

December 9, 2011 *[transmitted by email]*

To: Jim Oppenheim, Sunoco

cc: Hon Lee, EPA
Walter Payne, PADEP
Steve O'Neil, PADEP

From: David Burke, PADEP (484-250-5822)
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Re: Sunoco Philadelphia Refinery
Groundwater remediation program
Site Characterization Report for AOI 11

This memo provides comments on the "Site Characterization / Remedial Investigation Report" (SC/RIR) for Area of Interest 11 (AOI-11), submitted by Sunoco on September 12, 2011.

1. As you know, the U.S. Geological Survey (USGS) is preparing a report describing their recent work to study VOC contamination in the Lower Sand aquifer at and in the vicinity of the Philadelphia Refinery. We understand that USGS expects to provide a report to EPA/Region 3 in January 2012. Because USGS's work is relevant to the issues under consideration in Sunoco's AOI-11 investigation, the Department reserves the right to provide additional comments to Sunoco concerning AOI-11 after we have had a chance to review the final report from USGS. We will make sure that Sunoco also receives a copy of the USGS report when it is complete.
2. Contaminants of concern (COC) that exceed the Department's non-residential statewide health standards (NRSWHS) in deep groundwater medium are; chrysene, benzene, MTBE, naphthalene, cobalt, arsenic and manganese. Iron exceeds the SMCL.
3. The source concentrations input values in QD model for chrysene, benzene and MTBE were set to ZERO concentrations. The source concentrations values must be corrected to reflect the actual data from groundwater sampling results.

4. QD and SWLOAD models were utilized to evaluate the potential impact to surface water pathway for metals (manganese & arsenic). QD and SWLOAD models are primarily intended for use with dissolved organic compounds that may react with organic carbon in the soil and may be influenced by biodegradation that can be described by the 1st order decay. Therefore, we recommend that Mass Balance model found in the Department's Act 2 TGM Section IV-3(b) be utilized to evaluate the potential impact of metals to surface water pathway.
5. The potential impact to surface water pathway must be evaluated for all COC that exceed the NRSWHS.
6. The lowest WQ in stream criteria (LWQSC) for Iron (Total) is 1500ug/l, and iron (dissolved) is 300ug/l. Concentration of Iron in the deep groundwater aquifer exceed the LWQSC , therefore, the potential impact to surface water for iron must be evaluated.
7. The Department believes that flow conditions in the Lower Sand aquifer would best be evaluated using the most comprehensive set of monitoring points available. The Department proposes to coordinate a synoptic water level gauging event with representatives of the Defense Logistics Agency and the Philadelphia Gas Works, to gather water level data simultaneously at the Philadelphia Refinery and adjacent properties. The Department requests Sunoco's acknowledgement of your intention to cooperate in this effort. We will contact the other parties to request their cooperation as well.
8. After a more comprehensive groundwater flow map has been produced, as suggested in Comment #7 above, and groundwater flow vectors are better understood, it is possible that there will be a need to evaluate additional fate and transport scenarios, other than the ones already performed by Sunoco and documented in Appendix J of the SCR/RIR.
9. On Page 10 of the SCR/RIR, the following statement appears: *"The PRM aquifer system no longer is used as a source of water supply in Philadelphia because of highly elevated concentrations of iron ... etc."* This statement is somewhat misleading since it is offered without any further information about water uses associated with this aquifer. DEP requests that the SCR/RIR also provide information to the effect that the PRM aquifer system is used as a source of water supply in New Jersey. According to USGS's 2003 report, *"Ground-water flow from areas of contamination in South Philadelphia to adjacent downgradient areas of New Jersey has the potential to affect supply wells drawing water from the lower aquifer of the PRM."* (Sloto, 2003, page 35).