ORC TECHNICAL BULLETIN # 2.2.2.5

Oxygen Release Compound, ORC®

Vinyl Chloride Remediation Field Study

The enhanced bioremediation of vinyl chloride using ORC was demonstrated at an industrial site in Massachusetts. As part of the USEPA SITE program, ABB Environmental Services (now Harding Lawson Associates) conducted a dual phase treatment of a contaminant plume containing chlorinated hydrocarbons. The treatment took place in a recirculating well system as illustrated in Figure 1.

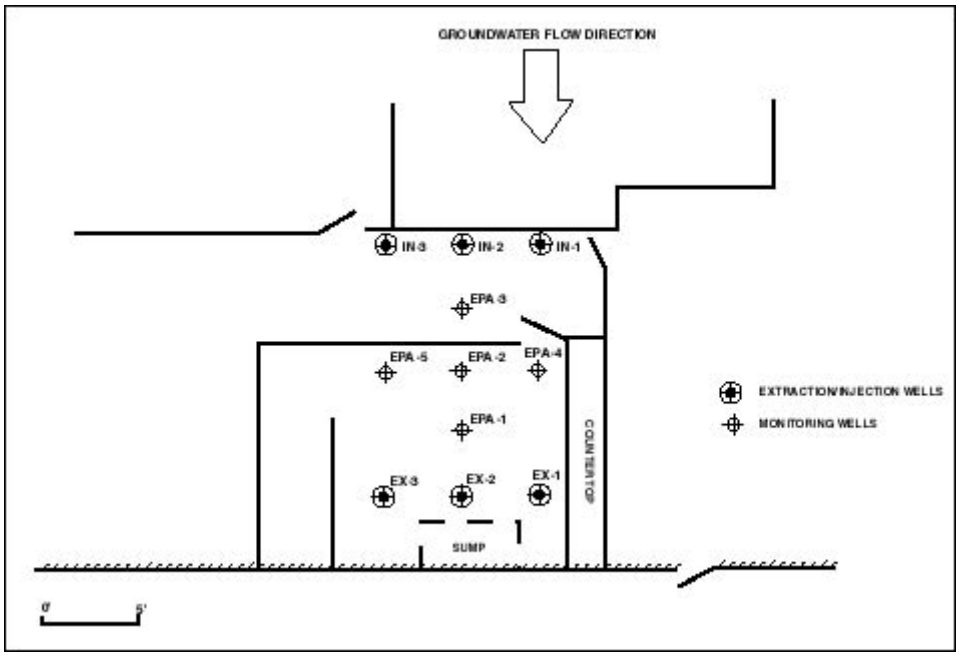

Figure 1

The first phase of treatment was the enhanced anaerobic biodegradation of the higher order chlorinated compounds (PCE and TCE) through the weekly addition of lactic acid. The products of the first phase of treatment, DCE and VC, were treated aerobically in the second phase. Aerobic conditions were maintained through the addition of ORC to the system. Results are presented in Figures 2 and 3. Following approximately 110 days of aerobic treatment with ORC, monitoring data averaged across IN-2, EPA-2, and EPA-3 indicated a 40% reduction in DCE and a 47% reduction in VC. Reductions at EPA-2 alone, at the center of the recirculating system, were 50% for DCE and 75% for VC. Cis-DCE epoxide, a transient biodegradation product, was detected, which is evidence showing that methane oxidizing bacteria were active and cis-DCE biodegradation was occurring.

As indicated in Figures 2 and 3, methane was added to the system during the middle of the aerobic treatment period in an effort to stimulate co-metabolic biodegradation. This step may have actually interfered with direct substrate remediation of DCE and VC.

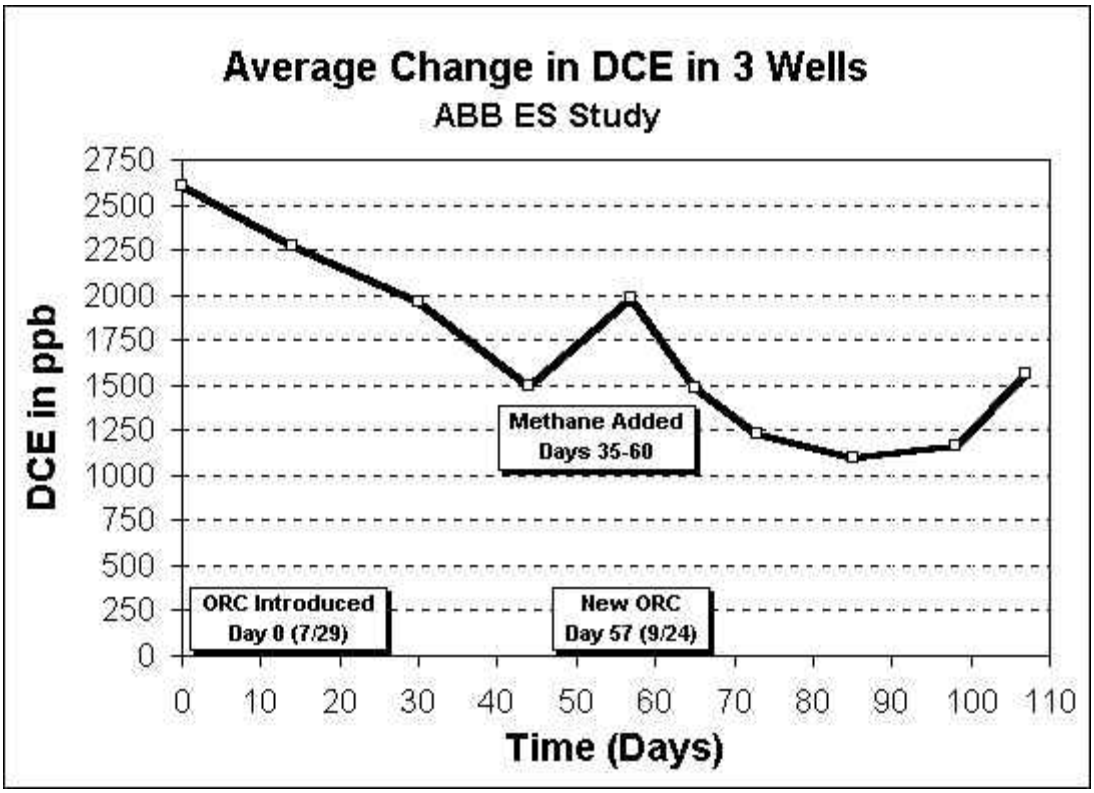

Figure 2

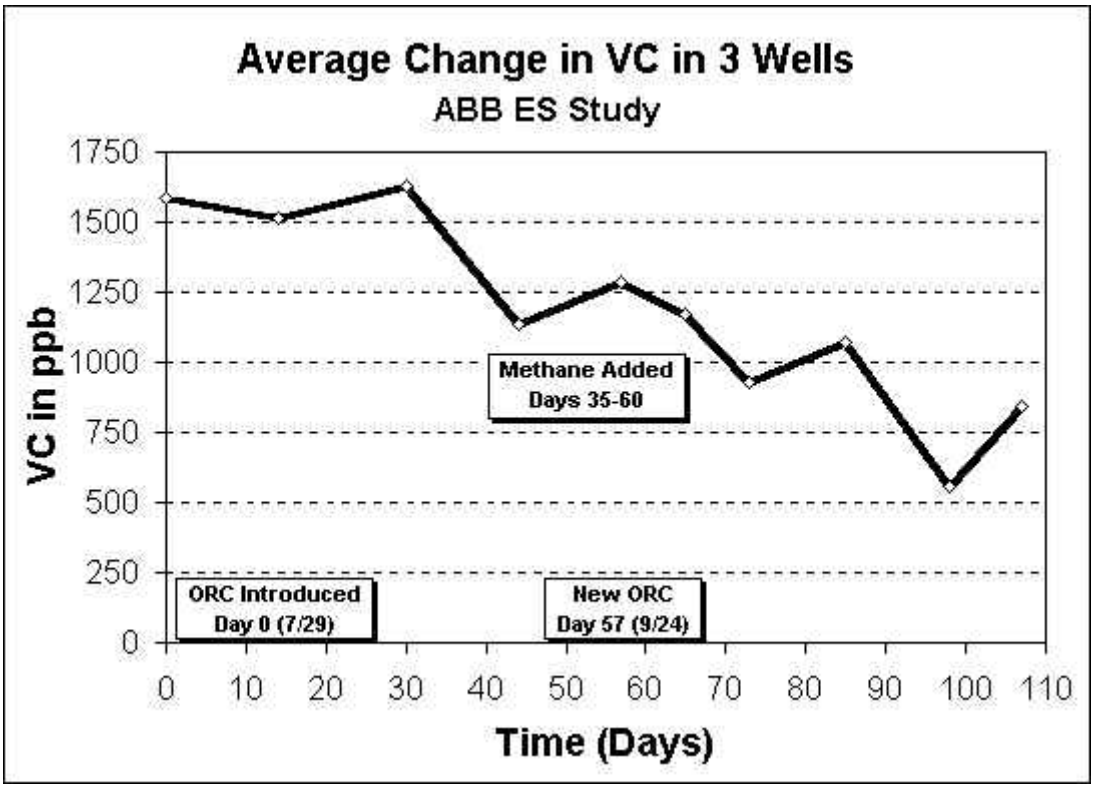

Figure 3

Technical Bulletin Index||Regenesis Home Page