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May 7, 2021

William Carroll
Pacific Crest Environmental
1531 Bendigo Boulevard N.
North Bend, WA 98045

Re: Next Steps at the Kelsey Creek Site:

- Site Name: Kelsey Creek Shopping Center
- Site Address: 15915 Main Street, Bellevue
- VCP No.: NW3158
- Facility/Site ID No.: 18225714
- Cleanup Site ID No.: 13324

Dear William Carroll:

Ecology has received your letter dated May 3, 2021. This letter includes responses to Ecology's comments in our September 30, 2019 Further Action letter and responses to Ecology's suggested next steps in our letter dated September 22, 2020.

The only proposed next step within your letter appears to be replacement of monitoring well KC-2 with a new monitoring well cluster (KC-2S and KC-2M). Ecology does not consider this to be a sufficient level of effort at this time to remain in good standing within the Voluntary Cleanup Program (VCP). As detailed in previous correspondence and discussions, Ecology has previously expressed concerns regarding progress on this Site. Under the VCP, Ecology commonly provides technical support in terms of "suggestions" for next steps. Because of the higher level of expectations on this Site, we are providing the following as "required" rather than "suggested" next steps. Ecology considers these next steps to be necessary and appropriate to maintain continued enrollment within the VCP.

Required Next Steps

Soil Vapor

The passive soil sampling data were valuable to identify "hot spots" that are suggestive of a release. The data suggests that the primary release area of concern is in the vicinity of SV-1 and monitoring well KC-2, based on soil vapor and groundwater sampling data.

These locations are roughly 20 feet east and 10 feet south of the sanitary sewer connection, a common release location associated with dry cleaners. Interestingly, location SV-6, located closer to the sanitary sewer connection, had much lower concentrations of PCE in the passive soil vapor sample. This means that uncertainties remain regarding the exact release mechanism at the Site. The next steps presented herein are anticipated to further understanding of the Site release(s) toward development of appropriate remedial approaches.

Your May 3, 2021 letter suggests that the vapor intrusion pathway can be considered inactive at the Site. The passive (sorbed) vapor samples can only be used to assess the vapor intrusion pathway from a qualitative standpoint, i.e. where areas of greatest vapor intrusion risk are. Historical active vapor sampling locations were collected that may be consistent with a use of comparing with Ecology's sub-slab vapor screening levels.

Please provide a map and table showing sub-slab vapor sampling results compared with screening levels that would support closure of this pathway. If sub-slab vapor screening levels are exceeded, then further action in terms of indoor air characterization would be indicated. Ecology notes that the following are commercial land use-based indoor air cleanup levels, which are then used to calculate sub-slab screening levels by applying a dilution attenuation factor of 33.78.

Compound	Commercial Indoor Air Cleanup Level (cancer) µg/m^3	Sub-Slab Screening Level (cancer) µg/m^3
Tetrachloroethene (PCE)	33.69	1138
Trichloroethene (TCE)	2.13	71.92
Vinyl chloride (VC)	1.00	33.63

New Monitoring Wells

A replacement well cluster is proposed for location KC-2, which appears to be in the vicinity of the source of PCE in groundwater based on data from previous investigations. Ecology asserts that additional monitoring wells are needed at this time to 1) define the horizontal and vertical extent of contamination, and 2) refine the conceptual site model (CSM). Because available lithological data are generally sufficient to define appropriate screened intervals, Ecology requests that these additional monitoring wells be installed during the next field program. Since mobilization costs are a considerable part of the costs of drilling monitoring wells, installing these additional monitoring wells now rather than later may actually result in long-term cost savings, especially since drilling depths are very shallow and multiple wells can likely be installed in one day.

The monitoring well clusters will refine the CSM by providing critical needed data including: horizontal and vertical contaminant distribution data; vertical hydraulic gradient and aquifer connectivity data; aquitard robustness data; and a refined understanding of contaminant fate and transport. These replacement monitoring wells are also needed to assess potential impacts from the previous monitoring wells that breached the aquitard, particularly at KC-2.

Based on the above lithological data, the following monitoring well completions are requested:

Table 1: Requested Monitoring Well Completions

Old Monitoring Well ID	New MW ID	Depth Interval (ft bgs)	Depth to Water (ft btoc)[1]	Screen Length (ft)	Screened Lithology	Comments
KC-1S	KC-101S	2.0-4.5	2.5-4.8	2.5	Sand	
		4.5-7.5			Silt	Aquitard[2]
KC-1M	KC-101M	7.5-15		7.5	Peat	
		15-20			Silt	
KC-5	KC-101D	25-35		10	Sand	Existing KC-5S
KC-2S	KC-102S	2.0-5.5	3.0-4.5	3.5	Sand	
		5.5-11.0			Silt	Aquitard[2]
KC-2M	KC-102M	11-15		4.0	Peat	
KC-3S	KC-103S	2.0-7.0	4.4-5.6	5.0	Peat	
		12.5-14.5			Silt	
KC-3M	KC-103M	14.5-?[3]		~5.0[3]	Sand	
KC-4S	KC-104S	2.0-7.5	5.0-5.7	5.0	Silty Sand	
		8-10			Silt	
KC-4M	KC-104M	10-15		5.0	Peat	
		18-20			Silt	
KC-4D	KC-104D	26-36		10.0	Sand	Existing KC-4D
Proposed MW	KC-105S[4]	TBD		TBD	TBD	
	KC-105M/D[4]	TBD		TBD	TBD	

TBD = To be determined based on geological strata observed at this location.

1 - Depth to water range between 2017 and 2019.

2 - The upper silt aquitard should be characterized at location KC-101 and KC-102 by either sampling and analyzing a representative soil sample for permeability, or by installing a point screened in the middle of silt and conducting a slug test.

3 - Existing monitoring well KC-3 had sand to a depth of 15 feet, but the bottom of this sand interval was not determined.

4 - Proposed MW location southwest of KC-2 proposed in Figure 5 of 2019 data gap report. One monitoring well should target the aquifer zone with the greatest likelihood of impacts from the KC-2 area, based on available data.

Ecology is suggesting new monitoring well IDs (e.g. KC-102S &M) to avoid confusion with previous locations and designations. Ecology notes that monitoring wells less than 10 feet deep are exempt from well permitting and construction requirements.

Field observations of lithologies should be made during drilling to verify previous findings, in particular at location KC-1/KC-5, where reported lithologies varied considerably between the two borings; at KC-3M, where only the upper part of a sand unit was previously encountered; and at new location KC-105.

During drilling, photoionization detector (PID) headspace samples should be taken from continuous soil samples, and recorded on a minimum two-foot interval, including below the water table. A one-foot head space sampling interval would be appropriate in the source area (KC-102S and KC-102M). PID readings and field observations (e.g. staining and odor) should be used to select appropriate soil samples for laboratory analysis. This will be particularly important at location KC-102, where soil samples should be collected within the upper sand, silt, and peat units.

New monitoring wells KC-101M and KC-102M should be over-developed in case existing monitoring wells KC-1 and KC-2 resulted in downward migration of contamination.

After the monitoring wells have been installed, they should all have the top of casing surveyed, and water level measurements taken to assess vertical hydraulic gradients and aquifer zone interconnectivity. Initial monthly water level measurements can be reduced to quarterly after the first quarter. Alternatively, pressure transducers can be installed within monitoring wells KC-102S and KC-102M. Head data from these monitoring wells are need to compare with surface water level data, as discussed in the following section on groundwater – surface water interaction.

In addition to assessing vertical gradients, water level data should be used to generate potentiometric surface maps for the aquifer zone(s) of greatest concern with respect to contaminant transport.

It should be noted that if the extent of contamination has not been defined by the requested monitoring wells, additional sampling and/or monitoring locations may be needed. Slug testing of the monitoring wells may also be needed to provide hydraulic property data due to the complex aquifer zonation found at the Site.

Groundwater - Surface Water Interaction

The proposed pore water sampling provided useful and valuable data but cannot be used alone to eliminate the groundwater to Kelsey Creek pathway since 1) gaining conditions to the creek may be seasonal, and 2), the pore water could potentially be diluted by surface water.

A hydrogeological cross section is needed to support understanding of this potential pathway. The cross section provided as Figure 5 of the June 5, 2019 data gap report is an excellent starting place for this cross section. Once the above monitoring wells are installed and surveyed, and water levels measured, then this cross section can be refined with the well completions, well and creek water levels, and pore water sampling depths.

Water levels within Kelsey Creek should be measured and recorded to identify high and low water levels to present on the cross section and compare with shallow groundwater levels. Placement of a pressure transducer within the creek (previously recommended by Ecology in September 2020) would be an appropriate method to collect this data, provided it is tied to a surveyed reference point to allow presentation as elevation data. By having this refined hydrogeological cross section and additional head data, potential groundwater -surface water interaction over time can be better understood.

The existing cross section shows the sides of the creek as presumably concrete (impermeable) walls, and an open bottom. This would suggest that any gaining or losing conditions would be from the bottom of the channel. The permeability of the creek base may need to be characterized, depending on the results of the head analysis.

Potential In-Situ Chemical Reduction Pilot Test

Your letter indicated that KCC is evaluating conducting a pilot test to evaluate the feasibility of using in-situ chemical reduction (ISCR) to reduce concentrations of PCE and TCE in groundwater. While Ecology is generally in favor of implementing Interim Remedial Actions (IRAs) at contaminated sites to reduce contaminant concentrations, the scope of work presented herein should be implemented prior to executing any IRAs or IRA pilot tests in order to develop better understanding of the nature and extent of contamination in this complex hydrogeological setting. It should also be noted that ISCR has potential to produce vinyl chloride, which has lower MTCA cleanup level concentrations due to its toxicity. Therefore, a IRA using ISCR should be carefully considered and evaluated prior to implementation.

In order to ensure that cleanup at the Site proceeds in an efficient and timely manner, we request that Pacific Crest Environmental provide a sampling and analysis plan for the completion of the required next step tasks within 30 days of receipt of this letter.

If you have any questions about this letter, please contact me by phone at (509) 454-7835 or e-mail at frank.winslow@ecy.wa.gov.

Sincerely,

Frank P. Winslow, LHG
Cleanup Site Manager
Toxics Cleanup Program
Headquarters Cleanup Section

cc: Brian Franklin, PMF Investments
Sandra Caldwell, Ecology