



ENVIRONMENTAL CONSULTATION & REMEDIATION

KPRG and Associates, Inc.

GROUNDWATER INJECTION WORK PLAN

September 30, 2021

Mr. Greg Moll
Wisconsin Department of Natural Resources
1027 W. St. Paul Avenue
Milwaukee, WI 53233

VIA FEDERAL EXPRESS

KPRG Project No. 10009

Re: Additional Groundwater Remediation
Westbrook Shopping Center/Bask Inc.
2136 E. Moreland Boulevard, Waukesha, WI
FID# 268188800, BRRTS# 02-68-297669

Dear Mr. Moll:

On behalf of the Westbrook Delaware Limited Partnership, KPRG and Associates, Inc. (KPRG) is submitting this Work Plan to complete an enhanced reductive dechlorination (ERD) injection in the area of the residual tetrachloroethene (PCE) impacted groundwater in the vicinity of, and upgradient of, monitoring well MW-6 (see Figure 1). The purpose of this groundwater ERD injection is to assist in decreasing the chlorinated solvent concentrations in groundwater and expediting and positioning this site for case closure.

KPRG's proposed strategy to address the residual chlorinated solvents concentrations in groundwater consists of an ERD injection program. ORIN Technologies (ORIN) will be contracted to perform the injection work. They will inject Anaerobic BioChem Plus (ABC⁺) into twelve (12) injection points around MW-6 and into eight (8) injection points adjacent to MW-7 (source area), which is upgradient of MW-6. ABC⁺ is a mixture of the ABC formula and Zero Valent Iron (ZVI). The ABC is a mixture of carbon substrates that include lactates, lactate esters, fatty acids, and a phosphate buffer to promote anaerobic biodegradation of halogenated solvents in groundwater. The ZVI creates a reducing environment and the ABC lasts up to 24 months allowing for long-term anaerobic biodegradation.

The initial ABC⁺ overall injection will consist of 20 injection points at the approximate locations shown on Figure 1. It is noted that the actual placement of these points will be refined in the field based on utility markings. The injection interval for the eight (8) injection points near MW-7 will occur from 15 feet to 25 feet below ground surface (bgs). The 12 injection points in the vicinity of well MW-6 will occur from 11 feet to 21 feet bgs.

The appropriate depth will be reached using direct push technology (DPT). The soil matrix within the target zones are layers of silty sands and sands. An average of 100 gallons of 12% ABC⁺ would be injected into each of the 12 injection locations around MW-6. An average of 200 gallons of 12% ABC⁺ would be injected into each of the eight (8) injection points in the vicinity of well MW-7. Each injection point will be spaced approximately 10 feet apart on center and have an assumed radius of influence of 5 feet. ORIN will use approximately 1-foot to 3-foot lift intervals for each vertical treatment zone. This injection point spacing is based on previous injection work successfully completed at this site. Due to the sandy nature of the subsurface materials any potential mounding associated with injection will dissipate in a short period of time. Injections will proceed from northwest to southeast (i.e., from downgradient to upgradient) thereby limiting any potential to push higher impacts further downgradient. There were no issues with additional or unexpected movement of contaminant noted during previous injection work at this site.

All water needed for remedial activities will be available from onsite fire hydrants or another source capable of providing 15 gallon per minute flow. Once an injection is completed at each specific injection point, the borehole will be filled with bentonite chips to prevent short-circuiting of any subsequent treatment. The injection work completed will be summarized in a documentation summary for submittal to WDNR.

Monitoring of the injection will be evaluated via subsequent groundwater sampling at well locations MW-4 through MW-16 (see Figure 1). The groundwater monitoring will include a total of six (6) rounds. This will include a quarterly sampling for the first year after injection and a semi-annual sampling during the following year. Each sampling event will include a duplicate sample for quality control purposes. All samples will be analyzed for chlorinated volatile organic compounds (CVOCs). A sampling summary will be provided to WDNR after each round of sampling. The data summary will include data tables, groundwater flow maps and extent of PCE impact maps.

A Wisconsin Pollutant Discharge Elimination System (WPDES) Permit and an Exemption Request for Remedial Action Injection will be submitted to the Wisconsin Department of Natural Resources (WDNR) for review and approval prior to proceeding with any groundwater remediation injection.

The Westbrook Delaware Limited Partnership and KPRG appreciate the constructive relationship and dialogue with the WDNR regarding this site. The execution of this Work Plan will be initiated upon WDNR approval. As indicated above, the purpose of this additional work is to expedite this site for closure consideration. We look forward to continue working cooperatively in moving this site forward to obtain closure. If there are any questions, please contact Mr. Greg Butts at 414-281-6000 or us at 262-781-0475.

Sincerely,
KPRG and Associates, Inc.



Richard R. Gnat, P.G.
Principal



Joshua D. Davenport, P.E.
Senior Project Engineer

cc: Mr. Greg Butts, Realty Management Consultants
Mr. Don Gallo, Axley Brynerson, LLP

FIGURE



LEGEND

- MW-12 EXISTING MONITORING WELL, PIEZOMETER LOCATION
- MW-2 ABANDONED MONITORING WELL LOCATION

- 5 TCE CONCENTRATION CONTOUR
- 5 PCE CONCENTRATION CONTOUR

TCE ENFORCEMENT STANDARD = 5 µg/L
 PCE ENFORCEMENT STANDARD = 5 µg/L

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EXTENT OF GROUNDWATER IMPACTS APRIL 2021 – PROPOSED INJECTION POINTS

WESTBROOK SHOPPING CENTER
 WAUKESHA, WISCONSIN

Scale: 1" = 130' Date: September 21, 2021

KPRG Project No. 10009 FIGURE 1

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