Project Summary

COMBINED REMEDIES ADDRESS CHLORINATED SOLVENT IMPACTS AT AN INDUSTRIAL SITE

BACKGROUND

Historical industrial property that utilized chlorinated solvents for equipment maintenance from the 1950s to 1970s. Materials are suspected to have been discharged to drain pipes which allowed for the migration of the product across the area. Site is still active with existing utilities and various structures. Contamination has been confirmed in both the unsaturated and saturated zones through High Resolution Characterization activities. Contamination has been identified from depths of 8 feet (ft) to 46 ft with depth to groundwater at 15 ft. The site geology consist of interbedded sands, silts and clays associated with river sedimentation. Site remediation complexities consisted of groundwater/surface water management and weather conditions due to implementation from late September to January. TCE concentrations have been detected in Groundwater at a maximum concentration of 730 mg/L and in soils at 5,350 mg/kg.

PROJECT TIMELINE

- Remedial Design Characterization (RDC) – October to December 2013. (Figure 1.)
- Advancement of 26 soil borings
- Collection of 186 soil samples (approximately every 2 ft bgs)
- Collection of 31 groundwater samples from micro wells
- Hydraulic Profile Testing/Hydraulic Conductivity testing along with Electrical Resistivity Testing to identify the bedrock profile
- Injection of BOS 100® Permeable Reactive Barrier (PRB) – May 2014 (Figure 2.)
- Soil Mixing of RemOx®L (Sodium Permanganate) – October to December 2015 (Figure 2.)

BOS 100 INJECTION

4,200 pounds of BOS 100® was applied in a 40 ft by 40 ft area from a depth of 26 ft to 46 ft bgs. BOS 100® was injected at 28 points on 7.5-ft centers, with injections at alternating elevations at each injection point.

POST TREATMENT MONITORING

- Monitoring points PRB-1 (within PRB) and PRB-2 (downgradient of PRB) were utilized to evaluate the effectiveness of the BOS 100® injection. (Figure 3.)
- Reinstallation of monitoring well MW-20S in the soil mixing treatment area. (Figure 4.)
- Confirmation soil samples were collected at 2 ft vertical intervals at 4 locations within the soil mixing area. (See table.)

RESULTS

Gasoline-range hydrocarbons were reduced by ~77% immediately following the initial injection. After a single sampling event spike in TPH-GRO, concentrations then dropped to a historic low (~92% drop). A second injection was conducted near MW9, dissolved concentrations of gasoline-range hydrocarbons and other VOCs remained below Method A CULs for four (4) consecutive quarters of groundwater monitoring post injection.

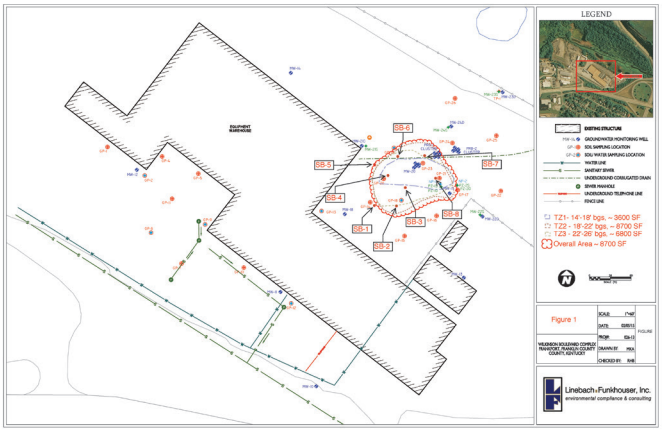


Figure 1. Site Map

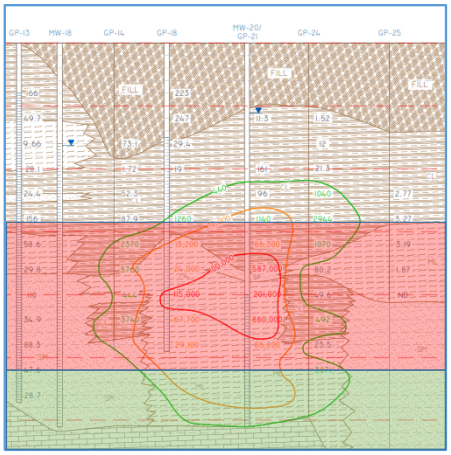
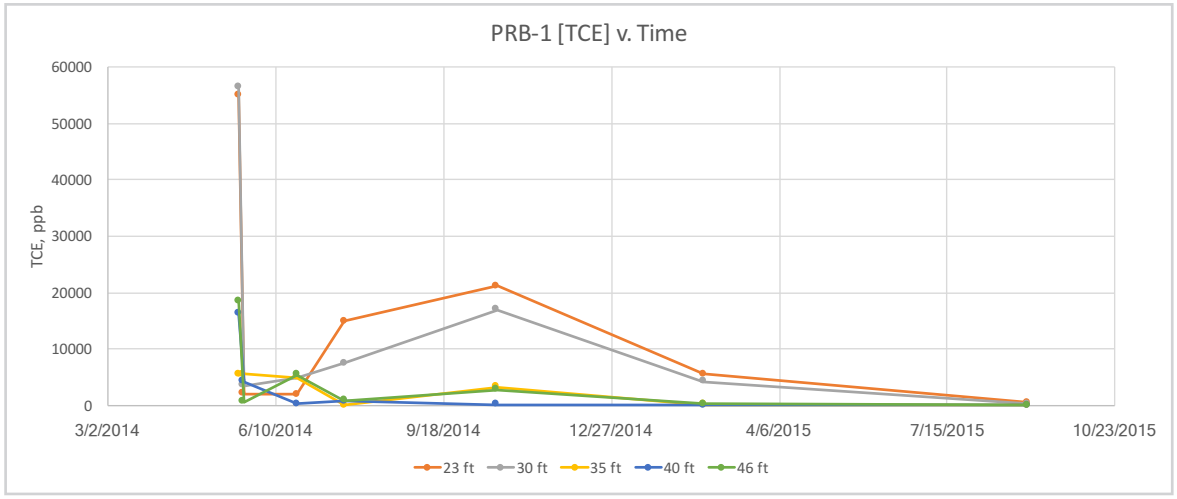


Figure 2. Cross Section - BOS 100® PRB

Figure 3. BOS 100® PRB Results



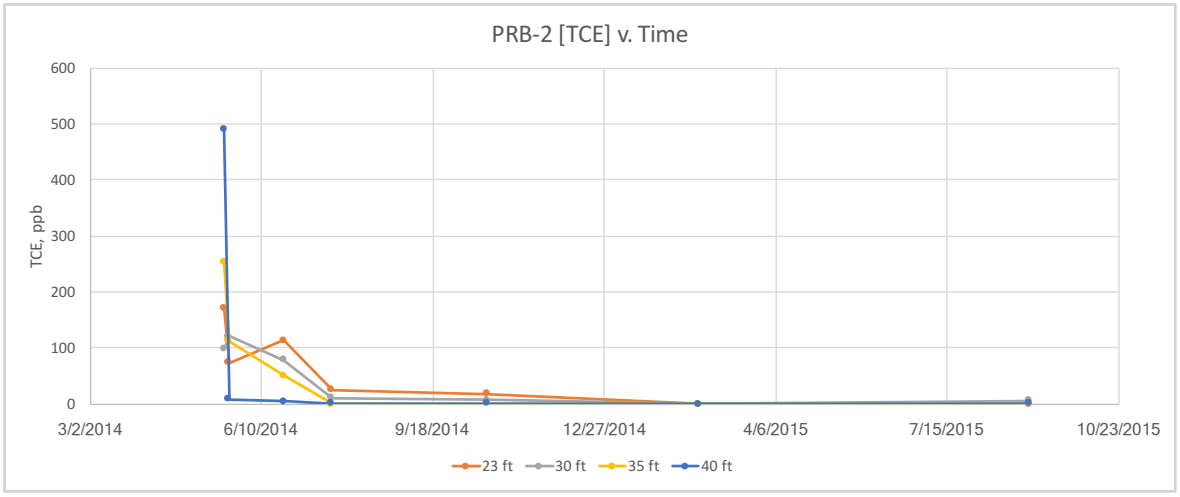


Figure 4. RemOx-L® Soil Blending Results