevation line further to the south to illustrate the slope of the hill or knoll where the CMP Pits are located. Based on the text in Section 1.4 (Observed Hydrology at the CMP Pits OU), page 5 of 104, the locally high topography at the CMP Pits impacts groundwater flow in a radial direction. Evidence of this can be seen in the elevated water table and low water table lines shown on the figure which illustrate a northerly flow towards Pen Branch and a southerly flow away from the CMP Pits. As such, it is recommended the CSM figure extend the ground surface elevation line further to the south to illustrate the slope of the hill or knoll where the CMP Pits are located.
6. **Figure 6, Regional Water Table Potentiometric Surface, Page 39 of 104:** It is unclear if the potentiometric surface depicted on the figure is representative of current water table elevations and flow directions. For example, according to the figure legend, the potentiometric surface depicted on the figure is based on water table elevation data collected during the second quarter 2017. Considering above average rainfall and monitoring wells showing a slight increase in water elevations during 2020, it is recommended the figure be updated with the most recent water table elevation data. Please revise the figure to address this issue.
7. **Figure 7, 2020 Potentiometric Surface for the TZ and MAZ, Page 41 of 104:** The potentiometric surface depicted for the TZ and the MAZ does not include southerly flow direction arrows. According to the water levels shown for the individual wells, a southerly flow direction from the CMP Pits is indicated. Please revise the figure to include groundwater flow direction to the south away from the CMP Pits.