

Project Location: Midwest

Time Frame: August 2002 - March 2004

Site Information: Site is an operating manufacturing facility with vadose-zone contamination identified at three locations on the property. Soils requiring treatment consist primarily of a low permeability silty clay till unit requiring treatment to approximately 15 feet at all three sites. Perched water existed in the silty clay till unit in one of the areas. Below the till is a sand and gravel layer. Regional water table occurs within the sand and gravel layer approximately 30 feet below ground surface (bgs); however, within one of the target treatment zones (TTZs), a perched water table extends to within 3 feet of ground surface. Dewatering of the TTZs was not required.

CoCs: Contaminants of Concern are as follows: tetrachloroethylene (PCE); trichloroethylene (TCE); and 1,1,1-trichloroethane (TCA).

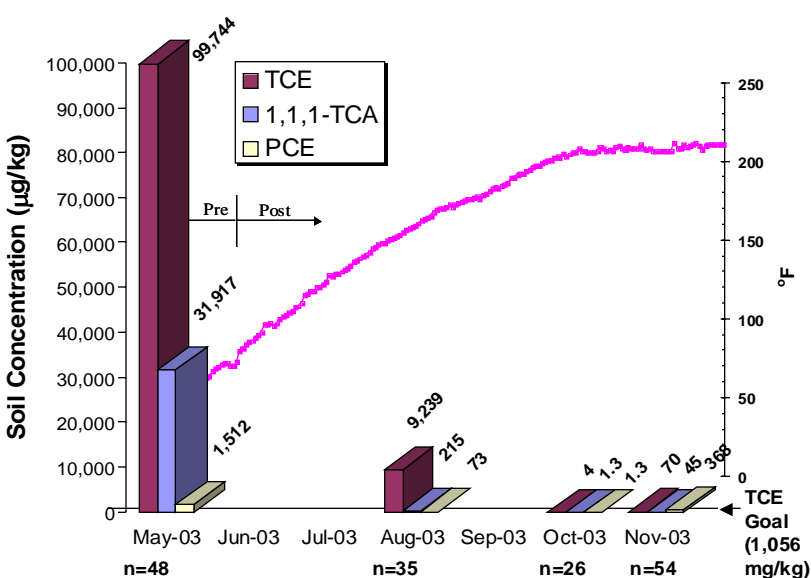
Project Approach: In-Situ Thermal Desorption (ISTD) remediation at the Confidential Midwest CVOC Site had the following design features: a) three treatment areas; b) 225 thermal wells; c) target treatment temperature of 210°F; d) neutralization and granular activated carbon (GAC) for off-gas treatment.

Project Staffing: As General Contractor, TerraTherm, Inc., provided all project design, construction, operation, and equipment.

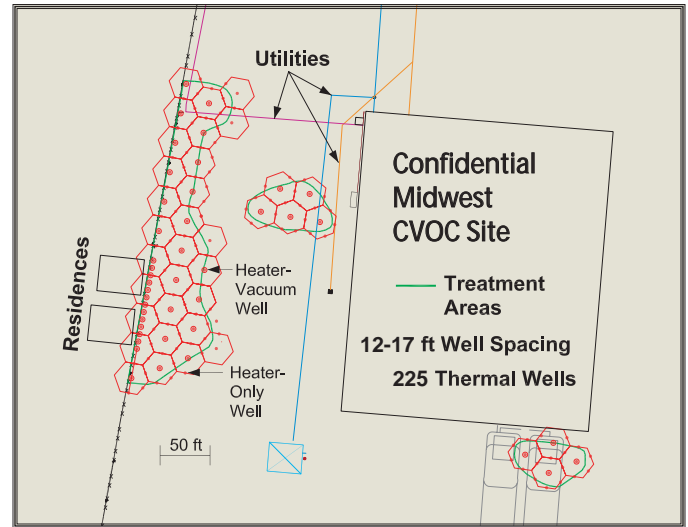
Project Time Line: Construction: Dec. 2002 - April 2003; ISTD Treatment May 2003- December 2003; Demobilization from site January-February 2004.

Costs: Turn-key remedial costs, including power were \$1.3M or \$118/cy. Contract included a performance guarantee.

Project Summary: Fractures within the clay till resulted in excessive water flowing into the treatment zones and



residents and the use of ISTD to remediate the three treatment areas provided the basis for a No Further Action (NFA) for soil at the site.



Residences Adjacent to Treatment Areas as Shown above on Site Map

and slower than expected heating rates. This required the installation of additional heater wells within the parking lot treatment areas. The additional heater wells were installed and made operational over a 14-day period with minimal disruption to operations. The target treatment temperature (210 °F) was achieved at locations in between the heater wells (i.e., the centroids) within 1 to 2 months following installation of the additional heaters. The guaranteed cleanup objectives were achieved 1 to 2 weeks following attainment of the target treatment temperature at the centroids. Soil temperatures in the immediate vicinity of the heater wells (e.g., 1-2 feet) ranged between 500 and 800°F (260 and 430°C) at the end of the heating period. The total treatment/heating time was 5 to 7 months.

The entire project was successfully completed with no disruption of plant activities or impacts to nearby