

Design and Operation of a Large Air Sparge / Soil Vapor Extraction System in Shallow Soils at a Landfill Superfund Site

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An air sparging / soil vapor extraction (AS/SVE) system was pilot tested, designed, installed and is operating for a volatile organic compounds (VOCs) hot spot (0.6 acres) at a Superfund landfill site in New Hampshire.

Pilot testing and design tasks were completed to determine: the distribution of COCs within low permeability refuse; the five foot treatment interval underlain by interbedded soils; the configuration of a barrier component; a low permeability cap to optimize SVE performance, and discharge air dispersion modeling.

A total of 134 AS locations were installed 15-foot on center. The main system is pulsed in four equally distributed groupings. Thirty-three SVE wells were installed 30-foot on center.

To incorporate sustainable practices the system is operated seasonally. The AS/SVE system removed over eight tons of VOCs in the first five months of operation. Groundwater performance monitoring a month after the first seasonal operation indicated concentration reductions were 75 percent on average with minimal rebound observed after an additional three months.

Impacted low permeability materials within the refuse are expected to result in diffusion limited conditions during treatment resulting in a remedial objective to reduce the level of VOCs to concentrations measured in the remainder of the landfill.