

City Chemical – University Boulevard
6586 University Boulevard
Winter Park, Florida
County: Orange
District: Central
Site Lead: Waste Cleanup Program
Approved for Cleanup: May 11, 1987
HWC # 041

Site Description and History

The City Chemical University Boulevard site is located at 6586 University Boulevard, Winter Park, Florida in Township 22S, Range 30E, Section 10 at 28° 35' 49.5531" N, 81° 17' 44.3812" W. This approximately 1-acre site was used by City Industries to store 55-gallon drums of waste chemicals that could not be stored at the nearby City Chemical plant on Forsyth Road. Many of the drums leaked or were dumped onto the ground, resulting in soil and groundwater contamination. Analytical results show that groundwater at the site is contaminated with chlorinated volatile organic compounds.

Approximately 3,500 drums of waste chemicals were stored at the site in 1980. The site has since been cleared and redeveloped.

Threat

Hydrogeologic data indicate that a contaminant plume is flowing toward the east-southeast. The closest receptor wells are located approximately ½ mile downgradient of the site. There is no immediate threat to surface water bodies.

Response Strategy and Status (June 2016)

The Florida Department of Environmental Regulation (FDER, now DEP) contractor, Environmental Science & Engineering (ES&E), completed a contamination assessment of the site in April 1986. The investigation revealed that the primary groundwater contaminants were tetrachloroethene and trichloroethene. It was also discovered that the plume had migrated offsite approximately 200 feet to the east-southeast.

ES&E completed a Risk Assessment and Feasibility Study (RA/FS) in January 1987. The RA developed acceptable goals for onsite groundwater concentrations to meet long-term drinking water criteria. Recovery and treatment of the contaminated groundwater was selected as the remedial alternative in the FS. ES&E completed Phase I of the selected remedial alternative development in June 1987.

Woodward-Clyde Consultants (WCC) submitted the Preliminary Design Report in January 1989. Based on the Preliminary Design results, further assessment of site conditions was necessary prior to continuing with the design of the treatment system. The additional fieldwork was completed in June 1989. The results showed that the groundwater contaminant plume had migrated approximately 250 feet further downgradient than anticipated. The fieldwork also confirmed the presence of an isolating clay layer at a depth of 30 to 35 feet below land surface (ft bls), and a clay

lens on the western side of the site at a depth of 20 ft bls. In November 1989, additional fieldwork was conducted to locate the leading edge of the groundwater contaminant plume. In December 1989, WCC submitted a draft 35% Design Report, followed in January 1990 with the 35% Design Report Addendum, which included the November fieldwork results.

In March 1990, WCC was tasked for completion of the design. In June 1990, WCC determined that injection to the surficial aquifer was not feasible for the disposal of treated groundwater. In January 1991, WCC was tasked to develop a work plan for additional design requirements, including construction of a Floridan Aquifer injection well and dynamic sampling and analysis of recovery. In March 1991, WCC was tasked to implement the activities in the work plan. In October 1991, property adjoining the site was leased by FDER for location of the treatment system.

Installation of the injection well was completed in January 1992. Low-level contamination by toluene and ethylene dibromide in the injection well precluded its use for effluent discharge. The Orange County Public Health Department did not detect contamination in the nearby private drinking water wells.

Subsequently, the DEP pursued surface water discharge for the disposal of treated groundwater. In November 1992, the DEP tasked WCC for additional design evaluations and modifications to the proposed groundwater treatment system to comply with the National Pollutant Discharge Elimination System (NPDES) permit. In December 1992, WCC submitted the results of the most recent sampling event. Extremely elevated contaminant levels upgradient indicated the possibility of additional contaminant sources. In February 1993, WCC resampled the site and reconfirmed the results of the previous analysis.

The DEP received the Final Design for the groundwater treatment system in November 1994, and concurrently received the final NPDES permit for discharge of the treated groundwater to a surface water drainage ditch. Phase I construction of the groundwater treatment system was completed in March 1996. Phase II which included construction and installation of the groundwater treatment system began in May 1996. Construction and installation of the treatment system was completed in September 1996. Treatment system effectiveness samples and an effluent sample, in accordance with the NPDES permit, were collected monthly to monitor the system.

In December 1996, an iron biofouling problem was identified and a sequestering agent injection system was added to the treatment train in January 1997.

Operation & Maintenance (O&M) of the treatment system was transferred to Groundwater Technology Incorporated (GTI) in March 1997. The system removed approximately 214 pounds of total chlorinated solvents from the upper and lower aquifer (about 8% of the total predicted mass in the saturated zone) before the system had to be shut down due to constant iron fouling and failure to meet the NPDES discharge criteria.

GTI submitted a Remedial Design Modification Report at the end of July 1998, which contained recommendations for improving the current remedial action at the site. The modification included recommendations for a system overhaul and soil sampling in the source area. The additional soil

assessment and a Remedial Design Modification Addendum Report were completed in December 1999. In August 2001, the existing treatment system was removed.

GTI submitted a Remedial Alternatives Evaluation (RAE) in January 2001, proposing potassium permanganate in situ chemical oxidation as the recommended remedy for the site. The report was approved in May 2001. In July 2001, the DEP tasked GTI to complete additional soil assessment activities downgradient of the site in an effort to locate additional source areas. Also included in this task assignment was the development of the Remedial Action Plan (RAP).

In January 2003, Shaw Environmental Inc. (Shaw), formerly GTI, collected 16 soil borings to identify clayey strata underlying the site. Shaw used the data to evaluate in situ enhanced bioremediation (ISEB) with soil vapor extraction (SVE) and in situ chemical oxidation with air sparging as potential remedial options. In April 2004, Shaw submitted a revised RAP for ISEB and SVE. The DEP approved the RAP in May 2004.

The construction activities began in August 2005, and were completed in November 2005. System startup was completed in April 2006. Operation and maintenance was performed until June 2006, when the ISEB system was turned off due to low pH in the groundwater. A design modification letter report for the addition of sodium bicarbonate to the groundwater to increase pH was submitted and approved in February 2007, and a system restart occurred in March 2007. The sodium bicarbonate was successful in increasing the pH. However, system filters became clogged with bacteria determined to be partially from a nearby septic system. The operation of the groundwater treatment system was terminated due to the presence of the bacteria.

In August 2009, Shaw performed a Gore Survey which consisted of 58 locations. There was no observed correlation between Gore Survey results and groundwater analytical data. The highest concentrations occurred at the locations along the southern boundary of the site. The DEP requested that Shaw perform a city directory search and site walk to determine if there are additional sources of contamination to explain the results of the Gore Survey.

The SVE system was restarted in July 2010, and operated until February 2011. The DEP requested that the SVE be shut down early in order to provide funding for additional offsite groundwater assessment using direct push technology (DPT). Based on SVE system data, it was determined that the system should remain off until modifications could be made to increase the mass recovery.

In April 2011, Shaw conducted a DPT groundwater assessment on properties adjacent to the site to an approximate depth of 35 feet bls. Results from the groundwater assessment have been referred to the Department's Central District to follow up on petroleum related contaminants in the groundwater that don't appear to be related to previous site activities.

In February 2012, Geosyntec conducted additional site assessment, including a membrane interface probe study, direct push groundwater sampling, and monitoring well installation. Two source areas were identified during additional assessment.

Geosyntec prepared a RAP Modification to address the source areas identified during additional assessment. The RAP Modification was approved in December 2012. The existing SVE system was paired with an air sparge (AS) system. Modifications were completed in May 2013. The remedial action objective was to reduce PCE in groundwater onsite to below the Natural Attenuation Default Concentration (NADC).

The AS/SVE systems achieved the remedial action objective of reducing PCE in onsite groundwater to below its NADC in May 2014, however, February 2015 groundwater data showed that PCE concentrations in several onsite monitoring wells increased above the NADC. Recent groundwater data collected from monitoring wells and DPT groundwater assessment in April and May 2016, respectively, shows exceedances of the NADCs for site contaminants of concern.

The AS/SVE systems have been offline since February 2016. The blower in the SVE system malfunctioned and needs to be replaced.

Schedule

It appears the AS/SVE systems have reached the end of their useful life. The systems are currently offline while the FDEP evaluates remedial options to address contamination in the shallow and intermediate groundwater that exceeds the NADC for site contaminants of concern. The site is on an annual groundwater monitoring schedule with the next event proposed in May 2017.