

Full-Scale Treatment of Coal Tar Lagoons with In Situ Smoldering: Successful Field Stories and Lessons Learned

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Background/Objectives: In situ smoldering using self-sustaining treatment for active remediation (STAR) is being applied as the primary source remedy at a site located in Newark, New Jersey. The STAR technology relies on the contaminant to be the fuel source and with supplied air and an initial heat source, ignition is begun. Once ignited, the burn is propagated with the supplied air only. The process can be sustained below the water table. Site contaminants include coal tars and cresols in both fill and native geological materials. The remedial objective is to treat free product to the extent practicable. Site activities have been ongoing for more than 3 years with about one year of operations remaining.

Approach/Activities. Treatment cells are comprised of ignition points, vapor extraction wells, and interstitial thermocouples. Ignition points are installed at the base of the target treatment zone with heaters deployed for the initial heat source and connection to a treatment plant for supplied air. Vapor extraction wells are installed within the treatment cell to extract injected air and capture vapors. Extracted vapors are treated using conventional ex situ means (thermal oxidizer). Interstitial thermocouples are installed to assess operational performance. Cell cycle times are relatively short (days) and following treatment the equipment is removed and reused in another treatment area. Once a cell is complete post-remedy verification is conducted.

Results/Lessons Learned. This presentation will focus on one lagoon area that has been investigated, treated and remedy verification completed. This area is approximately 2 acres in size and represents what other candidate sites may encounter. Treatment was performed at more than 120 ignition points. The period of performance was approximately 6 months. Remedy verification was performed and a multiple lines of evidence approach was conducted, comprised of cores to assess free NAPL, laboratory analysis for EPH, SVOC, VOC, and TarGOST™ for real-time assessment of treatment performance. Supplemental operations were required in a limited footprint of the lagoon area. Information on the achieved treatment extent, the number of treatment cells that required additional treatment, the remedy verification approach, and costs to apply the remedy to a lagoon of this size will be presented.