Targeted In Situ Remediation of Multiple Contaminants to Achieve Site Closure in a Performance-Based Remediation Contract

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Background/Objectives. The central portion of the former Kelly Air Force Base and the flight line area is demarcated as Zone 5 (approximately 2,600 acres). The central and northern portions of Zone 5 have historically been used for storage, maintenance of aircraft and flight operations. A large part of Zone 5 also consists of warehouses operated by various tenant organizations. Zone 5 includes seven sites contaminated by large trichloroethene (TCE), tetrachloroethene (PCE) and chlorobenzene plumes that have persisted for many years. Prior to Aptim's involvement in 2011several remedial techniques were in operation including soil vapor extraction (SVE), electrical resistivity heating (ERH), groundwater extraction and in situ injections. At the core of these plumes, concentrations of PCE, TCE and chlorobenzene were detected at 1,500 µg/L, 32,000 µg/L and 12,700 µg/L respectively. The goal of our PBR contract was to optimize the existing remedial systems and implement targeted remedial treatment systems to attain unrestricted site closure for Zone 5 by 2020.

Approach/Activities. In situ injections using different amendment mixtures were conducted at Zone 5. Injections included the use of: 1) emulsified vegetable oil (EVO) and ferrous gluconate to treat chlorinated solvents plume; 2) heat activated and iron activated sodium persulfate to treat a chlorobenzene plume; 3) Oxygen Release Compound (ORC) to treat a chlorobenzene plume; and 4) Plume Stop as a polishing step to treat residual concentrations of chlorinated solvents. Injections were conducted using injection points, temporary injection wells and open boreholes with packers. As of 2017, two to four rounds of injections have been conducted at each of the sites. We continue to evaluate the effectiveness of the injections to ensure concentrations reduce to below the groundwater protection standards (GWPSs). A focused injection will be conducted in late 2017 to reduce concentrations of the only remaining daughter product (vinyl chloride) to below the GWPS.

Results/Lessons Learned: Contaminant concentrations (including daughter products) at four of the seven sites have reduced to below the GWPS. At three of the other sites, only vinyl chloride remains at concentrations slightly above the GWPS (ranging from 2.3 µg/L to 6.6 µg/L). Since contaminant concentrations have reduced, the Zone 5 groundwater treatment plant has been turned off. The presentation will discuss the implementation of the project, field challenges and results of the performance monitoring events in detail.