Vapor Intrusion - Short Term Continuous Monitoring A Case Study Bhooma Sundar EPA Region 5



Sub Slab Soil Gas





Indoor Air TCE Discrete Data Points

EPA United States Environmental Protection Agency

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Study Objectives

Employed high resolution continuous monitoring techniques to

- Gain a better understanding of the variability in the dataset;
- Recognize factors contributing to the variability;
- Identify and assess preferential pathways; and
- Determine the best path toward returning the building to full industrial use.



Chart 1: Average TCE Concentrations by Area



Control Contro





Chart 5: Restricted Open Warehouse Area







Chart 7: 24-Hour Pressure Tendency – First Quarter 2018









Note: Shaded region indicates post-SSV system installation TCE concentration range at CA-AIR-08 (June 2016 - February 2017)





Chart 5: Interior Rooms (2020) with Differential Pressure



Chart 6: Differential Pressure vs. Atmospheric Pressure (2020)









Chart 8: PCE in Indoor Air (2020)

Note: A representative sample from each exposure area was selected for the purposes of this chart. PCE data for all sample locations are included in the charts in Appendix C.



Observations

Indoor air Source:

- Atmospheric pressure and TCE concentration appear to be inversely proportional.
- TCE concentrations increase as the pressure decreases.
- This correlation appears to be most apparent near the end of the sustained drop in atmospheric pressure.
- In the restricted area, use of TCE containing products may have had more impact on TCE concentration.

Observations

Preferential Pathway:

- The sump appears to be a potential vapor intrusion pathway subsequent to significant rain events.
- Initially following a significant rain event, vapor intrusion is suppressed due to pore space being filled with water.
- As the water continues to migrate downward, soil gas is displaced to the surface and vapor intrusion temporarily increases



Observations

Sub-slab Vapor Intrusion:

Relatively low TCE concentrations were observed during periods of relatively high wind speed. These data suggest that a vacuum can be propagated through the subsurface; however, a sustained source of vacuum, such as an active fan, would be more effective at reducing sub-slab pressures than relying on wind power alone.

In summary, data indicate that preferential pathway mitigation (2018) and the SSV improvements (2019) were successful in reducing TCE concentrations in the restricted building area.

