

## Effectiveness of Air Sparging Using a “Booster” Approach

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**Background/Objectives.** The Naval Facilities Engineering Command (NAVFAC) Mid-Atlantic is evaluating alternate treatment technologies to optimize the removal of contaminant mass at a site in eastern North Carolina that has had a groundwater extraction and treatment remedy in place since 1994. Air sparging has been selected for evaluation in an area that contains contaminants of concern (COCs) (trichloroethene [TCE] and daughter products) at depths up to 125 feet (ft) below ground surface (bgs) within a heterogenous lithology. A pilot study is ongoing to evaluate the effectiveness of air sparging at depth, with sparging wells nested at different intervals within the water column. Air sparging was initiated at the deepest interval and will continue into the shallower intervals, as needed, to achieve influence within the entire treatment zone.

**Approach/Activities.** Three clusters of injection wells were installed in a triangular orientation around the area of highest concentrations within the treatment area (greater than 10,000 ppb TCE). Each cluster consists of a shallow injection well (34 to 36 ft bgs), an intermediate injection well (96 to 98 ft bgs), and a deep injection well (132 to 134 ft bgs) nested within an 8-inch borehole. The air sparging system was commissioned in November 2017. Sparging will continue for up to one year.

Groundwater conditions are being monitored to determine if the sparging into the shallower injection wells is required. In addition to evaluation of geochemical parameters, groundwater samples are collected on a quarterly basis to evaluate if air sparging reduces the COC concentrations throughout the water column. Sparging operations may be adjusted or optimized based on the quarterly water quality and COC sampling results.

**Results/Lessons Learned.** The air sparging pilot study is ongoing and is expected to be completed in October 2018. The results of the phased startup approach and at least one round of post-startup monitoring will be available at the time of the presentation. The results of the pilot study will be used to evaluate full-scale air sparging against other alternate technologies in a Feasibility Study Amendment to provide long-term protectiveness and achieve the site's remedial action objectives within a reasonable timeframe.