



Aerobic Solvent Bioremediation Case Study: PCE, 1,1,1-TCA and 1,1-DCE Bioremediation at a New Jersey Manufacturing and Plating Company

Location

West Central New Jersey

Site Conditions

Ground water plume in an alluvial aquifer beneath an active facility. High permeability and hydraulic conductivity. Aerobic aquifer conditions.

Target Chemicals

The target chemicals were PCE, 1,1,1-TCE and 1,1-DCE. The risk driver and most significant exposure was via off-property migration.

Special Considerations

The bioaugmentation followed in-situ chemical oxidation that appeared to have reached a treatment limit.

Application

1,045 gallons of hydrated CL-Out microbes were injected through a grid of injection points.

Results

After four months all contaminant concentrations were below the remediation goals

Background

CL-Out® bioremediation successfully restored aquifer conditions at an operating industrial site in central New Jersey. The cleanup goal was to reduce the contaminant mass sufficiently to meet site-specific goals to prevent off-site migration risks.

Site Specific Conditions

The geology of the site was typical fluvial floodplain with coarse sand deposits. Both the porosity and the hydraulic conductivity were relatively high. The ground water had high natural dissolved oxygen levels, which favor CL-Out bioremediation by cometabolism.

The affected aquifer was approximately 20 to 25 feet thick. The water table was approximately 10 feet below ground surface. The bottom of the aquifer was at approximately 14 to 20 feet deep.

Chlorinated solvents were found in the ground water in two plumes covering a combined area of about one half acre. The contaminants were a mix of chlorinated solvents including 1,1,1-TCA, 1,1-DCE and PCE. The remediation goal was to reduce the mass of contamination in the ground water plume to prevent mitigate off-site risks.

Remediation Design

Nineteen drums of CL-Out (1,045 gallons) were injected into the contaminated soil and ground water through direct-push points on two monthly applications. The injection points covered the plume area on a grid with 20 foot spacing. Ground water samples were taken from monitoring wells to track the progress of the remediation.

Results

After the CL-Out application, ground water concentrations in all monitoring wells decreased significantly. The following table shows the concentration trend in a typical mid-plume monitoring well.

Sampling Date	PCE	1,1,1-TCA	1,1-DCE
2/17/09 Pre-treatment	5.13	47.3	1.23
6/24/09 Post-treatment	0.832	3.88	ND
Percent Reduction	84%	92%	100%

All concentrations shown in µg/L

After the treatment was completed and two rounds of post-treatment monitoring have shown that the cleanup goals were met.

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