

Liban, Cris B. (Tetrattech, Inc, Pasadena, CA), Katherine Hancock, Sally Liu, Kay Johnson (Tetrattech, Inc, Lafayette, CA), Ron Chu (Tetrattech, Inc, Pasadena, CA)

CALCULATING VAPOR INTRUSION TO INDOOR AIR FROM GROUNDWATER AND SOIL: AN EVOLVING SCIENCE

Vapor intrusion is the migration of volatile chemicals from the subsurface into overlying structures. Volatile chemicals from impacted soil and groundwater can emit vapors that may migrate into air spaces of overlying buildings. In extreme cases, the vapors may accumulate and exceed occupational criteria and explosive limits or cause unpleasant odors.

EPA issued a revised guidance (2002 Draft Guidance) in 2002 to address the demand for a more systematic approach of assessing subsurface vapor migration into indoor air. This new approach includes simple screening tools for rapid site assessment prior to conducting site-specific analyses. As with the previous (2001) guidance, the methodology depends on vapor intrusion analyses using the Johnson and Ettinger (1991) model. In addition, EPA updated the default model parameters and has developed a comprehensive vapor intrusion database that can aid in increasing the accuracy of model predictions. EPA foresees that the use of this guidance will lead to (1) less unnecessary sampling, (2) allocation of more resources to focus on real problems, and (3) provide a better confidence that the public is protected.

The 2002 Draft Guidance provides a basis for addressing vapor intrusion at petroleum-impacted sites. Vapor intrusion modeling has been conducted at a number of these sites across the country, including evaluation of a hypothetical refinery case in Southern California. Several of these case studies will be presented along with an analysis of how conclusions would differ, based on the 2002 Draft Guidance. Also, the utility of these tools to environmental managers will be examined with regard to designing appropriate mitigation measures for vapor control.