REGENESIS

PROJECT PROFILE

# Chlorinated Solvents in Soil, Gas, and Groundwater Remediated at Former Manufacturing Facility

***"No Further Action" Status Achieved at Ohio Brownfields Site***

## Project Highlights

- Integrated Site Remediation coupling enhanced reductive dechlorination (ERD) and vapor mitigation was implemented to address the immediate risk of vapor intrusion and the long-term risk of identified CVOCs in groundwater.
- Combined remedy approach allowed site to be redeveloped as an apartment complex roughly 6 months following the groundwater treatment.
- "No Further Action" status and covenant not to sue letter was granted in 2013.
- Cost for groundwater water treatment was approximately $10 per cubic yard (product and application) and vapor intrusion mitigation was $3.34 per square foot with no long term O&M required.

*Both vapor intrusion and chlorinated solvents were treated on-site.*

**Site Type:** Manufacturing

**Contaminant of Concern:** TCE, Cis-DCE, VC

**Concentration:** 1,300 ug/L

**Remediation Approach:** Enhanced Anaerobic Bioremediation, Bioaugmentation, Vapor Intrusion Mitigation

**Soil Type:** Clay with Interbedded Sand Layers

**Treatment Area:** 25,000 Square Feet (Groundwater Treatment)
15,522 Square Feet (Vapor Mitigation)

**Technology Used:** 3-D Microemulsion FE, BDI Plus, Geo-Seal

## Project Summary

The site, a former industrial magnet manufacturing facility in Ohio, received a $2.34 million Clean Ohio Revitalization Fund grant through the Ohio Department of Development in 2011. Site investigation activities identified chlorinated VOCs in groundwater and vapors above the state regulatory limits. Using a combined approach of ERD with vapor mitigation addressed the immediate risk of vapor intrusion and the long-term risk of groundwater impacts. By implementing this strategy, the site was allowed to be redeveloped as an apartment complex roughly 6 months following the groundwater treatment. "No Further Action" status and covenant not to sue letter was granted in 2013. The site currently operates as a residential apartment complex.

## Remediation Approach

In the Spring of 2012, ERD using 3-D Microemulsion® and Bio-Dechlor INOCULUM® Plus was implemented within the defined 24,000-square-foot treatment area via direct-push injection. In Fall 2012, the Geo-Seal™ vapor barrier system was installed below a 15,522-square-foot apartment complex raised at the site. The cost for groundwater treatment was approximately $10/cy (product and application) and Geo-Seal was $3.34/sf (product and installation).

## 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.

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.

Geo-Seal is a composite system that creates the ideal blend between constructability and chemical resistance by using both high density polyethylene (HDPE) and spray applied asphalt latex.