REGION 4
ATLANTA, GA 30303

July 1, 2025

ENVIRONMENTAL COMPLIANCE &

JUL - 1 2025

AREA COMPLETION PROJECTS

Mr. Matthew Baker, SRS Remedial Project Manager
Remediation and Deactivation & Decommissioning Division
U.S. Department of Energy
Savannah River Operations Office
P.O. Box A
Aiken, South Carolina 29802

EPA Comments: **GROUNDWATER REPORT FOR THE P-AREA GROUNDWATER (PAGW) OPERABLE UNIT (OU) (U), APRIL 2023 THROUGH MARCH 2024 DATA SEMS NUMBER: 81, SRNS-RP-2024-01436, REVISION 0, FEBRUARY 2025, SAVANNAH RIVER SITE**

Dear Mr. Baker,

The U.S. Environmental Protection Agency, Region 4 (EPA), has reviewed the Groundwater Report PAGW OU for the April 2023 through March 2024, Feb. 2025. Our comments are attached:

If you have any questions or require additional information, please contact me at (404) 431-1340.

Sincerely,

JON RICHARDS
Digitally signed by JON RICHARDS
Date: 2025.07.01 10:05:03 -04'00'

Jon Richards
FFA Remedial Project Manager
Superfund & Emergency Management Division

ec: C.L. Bergren, SRNS-ACP
Susan Fulmer, SCDHEC

GENERAL COMMENTS

1. The Groundwater Report states that the groundwater in the Lower Aquifer Zone (LAZ) does not currently discharge to surface water based on the depth below ground surface relative to surface water elevations and recent data from shallow well points PSC005 and PSC006. However, it is unclear why PSC005 and PSC006 are referenced, as these wells are located downstream from where the shallow plumes in the Upper Aquifer Zone (UAZ) are discharging to the surface water (i.e., at PSC003 and PSC004) as shown on Figure 17 (Upper Aquifer Zone Tritium Plume for the P-Area Groundwater Operable Unit) and Figure 31 (Upper Aquifer Zone Trichloroethylene Plume for the P-Area Groundwater Operable Unit). In addition, Figure 19 (Cross-Section of the Tritium Plume in P Area) and Figure 33 (Cross-Section of the Trichloroethylene Plume in P Area) indicate the downgradient extent of the plumes in the LAZ are unknown, as samples were not collected from the LAZ at monitoring well PSC003. *Please revise the Groundwater Report to clarify how shallow wells PSC005 and PSC006 support the conclusion that the LAZ is not discharging to surface water, and discuss how the extent of the downgradient plumes in the LAZ have been delineated in the vicinity of Steel Creek.*

2. The Groundwater Report figures of the tritium and trichloroethene (TCE) plumes (e.g., Figure 17, Upper Aquifer Zone Tritium Plume for the P-Area Groundwater Operable Unit) should show where the plume boundaries are inferred (e.g., using a dashed line for the plume extent). For example, the tritium plume at the P Reactor Area in the UAZ is not delineated to the south, as there are no wells directly downgradient to well PGW018C (49.3 picocurie per milliliter [pCi/mL]) and side-gradient to well PGW028DU (310 pCi/mL). Therefore, the extent of the UAZ tritium plume is inferred to the south. As another example, Figure 38 (Lower Aquifer Zone Trichloroethylene Plume for the P-Area Groundwater Operable Unit) should indicate the downgradient extent of the TCE plume is inferred (e.g., along Steel Creek). *Please revise the figures in the Groundwater Report to indicate where the plume boundaries are inferred.*

3. The Groundwater Report does not include a data usability assessment for the groundwater results collected between April 2023 and March 2024. It is unclear if the groundwater results were validated, and if all planned samples were successfully collected (i.e., the completeness of the data set). *Please revise the Groundwater Report to include a data usability assessment, if its available, for the groundwater results discussed in this monitoring report or provide a reference to where this information can be found.*

4. Some of the figures in the Groundwater Report do not include the monitoring well identifications. For example, Figure 23 (Lower Aquifer Zone Tritium Plume for the P-Area Groundwater Operable Unit) does not include labels with the well identifications in addition to the tritium concentrations reported. Also, the figures showing the potentiometric surfaces do not include well identifications. *Please revise the Groundwater Report figures to include well identifications in addition to the other data reported.*

SPECIFIC COMMENTS

1. **Section 3.3.1.1, Upper Aquifer Zone, Page 9 of 104:** The text identifies well P003L as a well with decreasing tritium concentrations since 2007, but Figure 21 (Time-Series Plot for Tritium at Upper Aquifer Zone Wells in the Vicinity of the P-Area Reactor Building Complex) indicates tritium was not detected until 2019. In addition, an increase in tritium concentrations after 2014 is discussed on the next page as a source of vertical migration of the tritium plume. *Please remove well P003L from the list of wells with decreasing tritium concentrations since 2007.*

2. **Section 3.3.1.1, Upper Aquifer Zone, Pages 9 to 10 of 104:** This section does not discuss the downgradient wells in the tritium plume. For example, it is unclear whether tritium concentrations in wells PGW018C and PGW028DU are increasing or decreasing. In addition, data gaps exist as there are no additional wells to the south of these plume wells to delineate the extent of the plume. *Please revise Section 3.3.1.1 to discuss the*

downgradient plume wells and any trends in these tritium concentrations, including if additional wells are needed to delineate the extent of the plume.

3. **Section 3.3.1.2, Lower Aquifer Zone, Page 11 of 104:** The text states that the tritium plume in the LAZ is bounded to the northeast by monitoring well PGW024B and to the northwest by monitoring wells PRB005C and PGW025B, but these wells are located within the plume boundary. The bounding wells should be located outside the plume to the northeast and northwest. Based on Figure 23 (Lower Aquifer Zone Tritium Plume for the P-Area Groundwater Operable Unit), there are wells located to the north, but no wells are located east of well PGW024B and west of well PGW025B, which has shown an overall increasing trend in tritium concentrations. *Please revise Section 3.3.1.2 to discuss how the tritium plume is delineated based on the wells and plume configuration shown on Figure 23.*

4. **Section 3.3.1.2, Lower Aquifer Zone, Page 11 of 104:** The text notes the detection of tritium at well PGW026C (36.1 pCi/L) exceeds the maximum contaminant level (MCL) and is independent of the plumes in the LAZ, but further discussion is not provided. It is unclear if tritium has previously exceeded the MCL at this location or if an increasing trend in tritium concentrations is evident at this well. *Please revise the text to discuss whether the tritium has previously exceeded the MCL at well PGW026C and if there is an increasing trend in tritium concentrations at this well.*

5. **Section 3.3.1.3, Gordon Aquifer Unit (GAU), Page 12 of 104:** The text discusses monitoring wells installed at the same depth and surrounding well PSB002AA to constrain the extent of tritium contamination in the GAU, but it is unclear why no wells are located to the south and southwest of PSB002AA as shown on Figure 26 (Gordon Aquifer Unit Tritium Plume for the P-Area Groundwater Operable Unit). Figure 16 (Gordon Aquifer Unit Potentiometric Surface for the P-Area Groundwater Operable Unit) indicates groundwater in the GAU flows to the south from the P Reactor Area. *Please revise the text to discuss the apparent data gap in the lateral extent of contamination downgradient of well PSB002AA.*

6. **Section 3.3.1.4, Surface Water, Page 13 of 104:** The ten shallow monitoring wells were installed at five locations based on Figure 28 (Surface Water and Shallow Well Locations for Tritium Plume Impact), but the text does not discuss the difference between the two wells installed at each location (e.g., if they were installed at different depth levels). For example, it is unclear why well PSC004D1 had elevated tritium (374 pCi/mL) compared to PSC004D2 (1.03 pCi/mL) while PSC003D2 had elevated tritium (190 pCi/mL) compared to PSC003D1 (4.67 pCi/mL). *Please revise this section to clarify the difference between the well pairs screened interval and discuss the difference in tritium concentrations found at each well pair.*

7. **Section 3.3.2.1, Upper Aquifer Zone, Pages 13 to 15 of 104:** This section does not discuss TCE concentration trends in several wells in the vicinity of the source area and in the distal area. For example, well PGW025C is located north of the source area wells PAO001DU and PAO002DL, and it is unclear if TCE concentrations are increasing or decreasing. Also, well PMP004DL had the second highest concentration of TCE at 4,480 micrograms/liter (ug/L) shown on Figure 34 (Upper Aquifer Zone Trichloroethylene Plume at Potential Source Area 3A). It is unclear why the elevated TCE concentration at PMP004DL is shown to be separate from P003L. In the distal area, it is unclear why only wells PGW026DL and PGW014DU are discussed, since PGW035C also has elevated TCE concentrations, and trends in downgradient wells (e.g., PGW027DU and PSC004D2) should also be assessed for plume migration. *Please revise the text to discuss these wells at the potential source area and distal plume area.*

8. **Section 3.3.3.1, PCE Exceedance, Page 18 of 104:** It is unclear if the extent of the hot spot of tetrachloroethene (PCE) contamination at monitoring well PGW034DL is being monitored. According to the text, previous investigations delineated the extent of the PCE plume at this location outside of P Area. However, based on Figure 44 (Upper Aquifer Zone PCE "Hot-Spot" at Groundwater Monitoring Well PGW034DL), there are no wells within 500 feet of the plume at PGW034DL to monitor potential plume

migration. *Please revise Section 3.3.3.1 to discuss how the extent of the PCE plume at well PGW034DL is monitored.*

9. **Figure 17, Upper Aquifer Zone Tritium Plume for the P-Area Groundwater Operable Unit, Page 41 of 104:** The locations of some of the wells are difficult to determine and the color shading does not correlate to the concentrations of tritium reported. For example, it is unclear where well PMP008DL (3.16 pCi/L tritium) is located, as a red dot is not visible near this label. A red dot is not visible for well P003U (7.99 pCi/L tritium) as well. It is also unclear if well P002U (11.7 pCi/L) is the red dot to the right of the label located in the purple shading, as this color represents tritium concentrations 100 to 499 pCi/L. As another example, well PDB 4 has a tritium concentration of 124 pCi/L, but appears to be located within the yellow shading, which represents concentrations of tritium between 20 to 99 pCi/L. *Please revise Figure 17 to ensure all well locations are clearly identified and in the correct shading for concentrations of tritium reported.*

Additional GW comments:

1. Elevated TCE detected in monitoring wells close to Steel Water Creek

There are five MW clusters located on the east bank of Steel Water Creek: PSC-002, PSC-003, PSC-004, PSC-005, and PSC-006, as shown in Figure 6 below. The TCE levels detected in four of the MW clusters, highlighted in turquoise in Figure 6, are below the maximum clean-up level (MCL) of 5 ug/L, and there is no trend or a decreasing trend for TCE in these MW clusters.

However, one MW, specifically PSC-004-D2 from PSC-004, is highlighted in pink, has shown an increasing trend of elevated TCE levels since 2018. Furthermore, this MW (PSC-004-D2) has a comparable screen interval to PSC-004-DA, both are approximately 230-233 ft above mean sea level (amsl). *It is recommended that further evaluation be conducted regarding this potential increase for TCE.*

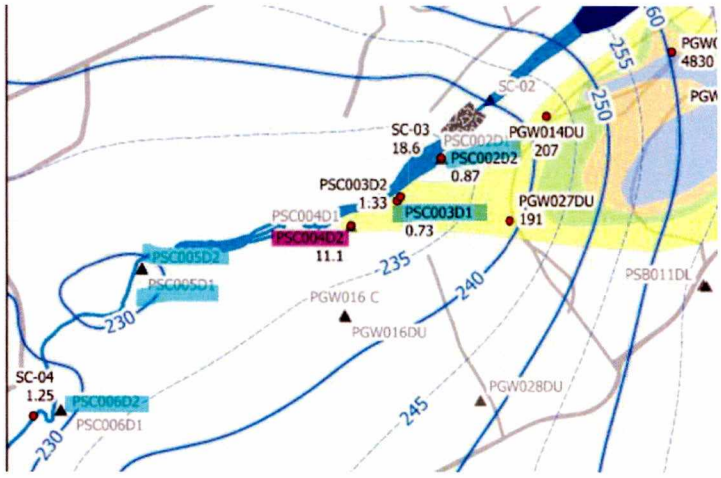

Figure 6. MW clusters that are located on the east bank of Steel Water Creek. The MWs with no trend

or a decreasing trend of TCE are highlighted in turquoise, while the MWs with an increasing trend of elevated TCE are highlighted in pink.

2. Current status and future plan for source area PSA-3B

The Report identifies two potential source areas for TCE and PCE: PSA-3A and PSA-3B. In 2011, In Situ Chemical Oxidation (ISCO) was conducted in the source area of PSA-3A, which successfully reduced TCE levels in groundwater. In 2019, a ZVI PRB was selected as the remedy for PSA-3B. However, as shown in Figures 7 and 8

below, the ZVI PRB is located further downgradient of the PSA-3B source area. *It is recommended that additional treatment be considered in this area of the Site.*

Moreover, the elevated TCE levels in MW cluster PGW-031-B/C show an increasing trend. This MW cluster is located upgradient of PSA-3B. *It is recommended to investigate this area for potential increased TCE concentration since 2021.*

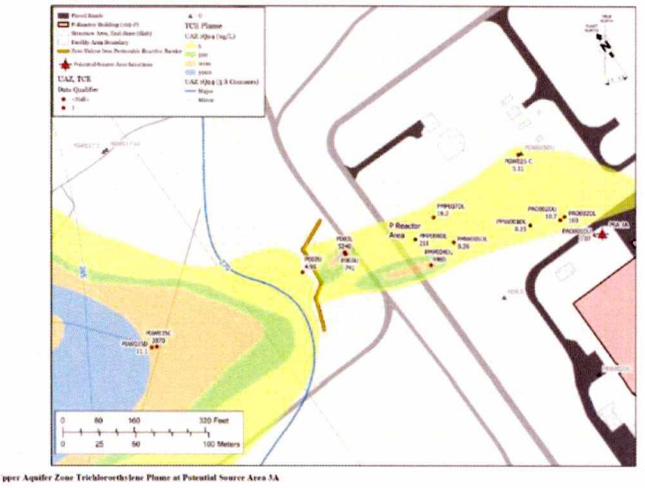

Figure 7. Location of ZVI PRB

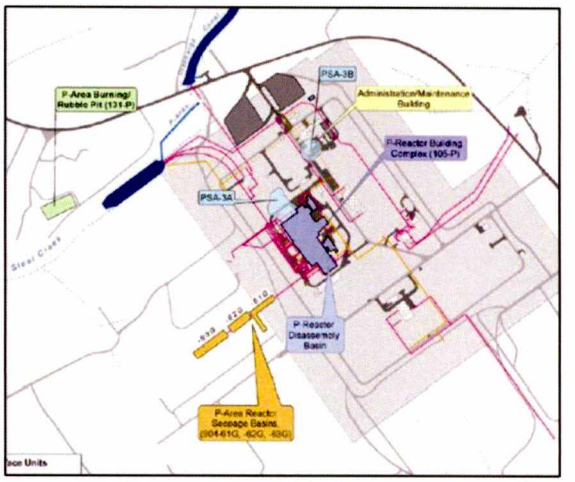

Figure 8. Location of source areas and P area

3. Additional recommendation

It is recommended to include monitoring data and trend lines for the monitoring wells (MWs) located downgradient from the PRB in future reports submitted to EPA for evaluation. This should encompass data from the following MW clusters: PRW-002, PRW-004, PRW-005, PRW-006, and PRW-007.

Additionally, include detailed construction information for MWs, such as the depth of screen intervals in the unit of "feet below ground surface".

4. *General observations: extension of TCE plume down gradient of PRB in P area – no response required unless any clarification needed below:*

The site has trichloroethylene (TCE) as one of the contaminants of concern (COC). The TCE plume located down gradient of the zero valent iron (ZVI) permeable reactive barrier (PRB) in P area has extended into the top two aquifers: the upper aquifer zone (UAZ) and the lower aquifer zone (LAZ). It may also continue to extend horizontally within the upper aquifer zone along the edge of the plume.

As shown in the clipped map, four monitoring well (MW) cluster locations—PGW-014, PGW-026, PGW-027, and PGW-035—are highlighted in orange. The trend of elevated TCE concentration from the start of groundwater monitoring to 2024 has been assessed. Table 1 summarizes the evaluated information, and Figures 2 to 5 provide clipped images for trend analysis of these four MWs.

Table 1. Trend analysis for four MWs in the TCE plume

MW cluster	MW-ID	Trend	Plume migration potential	Spatial location in the TCE plume	Aquifer designation	Screen zone (ft amsl)	Groundwater monitoring period
PGW-014	PGW-014-B	No trend	Plume extended and increasing in both upper and lower aquifers	Northwest edge of TCE plume	LAZ	123-133	2003-2024
	PGW-014-C	increase			LAZ	178-188	
	PGW-014-DU	Increase since 2016			UAZ	203-213	
PGW-026	PGW-026-B	No trend since 2019	Plume extended to both aquifers	Center area of the plume	LAZ	122-132	2011-2024
	PGW-026-C	No trend			LAZ	152-162	
	PGW-026-DL	No trend			UAZ	197-207	
PGW-027	PGW-027-C	No trend	Plume extended to both aquifers, increasing in the upper aquifer zone	Southwest edge of TCE plume	LAZ	148-158	2011-2024
	PGW-027-DL	No trend			LAZ	170-180	
	PGW-027-DU	increase			UAZ	205-215	
PGW-035	PGW-035-C	No trend	Plume extended to both aquifers, decreasing in the upper aquifer	Center area of the plume	LAZ	187-197	2018-2024
	PGW-035-D	decrease			UAZ	237-252	

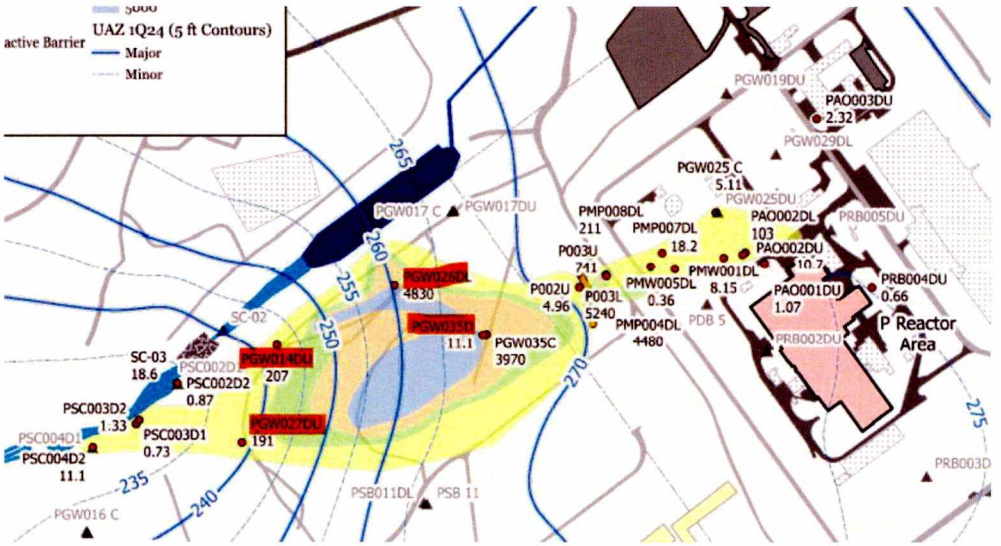

Figure 1. Groundwater monitoring network in P area, and elevated TCE concentrations for the 2023-2024 monitoring period. The four MWs selected for trend evaluation are highlighted in orange.

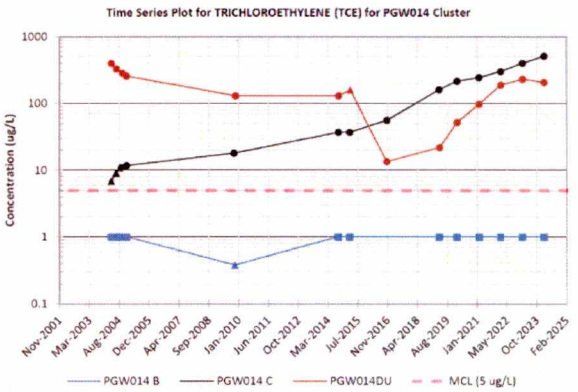

Figure 2. PGW-014 well cluster trend

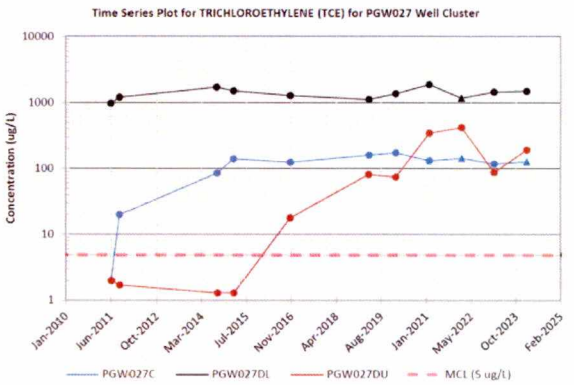

Figure 3. PGW-027 well cluster trend

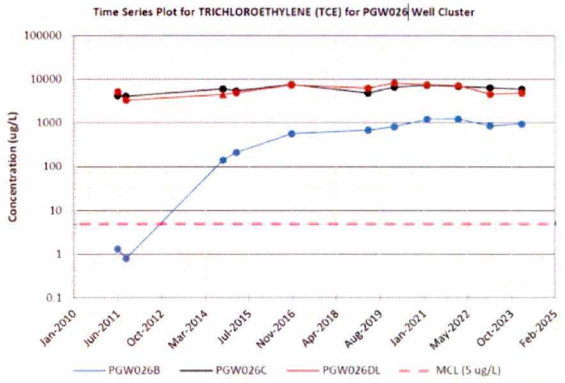

Figure 4. PGW-026 well cluster trend

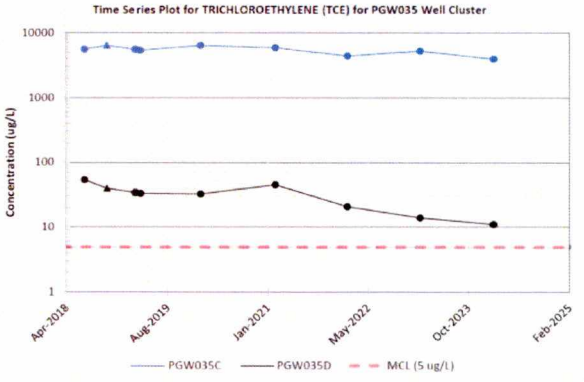

Figure 5. PGW-035 well cluster trend