FORMER BRANDYWINE DRMO YARD

SS-01

Joint Base Andrews February 2013

BACKGROUND

The former Brandywine Defense Reutilization and Marketing Office (DRMO) Yard (SS-01) is an inactive facility administratively controlled by Joint Base Andrews (JBA). The 8-acre site is approximately eight miles south-southeast of JBA in the town of Brandywine, MD. While in operation from 1943-1987, the Brandywine DRMO yard was used for temporary storage of scrap materials and hazardous waste generated from various Department of Defense facilities in the region.

The primary groundwater contaminant at the former DRMO site is trichloroethylene (TCE), a cleaning solvent. The plume has spread beyond the DRMO property into a residential neighborhood and commercial property. The primary soil contaminant is Polychlorinated Biphenyls (PCBs) and to a lesser extent metals and pesticides.

During the process of evaluating the extent of contamination, it was discovered that residents within a quarter-mile of the plume were using shallow groundwater wells for their drinking water source. In 1991, the Air Force converted some homes to public water. In 1994, a remedial action took place to remove the PCB impacted surface soils within the DRMO Yard and in 1996 a groundwater pump and treat system was installed on the DRMO. The Environmental Protection Agency (EPA) placed this site on the National Priorities List (NPL) in 1999. The complex Remedial Investigation (RI) was finalized in June 2005. The Feasibility Study (FS) was then completed and a Proposed Plan (PP) was issued in June 2006, in which the preferred remedy identified was in-situ bioaugmentation with groundwater gradient control. The Interim Record of Decision (IROD) was authorized in Sept 2006 confirming the selected remedy. Between 2007 and 2008, the AF acquired 3.6 acres of private property to strategically address the leading edge of the groundwater contamination. This acquisition occurred because during the remedial design of the groundwater remedy it was determined that the chlorinated volatile organic compound (VOC) plume had migrated farther off-property than was originally characterized. It was determined that, as of 2008, the plume was 20+ acres.

The Remedial Design (RD) was finalized in February 2008. Phase 1 of bioremediation activities was completed in 2008. In 2008, a groundwater pump and treat system was installed at 13709 Cherry Tree Crossing Road and system operation began. Operation of the 1996 system ceased. In 2009, JBA signed a Federal Facilities Agreement with the Environmental Protection Agency (EPA) which outlines the scope of efforts for remedial actions at SS-01. In 2010, Phase 2 of bioremediation activities occurred in an effort to treat the groundwater contamination by using direct push injections to condition the aquifer to allow for continued microbial bioremediation. The success of the bioremediation has resulted in a 78% plume reduction.

As of November 2012, the operations of the remedial system treatment facility treated over 11,200,000 million gallons of water resulting in over 85 pounds of volatile organic compounds being treated. JBA has performed 3 PCB removal actions, removing over 18,000 cubic yards of contaminated soil.

CHALLENGES

The new groundwater treatment system is strategically positioned to prevent plume migration. The high TCE concentrations observed in the groundwater coupled with confirmatory sampling suggests the presence of Dense Non-Aqueous Phase Liquid (DNAPL). Remediation of this source zone presents a significant technical obstacle given the plume extends under multiple private parcels (covering 20+ acres), including an active CSX railroad line. Long term access to private properties is required, so community involvement is critical. Regulatory agencies have a high level of concern with groundwater contamination under multiple private property parcels. Operation and maintenance of the remediation system is expected to last for many years. Successful transformation of the DRMO property from its current condition to a parcel suitable for future use will require proper planning from the technical and real estate communities.

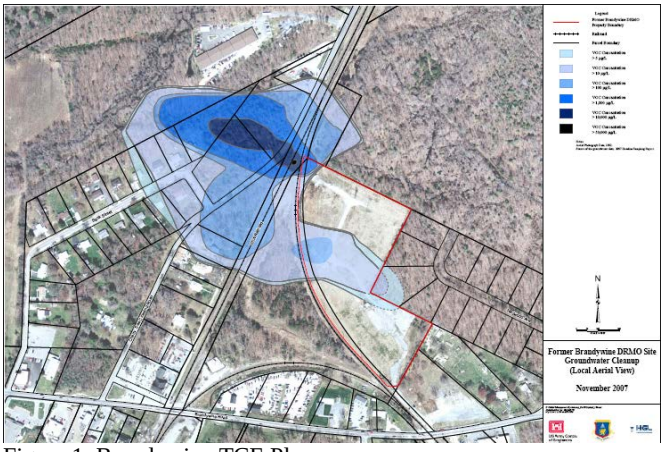

Figure 1. Brandywine TCE Plume

PERFORMANCE-BASED APPROACH

Two performance based contracts (PBCs) were awarded in 2006, one which addresses the solvent impacted groundwater, and the other to address the PCB impacted soils. The PCB impacted soils were removed in 2007.

The groundwater remediation project started in 2007, the objective is to prevent exposure to groundwater, vapor emanating from groundwater, and ultimately return it to drinking water standards. Institutional Controls (ICs) are in place to prevent groundwater use within a defined distance from the plume. A proprietary carbon based substrate similar to vegetable oil was injected into the groundwater, along with a bacteria culture known as Dehalococcoides, which consumes the chlorinated solvents in the presence of this carbon substrate. In addition to this biologic degradation, a strategically positioned groundwater remediation system was installed, managing hydraulic gradient and enhancing aquifer flushing, which will prevent further migration of the plume.

In 2012, a new multi-year PBC was awarded to attain a final Record of Decision (ROD) and remedy to address the source zone and pursue continued remediation of impacted groundwater.

RISK DRIVERS

Contaminants: TCE, DCE, PCE, and vinyl chloride in concentrations above regulatory standards. PCBs, SVOCs, and metals also extend onto neighboring properties.

Impacted Media: Groundwater and soil

Exposure Pathways Completed: Groundwater to domestic wells

Current Land Use/Surface Cover: Residential & Industrial

Reasonably Anticipated Land Use: Residential & Industrial

Relative Risk: High