In Situ Bioremediation: From Research to Practical Applications

Terry C. Hazen
Lawrence Berkeley National Laboratory, Center for Environmental Biotechnology
University of California, MS 70A-3317
One Cyclotron Road, Berkeley, CA 94720
fax (510) 486-7152; phone (510) 486-6223; E-mail tchazen@lbl.gov

For the past 10 years, we have been studying, demonstrating, and deploying several gaseous nutrient injection techniques for in situ bioremediation of groundwater and soil contaminated with a variety of hazardous organics. Fundamental research that provided a sound scientific basis for the strategies that were deployed in the field was essential for successful demonstrations and subsequent deployments. By doing a series of treatability tests for several sites, followed by mesoscale (column) studies we were able to develop a convincing set of data that could be presented to the stakeholders, endusers, and regulators. This allowed us to proceed with pilot-scale demonstrations and then full-scale demonstrations. It was critical to the success of the project that the technology developer and researcher stay involved with the initial permitting process and the subsequent field demonstrations. Subsequent commercialization and wide spread use of these technologies hinged on the full-scale demonstrations that convinced site owners, endusers, and regulators that these technologies were appropriate for the sites being considered. Examples of each step in the process will be presented for chlorinated solvent bioremediation. Case studies for full-scale demonstrations and deployment will also be discussed. Spin-off applications for creosote, PAHs, and petroleum sludge will also be presented briefly. The principle sites presented for this discussion are in CA, FL, VA, GA, SC, MI, and Poland.

Supported by Department of Energy under Contract No. DE-AC03-76SF00098.