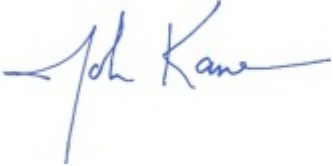




MEMORANDUM

To: Dr. Jerome Cruz
Site Manager, Washington State Department of Ecology

From: John Kane

Date: October 15, 2020 

Re: Bothell Service Center Simon & Son Site (BSCSS)
Multiple Sampling Regimes MW-42

The purpose of this memorandum is to provide a groundwater sampling scope of work at well MW-42, based on a telephone discussion circa September 3, 2020 with Dr. Jerome Cruz, Site Manager of the Washington State Department of Ecology, for the Bothell Service Center Simon & Son Site (BSCSS) regarding confirmation of deep aquifer groundwater remediation in the vicinity of former groundwater well MW-9. Dr. Cruz has requested this additional sampling protocol instead of installing a new deep groundwater monitoring well. This sampling approach will be completed during or near the Fall 2020 BSCSS quarterly groundwater sampling round which is currently on-going.

Previous groundwater well MW-9 was located in the former source area of the dry cleaning operation on the BSCSS site, where halogenated volatile organic compounds (HVOCs) soil and groundwater contamination was characterized during in the BSCSS Remedial Investigation. Dense non-aqueous phase liquid (DNAPL) was found at depths of 45 to 50 feet below ground surface (bgs) in vicinity of MW-9. It should be noted that electrical resistance heating (ERH) deep wells were installed and operated in this former source area to depths of 55 feet bgs.

Based on the discussion with Dr. Cruz, Kane Environmental proposes to sample downgradient groundwater from existing deep well MW-42 by employing longer groundwater sampling purge times at higher pumping rates. Groundwater well MW-42 is currently located downgradient and approximately 10 to 15 lineal feet from previous well MW-9. The concept is that a larger radius

of influence at the well screen depth would capture deep groundwater from the previous MW-9 screened interval and provide a representative sample of water quality associated with the deep source area determined in the BSCSS Remedial Investigation.

The proposed scope of work is as follows:

- In MW-42, three consecutive pumping regimes for sampling would be employed. The first would be using standard routine EPA low flow sampling methods typically used for groundwater sampling events at the Site. (This sample will be used for the Fall 2020 quarterly sampling round). An initial water level reading will be measured. The one-quarter (1/4) inch polyethylene tubing will be placed in well MW-42 to an approximate depth of 3 to 4 feet from the bottom of the well and near the center of the well screen. The tubing will be connected to a low-flow peristaltic pump, which is then connected to a YSI flow-through-cell with monitoring probes that measure pH, ORP, DO, specific conductance, and temperature. The peristaltic pump rate will be set at a rate not to exceed a 0.3 foot drawdown in water level in well MW-42 following EPA groundwater well protocol. The water level will be checked every 5 minutes during well purging. The groundwater sample will be collected when field parameters are within recommended EPA limits, and any discrepancies will be noted.
- The second pumping regime would be at a higher pumping rate, but within the higher end of recommended flow rates of 0.3 feet drawdown in the EPA low flow purging and sampling procedure. A longer purging time, using the peristaltic pump, will be employed, such that the estimated volume of purged groundwater would be theoretically capturing groundwater around the screen depth at former well MW-9. The end result will be considered acceptable data, but noted as being collected at the higher end of the operating parameters for low flow rate.
- For the first and second pumping regimes, performance criteria for determination of stabilization would still be achieved and will be based on water-level drawdown, pumping rate and equipment specifications for measuring indicator parameters.
- The third pumping regime will be at a much higher pumping rate and using a submersible pump placed near the center of the MW-42 well screen, instead of a

low-flow peristaltic pump. The objective of the third pumping regime is to maximize the radius of influence of well MW-42 to obtain a groundwater sample further upgradient, again targeted at the location of previous well MW-9. It is possible that this sample result may not be considered acceptable based on standard industry practice for groundwater monitoring, but the goal is to confirm cleanup standards have been achieved in the deep groundwater area of previous well MW-9.

- Groundwater analytical results from previous quarterly sampling has revealed PCE concentrations remediated to below the state groundwater cleanup standard, therefore, this approach to sampling would help further confirm this result.
- The groundwater samples will be analyzed for HVOCs (PCE, TCE, cis-1,2 DCE, and VC and field parameters pH, ORP, DO, specific conductance, and temperature.).
- An InSitu Level TROLL 700 water level monitor (pressure transducer) will be placed in nearby well MW-43 and synoptic water level measurements collected to help estimate cone of depression and extent of hydraulic influence/capture. Transducer data will be collected for all three pumping events.
- A letter report with analytical results, description of tasks carried out, and variances from the original planned work will be completed three weeks from receipt of final analytical data results for Ecology review.