

HIGHLY SUCCESSFUL ERD PILOT STUDY IN RESIDUAL DNAPL

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Groundwater at a manufacturing facility in east central Ohio contains trichloroethylene (TCE) at concentrations nearly 30% of its solubility limit, implying the presence of DNAPL. Enhanced reductive dechlorination was selected as the site remedy using ERDenhanced™, a patented carbohydrate-based additive formulated with macro-micro nutrients to stimulate native soil bacteria and enhance the destruction of chlorinated alkene source mass. A remedial pilot study was implemented to collect pre-design data for the full-scale remedy.

ERDenhanced™ was amended to the well bore of three monitoring wells utilizing Passive Release Sock (PRS) technology. Overall, there was an 80%Reduction to >99.9%Reduction in TCE concentrations at the three wells over 12 months. At one of the wells, there was a 99.9%Reduction in cis-1,2-dichloroethene (cis-1,2-DCE) and a 98%Reduction in vinyl chloride (VC), consistent with abiotic dechlorination. At the two other wells, there was an >186%Increase in cis-1,2-DCE and as high as a 500%Increase in VC.

The significant reduction in TCE concurrent with increased cis-1,2-DCE and VC is consistent with biotic dechlorination. Indicator parameter data were generally consistent with the development of anaerobic, chemically reducing conditions proceeding down to at least sulfate reduction at all three wells into which PRSs were deployed.

Conditions at a background well remained generally aerobic, chemically oxidizing throughout the plot study. CENSUS Bio-Trap data were collected at the wells into which PRSs were deployed and at a background well following ten months of PRS deployment. Each of the three Bio-Traps deployed at wells equipped with PRSs had positive indicator values (i.e., tceA Reductase, BAV1 VC Reductase, VC Reductase) up to 104 cells/bead whereas the one Bio-Trap deployed at the background well was non-detect.

A remedial design is under development to advance the site towards regulatory closure.

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