Aquifer Simulation Vessel (ASV) Studies

The Aquifer Simulation Vessel (ASV) is used to establish the influence from important field-scale parameters upon the efficacy of HRC. The ASV, shown in Figure 1, consists of a horizontal six-inch diameter/six-foot length pipe. ASVs are designed to allow measurement at six-inch intervals along the pipe. Each pipe is packed with contaminated soil from an actual field site. HRC is placed in the system at the "CAH-water" inlet side; the flowing water will pass through the HRC and then move through the length of the pipe. The water can be added with varying concentrations of CAHs and corresponding remediation rates can be measured. It is also possible to measure the distribution of lactic acid and its breakdown products (see HRC technical bulletin #1.3.2).

In initial studies, the ability of HRC to facilitate the reductive dechlorination of TCE was measured. An ASC was filled with soil and a 6mg/L TCE solution was added to the soil at the CAH-water inlet side. The ASV was allowed to acclimate over a period of 6 days, during which time baseline TCE concentration profiles were established. Finally, a "slug" of HRC was added to the inlet side and the system was run at a flow rate of 0.5 ft/day for a period of 9 days. Results from one experiment in which TCE levels were measured at days 1, 6, and 9 at each six-inch interval along the ASV are presented in Figures 2, 3, and 4, respectively

Figure 1

Figure 2

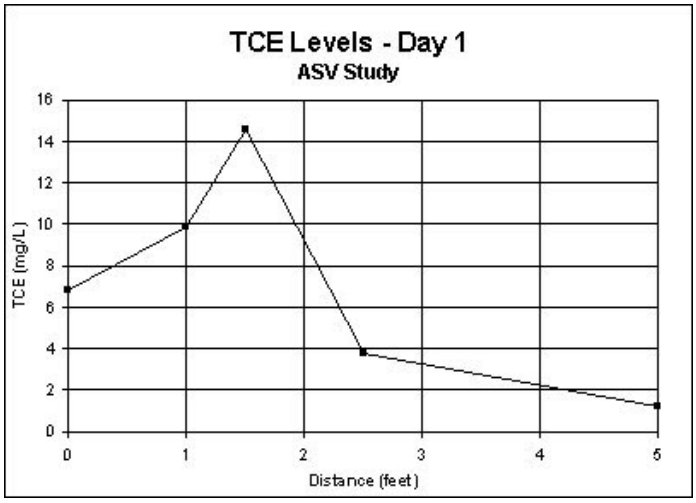

Figure 3

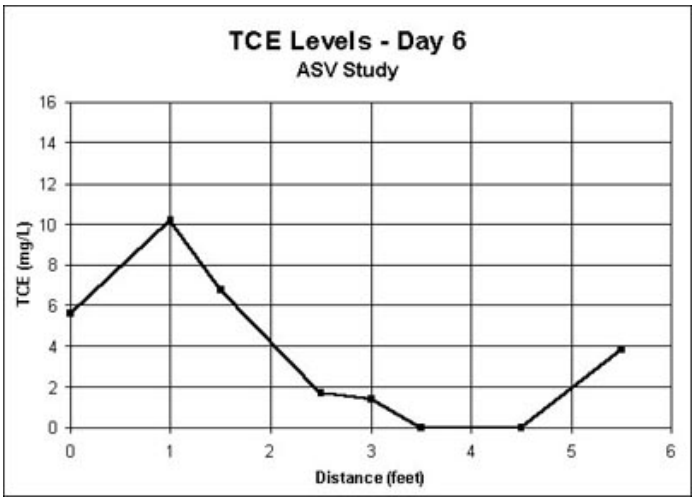

Figure 4