

CASE STUDY

Type of Project:	Full-Scale Remediation
Contaminants Treated:	TRPH
Concentration:	Maximum of 12,000 ppb total BTEX observed, LNAPL present
Technology Applied:	Aerobic bioremediation via GW amendments, oxygenation and recirculation
Geology:	Fine sand with a clay horizon (~2 ft. thickness)
Treatment Interval:	7-20 ft. bgs
Average % Reduction:	>99% reduction of all VOCs, >95% reduction in all BNs
Timeframe:	18 months of active GW recirculation

DESCRIPTION

A groundwater oxygenation and recirculation process was used at a residential property to treat heating oil-contaminated soil and groundwater. The full-scale location is the source area and has the dimensions of 40 feet wide by 70 feet long, and a saturated thickness of 13 feet (total volume of 1,350 cubic yards). Saturated zone lithology is fine sand with a 1-2 ft thick clay horizon in the smear zone. Re-circulating groundwater was amended with hydrocarbon-degrading bacteria and nutrients (BioRem-2000 Products). Groundwater was extracted from two recovery wells (RWs). Following extraction, oxygenation, and biological amendment, the treatment water was redistributed into 10 injection points and a shallow injection trench.

The biological amendment and nutrient application rates were based on the mass of fuel constituents and the size of the impacted area. Monitoring wells were used to assess the effectiveness of the approach. Groundwater samples were analyzed for regulated fuel constituents, nutrients and other water quality parameters (pH, DO, etc.) during the 18-month treatment. This data was used to modify the treatment system to maximize efficiency.

RESULTS & DISCUSSION

Results and observations from the full-scale implementation include the following:

- TRPH concentrations onsite were reduced by greater than 90% within 7-8 months.
- LNAPL (mobile and trapped) was degraded biologically over time with the aid of nutrients.