



March 13, 2017

Mr. Griff Miller
LCDR, U.S. Public Health Service
Office of Pennsylvania Remediation
United States Environmental Protection Agency
Region III
1650 Arch Street
Philadelphia, PA 19103-2029

*Re: Response to EPA Comments on the Supplemental Remedial Investigation Report (Part 2)
Former York Naval Ordnance Plant
Springettsbury Township, York, Pennsylvania*

Dear Griff:

This letter provides responses to the United States Environmental Protection Agency (EPA) comments on the Supplemental Remedial Investigation Groundwater Report (Part 2) dated August 2016 for the former York Naval Ordnance Plant (fYNOP) located in York, Pennsylvania. The letter was prepared by Groundwater Sciences Corporation (GSC) on behalf of the fYNOP project team. We reserve the right to supplement the responses.

EPA's comments were provided in a letter addressed to Harley-Davidson dated January 27, 2017, and were reviewed and discussed during the meeting at GSC's Harrisburg, Pennsylvania office on January 31, 2017. Below is a listing of the comments followed by a response to each comment in *italicized font*.

1. Section 1.2.2, P. 9, top of page - for on-site soils, non-residential MSCs were used for direct contact. Does soil delineation extend to off-site (or property boundary) and indicate that delineation to residential screening level achieved at property boundary or beyond? Need institutional control which prevents future residential use of property. Screening should also include EPA RSLs, not just PADEP MSCs.

Soil delineation was reported in the December 1, 2009 Supplemental Investigation Soils Report by SAIC. There are two areas where soil delineation extended beyond the fYNOP Site property boundaries: 1) In the SPBA Sanitary Sewer Area, there is a limited area of contamination extending across the property line, see Figure 3.4-2 of the referenced report. Remedial options for this area will be evaluated as part of the Corrective Measures Study (CMS). 2) In Area B, located in the northwestern portion of the West Parking Lot

(WPL), see Figure 3.5-1 of the referenced report. Soil samples were collected on the railroad right of way.

The screening process included screening of EPA risk-based screening levels (RSLs) after screening for Pennsylvania Department of Environmental Protection (PADEP) medium specific concentrations (MSCs), as described in Section 3.1 (page 8) of the Soils Risk Assessment Former York Naval Ordnance Plant, dated March 2012, by GSC. This project is part of the One Cleanup Program and the PADEP MSCs apply for purposes of demonstrating attainment of cleanup standards. As part of the CMS, results of soil samples in this area will be screened for residential standards. Institutional controls which prevent future residential use of off-site property will be considered if necessary to demonstrate attainment. No changes to this section of the SRI (Part 2) report are proposed.

2. Section 1.2.3, Soils Risk Assessment (page 9) - text states that there were no unacceptable soil exposures at the site under current or future land use assumptions, and that the risk assessment demonstrated attainment of the site-specific standard for soils. This statement implies that exposure controls (pathway elimination) were needed (i.e., there were levels exceeding statewide health standards). Every engineering control relied upon for pathway elimination needs to be identified, mapped, and evaluated for effectiveness (as part of the CMS). These controls, if selected for a final remedy, will need to be covered by an enforceable institutional control. Media cleanup objectives for these remedies need to be stated. For example, are all soils which exceed a non-residential cleanup level mapped, covered or capped and subject to OM&M?

The fYNOP Team understands that engineering controls relied upon for pathway elimination in the Soils Risk Assessment need to be identified, mapped, and evaluated for effectiveness as part of the CMS, and that an institutional control (i.e., environmental covenant) will be required for both properties (East and West Campuses). Please note that the West Campus is already subject to a recorded environmental covenant that was recorded at the time of sale. That covenant will be reevaluated as part of the CMS if additional restrictions are required to demonstrate or maintain attainment of cleanup standards, they will be implemented. There are a few areas where soil MSCs were exceeded, e.g. between Eden Road and the WPL, that had soil cover only when the risk assessment was conducted. No changes to this section of the SRI (Part 2) report are proposed.

3. Section 3.6. 1, New Pumping Configuration (page 149) - The second bullet indicates the potential for Bldg58 groundwater to migrate southward under the new configuration (CW-8 off). Is this possibility being monitored?

The noted potential migration is being monitored. Monitoring wells to the south and west of the Bldg58 area were sampled for VOCs during the 2016 comprehensive groundwater sampling event. Groundwater levels were also collected. Analysis of groundwater samples from these wells will also be proposed for the 2017 comprehensive sampling event. The

information will be reported and considered during the CMS. No changes to this section of the SRI (Part 2) report are proposed.

4. Section 4 Conceptual Site Model - The description of Figure 4.0-4 indicates that Figure 4.02 shows the curved trace of this cross-section. Figure 4.02 is Section A-A' – the correct reference is Figure 4.0-1.

Acknowledged, this reference will be changed (Page 170).

5. Figure 3.1-19, Northern Property Boundary Area Monitored Shutdown Chemistry Data. The shading/contouring of TCE is not shown correctly for well MW-103S, which had detections above 50 in the 2015 result, yet is shaded as light blue instead of pink. The figure should indicate which well data is being considered in the contouring, for example MW-102D exceeds 100 ppb TCE, but the contouring/shading does not indicate that. The color is consistent with the detections at MW-102S, which implies that the contouring/shading represents shallow wells.

Acknowledged, shading and contouring on this figure will be reviewed and the suggested note added.

6. Figure 3.1-23, X-Section G-G' (also Appendix N, Figure 3, cross section B-B') - Well MW-110 should include a table of detections. The cross-section should color contour VOC data (as was done for Sections A-A' through D-D') to indicate concentrations in the limestone aquifer. Well MW-161 is shown as screened across the residuum/limestone interface, but the boring log for that well does not indicate that limestone was encountered.

This figure is from the SPBA vapor intrusion investigation report (GSC, July 2015) which was previously submitted and reviewed by EPA and PADEP. That report is attached to the GWRI (Part 2) as Appendix N, and provided sufficient information to characterize the shallow groundwater and the VI potential in the residential area south of the SPBA. However, it is acknowledged that this figure (cross section G-G') does not completely illustrate the geologic structure or the concentrations of VOCs in the deeper groundwater beneath the SPBA area. The text in this section of the SRI (Part 2) report will be revised and related figures redesigned or replaced to better explain the hydrogeology and groundwater chemistry at depth in the aquifer. Appendix N figures will not be edited.

7. Figure 3.1-23, X-Section F-F' (also Appendix N, Figure 3, cross-section A-A') – the sandstone on the western side is shown as ending with depth and underlain by limestone. This contradicts the geologic map which indicates the sandstone is older than the limestone. The geologic map indicates the area near MW-164 & 165 is the axis of a tight anticline, and the area further east centered on MW-161 is centered on a tight syncline. To be consistent with the geologic map, the sandstone on the western end of A-A' should be drawn as continuing with depth and connecting with the sandstone on the eastern end of the cross-section. This begs the question as to why MW-165 encountered limestone below the sandstone, which could be explained either as an overturned anticline, or as an unmapped

reverse fault. Also, the cross-section should color contour VOC data (as was done for Sections A-A' through D-D') to indicate concentrations in the limestone aquifer.

See response to Comment #6. The changes requested in this Paragraph 7 will be addressed in the revisions identified in response to Comment #6.

8. Figure 3.1-26 (and Plate 2) - The gray shaded area (PCE between 5 and 50 ppb) should be extended around wells MW-165 and MW-167.

Figures 3.1-25 (TCE concentration contours) and 3.1-26 (PCE concentration contours) and Plates 1 and 2, from which these figures were derived, did not incorporate the shallow groundwater chemistry from the SPBA vapor intrusion study due to a timing issue. These figures will be redesigned or replaced to incorporate the additional data.

9. Figures 3.1-37 through 3.1-45 should be expanded to cover the entire property, so that the SPBA area plumes are shown as well (although additional elevations above 310' will be needed).

These figures illustrate TCE, PCE, and cis1,2DCE concentration and piezometric contours at 3 different depths in the carbonate aquifer. They were constructed because there was sufficient data to support the construction of these maps, and relied on the multilevel sampling points and deep drilling that occurred in the Central Plant Area (CPA) and the Levee Area, which also supported the construction of numerous cross sections through the area, allowing three dimensional interpolation in that portion of the Site. GSC did not believe that sufficient data was available to extend the maps beyond the current figure limits or that such extension was necessary to demonstrate attainment of a cleanup standard and lack of vapor intrusion potential. Further consideration will be given to using available information to illustrate the distribution of COCs at depth in the SPBA area, either through additional maps or redesigned cross sections.

10. Figures 4.02, 4.03, and 4.04 - These sections show Dissolved Chlorinated Hydrocarbons in orange, and Dissolved Chlorinated Hydrocarbons Migrating with Groundwater in gray. What is the difference between the two (since both are dissolved phase) - is it just a concentration difference, or is something else implied?

The use of two colors on these figures was meant to differentiate between higher concentration dissolved phase partitioning from DNAPL sources into groundwater (orange) versus lower concentration groundwater with distance away from the sources (gray). We have observed higher concentrations of chlorinated hydrocarbons in the suspected release/source areas, and significantly lower concentrations a short distance (on the order of 50 feet) from the source. The use of two colors was to differentiate this concept of near source dissolved phase concentrations and significantly lower concentrations a short distance from the source area that were a result of groundwater advection (transport of dissolved VOCs by bulk groundwater movement). We will review the data supporting this concept and consider adding a note on the figures for clarification.

11. Figure 4.0-4, Conceptual Site Model Cross Section B-B' -The north end of this section extends approximately to the MW-92 location. The surface elevation there is shown on the cross-section as around 575', but the actual surface elevations there are more on the order of 475' (based on USGS topo contours shown in Figure 1.0-1). The surface elevation shown at the FYNOP property line is about 480 feet on the section, but is about 410 feet based on Figure 1.0-1.

Acknowledged, as with the other figures in the SPBA area (see response to Comment #6), this cross section will be redesigned or replaced to better illustrate the hydrogeology and groundwater chemistry at depth in this portion of the aquifer. While we acknowledge the discrepancy, the corrections do not alter the conclusions in the RI.

12. Figure 4.0-4, Conceptual Site Model Cross Section B-B' - This section does not show a residual soil VOC source above the water table, but MIPs data indicates a soil source may be present. The gray shading representing dissolved chlorinated hydrocarbons is disconnected between numbers 3 and 5.

Acknowledged, see response to Comment #11. The membrane interface probe (MIP) data was reviewed when the work plan for the shallow groundwater/vapor intrusion investigation in the SPBA was designed and approved by PADEP and EPA. There has been sampling in the SPBA area pursuant to approved work plans without definitive identification of a significant source area. While a residual soil VOC source may or may not be present, the Conceptual Site Model cross sections demonstrate what is known to exist in the area after extensive study. The data will be further reviewed and incorporated into the conceptual site model figures if changes are warranted based on that review.

13. Figure 4.01, Traces of Conceptual Site Model Cross Sections, and Figure 4.0-4, Conceptual Site Model Cross Section B-B' - The map and cross-section B-B' imply that the VOCs at former Cole Steel are sourced from the north and not from the SPBA, yet figure 3.1-27 (Detections of D&C Red #28 October 2014) clearly indicates the connection of the SPBA and the Cole wells. Figures 2.3-14 and 2.3-17 show the SPBA VOC plume more clearly connected to well MW-110. Plate 2 (Site-Wide PCE Plume Shallow Groundwater Chemistry) shows MW-110 disconnected from the SPBA PCE plume, yet they are actually connected via the carbonate aquifer.

Acknowledged, see responses to Comments #6 and #11. Diagrams will be developed to address the issues. Again, the development of the figures does not alter the conclusions in the RI. The connection between the site and MW-110 has been acknowledged, however depiction of the vertical gradient makes the development of the maps and cross-sections difficult, and GSC elected to not provide such diagrams to avoid confusion.

14. Figure 4.1-02 Epikarst Surface (Top of Bedrock) should be expanded to also cover the SPBA.

GSC believes sufficient data is not available to extend the map to show the epikarst surface features beyond the current figure limits; any further expansion would be unsupported extrapolation. Further consideration will be given to using available information to illustrate the hydrogeology and groundwater chemistry at depth in the SPBA area, either through additional maps or redesigned cross sections as discussed above.

15. Appendix H Well Logs - The logs for wells 126 through 156 include PID readings, but the logs for wells 161 through 175 do not. Was a PID used for screening for these wells but not recorded on the logs? If so, please add.

A photoionization detector (PID) was not used for screening of soil sample headspace at wells 161 through 175. This was discussed in the work plan for the SPBA shallow groundwater investigation that was approved by PADEP and EPA. The investigation was designed to characterize shallow groundwater VOC concentrations that potentially migrated from the source onsite; therefore PID headspace screening of vadose zone soil samples was not performed or necessary.

In addition, the following comments related to the Supplemental Remedial Investigations Soil Report are provided as they may impact the remedy selection process for some areas of the Facility moving forward:

16. The Supplemental Remedial Investigations Soil Report, December 1, 2009, includes MIPs data from the SPBA (Table 3.4-2), and indicate TCE and PCE in some of the borings to a depth of 15 feet (still above the water table) with the highest detections at the deepest samples. There was apparently no follow up soil analytical work done, so there is no way to assess soil to groundwater or direct contact pathways. It appears there is at least an on-going source to groundwater based on groundwater data, so the lack of soil data represents a data gap. Further characterization should be conducted to quantify risks and to determine whether a soil remedy is needed either for direct contact or to address an ongoing source to groundwater.

The results of sampling performed in the SPBA, including the MIPs and all other data will be reevaluated. If appropriate, a work plan will be prepared to further investigate potential sources of TCE and PCE in the on-site unsaturated soils in the SPBA area. Any such work plan would be submitted to EPA and PADEP for review prior to conducting any investigation. Any work plan will be completed as part of the design support for the CMS.

17. Supplemental Remedial Investigations Soil Report, December 1, 2009 - Figures 5-1 and 5-2 indicate samples collected west of west parking lot with surface soils exceeding direct contact and soil to groundwater screening levels - not included in risk assessments?

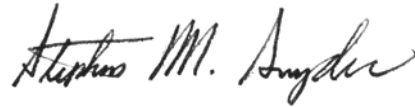
The results of the off-site sampling west of the western site boundary were not included in the Soils Risk Assessment. This area was excluded from the settlement agreement between the U.S. and Harley-Davidson. The sampling was performed for the convenience of EPA, and EPA followed up these samples with additional soil samples in this area. The area in

question is not part of the fYNOP site nor does it represent impacts from the site. Accordingly, the data was appropriately left out of the risk assessments.

The SRI (Part 2) Report will be revised as described herein and submitted in electronic format to EPA and PADEP. Upon approval by EPA, PADEP will be provided hard copies of the changed portions of the report.

We appreciate the opportunity to continue to work with the EPA on the fYNOP Site project. Please feel free to contact the undersigned at 717-901-8187 with any questions.

Regards,
GROUNDWATER SCIENCES CORPORATION



Stephen M. Snyder, P.G.
Senior Associate & Hydrogeologist

cc: Sharon R. Fisher, Harley-Davidson
Ralph Golia, AMO Environmental Decisions, Inc.
Hamid Rafiee, U.S. Army Corps of Engineers (USACE), Baltimore District
Kathy Horvath, PADEP
Pamela Trowbridge, PADEP