

Combined Remedies Used at Historic Illinois Chemical Company *cVOCs in Bedrock Treated at Active Manufacturing Facility*

Project Highlights

- RegenesiS Remediation Services (RRS) used combined technologies to work toward the shutdown of a pump and treat (P&T) system.
- Previous Enhanced Reductive Dechlorination (ERD) technology applications did not achieve COC reductions.
- Advanced ERD, Bioaugmentation and ISCR remedies were combined and applied into weathered bedrock.
- The project required RRS to be PICS certified. PICS is a contractor prequalification services used many large E&C and fortune 500 companies.



10-foot vertical injections were applied into silty sand and clay over weathered bedrock.

Project Summary

The site is home to an active chemical manufacturing facility with historic spills of cVOCs. Within the contamination impact zones, a groundwater P&T system is being used to mitigate off-site migration of cVOCs in the groundwater. The consultant was seeking ways to turn off the P&T system by treating the plume in-situ. They had previously used an ERD technology without fully achieving primary COC reductions. RRS designed and implemented a pilot study for the site.

Remediation Approach

The pilot study was designed to test RegenesiS' combined remedy approach which incorporated ERD using 3-D Microemulsion, Bioaugmentation with BDI Plus and ISCR with CRS. RRS applied the integrated technologies through direct-push borings. The 2,500-square-foot treatment zone included 10-foot vertical injections into silty sand and clay over weathered dolomite bedrock.

Technology Description

3-D Microemulsion is an engineered electron donor material that offers a novel 3-stage electron donor release profile, pH neutral chemistry and is delivered on-site as a factory-emulsified product.

HRC Primer is a less viscous version of the standard Hydrogen Release Compound (HRC) product. It is a thinner, water-like compound that is typically injected into an aquifer where it releases lactic acid at a rate faster than standard HRC (several weeks), but at a slower, more controlled rate than dispersing aqueous simple sugar solutions or straight lactic acid (several days).

Bio-Dechlor INOCULUM Plus is an enriched natural microbial consortium containing species of Dehalococcoides sp. (DHC). This microbial consortium has since been enriched to increase its ability to rapidly dechlorinate contaminants during in situ bioremediation processes.

CRS® (Chemical Reducing Solution) is an iron-based amendment for in situ chemical reduction (ISCR) of halogenated hydrocarbon contaminants such as chlorinated ethenes and ethanes.

Site Type: Industrial

Contaminant of Concern: cVOCs

Concentration: 3-5 ppm

Remediation Approach: Enhanced Anaerobic Bioremediation, Bioaugmentation, In Situ Chemical Reduction

Soil Type: Bedrock, Clay, Silty Sand

Treatment Area: 2,500 Square Feet

Technology Used: 3-D Microemulsion, BDI Plus, CRS, HRC Primer