

ISCO/ERD Treat PCE Contamination at Indiana Dry Cleaner

Remediation Plan Addresses Concentrations Below Facility and Downgradient

Project Highlights

- PersulfOx utilized subslab near the source to inhibit vapor issues within the building.
- Combined remediation plan addressed impacts both below the building and downgradient of the facility.
- PCE contamination was nearly depleted and TCE levels below 10 ppb were observed.
- The site is currently being monitored to demonstrate plume stability with approximately 3-4 more monitoring events prior to site closure.



PersulfOx was applied sub-slab near the source to inhibit vapor issues within the building.

Project Summary

A release of PCE from a former dry cleaning operation in Indianapolis resulted in groundwater contamination below the facility and downgradient. Contamination impacts were also observed in shallow fill below the concrete slab. Along with the groundwater/soil contamination, vapor intrusion was also detected within the facility and adjacent spaces in the strip mall. A combination of enhanced reductive dechlorination (ERD) and in situ chemical oxidation (ISCO) was used for remedial action. Analytical results obtained indicate nearly complete reduction of PCE and less than 10 ppb of TCE in all wells. Currently, elevated VC concentrations in two wells were observed but reductions are expected as the ERD process is completed.

Remediation Approach

PersulfOx[®] Catalyzed Persulfate was injected below the floor slab of the dry cleaner to inhibit vapor production within the facility and adjacent spaces. 3-D Microemulsion[®] and Bio-Dechlor INNOCULUM[®] Plus were injected into the uppermost water-bearing area below the dry cleaner and into two areas downgradient on either side of the building. Supplemental ERD injections were applied in two areas approximately 9 months after the initial injection to address minor sand stringers that were contributing to continued contamination impacts. The supplemental injection resulted in immediate elimination of PCE/TCE and a rapid production of VC. The site is currently being monitored to demonstrate plume stability with approximately 3-4 more monitoring events prior to site closure.

Technology Description

PersulfOx is a sodium persulfate-based chemical oxidation technology which destroys both hydrocarbon and chlorinated solvent-type contaminants in the subsurface. PersulfOx contains a built-in catalyst which activates the persulfate component and generates contaminant-destroying free radicals without the need for the addition of a separate activator.

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 INNOCULUM 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.

Site Type: Dry Cleaner

Contaminant of Concern:
PCE, TCE, VC

Concentration:
PCE –350-600 ppb; TCE – 55-250 ppb; VC 9-45 ppb

Remediation Approach:
Enhanced Reductive Dechlorination, In Situ Chemical Oxidation

Soil Type:
Silty Sand Lenses in Clay Matrix

Technology Used:
3-D Microemulsion, BDI Plus, PersulfOx