

## **282g Laboratory and Field Demonstration of Bioaugmentation for Remediation of Tetrachloroethylene**

*sathishkumar Santharam, Jwan Ibbini, Larry Davis, and Larry E. Erickson*

Laboratory research has been carried out and a pilot study is in progress for remediation of a tetrachloroethylene (PCE) contaminated site at Manhattan, KS. The subsurface has two distinct aquifers, termed shallow aquifer and deep aquifer with groundwater velocities of about 1.1 ft/day and 0.7 ft/day. PCE concentration in groundwater at the pilot study area (PSA) is about 15 mg/L (ppm) in the deep aquifer and 1 mg/L in the shallow aquifer. Laboratory microcosms prepared with groundwater from the site exhibited partial dechlorination to cis 1,2-dichloroethylene when amended with yeast extract and glucose or soy oil methyl esters (SOME) or lactate. After addition of KB-1, a consortium of *Dehalococcoides*, however, a large fraction of the PCE was converted to the end product ethene/methane. PCE degradation was also studied in channels of dimensions 110 cm length, 10 cm width and 60 cm depth. PCE solution, at a concentration of about 12 iM (~2 mg/L), was fed into the channels continuously to simulate groundwater flow conditions. One channel was treated with glucose and another channel with SOME. No PCE was detected in the outlet solution from the glucose treated channel and all the inlet PCE was converted to dichloroethene (DCE). In the SOME treated channel, only about 60% of inlet PCE was converted to daughter compounds of PCE. However, when SOME was added through a well located midway (~ 60 cm from inlet) of the channel, no PCE was present in the outlet. SOME fed at the inlet may be trapped in the initial portion of the channel. It is not as easily dispersed along the length of the channel as glucose. Based on the results from the microcosm and mesocosm (channels), a pilot study will be conducted in the field.