Ohio Environmental Protection Agency

John R. Kasich, Governor
Mary Taylor, Lt. Governor
Craig W. Butler, Director

US EPA RECORDS CENTER REGION 5
489097

August 21, 2015

Ms. Shari Kolak
Remedial Project Manager
U.S. EPA Region 5
77 W. Jacksn Blvd.
Chicago, IL 60604

RE: Troy Well Field Unknown Source
Remediation Reports
Remedial Response
Miami County
555001353004

Subject: Ohio EPA Review; Draft Feasibility Study East Troy Contaminated Aquifer Site, Troy, Miami County

Dear Ms. Kolak:

On July 8, 2015, the Ohio Environmental Protection Agency (EPA) Division of Environmental Response and Revitalization, received the Draft Feasibility Study (FS) submitted by SulTrac, on behalf of U.S. EPA, for the East Troy Contaminated Aquifer Site (ETCA) located in Troy, Miami County. Ohio EPA is providing the following comments to assist in the completion of an approvable document.

General Comments

1. There is a lack of rationale for various conclusions in the detailed analysis:

    a. The detailed descriptions need to include information on computing mass reduction percentages for source remedies.

    b. The detailed descriptions need to include information on computing remedy completion times for ground water remedies.

    c. Each ground water remedy (apart from the no action remedy) proposes to inject a redox amendment for treating the source area of the ground water plume. However, none of the injections consider the geochemistry of the source area. In order to determine if a redox amendment is appropriate for a given area, it is necessary to consider the geochemistry of the aquifer and map the geochemistry against the type of amendment.

    d. RGW-4 proposes a pump and treat system for both the residential and East Water Street plumes. However, no information has been provided on the adequacy of the lay out of the system. In order to determine if a pump and treat system will be effective and to determine costs, it is necessary to model the capture zone of the proposed pump and treat system.

2. There is conflicting information regarding the chemicals of concern (COCs) at the site. It is noted within the text in Section 1.2.4 on page 14 that trihalomethanes (THMs), while above screening levels in ground water and sub-slab and indoor air, were not included in the risk assessment as they are not contaminants that are generally associated with dry cleaning and industrial contamination. The justification for not including THMs is acceptable; however, in Section 1.2.4.1 on page 17, the text discusses lead contamination. Lead was found to be above site screening levels at one sample taken on Hobart property. A majority of the remedies evaluated in Section 4 also include lead as well as footnote 5 in Section 2.2 on page 26, which discusses taking additional samples to determine the extent of lead contamination on the Hobart property. It is not clear why lead is being considered as a COC while THMs are not. Please correct this discrepancy by removing lead as a COC, or by adding an explanation on why lead is a COC.

3. All of the remedies proposed (with the exception of the no action remedies) include institutional controls (ICs) as part of the remedy. We do not currently have access to any of the suspected source areas for the residential plume. Is there a plan for obtaining access? Contingencies should be added to the remedies in case access is not obtained and ICs cannot be implemented on private properties.

4. The ground water remedies listed for both plumes discusses various substances for injection. The proposed remedies only include one type of amendment being employed at a time. It may be that different types of amendments would work better when used in tandem at different portions of the aquifer. More specifically, a statement on page 45 of the FS states that 45% of the aquifer is under reducing conditions, this implies that 55% of the aquifer is under oxidizing conditions. It would be beneficial to map out redox zones within the aquifer based on ground water chemistry and determine which amendment would be most effective in each area. A ground water alternative could then be proposed that uses various amendments in areas across the plume based on the assessment of the geochemistry. In addition to taking advantage of the natural processes already occurring in an area, this approach would be more cost effective, considering that under Appendix C – Remedial Alternative Cost Estimates, the costs associated with the amendments are very high. For example, the amendment in RGW-2 is roughly 46% of the total cost for that alternative.

5. Section 4.2.5.1 on pages 68 and 69 discusses that there is little evidence that natural attenuation is occurring at a detectible rate. However, ground water remedies for residential ground water (RGW)-1, 2, 3, and 4 and East Water Street (EWS)-1 and 2 all include monitored natural attenuation (MNA) on the residuals of the residential and East Water Street plumes. MNA would rely on biodegradation, dilution and dispersion processes. It should be considered that the aquifer currently shows little to no degradation of contaminants occurring and

biodegradation would likely need some enhancements. In addition, Ohio EPA does not encourage dilution or dispersion as attenuation remedies, which would be the main attenuation processes taking place if conditions are not conducive to biodegradation.

6. The FS makes an assumption that access to the First Presbyterian Church for remedial purposes will be denied because access was denied for investigative purposes during the Remedial Investigation (RI). Ohio EPA is concerned that this assumption may be premature. The First Presbyterian Church is the suspected source area for a ground water plume that is potentially affecting some 115 homes and the city of Troy's east well field, which provides drinking water to 25,000 people. It is imperative that we get access to this property for remedial purposes. In addition, Ohio EPA still has concerns that the vapor intrusion (VI) pathway for this property has not been fully delineated. It is necessary to obtain access to this property for sampling of VI risks. Furthermore, it does not seem appropriate to rely on ICs as part of every soil and ground water remedy (apart from the no action remedy) when there is no proposal to obtain access.

7. Ohio EPA requests that consideration be given to evaluate soil vapor extraction (SVE) below the Hobart and Spinnaker buildings. These areas have been hypothesized to potentially have contamination beneath the buildings but a remedy to address the sources has not been proposed in the FS.

   As illustrated in Figures 1-5 and 1-6, the highest volatile organic compound (VOC) concentrations in soil likely extend beneath the buildings at Hobart and Spinnaker, and the nature and extent of this contamination remains unknown. The FS currently evaluates only capping and excavation in the areas not beneath the buildings. However, Section 5.1.3.2 (page 87) points out that *"excavation along the building footers may undermine the structures, and if soil contamination exists below or behind the building footers, it will not be remedied by this alternative."* At the source for the residential plume under the First Presbyterian Church property, where excavation is not feasible due to the presence of a building, SVE is proposed as a remedial alternative in S-3 and S-4. It is therefore unclear why SVE is not also proposed for the Hobart and Spinnaker buildings.

Specific Comments

8. Section 2.2, pages 36-37 provides the soil Preliminary Remediation Goals (PRGs) for the protection of ground water and the rationale behind the calculations used to derive the PRGs. The PRGs [100 ug/kg for perchloroethene (PCE), trichloroethene (TCE) and 1,1,2-trichloroethane (1,1,2-TCA)] were derived by using the "20 Times Rule" which is often used under the Resource Conservation and Recovery Act (RCRA) program as a generic means of screening a sample to determine the concentrations of COCs in leachate percolating through waste. Ohio EPA believes the use of the "20 Times Rule" is

inappropriate and that site-specific screening levels should be calculated and used as PRGs at the site.

In addition, page 37 states, *"Final soil remediation goal will be calculated from a site-specific DAF, which will be developed during the remedial design."* A site-specific number needs to be calculated now in order to ensure the proposed remedy can achieve the necessary remediation goals.

9. Regarding the Remedial Action Objectives (RAOs) for VI in Section 2.4 (page 41), please consider the following:

    a. Sub-slab PRGs were determined using a sub-slab attenuation factor of 0.1. Ohio EPA recommends a sub-slab attenuation factor of 0.03; this is consistent with U.S. EPA's VI guidance (June 2015).

    b. Because both soil gas and sub-slab vapor samples are discussed in the FS (for example, on page 76), it would be helpful to indicate that the sub-slab and soil gas PRGs are the same.

    c. Ohio EPA recommends adding a footnote or additional column specifying that it is not appropriate to use an attenuation factor where dirt floor basements are present (attenuation factor = 1); this is consistent with U.S. EPA's VI guidance (June 2015).

10. Sections 2.6.1, page 45 and 5.1.4, page 89 have conflicting statements regarding soil contamination at the Hobart property exceeding RAOs. Section 2.6.1 states, *"Thus, based on the assumption that groundwater is present at a depth of approximately 15 feet bgs, the volume of unsaturated soil that exceeds RAOs at the Hobart site is 6,750 yards."* While Section 5.1.4 states, *"There are no areas on the Hobart property that contain soil contamination exceeding the RAOs, which are presently under a paved surface."* Please correct this discrepancy.

11. ICs are evaluated as part of several alternatives in the FS. In Section 4.1.2, page 56, it states, *"Institutional controls (temporary or permanent) would also be implemented to ensure the effectiveness of other process options, such as capping or SVE."* In evaluating several soil alternatives (SVE and capping), associated text states, *"Based on results of the groundwater monitoring program, institutional controls for soil may be discontinued in the future."* If ICs are implemented to ensure the effectiveness of a remedy, then the IC should remain in place as long as the remedy is in place. Furthermore, discontinuation of the IC should be dependent upon multiple lines of evidence that COCs have been mitigated in all media forms (soil, ground water, and soil gas), not just ground water as stated in the text above. For example, residual contamination below the buildings or caps may still exceed soil and vapor RAOs and, if the buildings are removed after ground water RAOs are achieved, infiltration and leaching may re-

contaminate the aquifer. Ohio EPA recommends updating statements associated with the respective alternatives to reflect the discussion above.

12. In Section 4.2.6 "removal" is discussed as a ground water general response action (GRA); however, it is not listed as a ground water GRA in Section 4.2. For clarity, please add "removal" to the list of ground water GRAs.

13. Section 4.2.5.1 does not state that MNA is being retained for further evaluation as a process option. However, on page 67 in Section 4.2.3.1 – Ground Water Monitoring there is a misplaced paragraph that discusses MNA and concludes that MNA is retained for further discussion. Please correct this discrepancy to clearly state that MNA is being retained as a process option.

14. Section 4.2.5.5 discusses air sparging as a remedy for the ground water source areas and concludes that air sparging will not be evaluated as a possible remedy at the site. Air Sparging has been used successfully elsewhere in Ohio. As such, Ohio EPA recommends that this option be further evaluated as it may be a compatible option for the high permeable sand-gravel zones of the aquifer. There is the possibility for air sparging to be used in conjunction with SVE to help remove the source area and to lessen the threat of VI risks.

15. Section 4.2.7.1, page 72 does not include supplemental untreated and treated water sample collection from the air stripper. Ohio EPA recommends periodic sampling of the untreated and treated water to monitor the efficiency of the air stripper to treat contaminated water.

16. Section 4.2.8.1, page 73 discusses discharge to injection wells. Ohio EPA recommends that consideration is given to whether discharge to injection wells is a reasonable option given the proximity to public water supply wells. Depending on the treatment process and details, this could change the ground water chemistry and potentially impact the city of Troy's treatment process. Ohio EPA recommends that an evaluation is provided as to whether discharging to injection wells at the site would impact the wellfield. Ohio EPA's Underground Injection Control program should be notified if this injection option is chosen.

17. Section 4.2.8.2 discusses discharging treated water to surface water. Ohio EPA would require a formal National Pollutant Discharge Elimination System (NPDES) permit for offsite surface water discharge. The Applicable or Relevant and Appropriate (ARAR) process does not exempt the site from obtaining a permit for activities that discharge offsite.

18. *Soil Alternative S-2: Capping in Combination with ICs*

    Please provide a figure depicting the *"existing building and pavement associated with the church addition"* (page 84) that is proposed to serve as a leaching barrier in soil remedy S-2. According to text in Section 4.1.4.2, the extent of

contamination below the former dry cleaner facility is not well known. What evidence will be used to determine that the extent of the proposed leaching barrier is sufficient? In addition, the proposed building and asphalt cap at the church is missing from the detailed analysis in Section 6.2.2 (page 112).

19. *Soil Alternative S-2: Capping in Combination with ICs*

Section 5.1.2 notes that soil alternative S-2 associated with the former One-Hour Martinizing property (present First Presbyterian Church) would utilize the current pavement to act as a cap. This remedy proposes to leave the church building and current asphalt areas at the residential plume source as is, without modifying them for protection of ground water. It should be noted in the text that the current pavement may not comply with the requirements in "Asphalt Covers to Prevent Leaching at Industrial Sites, August 18, 2003." Ohio EPA recommends that the integrity of the asphalt cap left in place be evaluated because it appears that leaching through these asphalt caps is occurring.

20. *Soil Alternative S-3: SVE and Excavation in Combination with Offsite Disposal and ICs*

Section 5.1.3, page 86, proposes the installation of an SVE system. No information was provided on how the system will be periodically measured to evaluate the radius of influence (negative pressure on the formation / vacuum pressure) imposed by the extraction well on the unsaturated formation. It was not discussed how the system will be monitored to ensure it remains efficient in capturing soil vapor emanating from contamination in soil. Also, it was not discussed how it will be ensured that short circuiting will not occur. Please add a discussion on these issues. Additionally, these periodic measurements would incur additional costs that should be noted in Section 5.1.3.3, page 88.

21. *Soil Alternative S-3: SVE and Excavation in Combination with Offsite Disposal and ICs*

Ohio EPA recommends that periodic influent air sampling be conducted to measure the concentrations of COCs in soil vapor in order to demonstrate that source area COCs are being remediated. Influent air sampling will provide additional evidence to support discontinuation of ICs (along with the ground water monitoring program) as noted in Section 5.1.3, page 86, end of the third paragraph. These periodic sampling events would incur additional costs that should be noted in Section 5.1.3.3, page 88.

22. *Soil Alternative S-4: SVE and Excavation in Combination in Combination with Offsite Disposal, ICs, and Capping*

This remedy discusses leaving the current asphalt at the Spinnaker and Hobart properties as cover for the soil source areas. Ohio EPA recommends that the

integrity of the asphalt cap left in place be evaluated because it appears that leaching through these asphalt caps is occurring. It will be necessary to evaluate the integrity of the asphalt cap left in place to be sure that it complies with the requirements in "Asphalt Covers to Prevent Leaching at Industrial Sites, August 18, 2003."

23. *Soil Alternative S-4: SVE and Excavation in Combination in Combination with Offsite Disposal, ICs, and Capping*

    Please refer to comments 20 and 21 above concerning periodic vacuum measurements and influent SVE air sampling. In addition, these sampling events and measurements would incur additional costs that should be noted in Section 5.1.4.3, page 90. Please add the additional information to this section.

24. *Soil Alternative S-4: SVE and Excavation in Combination in Combination with Offsite Disposal, ICs, and Capping*

    The last paragraph of the Technical Feasibility sub-section (Section 6.2.4.6, page 129) states, *"Effluent air would be sampled to verify that the SVE system was removing VOCs from the former dry cleaner property."* Please add clarifying language as to whether this would be a one-time event or if it would be periodic sampling.

25. *Soil Alternative S-4: SVE and Excavation in Combination in Combination with Offsite Disposal, ICs, and Capping*

    The third major capital cost listed is *"(3) installation of the cap."* It is Ohio EPA's understanding that for soil alternative S-4, the remaining asphalt will be left in place. Please refer to comments 19 and 22 above and provide clarification as to whether the existing asphalt cap will be left in place as is or if a new asphalt cap will be installed.

26. *Soil Alternatives S-2, S-3, and S-4:*

    Sections 5.1.2 (page 84), 5.1.3 (page 86), and 5.1.4 (page 89) state that *"institutional controls would also be required to restrict future residential land use on the former dry cleaning property by preventing the zoning of the area for residential land use"* for alternatives S-2, S-3, and S-4. Section 6.2.2 (page 113) specifies that these ICs would *"restrict future land use by preventing specific areas from being zoned for residential land use, maintaining the caps in perpetuity, and preventing excavation of soil."* Please consider the following:

    a. Please clarify whether "zoning" refers to city zoning or a deed restriction.

    b. In response to Ohio EPA's Comment 1 on the draft RI (October 7, 2014), the VI data collected in the First Presbyterian Church was compared with

screening levels for residential land use, rather than commercial/industrial land use. Is the proposed IC at the former dry cleaning property inconsistent with the current land use?

c. Will the IC for the former dry cleaning property apply to the dry cleaning property, the entire church property, or another area? Sections 5.1.2 (page 84), 5.1.3 (page 86), and 5.1.4 (page 89) state that ICs would apply to the former dry cleaning property. However, Sections 5.1.3 (page 86) and 6.2.2 (page 112) specify that ICs would be required where soil contamination remains above PRGs. The extent of soil contamination above PRGs at the former dry cleaning facility is currently unknown.

d. How will it be demonstrated that the extent of the IC is sufficient? For example, S-4 Section 4.1.4.2 (page 90) states that *"the nature and extent of contamination at the former dry cleaner facility... is not well defined because of physical constraints and access restrictions... therefore, an SVE system may not target the main source material."*

27. *Soil Alternative S-2, S-3, and S-4:*

Soil remedy S-2, Section 5.1.2 (page 84) proposes that the *"existing building and pavement associated with the church addition"* serve as leaching barriers. However, the same consideration is not made for known or suspected residual contamination beneath the Hobart and Spinnaker buildings in soil remedies S-2, S-3, or S-4. The potential for known or suspected residual contamination beneath the Hobart and Spinnaker buildings is also missing from the detailed analysis of soil remedy S-2 (Section 6.2.2, page 112), soil remedy S-3 (Section 6.2.3, page 117), and soil remedy S-4 (Section 6.2.4, page 123). In addition, because the Hobart and Spinnaker buildings are not currently proposed as leaching barriers, the cost of maintaining the Hobart and Spinnaker buildings as leaching barriers under O&M is not included in the cost estimates in Appendix C-1.

28. *Soil Alternatives S-2, S-3, and S-4:*

According to Section 2.6.1.2 (page 2-107) of the Human Health Risk Assessment (HHRA), the extent of the soil contamination at Spinnaker may be more extensive if historical data are also considered. The text notes that the extent of soil contamination at Spinnaker should consider RI and pre-RI sampling results for a complete evaluation of site conditions. It appears that the highest VOC detections based on the Shaw 2006 report (Figure 1.6 of the FS) extend past the proposed excavation or capping areas in S-2, S-3, and S-4 (Figures 5-1, 5-3, and 5-4). It is therefore not clear if the proposed excavation or capping areas on the Spinnaker property include all contamination above soil RAOs.

29. Section 5.2 discusses ground water remedies. It appears that apart from the no action and RGW-4 remedies, all of the proposed ground water remedies use reinjection of contaminated ground water after amendments with various substrates and or chemicals. The descriptions of the technologies in the main text of the FS do not contain this information. It is only described in Appendix C. Please update the necessary text within the FS or within Appendix C to accurately reflect whether reinjection will be a component of a ground water remedy. The reinjection of contaminated ground water and the recirculation systems should be described in the main text of the FS along with the ARARs that would apply. Please also consider that Ohio EPA, Underground Injection Control, does not look favorably on re-injecting ground water that is above the maximum contaminant level.

30. Section 5.2 discusses ground water remedies. Please provide further discussion on why reductive dechlorination is not considered for the East Water Street plume, while it is considered for the residential area plume.

31. *Ground Water Alternative SGW-1: No Action*

    Section 6.3.1.3 (page 131) states, *"natural processes would be too slow to produce a significant change in the magnitude or extent of contamination in the foreseeable future. Therefore, existing risks would remain without any significant reduction in magnitude."* It may be appropriate here to discuss the potential increase in contamination reaching the East Troy Well Field that provides drinking water to more than 25,000 residents.

32. *Ground Water Alternative RGW-1: Source Treatment using ERD, MNA for Residuals, and ICs*

    Section 5.2.6, page 99, states, *"Monitoring wells EPA-114S and GZA-2 seems to suggest another source, this increase may be direct result of the Water Street plume commingling with the more contaminated Residential Area plume just upgradient of EPA-114S."* In Section 1.1.2, pages 4-5, a discussion is provided on the Former Waltz Cleaners location being a potential source contributing to the VOCs in the residential area plume and commingling with the East Water Street plume. It is understood that access to the property was denied; however, clarification is needed in the text as to why this property was not further investigated as a source and why alternatives are not being evaluated to mitigate the elevated concentrations of VOCs in ground water. In addition, please provide information as to whether current proposed alternatives will be sufficient to mitigate contamination in the soil and ground water at the Former Waltz Cleaners property. If current proposed alternatives will not address this area, please include remedies that will as this is the area where it has been hypothesized that contamination from the residential plume is being pulled toward the Troy well field.

33. Section 5.2.6 states that only water soluble chemicals can be injected into the East Water Street plume area. It is unclear why this situation exists for the East Water Street plume, while such a restriction does not apply to the residential plume. For example, RGW-2 makes no mention that only water soluble substances can be injected. Please provide a rational or update the language to also include other amendments.

34. *Ground Water Alternative RGW-1: Source Treatment using ERD, MNA for Residuals, and ICs*

    In the introductory paragraph of Section 6.3.2, page 132, it states, *"Active remediation would transition to MNA when COC concentrations in the source area have decreased by 90 to 99 percent without any evidence of rebound."* Ohio EPA recommends that before transitioning to MNA, sufficient evidence that demonstrates MNA will meet remediation objectives is provided. In addition, Ohio EPA recommends clarification on the timeframe that would be allowed to determine if rebounding is occurring.

35. *Ground Water Alternative RGW-1: Source Treatment using ERD, MNA for Residuals, and ICs*

    Section 6.3.2.1 states that this alternative would destroy over 90% of the source mass. Please provide a statement of basis for this claim. Similar statements appear for other remedial options throughout this report and should include some reasons behind the estimates about performance. For example, a mass balance demonstration could be provided.

36. *Ground Water Alternative RGW-1: Source Treatment using ERD, MNA for Residuals, and ICs*

    Section 6.3.2.1, page 132 discusses the risks imposed by ground water alternative RGW-1, including daughter products of PCE and TCE and how they will be addressed. In later text, risks associated with the solubility and mobility of metals are addressed; however, no discussion of metals analysis is provided in this section. Ohio EPA recommends that metals analysis be included with VOCs analysis when collecting ground water samples to monitor the progress of the remedy.

37. *Ground Water Alternative RGW-2: Source Treatment using ISCR, MNA for Residuals, and ICs*

    Section 6.3.3.1 discusses the overall protection to human health and the environment for ground water alternative RGW-2. While the section discusses daughter product formation from dechlorination, it underestimates the possible risks. As such, Ohio EPA recommends that this alternative, and all of the ground

water remedies that propose to use redox amendments for source treatment, include monitoring ground water and vapor for vinyl chloride.

38. *Ground Water Alternative RGW-3: Source Treatment using ISCO, MNA for Residuals, and ICs*

    Section 5.2.4 (Page 96) states, *"Active remediation would transition to MNA when COC concentrations in the source area have decreased to by 90 to 99 percent without any evidence of rebound."* MNA is proposed as a remedy once active remediation has reduced concentrations by 90 to 99 percent their remediation goals. However, it is likely that the In-Situ Chemical Oxidation (ISCO) (and other source treatments) would prevent biodegradation from occurring, and MNA would rely on dilution and dispersion processes. As noted previously, Ohio EPA does not encourage dilution or dispersion as attenuation remedies, which would be the main attenuation processes taking place if conditions are not conducive to biodegradation.

39. *Ground Water Alternative RGW-3: Source Treatment using ISCO, MNA for Residuals, and ICs*

    Section 5.2.4 (page 96) states, *"Active remediation would transition to MNA when COC concentrations in the source area have decreased to by 90 to 99 percent without any evidence of rebound."* Please refer to comment 34 above.

40. *Ground Water Alternative RWG-3: Source Treatment using ISCO, MNA for Residuals, and ICs*

    Section 6.3.4.1 discusses the overall protection of human health and the environment for ground water alternative RGW-3. The text notes that Chromium VI will quickly revert back to Chromium III by oxidation once outside the treatment zone. Please provide a statement of bases for this conclusion. For example one approach might be to report the redox potential and pH in the aquifer that is occurring outside of the treatment area. Using a Pourbaix diagram for chromium, it could be shown that the normal potential/pH combination for the aquifer corresponds to a stable field for trivalent chromium. Further justification could be provided by referencing where ISCO was used in a similar aquifer that demonstrated that hexavalent chromium was not a persistent problem down gradient from the treatment zone. Ohio EPA notes, however, that post-remedial monitoring should still occur to track potentially harmful species such as hexavalent chromium.

41. *Ground Water Alternative RGW-4: Pump and Treat with Source Treatment and ICs*

    The introductory paragraph in Section 5.2, page 91 states, *"The first alternative addresses the entire site, the next four alternatives address the Residential Area*

plume [this includes RGW-4], and the last two alternatives address the East Water Street plume." However, the first sentence in Section 5.2.5, page 97, states, *"Alternative RGW-4 would actively remediate the entire plume using a pump-and-treat system."* Ohio EPA recommends clarifying the statement in Section 5.2.5 as to whether ground water alternative RGW-4 addresses the entire plume. It may be better to label RGW-4 as Site Ground Water (SGW)-2 as it appears this remedy will address the entire site for ground water.

42. *Alternative RGW-4: Pump and Treat with Source Treatment and ICs*

Section 5.2.5 discusses the ground water alternative RGW-4 and proposes to use ground water pump and treat for contaminated ground water above a concentration of 100 ug/L in the residential plume. The description of RGW-4 states, *"Thirteen (13) extraction wells would capture the entire residential area plume pumping at slightly less than 25 gallons per minute (gpm) each."* However, a model that justifies the use of this set up was not provided. Figure 5-8 depicts the layout of the extraction wells and a caption on the figure states *"Pump and treat alternative has not been modeled."*

It is necessary that this alternative be modeled in order for it to be evaluated during this FS. The site overlies a very prolific aquifer system. Considering other pump and treat systems within this aquifer, extraction wells pumping 25 gpm would probably not capture the plume, even with the configuration depicted on Figure 5-8. Capture zone modeling should have been performed and provided in the FS to fully evaluate this alternative to determine if it is even a viable option.

Additionally, according to Figure 5-8, which presents the locations of proposed ground water extraction wells, there is a single ground water extraction well proposed in the East Water Street plume in addition to the thirteen extraction wells proposed at the residential area plume. Ohio EPA does not believe that the single extraction well will actively remediate the entire portion of the East Water Street plume. Ohio EPA recommends that ground water alternative RGW-4 be re-evaluated to determine whether one extraction well is appropriate or whether additional extractions wells are needed to address ground water contamination near the Former Waltz Cleaners and/or in the East Water Street plume.

43. *Ground Water Alternative RGW-4: Pump and Treat with Source Treatment and ICs*

Section 6.3.5, page 144 discusses generally what is included in implementing pump and treat as a ground water treatment option. Ohio EPA recommends that in order to demonstrate that a pump and treat system is completely capturing a plume, ground water levels should be periodically measured and the resulting potentiometric surface maps should be provided.

44. *Ground Water Alternative RGW-4: Pump and Treat with Source Treatment and ICs*

Based on the location of extraction wells and source treatment injection point locations presented on referenced Figure 5-8, Ohio EPA is concerned that if injections occur when the pump and treat system is running, the injections may not be successful. Injected chemicals may get pulled through the source area at a faster rate and decrease the efficiency of the source treatment chemicals on the contaminated ground water.

45. *Ground Water Alternative EGW-2: Source Treatment using ISCO with MNA for Residuals and ICs*

In Section 5.2.7, Page 100, the text states, *"MNA would commence when source area remediation is complete."* Please clarify what is meant by, *"when source area remediation is complete,"* because other alternatives state *"When COC concentrations in the source area have decreased by 90 to 99 percent without any evidence of rebound."* Please refer to comment 26 above.

46. *Vapor Intrusion Alternative VI-2: SSDS, Sealing, ICs*

The FS notes that there will be buildings that may require VI mitigation. Vapor remedy VI-2 proposes buildings to be sampled and if necessary to be fit with a sub-slab depressurization system (SSDS), localized SVE, general sealing, or ICs. However, the effort of sampling to determine which buildings require vapor remedy VI-2 is not described in the text that discusses VI-2 (Section 5.3.2, page 102 and Section 6.4.2, page 157). In particular, please consider the following:

a. Section 2.6.2.3 (page 2-112) of the HHRA noted that the *"potential for indoor air–related receptor-specific risks and hazards associated with inhalation of indoor air may be underestimated. This is especially relevant for buildings over areas of known (or strongly suspected) subsurface VOC contamination at which indoor air or sub-slab soil gas samples could not be collected during the RI. Examples include the Hobart and Spinnaker Buildings... and the First Presbyterian Church."* Based on the information collected regarding the source areas, will the First Presbyterian Church, the Hobart building, and the Spinnaker building be sampled to determine if these buildings require an SSDS or other vapor remedy?

b. Ohio EPA agrees that *"the VI pathway may be complete at locations that directly overlie the ground water plumes"* (page 25) and that *"the areas of most significant potential concern regarding VI are generally aligned with the axis of the groundwater contaminant plumes"* (page 24). However, the areas directly overlying the ground water plumes and the areas with the

highest potential for VI may or may not include all of the buildings that present risks and hazards exceeding US EPA's risk range (1E-06 to 1E-04) or target hazard (1). For example, St. Patrick Elementary School required mitigation but is located outside the ground water plume boundaries. Therefore, Ohio EPA recommends a step-out approach that begins with buildings along the axis of the plumes as well as the buildings near the source areas (for example, adjacent to the First Presbyterian Church). This approach is consistent with US EPA's VI guidance (June 2015).

c. The time and cost of sampling structures that will not need SSDS is not considered in the cost estimate in Appendix C-3. Please add these costs to Appendix C-3 and add a discussion to the text.

47. *Vapor Intrusion Alternative VI-2: SSDS, Sealing, ICs*

Section 6.4.2 (page 157) states, *"In cases where SSD is not feasible or access to install a SSD system is not granted, localized SVE systems installed adjacent to the structures are an option as a contingent measure."* Please elaborate on this contingency – Does this mean that an SVE system will be installed for a single home? Would this apply to homes with dirt floor basements? What if access is not granted to determine if the home needs to be mitigated or not? How would SVE effectiveness inside a building be evaluated if access is denied? Is this contingency adequately accounted for in the cost estimate in Appendix C-3?

48. *Vapor Intrusion Alternative VI-2: SSDS, Sealing, ICs*

It was noted during the time-critical removal action that some of the residential homes overlying the residential plume have dirt floor basements. Please add to the text a discussion of how a home with a dirt floor basement would be mitigated. For example, would a new slab be poured, an alternative membrane installed, or perhaps other technology employed such as SVE? Should these instances be accounted for the in cost estimate in Appendix C-3? Please add a discussion of the possible issues surrounding such a scenario to the text of Section 6.4.2.6 (page 104).

49. *Vapor Intrusion Alternative VI-2: SSDS, Sealing, ICs*

The FS (for example, page 75) discusses ICs to prevent future potential VI issues by prohibiting construction at specific locations or requiring vapor mitigation systems or building control technologies for new construction. Please also consider an option for a demonstration that a vapor mitigation system is not necessary in a new building.

50. *Vapor Intrusion Alternative VI-2: SSDS, Sealing, ICs*

Soil alternatives S-2 and S-4 propose to cap the vacant portions of the Spinnaker, Hobart, and First Presbyterian church properties to prevent leaching.

As discussed in Section 6.2.2.1 (page 113), capping would not mitigate the VI pathway if new buildings were constructed or existing buildings were expanded onto these capped areas. Ohio EPA recommends that ICs specifically for VI be considered for the capped areas in soil alternatives S-2 and S-4. Such institutional controls would remain in effect after ground water was remediated because VOCs would remain in soil beneath the caps.

51. *Vapor Intrusion Alternative VI-2: SSDS, Sealing, ICs*

Please clarify what criteria will be used to determine if a building needs to be mitigated and what criteria will be used to determine if vacant land needs an IC for VI-2. These criteria and any impact they may have on the cost estimates should be discussed in the FS – for example, will soil gas samples be collected to determine if vacant land needs an IC? Section 6.4.2.3 (page 159) proposes ICs for new construction "near the groundwater plumes," but it is not clear what this means. Please consider Ohio EPA's concern in comment 46 regarding the extent of vapor intrusion.

Appendix A – RAOs Comments

52. Table A-5 (page A-10) is missing TCE.

Appendix C – Remedial Alternative Cost Estimates Comments

53. *Soil Alternative S-2 Capping at Hobart and Spinnaker*

The multiple layer cap described in this cost estimate should include an impermeable membrane under the drainage layer, not just a geotextile as described. Please add in the necessary capping components consistent with "Asphalt Covers to Prevent Leaching at Industrial Sites, August 18, 2003."

Ohio EPA estimated the areas to be capped (based on Figure 5-1) and computed numbers that are somewhat greater than the estimates presented in the report. Ohio EPA's estimate for the Hobart property is approximately 16,600 ft2 and for the Spinnaker property is approximately 22,000 ft2. Though some of the areas shown in Figure 5-1 are under buildings, no demonstration was provided regarding how the estimates in the report were computed. Ohio EPA requests that the information be provided in the FS in order to resolve the total area being capped.

In addition, the cost estimate for this alternative discusses an Operation and Maintenance (O&M) plan. Ohio EPA has concerns that the O&M plan indicates that the capped areas will be evaluated every ten years for potholes and cracks. The plan should be revised to require fixing large potholes on an annual basis.

54. *Ground Water Alternative RGW-3*

Table C-2-3A includes only two years of In-Situ Chemical Oxidation injections (O&M items), while the plan calls for three. Also, table C-2-3A shows identical costs for years one and two despite quarterly monitoring in the first year and semi-annual monitoring in the second year. Please address these discrepancies.

There appears to be a discrepancy between the amounts of sodium permanganate needed: Under the cost estimate, RGW-3 will require 462 tons of sodium permanganate, while RGW-4 only requires 153 tons. Please provide a rational for the different in amendment amounts between these two remedies.

55. *Ground Water Alternative RGW-4*

A cost estimate from the city of Troy is provided for treatment costs at a Publicly Owned Treatment Works (POTW). Please indicate whether this is an actual quote provided by the city or whether this is an estimate.

56. *Appendix C-3, Vapor Intrusion Costs*

The cost estimates three hours per year to inspect each SSDS. No justification for the estimated time was provided, Ohio EPA is concerned that the estimate is too high considering the SSDS will be simple household units. In addition, table C-3-1 only budgets $100/year for maintenance of each unit, which seems low if indeed three hours are needed for each inspection. Does the $100/year represent a maximum per year or would the $100 be an average that rolled over each year. For example, one common cost of the SSDS is replacement of the fan, which will usually cost around $400 and would most likely occur once every 4-5 years.

Another discrepancy to this is in item 4 in the O&M costs. Item 4 only budgets 20 hours per year for inspections. These numbers are confusing and contradictory. Please clarify the time and costs for the inspections.

It is estimated that each indoor air sample will cost $1200. No justification for this number was provided and Ohio EPA has concerns that the estimate may be too high. For example, the contract lab that Ohio EPA uses charges $135 for an air sample analysis. Thus, with a similar lab rate, sample collection and processing would run over $1000 for each specimen. Please review the costs for this remedy and add clarifying language where necessary. It would be helpful to include an itemized estimate.

If you have any questions or would like to meet to discuss the comments, please contact me at (937) 285-6456 or madelyn.adams@epa.ohio.gov.

Sincerely,

Madelyn Adams

Madelyn Adams
Site Coordinator
Division of Environmental Response and Revitalization

MA/tb

ec: Guy Montfort, Tetra Tech
Erin LeGalley, DERR-CO
Dwayne Gross, DDAGW-SWDO