



Maryland Department of the  
Environment

## FACTS ABOUT: Former SHA Eastern Regional Laboratory

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### **Site Location And Description**

The former State Highway Administration (SHA) Eastern Regional Laboratory Property (the Site) is located at 7857 Ocean Gateway in Easton, Talbot County, Maryland. The Site occupies approximately one half acre of land in a commercial area. Neighboring properties include retail shops to the north, a wetland and unnamed stream to the east, a church to the south, and four-lanes and associated easements of U.S. Route 50/Ocean Gateway to the west.

### **Site History**

Historically, the Site was used for auto repair. SHA purchased the Site in 1963 and converted the auto repair building to a laboratory for testing roadway materials. The laboratory uses chlorinated solvents, including trichloroethene (TCE) as part of the material testing process. TCE is an organic chemical that is commonly used as an industrial solvent. For testing asphalt, asphalt samples were dissolved in TCE to extract asphalt from aggregate in core samples. It was estimated that during the active years, on-Site operations generated approximately 836 gallons of waste TCE annually. This waste material was stored in 55-gallon drums in a dedicated pre-disposal storage area on the north side of the building. Over time TCE was inadvertently released into the subsurface. The TCE was likely released both as a virgin and spent solvent during storage, handling and various processes conducted at the Site. As a consequence of these historic operations, soil and groundwater at the site became contaminated with TCE.

Since 1986, the Site was serviced by municipal water and sewer service. Before 1986, the Site used an on-Site septic system and potable water was provided by an on-Site supply well. In 1988, the laboratory operations were relocated to their present location at 8204 Elliott Road in Easton and the Site has remained unoccupied since that time. In 2007, the former on-Site building was razed and the Site was re-graded.

### **Environmental Investigations And Actions**

Extensive investigations have been conducted at the Site and on adjoining properties to the north and east. In 1985, concerns regarding the potential for chlorinated solvent contamination were brought to the attention of the Waste Management Administration (WMA) of the Maryland Department of Health and Mental Hygiene (DHMH), the regulatory predecessor of MDE. In November 1985, WMA began to prepare a work plan



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to investigate the suspect chlorinated solvent contamination. A soil gas survey was completed at the Site in January 1989. The groundwater beneath the Site was found to contain free phase and elevated levels of dissolved phase chlorinated solvents, primarily TCE. From October 1992 to February 1993, a hydrological assessment and remedial design to address the TCE contamination identified at the Site was prepared and, based on the recommendations made in the assessment, a pump-and-treat and liquid phase recovery system was designed and installed at the Site.

The shallow groundwater pump-and-treat and liquid phase recovery system operated on-Site from 1994 to 2003. During its operational history, the system recovered approximately 95.5 gallons of TCE (9.2 gallons of free phase and 86.3 gallons of dissolved phase); however, dissolved phase concentrations of TCE remained elevated at concentrations that implied continued presence of free phase TCE. The system was decommissioned in August 2003 because of a combination of the waning effectiveness of the system and concerns about the structural integrity of the on-Site structure in which it was housed. The groundwater treatment system was ultimately dismantled and removed during the demolition of the on-Site building in 2007.

In 2007, SHA's environmental consultants performed a Site assessment/characterization investigation to evaluate the extent of the chlorinated solvent contamination, identify source zone structure, and to summarize the entirety of the environmental investigation and remediation performed on the Site to-date. The site assessment activities covered a broad range of activities including (1) a review of public records and historical documents; (2) a geophysical investigation to trace drain pipes, locate septic system features, and evaluate the depth and continuity of subsurface clay layers (3) gauging and sampling of existing wells to support site characterization and evaluate the possibility of natural attenuation of chlorinated solvents in groundwater; (4) additional sampling of surface water and sediment to evaluate possible discharges to nearby wetlands and streams; (5) membrane interface probe borings were installed at 23 locations in order to characterize soils and TCE source zone structure; (6) direct push technology (DPT) soil sampling was conducted and selected samples from each borehole were analyzed for volatile organic compounds (VOCs), including TCE; (7) groundwater sampling was performed in the DPT boreholes, and slug tests were performed in one temporary well and at DPT boreholes to determine the hydraulic conductivity of the surficial Columbia Aquifer and the Chesapeake Group; (8) soil samples from the Columbia Aquifer and underlying Chesapeake Group aquitard were analyzed; (9) nearby water supply wells were tested; and (10) a complete topographical survey of the site and vicinity showing well and sample locations was performed.

The investigation revealed that contaminants had migrated off site to the north and east, as reported to MDE in a Site assessment report in December 2007 and a supplemental off-Site investigation report in March 2008.



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In September of 2008, MDE issued a Consent Order directing SHA to provide a comprehensive Remedial Investigation (RI) Report addressing the Site and portions of the adjoining properties to the north and east. The Consent Order also required development of a Feasibility Study (FS) of Remedial Alternatives after MDE acceptance of the RI Report. SHA submitted the RI Report to MDE on August 4, 2009.

These investigations noted that the water table was encountered at approximately 8 to 10 feet below ground surface (bgs) at the Site, and groundwater locally trended to the northeast across the site towards wetlands and an unnamed tributary of the Tred Avon River, which flows southward regionally. TCE was detected in groundwater at concentrations up to approximately 230,000 parts per billion (ppb). TCE was detected in soil at concentrations up to 360 parts per million (ppm) and was confirmed to be the main driver for site characterization. TCE had migrated to the bottom of the Columbia Aquifer at approximately 17 to 25 feet bgs and infiltrated the deeper Chesapeake Group clays to depths up to 43 feet bgs. The lateral and vertical limits of the TCE were defined, with most of the suspect TCE source material found to lay beneath the water table in a clayey aquitard of very low permeability. There was limited evidence of biodegradation of TCE within the source soils and there was no TCE source material identified beneath the wetlands or wetland buffer. Site-related TCE contamination was present on adjacent properties to the north and east. The impacted area to the north of the Site was purchased by the SHA to support remediation. The impacted area to the east of the Site is beneath wetlands and undevelopable, and will be remediated over time by natural attenuation following remediation of the Site.

The RI revealed that there are no identified receptors for the site contaminants. Sediment and surface water analytical results indicated that there is no ecological risk posed by the Site. Five potential water supply wells were identified within 600 feet of the facility. However, the known wells are both out of use, topographically isolated from the Site, and/or at least 140 feet deep and separated from site contaminants by a thick clay layer. As such, none of these wells are anticipated to be at risk from the Site.

In the March 2010 FS Report, remedial alternatives to address TCE mass reduction were evaluated for their ability to protect human health, comply with cleanup standards and State or federal laws, regulations and other requirements, for their long term effectiveness and permanence, reduction of toxicity, mobility or volume through treatment, short term effectiveness, implementability, site-specific limitations, and estimated capital and operating costs. Based upon the findings of the FS Report, thermal treatment was the recommended alternative. This alternative was the only one that met all of the evaluation criteria. MDE accepted the findings of the FS Report in a March 2010 letter.

SHA's consultants submitted a work plan for thermal remediation via electrical resistance



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heating of the TCE source area at the Site in February 2011. The work plan set the clean-up criteria for the thermal remediation, which was set at a 95% reduction of TCE concentrations in the source area, based on the average results of post-remediation soil sampling, with maximum remaining TCE concentrations in soil not to exceed 7.2 ppm. Construction of the infrastructure began in January 2012. Pilot testing of the system began in February 2012, which confirmed that thermal remediation was a viable remediation strategy to implement at full scale at the Site. The thermal remediation system ran from March 2012 to July 2012, at which time, confirmatory sampling of the treatment area at the Site was used to determine that the predetermined clean-up criteria had been adequately met. Based on the tasks outlined in the February 2011 work plan and an MDE approved post-remediation groundwater monitoring program, dated October 2012, the project entered its post-remediation monitoring phase. Ten new monitoring wells were installed at the Site in January 2013 to gauge the effectiveness of the thermal remediation over the long term.

### **Current Site Status**

As of January 2013, post-thermal remediation monitoring of the groundwater of the site is ongoing. The on-Site monitoring well network is sampled and monitored on a semiannual basis. To date, results suggest that the thermal remediation was successful at significantly reducing the TCE source area concentrations at the Site; however, elevated concentrations of TCE and its breakdown products cis-1,2-dichloroethene (cis-1,2-DCE) and vinyl chloride (VC) persist in monitoring wells in and near the easterly adjoining wooded wetland area. Additionally, in late August/early September 2015, SHA's consultant is collecting additional soil and groundwater samples from the western side of the wetland area to determine if the VOC contamination has migrated past the low point in the wetland area. MDE and SHA will use this information to assess and strategize a mitigation strategy for the remaining persistent VOC contamination present in the adjoining wetlands area.



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