Department of Energy
Savannah River Operations Office
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MAY - 6 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 Groundwater Report for the P-Area Groundwater (PAGW) Operable Unit (OU) April 2019 through March 2020 Data (SRNS-RP-2020-00621, Revision 0, October 2020) SEMS Number: 81

The U.S. Department of Energy (DOE) is submitting the enclosed responses to regulatory comments for your review. The South Carolina Department of Health and Environmental Control (SCDHEC) approved and the U. S. Environmental Protection Agency (EPA) provided comments on the Revision 0 document on February 3, 2021 and February 26, 2021, respectively. This report will not be revised; however, all comment responses will be included and/or addressed in the next data report, as applicable. Please review the information and provide your response within thirty (30) days of receipt. The effort and time that the EPA and the SCDHEC have provided on this 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: 2021.05.05 17:15:30 -04'00'

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

IACD-21-136

Enclosure:
SRS Responses to the U. S. Environmental Protection Agency's Comments on Groundwater Report for the P-Area Groundwater (PAGW) Operable Unit (OU) (U) April 2019 Through March 2020 Data, SEMS Number: 81, SRNS-RP-2020-00621, Revision 0, October 2020

cc w/o encl:
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B. Cameron, SCDHEC–Aiken Environmental Affairs Office
K. L. Beatty, SCDHEC–Aiken Environmental Affairs Office
R. H. Pope, EPA-Atlanta

cc w/encl:
J. Tufts, EPA-Atlanta
M. McRae, TechLaw, Inc.

USEPA Comments Received February 26, 2021

GENERAL COMMENT

1. Based on the data presented in the Groundwater Report for the P-Area Groundwater (PAGW) Operable Unit (OU) (U) April 2019 Through March 202 Data, SEMS Number: 81, SRNS-RP-2020-00621, Revision 0, dated October 2020 (the Report), the current monitoring well network for the lower aquifer zone (LAZ) and Gordon Aquifer (GA) appear to be inadequate. Data gaps have been identified in the LAZ and GA monitoring well networks resulting in uncertainty in the delineation of the vertical and lateral extents of groundwater contamination. For example, the following data gaps in the monitoring network were identified:

    - The lateral extent of tritium contamination is poorly defined in the GA at wells PSB002AA and PSB002AL. For example, as seen in Figure 32. Gordon Aquifer Tritium Plume for the P Area Groundwater Operable Unit, GA wells PSB002AA and PSB002AL measured tritium at a concentration of 5680 pCi/mL and 47 pCi/mL, respectively. However, since no monitoring wells are located downgradient of PSB002AA and PSB002AL the lateral extent of tritium contamination in the GA is unknown.

Response: Clarification

SRS believes monitoring in P Area is sufficient to provide long-term monitoring of the groundwater plumes. As previously discussed in Core Team meeting in 2013 and 2017 and documented in the 2013 Sampling and Analysis Plan (SAP), a groundwater investigation effort in 2010/2011 was completed to address groundwater data gaps which included delineation of horizontal and vertical groundwater contaminant extent in the Upper Aquifer Zone (UAZ), Lower Aquifer Zone (LAZ), and Gordon Aquifer (GA) (SRNS 2011). Specifically, this investigation led to detections of tritium in the LAZ, Gordon Confining Unit (GCU), and GA at the P-Area Reactor Seepage Basins. Detection of tritium was limited to the PSB 2 well cluster. The extensive investigative effort from 2010/2011 is illustrated in Figure 1 for direct push technology (DPT), cone penetrometer technology (CPT) and Isoflow locations. Figure 2 depicts installed monitoring wells completed as an outcome of the investigation. In the 2013 scoping meeting, this finding was discussed, and a SAP was developed to further address this data gap. Field work in support of the 2013 SAP included sampling at three GA locations in the vicinity of PSB 2, installation of three GA monitoring wells, and retrofitting of PGW03A to monitoring well status (SRNS 2013). Figure 3 presents the locations of the 2013 SAP investigations. In January 2017, a scoping meeting was held to discuss the completeness of the 2013 SAP and it was agreed that work was complete, and no further investigation was warranted (SRNS 2017).

The 2010/2011 and 2013 groundwater investigations found no evidence of tritium in the GA beyond the PSB 2 well cluster. Sampling at newly installed wells in the GA also found no evidence of tritium. Therefore, the extent of tritium contamination in the GA is localized around the PSB 2 well cluster, with future monitoring of the existing GA network to continue.

No page changes are suggested in the document.

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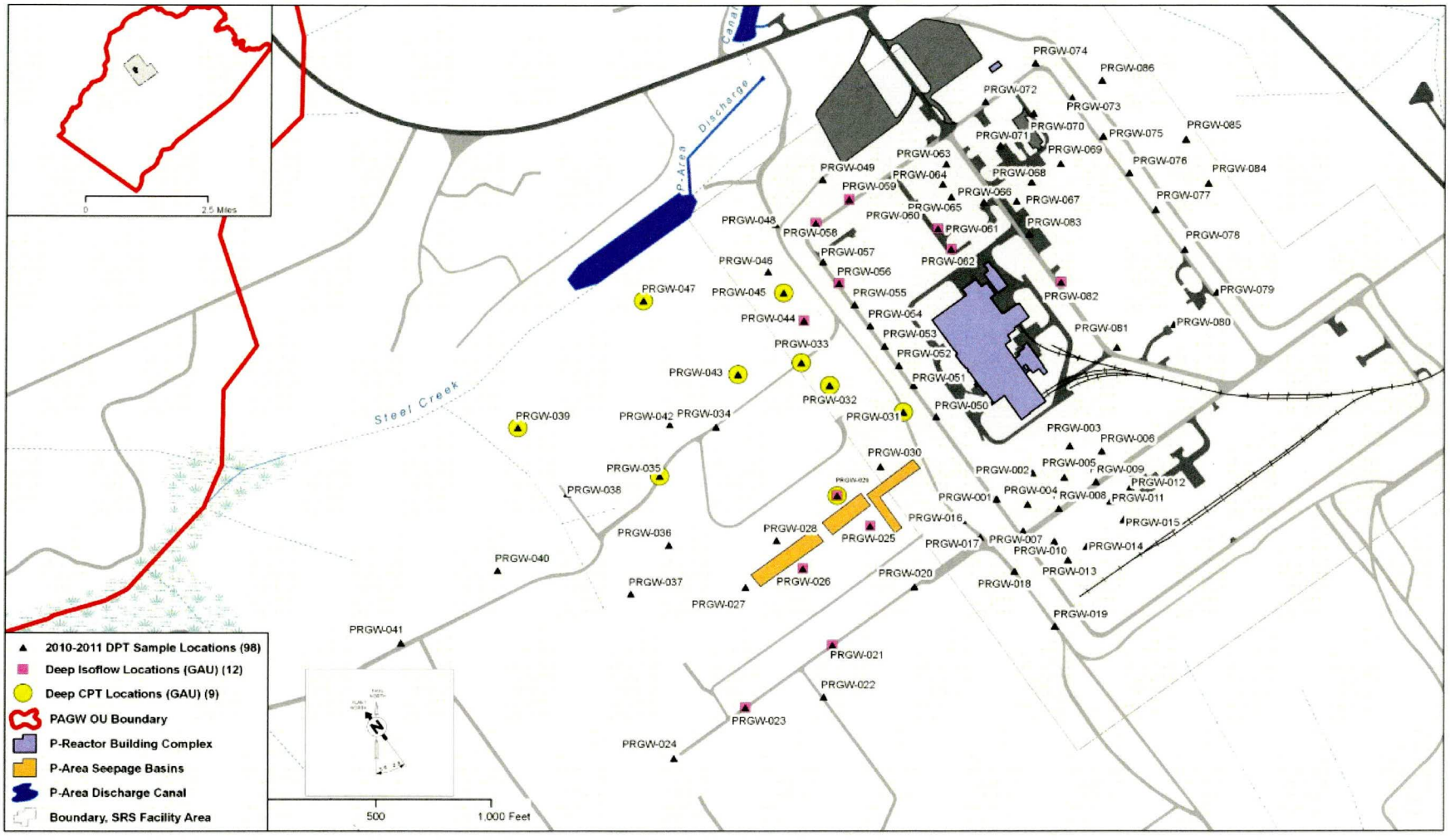

Figure 1. DPT, CPT, and Isoflow Locations for the 2010/2011 Investigation of PAGW OU

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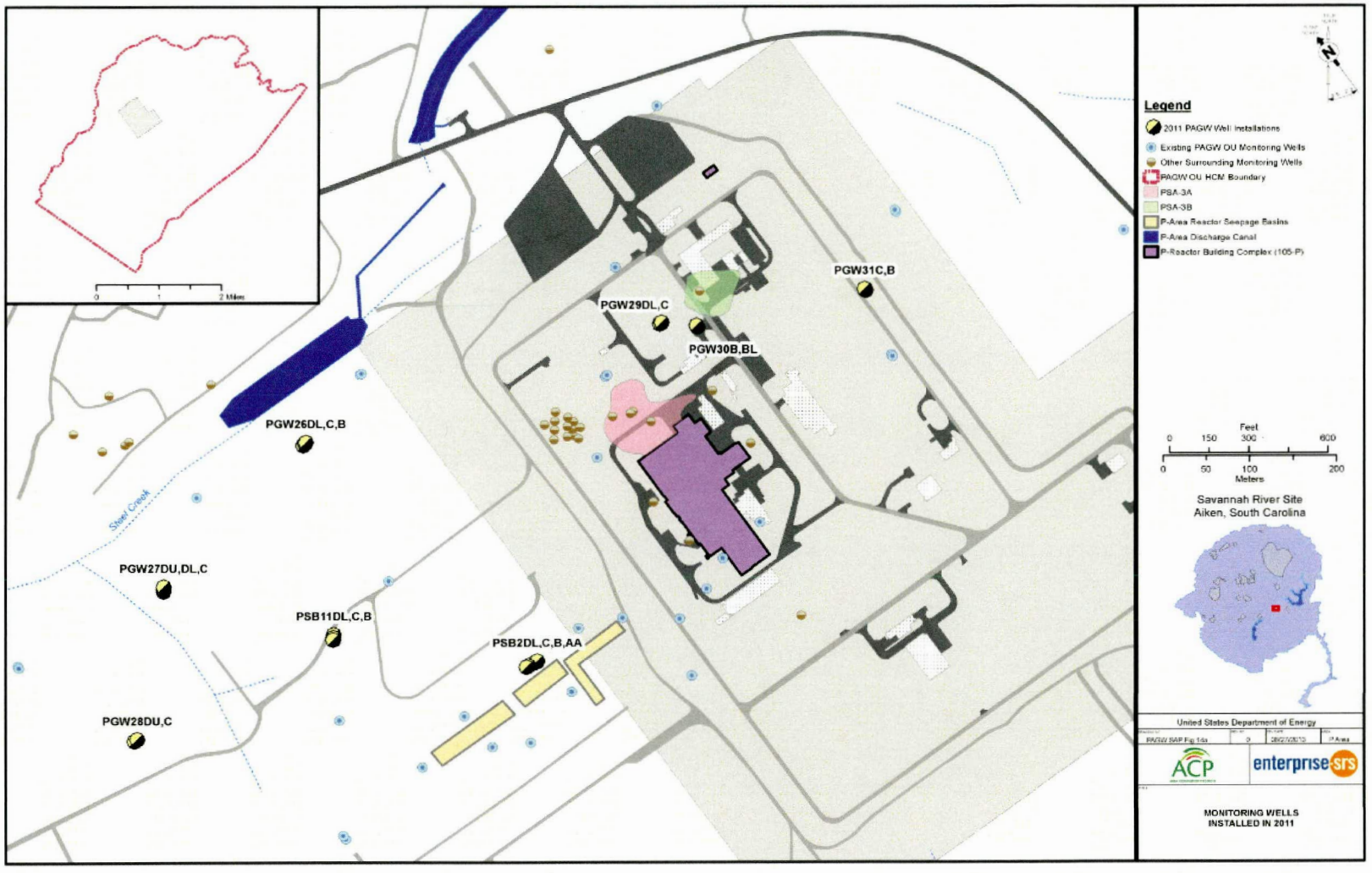

Figure 2. Monitoring Well Locations Installed During the 2010/2011 Investigation of PAGW OU

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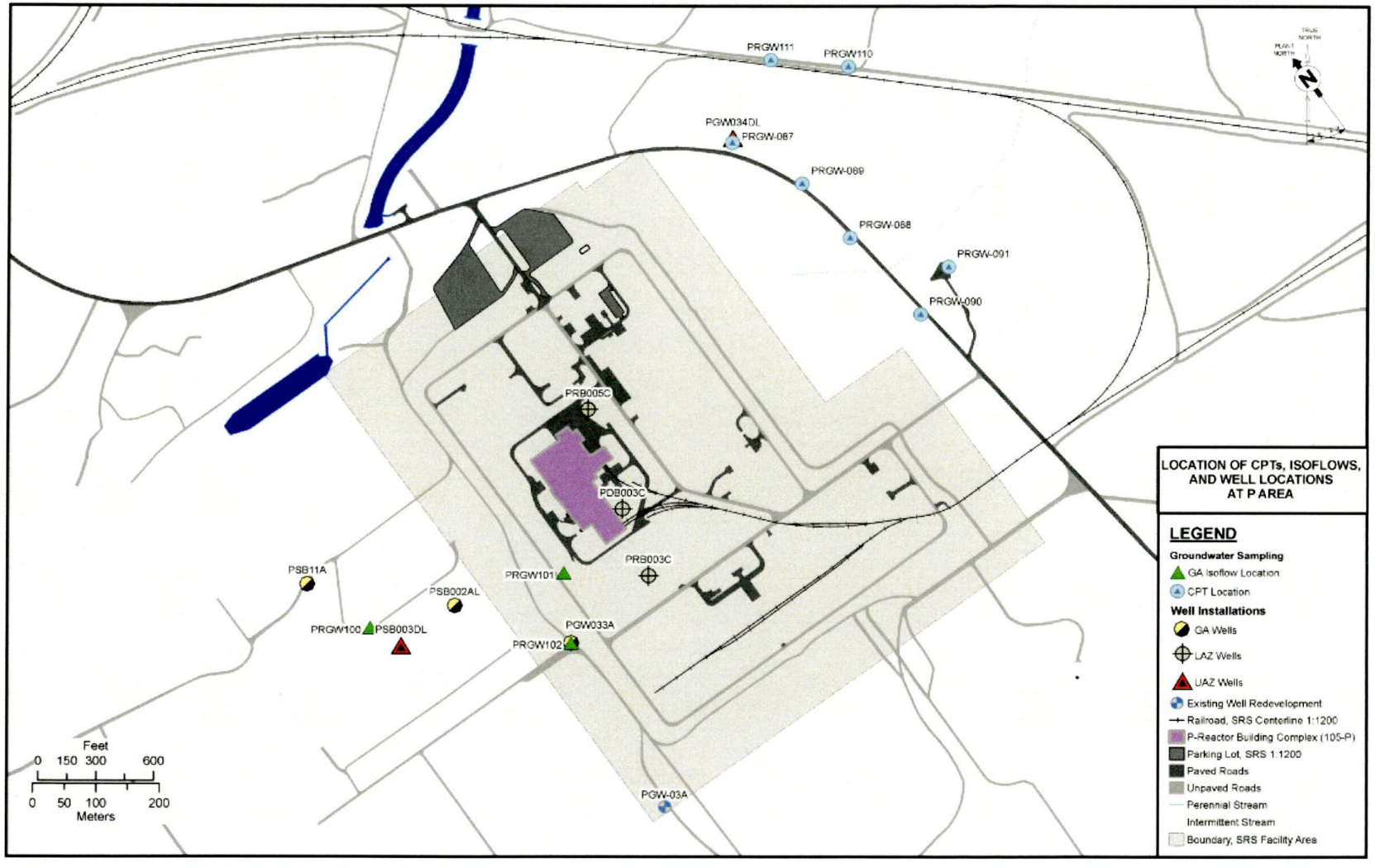

Figure 3. Investigation Locations as Part of the 2013 SAP in the PAGW OU

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- The vertical extent of trichloroethylene (TCE) contamination is not defined at LAZ well PGW027C. As seen in Figure 38. Cross-Section of the Trichloroethylene Plume in P Area, TCE was measured at 173 micrograms per liter (µg/L) in PGW027C; however, no wells are monitored deeper than PGW027C to define the vertical extent of TCE contamination in the LAZ. Additionally, increasing TCE concentration trends are noted for LAZ wells PGW027C and PGW026B as seen in Figure 45. Time-Series Plots for Trichloroethylene at Distal Area Wells in the Lower Aquifer Zone.

Response: Clarification

SRS believes the proposed data gap of vertical TCE extent in the LAZ has been addressed through previous and most recently completed investigations and ongoing groundwater monitoring. Groundwater investigation in 2010/2011 included CPT and DPT sampling of the distal portion of the VOC and tritium groundwater plumes (SRNS 2011) (Figure 1). As an outcome, 21 new groundwater monitoring wells were installed to monitor the groundwater plumes. In addition, the 2018 SAP Addendum for the PAGW OU included multiple soil borings to investigate the extent of groundwater contamination in the elbow and distal portion of the VOC plume as depicted in Figure 4 (SRNS 2018). The 2018 SAP soil borings provided depth-discrete sampling in the vicinity of PGW027 and beyond towards the PGW016 well cluster. Findings of the 2018 SAP investigation show that TCE contamination does not extend to PEB001SB or PEB002SB borings, which are downgradient from PGW027. The findings were presented in a July 2020 data review meeting (SRNL 2020). Vertical extent of contamination has been investigated previously and the TCE plume is bounded by soils data combined with current groundwater monitoring. Additionally, existing monitoring well cluster PGW016 is down gradient of the PGW027 monitoring well cluster and no detection of groundwater contaminants have been observed.

No page changes are suggested in the document.

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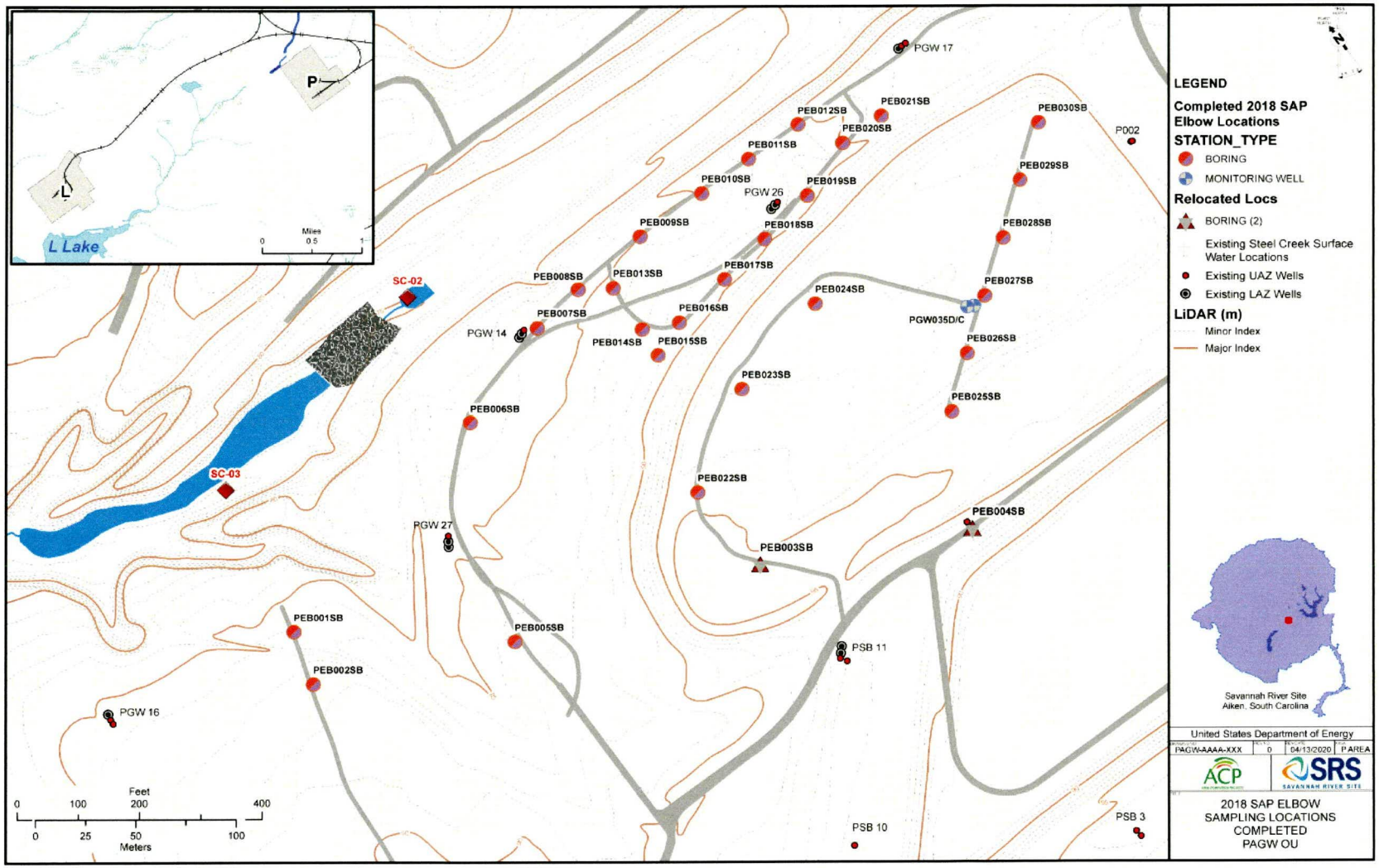

Figure 4. Soil Boring Locations in Support of the 2018 SAP Investigation of the PAGW OU

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The Report states the overall objective of the monitoring at PAGW OU is to assess the state of groundwater contamination in the unit for future response actions. It is currently unknown whether LAZ and/or GA wells exist that are not currently being monitored, that could be used for future monitoring to address the identified data gaps and uncertainties. If no existing monitoring wells are available, then additional monitoring well installation will be warranted to adequately characterize groundwater contamination in the PAGW OU. Please revise the Report to address these data gaps to ensure the noted uncertainties in the LAZ and GA are adequately addressed in support future response actions.

The general comment was addressed in parts above. SRS believes previous investigations of the PAGW OU completed to date are extensive and have adequately determined the extent of tritium contamination in the GA. Tritium contamination in the GA is restricted to the area surrounding the PSB 2 well cluster. No detections of tritium were observed in depth-discrete samples collected as part of previous investigations or in currently monitored GA wells. SRS also believes completed investigations to date of the PAGW OU have adequately delineated the TCE plume in the LAZ near Steel Creek. The most recent work completed as part of the 2018 SAP Addendum delineated the vertical and horizontal extent of groundwater contamination near Steel Creek. Based on the existing monitoring well network and previous investigations, SRS believes additional monitoring is not necessary at this time. No page changes are suggested in the document.

Responsible Party: Adam Willey, (803) 646-4944, adam.willey@srs.gov

USEPA Comments Received February 26, 2021

SPECIFIC COMMENTS

1. **Section 2.1.5, PAGW OU NTC Removal Action, Pages 4-5 of 90:** The assertion regarding the effectiveness or expected performance of the ZVI-PRB non-time critical removal action (NTCRA) is currently not supported through an assessment of the groundwater monitoring data. For example, the text in the first paragraph states "The ZVI-PRB intersects the cVOC plumes at the Neck Area, essentially cutting off down-gradient migration of cVOC contaminants from the Source Area. Contaminated groundwater that comes in contact with the ZVI-PRB by groundwater flow through the permeable barrier, is remediated and clean groundwater flows down-gradient." However, the text further states "Monitoring and assessment of the ZVI-PRB performance is conducted in accordance with the ZVI-PRB Effectiveness Monitoring Plan and will be discussed in the annual NTC RA Effectiveness Monitoring Report (EMR)." Since no effectiveness evaluation of the data was presented in the Report, please revise the text to clarify that it is currently unknown whether the ZVI-PRB is cutting off downgradient migration of chlorinated volatile organic compound (cVOC) contaminants from the Source Area.

Response: Agree

The text in Section 2.1.5 will be revised in the Groundwater Report to be submitted in October 2022 to clarify it is currently unknown where the ZVI-PRB is cutting off downgradient migration of cVOCs from the Source Area. For 2021, SRS will send data summary tables only as specified in the 2018 SAP Addendum (SRNS 2018). The text in question will be revised as follows:

The ZVI-PRB intersects the cVOC plumes at the Neck Area and is intended to cut off down-gradient migration of cVOC contaminants from the Source Area. Conceptually, contaminated groundwater that comes in contact with the ZVI-PRB by groundwater flow through the permeable barrier will be remediated and clean groundwater will flow down-gradient. Performance of the ZVI-PRB has not been assessed as of this report and therefore, effectiveness of the technology in P Area is currently unknown. Monitoring and assessment of the ZVI-PRB performance is conducted in accordance with the ZVI-PRB Effectiveness Monitoring Plan and will be discussed in the annual NTC RA Effectiveness Monitoring Report (EMR).

No changes to the 2020 PAGW Groundwater Report are proposed.

Responsible Party: Adam Willey, (803) 646-4944, adam.willey@srs.gov

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2. **Figure 12. Upper Aquifer Zone Potentiometric Surface for the P-Area Groundwater Operable Unit, Page 31 of 90:** Steel Creek is not clearly identified on Figure 12. For example, the identifier for Steel Creek on Figure 12 is not in the area of a surface water body. In addition, Steel Creek is not identified on the legend. Please revise Figure 12 to address these issues.

Response: Agree

SRS will revise Figure 12 to identify Steel Creek more clearly in the Groundwater Report to be submitted in October 2022. For 2021, SRS will send data summary tables only as specified in the 2018 SAP Addendum (SRNS 2018). No changes to the 2020 Groundwater Report are proposed.

Responsible Party: Adam Willey, (803) 646-4944, adam.willey@srs.gov

3. **Figure 32. Gordon Aquifer Tritium Plume for the P-Area Groundwater Operable Unit, Page 57 of 90:** The direction of groundwater flow is unclear based on the data presented on the figure. For example, the elevation of the minor contours are not defined; thus, the direction of groundwater flow is unclear based on the data presented on the figure. Please revise the figure to address this issue.

Response: Agree

SRS will revise Figure 32 to include the minor contour labels and groundwater flow direction in the Groundwater Report to be submitted in October 2022. For 2021, SRS will send data summary tables only as specified in the 2018 SAP Addendum (SRNS 2018). No changes to the 2020 Groundwater Report are proposed.

Responsible Party: Adam Willey, (803) 646-4944, adam.willey@srs.gov

4. **Figure 38. Cross-Section of the Trichloroethylene Plume in P Area, Page 67 of 90:** The relative aquifer zones and confining units have not been identified in the figure. Please revise the figure to clearly identify the aquifer zones and confining units depicted.

Response: Agree

SRS will revise Figure 38 to include the lithologic unit identities in the Groundwater Report to be submitted in October 2022. For 2021, SRS will send data summary tables only as specified in the 2018 SAP Addendum (SRNS 2018). No changes to the 2020 Groundwater Report are proposed.

Responsible Party: Adam Willey, (803) 646-4944, adam.willey@srs.gov

REFERENCES:

SRNS 2011. *Field Summary Report for Groundwater Pre-Characterization Activities at the P-Area Reactor Groundwater Operable Unit,* SRNS-RP-2011-00296, May 2011, Savannah River Nuclear Solutions, LLC, Savannah River Site, Aiken, SC.

SRNS 2013. *Sampling and Analysis Plan for the P-Area Groundwater Operable Unit (U),* SRNS-RP-2011-01284, Revision 1, September 2013, Savannah River Nuclear Solutions, LLC, Savannah River Site, Aiken, SC.

SRNS 2017. *Scoping Summary for the P-Area Groundwater Operable Unit (NBN) (U),* ERD-EN-2013-0009, May 2017, Savannah River Nuclear Solutions, LLC, Savannah River Site, Aiken, SC.

SRNS 2018. *Sampling and Analysis Plan Addendum for the P-Area Groundwater Operable Unit (U),* SRNS-RP-2018-00261, Revision 1, August 2018, Savannah River Nuclear Solutions, LLC, Savannah River Site, Aiken, SC.

SRNL 2020. *2018 Sampling & Analysis Plan Addendum Data Review (Steel Creek & Elbow Areas), P-Area Groundwater Operable Unit,* SRNL-L3220-2020-00009, July 2020, Savannah River National Laboratory, Savannah River Site, Aiken, SC. Transmitted Via Email on June 29, 2020.