

FY 2015 ESTCP Environmental Restoration (ER) – BAA

Topic 1: Assessment of Vapor Intrusion from Subsurface Volatile Organic Compound Contamination

Objective

The objective of this Topic Area is to seek demonstration projects of methodologies, protocols, or decision-making tools that can improve our ability to more accurately and cost effectively assess vapor intrusion from subsurface volatile organic compounds. Vapor intrusion from chlorinated solvents is of particular interest. The ultimate goal of these efforts is to provide better and more cost-effective protection of human health. The following issues must be considered:

- Impact of temporal and spatial variability of contaminant measurements on vapor intrusion assessments.
- Impact of preferential vapor pathways on vapor intrusion assessments.
- Identification of the lines of evidence required for a more accurate assessment of vapor intrusion.
- Determination and management of the uncertainties associated with samples collected in the short term and their extrapolation over the long term.

Of particular interest is the development of an improved paradigm for assessing vapor intrusion that takes into account, but is not limited to, the issues listed above. Residential and industrial buildings are of concern.

Background

The vapor intrusion impacts to specific buildings can be difficult to predict or even measure accurately. The key uncertainties of concern include the delineation of subsurface sources, the degree of spatial and temporal variability, and the location and impacts of preferential pathways that often determine whether vapor intrusion will be a concern at a specific building. As a result of these uncertainties, vapor intrusion investigations can consume enormous time and resources, and cause considerable public concern.

Given these difficulties, there is a critical need to develop and demonstrate the tools and guidance needed to make robust decisions quickly and cost-effectively at vapor intrusion sites. Such guidance should include decision diagrams and detail the lines of evidence required, and should also help managers understand and manage the inevitable uncertainty involved in vapor intrusion assessments.

SERDP and ESTCP have funded several projects in an effort to understand vapor intrusion processes, develop low cost alternatives for sampling and analysis, and validate cost effective methods for mitigating VOC subsurface vapor intrusion. An ongoing SERDP study has shown the variable temporal nature of vapor intrusion impacts to indoor air and that conventional, relatively infrequent, point-in-time sampling methods may not accurately characterize vapor intrusion (Johnson et al., 2012). In addition, preliminary data from this study suggests that changes in groundwater concentration are not the primary factor affecting indoor air temporal

behavior. Additional results from this study can be found at <http://www.serdp-estcp.org/content/download/16795/188564/file/ER-1686-IR.pdf>.

Proposers should be familiar with these past vapor intrusion projects, which can be found at: <http://serdp.org/Featured-Initiatives/Cleanup-Initiatives/Vapor-Intrusion>. This work has laid the foundation for an improved vapor intrusion paradigm.

Proposed technologies should have completed all required laboratory work, although site-specific treatability/calibration work prior to the field demonstration is acceptable. Technologies and methods are sought that have well-defined demonstration/validation questions to address.

ESTCP demonstrations should address technical and/or regulatory issues that inhibit the widespread use of the proposed approach across DoD. ESTCP supports demonstrations at a scale sufficient to determine the operational performance of the remediation technology and to estimate its expected full-scale costs. Full-scale cleanup of specific sites is not performed under ESTCP. Specific DoD demonstration site(s) may be suggested in the pre-proposal, but are not required.

Johnson, P.C., H. Luo, C. Holten, P. Dahlen, and Y. Guo. 2012. *Integrated Field-Scale, Lab-Scale and Modeling Studies for Improving the Ability to Assess the Groundwater to Indoor Air Pathway at Chlorinated Solvent-Impacted Groundwater Sites*. Interim Report Submitted to SERDP, Alexandria VA. <http://www.serdp-estcp.org/content/download/16795/188564/file/ER-1686-IR.pdf>

Point of Contact

Andrea Leeson, Ph.D.

Deputy Director & Environmental Restoration Program Manager for SERDP & ESTCP
Environmental Security Technology Certification Program (ESTCP)

4800 Mark Center Drive, Suite 17D08

Alexandria, VA 22350-3605

Telephone: 571-372-6398

E-mail: Andrea.Leeson.civ@mail.mil