



ITRC PROJECT PROPOSAL

Petroleum Vapor Intrusion: A Multiple Lines of Evidence Approach

PROPOSAL DATE: Revised September 15, 2011

Proposal Contact

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Call for Proposals Topical Area

CHAR Site characterization, sampling, and monitoring

Problem Statement (why is this project necessary and relevant to ITRC's purpose & mission?)

As was the case in 2004 when the original ITRC Vapor Intrusion Team was formed is the same today – the vapor intrusion pathway remains one of the top environmental issues for state agencies. In fact, the results of the ITRC State Priorities Survey have ranked vapor intrusion in the Top 4 every year for the last five years. The ITRC Vapor Intrusion Team had a highly successful Internet-based training (over 2,700 participants with the largest class of 451) and classroom training (1,351 attendees so far).

The main reason that vapor intrusion has remained a critical environmental issue is the continued evolution of the pathway. While the investigation of contaminated soil and groundwater has been around for well over a century, vapor intrusion has only been in the national spotlight for the last ten years. Scientific research is continually providing new insight into the movement and mitigation of subsurface vapors. Thus, state and federal environmental agencies, consulting firms and industry are desperately trying to stay up-to-date on the ever-changing approaches to vapor intrusion.

In short, the problem is the lack of current, reliable and scientifically-based information on the investigative strategies and mitigation measures of the vapor intrusion pathway. Specifically, there is a lack of clear guidance on the application of multiple lines of evidence for petroleum vapor intrusion.

In November 2002, the EPA released the *OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance)*. The guidance stated that it was not recommended for use at Subtitle I UST sites because of certain conservative assumptions, designed to address chlorinated solvents, which may not be appropriate at a majority of petroleum release sites (LUST sites).

Most vapor intrusion guidance presently available from state agencies, the federal government, the Department of Defense (DOD), industry groups, and the ITRC itself recognize the unique nature of petroleum vapor intrusion, but fail to devote sufficient discussion to the subject. The complexity of petroleum vapor intrusion necessitates a broad investigative approach that varies from chlorinated compounds.

The approved 2008 ITRC Vapor Intrusion Multi-Day Classroom Training Project included a Year 5 (2012) "evaluation and modification as necessary of Tech/Reg guidance . . . to stay up-to-date with current research and developments." This step envisioned the possible need to reconvene the ITRC VI Team to address any modifications.

The necessity for a Tech/Reg document that elaborates on the multiple lines of evidence associated with petroleum vapor intrusion is clear and timely. It is a natural transition for the ITRC Vapor Intrusion

Training Team to address this technical gap and an opportunity to work collectively with our partners at the USEPA, Department of Defense, Industrial Affiliates Program, and state environmental agencies.

This project supports ITRC's Mission to develop information resources and help break down barriers to the acceptance and use of technically sound innovative solutions to environmental challenges through an active network of diverse professionals. In addition, this project meets the ITRC Strategic Element to be the "go-to" environmental solution provider in the realm of applying innovative solutions to protect human health and the environment.

Proposed Scope to Address Problem (what is the approach for this project?)

The proposed PVI Multiple Lines of Evidence Tech/Reg will provide a technical explanation of biodegradation of petroleum hydrocarbon vapors in vadose zone soils. An extensive discussion of the various investigative tools relevant to petroleum hydrocarbons will be enumerated with a technical overview, pros and cons, and proper application. Based on these tools and the development of a conceptual site model, the role of a multiple lines of evidence approach will be explained. Thus, a comprehensive practical methodology to evaluating sites for petroleum vapor intrusion will be developed.

An assessment of the current regulatory approach to petroleum vapor intrusion will be completed and a summary provided in the Tech/Reg document. Case studies and peer-reviewed research will be included to support the multiple lines of evidence approach for petroleum hydrocarbons. In addition, an overview of petroleum-related vapor intrusion mitigation will be furnished.

Targeted Users (who will use products generated by this project?)

Primary audience - State and federal regulators, consultants and other environmental professionals engaged in vapor intrusion issues at petroleum hydrocarbon contaminated sites (i.e., gas stations, refineries and storage terminals, heating oil facilities, military installations).

Secondary audience – Developers, community stakeholders, and the general public concerned about petroleum hydrocarbon contamination.

According to the ITRC State Engagement Program – Summary of ITRC State Priority Issues for November 2010, vapor intrusion was the fourth highest issue with a weighted average score of 9.9.

Summary of Deliverables (primary project products)

Products:

1. Tech/Reg Guidance Document outlining the multiple lines of evidence approach to petroleum vapor intrusion. Detailed discussions will be provided on the various investigative tools and mitigation methods related to petroleum hydrocarbons.
2. Internet-Based Training Course.

Impact (how will this project result in more effective environmental decision making?)

Many state and federal agencies are utilizing vast resources on petroleum vapor intrusion evaluations that may not be necessary due to the lack of a technical guidance based on current science. The extensive advancement over the last decade of our understanding of petroleum vapor intrusion and the variety of investigative tools will be documented in the ITRC Technical and Regulatory Guidance document and associated internet based training course. With this document and training course, states and federal government, DOD, and DOE will be able to evaluate PVI in a practical and cost-effective manner.

Project Schedule

ITRC PVI Team membership registration will open in late February 2012. The kick-off meeting of the PVI Team will take place in April 2012. The proposed project schedule is to complete the ITRC PVI: A Multiple Lines of Evidence Approach Tech/Reg document and the associated internet based training course by Spring 2014.

Proposed Personnel

Team Leaders:

John Boyer (NJDEP)

John Menatti (UT DEQ)

Supporting State Members:

Jeff Kuhn, Chief, LUST Brownfields Section (MT DEQ). Other state regulators to be identified through the team formation process.

Other Organizations:

Preliminary discussions have been held with other state regulatory agencies, the American Petroleum Institute, Arizona State University, Shell, Chevron, BP, and representatives of numerous consulting firms.

Skill Mix of Team Members:

The team members will provide a variety of scientific and educational backgrounds related to petroleum vapor intrusion, including Hydrogeologist, toxicologist, petroleum storage tank regulators, Geochemists and others.

Proposed In-Kind/Direct Project Funding:

Several IAPs have indicated that they would support the ITRC PVI Team with funding.

Related Work

The ITRC PVI Multiple Lines of Evidence Tech/Reg document will be released after the release of the USEPA OUST Petroleum Vapor Intrusion Guidance document. Through careful coordination, the ITRC document should complement activities of the USEPA's OUST PVI work group and expand the available guidance on petroleum hydrocarbons and the vapor intrusion pathway, while also providing much needed training on this topic.