



# ***Combined Air Sparging and Bioaugmentation***

## ***Case Study:***

### ***Cis 1,2-Dichloroethylene and Vinyl Chloride Removal Confidential Site, Cincinnati, Ohio***

#### ***Site Summary:***

The natural attenuation of trichloroethylene(TCE) left high concentrations of 1,2-dichloroethylene (1,2-DCE) and vinyl chloride in soil and ground water at a printing company . The anaerobic conditions of the site induced reductive dechlorination of TCE by indigenous organisms. However, the conditions and indigenous organisms were incapable of completing the contaminant removal, leaving behind the residual contamination.

Since studies have shown that cis 1,2-DCE and vinyl chloride are more easily removed by aerobic oxidation, air sparging and BioLogix CL® bioaugmentation were implemented to complete the contaminant removal. Within three months of the combined approach the concentrations of both contaminants were below detection limits.

#### ***Geology and Hydrogeology***

The site is on a thin mantle of silty clay over fractured and thinly bedded shale and limestone. Ground water is perched in the overburden and fractures in the bedrock.

#### ***Remediation Design***

The plume area was approximately 3,000 square feet. Bioaugmentation was implemented through six temporary well injection points.

BioLogix CL ® microbes were initially added in January 2001 without air sparging. After this initial inoculation, the cis 1,2-DCE concentration decreased from 193 to 46 µg/L, but there was little change in the vinyl chloride concentration. Aeration was added in February 2001 and a second inoculation took place. The following month the cis1,2-DCE and vinyl chloride concentrations were below detection limits. The following table shows the contaminant concentration results.

<b>Contaminant Concentrations in Ground Water (µg/L)</b>		
<b>Sampling Date</b>	<b>Cis 1,2-DCE</b>	<b>Vinyl Chloride</b>
<b>6/29/00</b>	<b>391</b>	<b>416</b>
<b>10/16/00</b>	<b>193</b>	<b>293</b>
<b>BioLogix CL® Injection</b>		
<b>2/07/01</b>	<b>46</b>	<b>290</b>
<b>BioLogix CL® Injection with Aeration</b>		
<b>3/9/01</b>	<b>&lt;5</b>	<b>&lt;2</b>

