

### ***Project***

Confidential Client Northeast, USA

*In Situ* Treatment of Bis (2-ethylhexyl) phthalate (BEHP)  
Impacted Soil

### ***Summary***

DARAMEND® technology was selected as the remedial option of choice for the in situ treatment of 14,000 tons of BEHP impacted soil at a former plastics manufacturing facility in New Jersey. Surface soil (0-2 ft) was cleared of oversized debris and boulders (>6") using a bulldozer equipped with sub-soilers (equipment attached to a tractor to unearth large debris within the soil) and loaders equipped with a specially designed stone fork implement.



### ***The Challenge***

The remedial goal of 210 mg/kg for BEHP had to be achieved in the upper two feet of all impacted areas of the site. Some regions of the site also required treatment of PAHs to NJ Department of Environmental Protection (DEP) industrial direct contact criteria. Over 4 acres of the 12-acre site required treatment. In some of the treatment areas activities had to be coordinated with tidal fluctuations, since the water table (which was very close to the surface in these locations) was substantially influenced by the tide.

### ***The Solution***

Following preparation of the treatment area, DARAMEND was applied in situ using a site-specific aerobic protocol. *In Situ* application of the technology eliminated the costs for soil excavation and construction of a treatment cell. The process required the addition of nutrients and proprietary organic amendments to optimize the rate of microbial activity in the soil. The process also required control of the soil moisture content through irrigation and tillage. Tilling was accomplished using a specialized rotary tiller with the capacity to till to a depth of 2 ft.

### ***The Result***

The mean concentration of BEHP was reduced from 1,250 mg/kg to less than 150 mg/kg after approximately 10 months of active treatment. The remedial goal of 210 mg/kg was achieved in all regions of the site. Elevated PAH concentrations were also reduced to below the NJ DEP criteria within the same timeframe.

***The Cost***

Cost to treat approximately 14,000 tons of soil at this site averaged approximately \$35/ton. Treatment costs were particularly low at this site because soil was treated in situ.

***The Timeline***

Treatment goals were attained after approximately 14 months, between May 1999 and June 2000, including 10 months of active treatment and 4 inactive months during the winter.

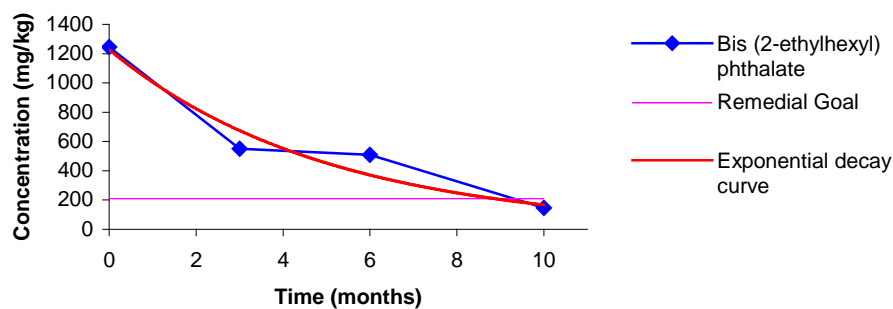


Figure 1. Influence of DARAMEND bioremediation on phthalate impacted soil.

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