ITRC TEAM PROJECT SUMMARY STATEMENT

PRE-IMPLEMENTATION

ITRC In Situ Bioremediation of Chlorinated Ethene: DNAPL Source Zone
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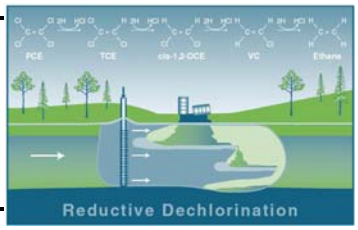

TECHNOLOGY/METHODOLOGY SUMMARY

State of the Technology/Methodology

A DNAPL source zone can act as a reservoir that sustains a contaminant plume in groundwater over the long term. In situ bioremediation (ISB) increases contaminant removal by (1) enhancing dissolution and/or desorption of nonaqueous- and/or sorbed-phase contaminant mass and (2) promoting subsequent biological degradation to nonchlorinated, nontoxic end products. This process can help to achieve the goals for dense, nonaqueous-phase liquid (DNAPL) source treatment, which are to reduce the mass of contaminants within the source area and to minimize contaminant migration above unacceptable levels. While the treatment of dissolved-phase chlorinated ethenes in groundwater using ISB is an established technology, its use for DNAPL source zones is an emerging application.

The Future

Based on a review of relevant case studies, the ITRC's Bioremediation of DNAPLs (BioDNAPL) Team concluded that ISB of DNAPL source zones is a viable technology and can be an effective component of a treatment plan. The future use and acceptance of ISB of chlorinated ethenes will improve and accelerate by the use of *In Situ Bioremediation of Chlorinated Ethene: DNAPL Source Zones* (BioDNAPL-3, available at **www.itrcweb.org/Documents/bioDNPL_Docs/BioDNAPL3.pdf**. The objective of this guidance is to provide a systematic understanding of the technical and regulatory considerations for the use of ISB at DNAPL source zone sites. The document provides information related to site characterization requirements, application and design criteria, process monitoring, and process optimization. Six ISB case studies at DNAPL sites are also summarized.

TEAM SUMMARY

ITRC Team Process Attributes

The ITRC BioDNAPL Team comprised representatives from state regulators, academia, stakeholders, federal partners, and industry. Fields of expertise ranged from biology, biochemistry, and geology to engineering.

Key Learning

- Successful implementation depends on the expectations and the understanding among the regulators, public, and remediation team.

- Costs to implement additional monitoring parameters depend on the regulatory requirements and may be of concern to the regulator.
- Inadequate groundwater source zone characterization is often one of the major reasons for problems cited for inadequate remedy performance. Additional site characterization, once remediation has been implemented, is a common response to address inadequate performance. The characterization of a complex DNAPL source area can incur considerable cost; however, costs leading to a thorough understanding of the DNAPL source area will help optimize the remedy and ultimately allow for a more cost-effective remediation through the life cycle of the project.

ITRC Team Next Steps

During implementation the team expects to accomplish the following:

- Offer short classroom training courses in coordination with conferences and meetings
- Find opportunities to incorporate ISB of ethenes into existing projects
- Investigate the appropriateness of incorporating the guidance into college environmental course work.
- Develop a one-hour series of slides describing the use of the guidance and offer it in EPA regions, brownbag lunches, corporate trainings, etc.