

Investigation and Mitigation of Vapor Intrusion at a Superfund Site: Case Study

Elie H. Haddad and Jessica Ramirez (Locus Technologies, Mountain View, California)

Indoor air concentrations can be attributed to facility or occupational sources (e.g., sources attributed to building construction, operations, and occupation), potential volatilization from the subsurface into the building, and contributions from outdoor air. Vapor intrusion was evaluated at a Superfund site in Northern California, in what is perhaps the most comprehensive evaluation performed for this pathway. The following types of air samples were collected: 1) indoor samples, 2) pathway samples, 3) outdoor samples, 4) background outdoor samples, and 5) quality assurance samples.

To date, more than 1,200 indoor, outdoor, and pathway samples have been collected at the site from 13 residences and 29 commercial buildings. The concentrations were evaluated using a tiered approach: Tier 1: comparing concentrations to background, 2) comparing concentrations to short term risk levels, and 3) comparing concentrations to long-term risk levels.

All measured indoor air concentrations in commercial buildings met the evaluation criteria except for five buildings where certain indoor TCE air concentrations were above the evaluation criteria. Mitigation measures were implemented to reduce the concentrations in these buildings. Certain pathway samples also showed concentrations of TCE above the evaluation criteria. Although exposure to concentrations in pathway sample areas typically would be short and infrequent, or not feasible (e.g., in floor slab cracks), mitigation measures were implemented for these locations as well.

The mitigation measures included installation or refurbishing of ventilation systems, sealing of cracks and conduits, and installation of air purification systems. The presentation will demonstrate the effect of mitigation measures on indoor air concentrations by showing before and after plots, and will evaluate the effectiveness of the mitigation measures. The presentation will also show conclusions that were reached by evaluating this vast dataset.