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PROJECT DETAILS

Location:

SE United States

Project Type:

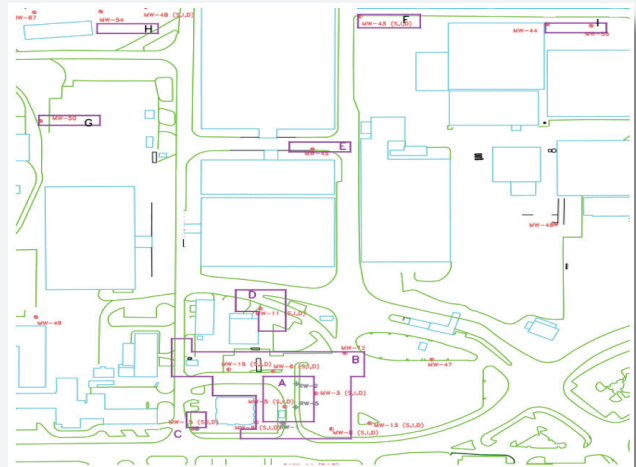
EZVI (DNAPL) and
In-Situ Bioremediation

PROJECT SUMMARY

In-situ chemical reduction (ISCR) was utilized at an active industrial facility in the southeastern U.S. to remediate groundwater and soil. The contaminants of concern were trichloroethylene (TCE) and daughter products. The total area of the remediation covered approximately 38 acres and targeted groundwater and soil from 35 – 45 ft. bgs. The remediation products were delivered through a total of 92 injection points, covering 9 treatment areas, via direct push technologies (Fig 1). Three injection intervals were utilized between 35 and 45 feet bgs to emplace the remedial products within the targeted soil and groundwater affecting a radius of approximately 15 feet for each point.

REMEDIATION PLAN

The drilling/injection program utilized direct push technology combined with Badger Injection Solutions delivery technology. A combination of Emulsified Zero Valent Iron (EZVI) and KB-1 in the source area and electron donor with KB-1 in the downgradient dissolved plume areas was implemented during 2 small pilot studies (targeting TCE hot spots) and again for the site wide remedial approach. Trichloroethene and its daughter products, cis-1, 2- dichloroethene and vinyl chloride were the targeted contaminants of concern with TCE levels exceeding 400 mg/l (ppm) in the former sump area (area A on Fig. 2). The geology at the site consists of fine sands with traces of silty-sandy clay from near the surface to approximate depths of 40 to 46 feet bgs. Underlying this upper



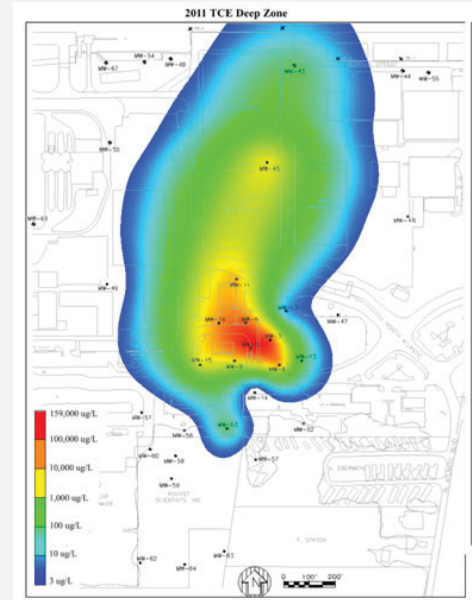
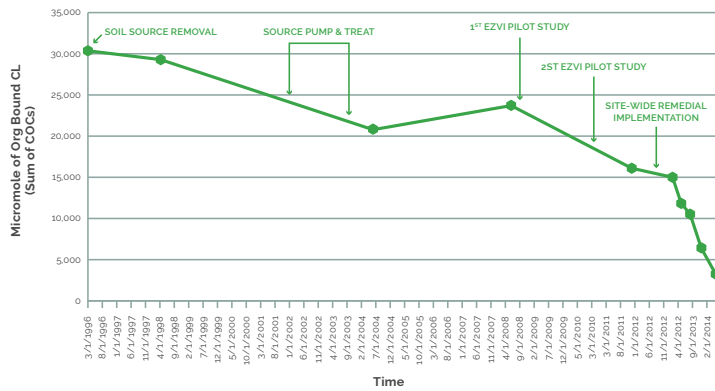
sandy zone is a clay layer approximately 15 feet thick at the location of the former source area. A total of 92 temporary injection points were used to deliver approximately 19,700 gallons of EZVI, approximately 25,000 gallons of electron donor (veg. oil), and 472 liters of KB-1 into 8 distinct areas over 8 working days.

THE RESULTS

The results since the full scale implementation (18 months) have shown over a 60 fold enhancement of the site wide reductive dehalogenation kinetics. This was a DNAPL TCE site with initial groundwater TCE concentrations exceeding 800,000 µg/L.

To date over 96% of the parent compound has been destroyed site wide (over a 38 acre area) and the owner is now in position to petition for risk-based closure. A risk assessment has been prepared and is ready for submittal.

REMEDIATION TIMELINE



POST INJECTION ANALYSIS

