

 pennsylvania DEPARTMENT OF ENVIRONMENTAL PROTECTION	REPORT COMMENTS C. David Brown 20 Oct 2017	Commonwealth of Pennsylvania Department of Environmental Protection Southeast Regional Office Environmental Cleanup and Brownfields
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Site: Philadelphia Refinery AOI 2 3144 West Passyunk Avenue Philadelphia, PA 19145	eFACTS Facility ID: 778376	Tank Facility ID: 51-19781
	Incident ID: <i>multiple</i>	NIR Date: 14 Dec 2016
Municipality: Philadelphia	County: Philadelphia	Location: 39.9166°N, 75.1989°W

PA DEP comments on AOI 2 “Remedial Investigation Report” dated 20 Jul 2017, prepared by Langan Engineering and Environmental Services, Inc. on behalf of Evergreen Resources Group, LLC, for the former Sunoco Philadelphia Refinery, currently the Philadelphia Energy Solutions Refining and Marketing, LLC facility.

Soil

1. No soil characterization was performed in most of the AOI 2 land area. Almost no samples were collected in the northern area of buildings and parking lots, although this included the historic “batch stills and processed solvent mates” (Appendix B). Also, there were almost no samples from the active and historic operating units across the central and southern parts of AOI 2 (WWTP, crude unit, hydrocracker unit, reformer units, hydrogen desulfurization units, FCCU, and alkylation unit). In addition, very few samples were obtained along the network of pipelines throughout the site. Please explain why these potential source areas were not investigated.
2. Exceedances of the benzo(a)pyrene direct contact MSC were identified in shallow soil. EPA issued a new IRIS toxicological review of benzo(a)pyrene in Jan 2017. Evergreen might consider calculating a site-specific numerical value for benzo(a)pyrene or performing a risk assessment using the updated toxicological information.

Groundwater & LNAPL

3. The area of high groundwater elevations in the north appears to be centered on the WWTP. Has Evergreen considered whether this groundwater feature might be related to operations (leakage) at the plant? Should this possibility be investigated?
4. Please provide a shallow groundwater elevation map of AOI 2 and vicinity including synoptic data from the Philadelphia Gas Works facility.

5. The middle distillate LNAPL plume and shallow groundwater contamination in the northwest of AOI 2 has not been fully delineated to the west, adjacent to the Schuylkill River. Determining the horizontal extent of contamination is required by §250.408(e). DEP accepts that this additional delineation will be fully described in a future Act 2 report on groundwater fate-and-transport and surface water compliance.
6. Regarding the two new wells installed adjacent to the river in the northwest, please provide the following (prior to the fate-and-transport report):
 - Boring logs and well construction details
 - Two rounds of gauging data
 - Groundwater elevation contour maps for those two gauging events (for either all of AOI 2 or just the northwest area)
 - Analytical results from two sampling rounds.
7. Langan suggested that the “vertical wall” along the river at the northwest edge of AOI 2 impedes groundwater discharge to the river (Sections 5.4, 9.2, Appendix I). Explain why this is thought to be true. What is the purpose of this wall? When was it constructed? The report states that the wall is made of stone and concrete, but a stone wall would probably not inhibit groundwater flow. What prevents groundwater from underflowing the wall? Provide a more complete description of the wall’s construction (what parts are stone, and what parts are concrete?; is the stone mortared?; what is the wall’s thickness, height, and depth below grade?). What is the ground surface elevation difference across the wall? A short cross section including the LNAPL plume and one of the new delineation wells would help show how groundwater relates to this structure.
8. Langan considered most LNAPL plumes to be immobile or hydraulically controlled (Section 5.7). Compared to some other recent reports submitted by Evergreen, there is little discussion and supporting information for this statement. There has been no evaluation of LNAPL transmissivity or a lines-of-evidence assessment, for instance. DEP requests further evaluation and discussion of the LNAPL stability conclusions.
9. I recommend that Evergreen demonstrate hydraulic control of the LNAPL plumes at the west end of the Pollack Street sewer, near the river.
10. Does LNAPL continue to enter the Pollack Street sewer despite operation of the horizontal well and west end recovery systems? What cumulative and recent quantity of LNAPL was recovered by the skimmer at the outfall (total gallons and/or gallons per year)?
11. Please show the inactive Pollack Street vertical well system on a map, or list the wells that were part of the system. Did this system collect LNAPL, groundwater, or both? When was it deactivated? What were the recovery totals for LNAPL/groundwater?
12. Where was the inactive Short Pier recovery system? When was it installed? How many wells did it include? Did it collect LNAPL, groundwater, or both? What were the recovery totals for LNAPL/groundwater?

13. Does (or did) the Passyunk Avenue sewer outfall have LNAPL discharge controls, similar to those for the Pollack Street sewer outfall?

Exposure Pathways

14. As discussed previously with Evergreen, further information is needed to document the evaluation of potential vapor intrusion receptors (see 8/28/2017 e-mail). A map should be provided to identify those structures that are not of concern because of positive pressurization, being elevated above the ground, or lacking occupancy. The presence of basements in any buildings should be noted. If trailers are present, they should be listed and mapped. [§250.404(a), §250.408(a)]
15. Several buildings are visible in aerial photographs and maps of the Point Breeze Process Area that are not mentioned in the report. Explain how each of these is being addressed for VI.
- Building located immediately south of Refinery Hall (aka Main Office Annex, 5917)
 - Building located immediately north of the maintenance shop (2448)
 - WWTP Building 2446
 - Area 9-0-1E No. 3 barrel warehouse (Building 5933)
 - Area 9-0-4C Buildings 5624 and 6416
 - Area 9-210C control room (Building 4225)
 - Area 9-0-2D No. 14 service building and main control center (Building 2587)
 - Area 9-864 Building 2450
16. Some reporting levels in the indoor air sample analyses exceeded applicable screening values (Table 7). Please refer to DEP's [FAQs](#) on the VI guidance for the application of PQLs to screening.
17. The report indicates that four buildings in AOI 2 are positively pressurized and will not require additional VI evaluation. If Evergreen will use building pressurization as an engineering control to mitigate VI, then methods for measuring differential pressures in the buildings should be described in the cleanup plan. The post-remedial care plan and environmental covenant should include periodic monitoring of the pressurization.
18. In the PNDI review, The Pennsylvania Fish and Boat Commission identified two threatened/endangered species at AOI 2 (Appendix A). Further information was provided by PFBC to DEP on 10/10/2017 (attached). The species of concern are the shortnose sturgeon and the eastern redbelly turtle. PFBC also clarified that their earlier conclusion that "no adverse impacts are expected" did not account for soil, groundwater, and sediment contamination. There is a potentially complete exposure pathway for the two species of concern at AOI 2, and further ecological assessment is required. [§250.402(d)]

Tables, Figures, and Appendices

19. In Jun 2017 EPA published inhalation RSLs for trimethylbenzenes. The RSLs for workers at HQ = 0.1 are 26 $\mu\text{g}/\text{m}^3$. The screening values in Table 7 should be updated accordingly.
20. The Passyunk Avenue sewer is mentioned in the report but not shown in the figures or cross section. Please provide a figure showing the Passyunk sewer and the location of the outfall.

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