

From: [Winslow, Frank \(ECY\)](#)
To: [Yusuf Pehlivan](#)
Cc: [Peter Kingston](#)
Subject: RE: Washington Cold Storage, eVCP Project ID XS0012 - Supplemental SSI Summary
Date: Monday, March 13, 2023 2:19:08 PM
Attachments: [image001.png](#)

Hi Yusuf,

Thank you for your email update.

Ecology concurs with the appropriateness of conducting source removal excavations for soil contamination at FB-05 (TCE at 3'), FMW-10 (PCE and TCE at 7'), A-2 (ORO at 0.5'), and A-22 (Benzene at 1' and 8'). Confirmation that soil contamination has been sufficiently removed would include 1) confirmation soil sampling at each of the remedial excavations including a minimum of four sidewall and one floor sample, and 2) disposal receipts demonstrating proper disposal of contaminated soils at a permitted disposal facility.

Ecology also concurs with the need for defining the extent of groundwater contamination downgradient of locations FMW-9 (Benzene) and FMW-10 (TCE and cis-1,2-DCE). If the neighbor to the north is not amenable to monitoring well installations on their property, then temporary groundwater sampling via direct push or temporary installations is an option to consider. If cleanup of downgradient groundwater contamination above cleanup levels is not practicable, then a property-specific NFA may be the target for the Washington Cold Storage Property. To the extent possible, Ecology would encourage cleanup to target a Site NFA.

Ecology is eager to see the results of the PFAS groundwater sampling at MW-4 through MW-6 when they are available. We are also eager to hear the results of the records request for JBLM regarding use of AFFF during fire suppression work on the Property.

The reason for the significant concentration reductions for DRO and benzene in groundwater at locations such as MW-1, MW-2, MW-7 warrants further evaluation/discussion. Is it possible that more recent groundwater sampling could have involved sampling at a deeper depth (pump intake set depth) within the monitoring wells by Atlas and Farallon during later events? Please verify the sampling intake depths for sampling done by Atlas and Farallon, to the extent possible. An alternative hypothesis could involve rapid biodegradation, such as if the fire control work at the Property delivered materials that stimulated rapid biodegradation. This hypothesis may be supported by reductions in DRO and Benzene in MW-2, MW-4, and MW-7 observed during and following Atlas sampling rounds. Ecology notes that since these concentration reductions are more dramatic than typically exhibited over such a timeframe, it would be helpful if an apparent reason for these declines could be pointed to. A third hypothesis could involve the analytical laboratories used, if any QA/QC data suggested potential laboratory performance concerns.

Ecology concurs that inclusion of a vapor barrier is likely appropriate for construction on the Property. This is particularly important since it is possible that other contamination releases to soil could have occurred that were not found by the soil sampling. In general, inclusion of passive sub-slab depressurization systems may carry a higher confidence in ensuring vapor intrusion concerns

are eliminated rather than vapor barriers alone. Ecology would encourage the inclusion of such measures for new construction to ensure long-term protectiveness.

With respect to potential injection cleanup of groundwater, Ecology notes that petroleum and benzene are commonly addressed through injection of destructive oxidant or aerobic enhanced biodegradation stimulation, whereas CVOs are commonly addressed through injection of destructive oxidant or anaerobic enhanced biodegradation stimulation. Inclusion of a colloidal carbon would generally be more about reducing contaminant mobility than contaminant destruction or biodegradation, although we recognize that many carbon injectates may include enhanced biodegradation additives. Prior to proceeding with plans to inject materials to address the petroleum/benzene, and CVOs in groundwater, we would request greater clarity on the targeted actions of specific injectates.

Please let me know if you have any questions regarding Ecology's above feedback.

Thanks, Frank

Frank P. Winslow, LHG

WA Expedited VCP Site Manager
Department of Ecology – Toxics Cleanup Program
1250 W. Alder Street, Union Gap, WA 98903
(509) 424-0543 (cell)

Frank.Winslow@ecy.wa.gov

From: Yusuf Pehlivan <ypehlivan@farallonconsulting.com>

Sent: Friday, March 10, 2023 2:15 PM

To: Winslow, Frank (ECY) <fwin461@ECY.WA.GOV>

Cc: Peter Kingston <pkingston@farallonconsulting.com>

Subject: Washington Cold Storage, eVCP Project ID XS0012 - Supplemental SSI Summary

Frank,

Farallon has prepared this email to provide an update on remedial investigation and planned cleanup activities at the former Washington Cold Storage facility at 240 15th Street Southeast in Puyallup, Washington (the Property) (Figures 1 and 2). The facility is enrolled in Ecology's expedited VCP program under VCP Project ID. XS0012. We previously sent you an email on January 31, 2023 to summarize remedial investigation activities conducted at the Property by Farallon between December 2022 and 2023, including conducting a passive soil gas survey and a groundwater monitoring event, and review of previous work conducted by Atlas Technical Consultants LLC (Atlas). Farallon returned to the Property in February 2023 to conduct a supplemental subsurface investigation which included the following:

- Advancing borings FB-01 through FB-06 at the locations shown on Figure 2 to evaluate potential source areas identified during the passive soil gas survey;
- Installing monitoring wells FMW-8 through FMW-13 at the locations shown on Figure 2 to

evaluate potential source areas identified during the passive soil gas survey and further evaluate groundwater conditions beneath the Property; and

- Conducting a groundwater monitoring event at the new and existing monitoring wells on the Property.

A summary of the work elements and results of Farallon's supplemental subsurface investigation are presented below. Analytical results for samples collected by Farallon and Atlas are presented in the attached Figures 1 through 9 and Tables 1 through 7.

Drilling and Monitoring Well Installation

The supplemental subsurface investigation was conducted to evaluate potential source areas of hazardous substances identified during the passive soil gas survey, and to further evaluate groundwater conditions beneath the Property. Drilling and monitoring well installation activities were conducted between February 7 and 9, 2023.

Borings FB-01 through FB-06 and monitoring wells FMW-8 through FMW-13 were advanced at the locations shown on Figure 2 by a Washington-state licensed drilling contractor using a direct-push drill rig. Borings FB-01 through FB-06 were advanced to depths of up to 24 feet below ground surface (bgs), and monitoring wells FMW-8 through FMW-13 were installed to total depths between 13 and 15 feet bgs. Monitoring wells were installed using 10 feet of 0.010-inch slotted polyvinyl chloride screen set to intersect the surface of the first encountered groundwater-bearing zone.

Soil samples collected during the supplemental subsurface investigation were submitted to Apex Labs (Apex) of Tigard Oregon for analysis of one or more of the following:

- Total petroleum hydrocarbons as diesel-range organics (DRO) and as oil-range organics (ORO) by Northwest Method NWTPH-Dx;
- Total petroleum hydrocarbons as gasoline-range organics (GRO) by Northwest Method NWTPH-Gx;
- Benzene, toluene, ethylbenzene, xylenes, and naphthalene by U.S. Environmental Protection Agency (EPA) Method 8260D; and
- Halogenated volatile organic compounds (HVOCs) by EPA Method 8260D.

A summary of soil analytical results collected during the supplemental subsurface investigation is presented below:

- Tetrachloroethene (PCE) was detected at a concentration slightly exceeding the MTCA Method A cleanup level of 0.05 milligrams per kilogram (mg/kg) in the soil sample collected from monitoring well FMW-10 at a depth of 10 feet bgs. PCE was reported non-detect at the laboratory practical quantitation limit (PQL) in the remaining soil samples analyzed (Figure 5, Table 3).
- Trichloroethene (TCE) was detected at concentrations exceeding the MTCA Method A cleanup level of 0.03 mg/kg in soil samples collected from boring FB-03 at a depth of 3 feet bgs, and from monitoring FMW-10 at a depth of 7 feet bgs. TCE was reported non-detect at the laboratory PQL in the remaining soil samples analyzed (Figure 5, Table 3).
- DRO, ORO, GRO, and benzene either were detected at concentrations less than their respective MTCA Method A cleanup levels, or were reported non-detect at the laboratory PQL in all soil samples analyzed (Figure 4, Table 2).

Groundwater Monitoring Event

Farallon conducted a groundwater monitoring event at the Property on February 13 and 14, 2023, which included measuring groundwater elevations and collecting groundwater samples at monitoring wells MW-1 through 7 and FMW-8 through FMW-13. Groundwater samples from all wells were submitted to Apex for analysis of DRO, ORO, GRO, and VOCs. Groundwater samples from MW-4 through MW-6 located along the southern edge of the Property also were submitted to ALS Limited of Kelso, Washington for analysis of per- and poly-fluoroalkyl substances (PFAS), but PFAS analytical results have not yet been received.

Groundwater analytical results indicated that concentrations of petroleum hydrocarbons and benzene have steadily decreased since the initial groundwater monitoring event conducted by Atlas in November 2021. A summary of the groundwater monitoring event conducted by Farallon is presented below:

- Depth to groundwater measurements indicated that groundwater was encountered at depths of approximately 3.5 to 9.5 feet bgs and flows to the north (Figure 3, Table 1).
- Benzene was detected in groundwater at concentrations exceeding the MTCA Method A cleanup level in monitoring wells MW-7 and FMW-09, located in the northwestern portion of the Property. Benzene was detected at concentrations of 13.7 micrograms per liter (µg/l) and 6.64 µg/l in MW-7 and FMW-09 respectively, exceeding the MTCA Method A cleanup level of 5 µg/l. Benzene was detected at concentrations less than the MTCA Method A cleanup level or was reported non-detect at the laboratory PQL in the remaining groundwater samples analyzed (Figure 7, Table 6).
- TCE and cis-1,2-dichloroethene (cis-1,2-DCE) were detected at concentrations exceeding their respective MTCA Method A cleanup levels of 5 µg/l and 16 µg/l in monitoring FMW-10, located along the northern Property boundary (Figure 8, Table 7).
- PCE was detected at a concentration less than the MTCA Method A cleanup level of 5 µg/l in monitoring well FMW-10, and was reported non-detect at the laboratory PQL in the remaining groundwater samples analyzed (Figure 8, Table 7).
- 1,2-dichloroethane (EDC) was detected at a concentration less than the MTCA Method A cleanup level of 5 µg/l in monitoring well MW-7 and was reported non-detect at the laboratory PQL in the remaining groundwater samples analyzed (Figure 8, Table 7).
- DRO and/or ORO were detected at concentrations less than the MTCA Method A cleanup level of 500 µg/l in monitoring wells MW-1, MW-3, MW-7, FMW-09, and FMW-10, and were reported non-detect at the laboratory PQL in the remaining groundwater samples analyzed (Figure 7, Table 6).
- GRO was detected at a concentration less than the MTCA Method A cleanup level of 800 µg/l in monitoring well MW-7, and was reported non-detect at the laboratory PQL in the remaining groundwater samples analyzed (Figure 7, Table 6).

Discussion

Soil analytical results indicate that petroleum hydrocarbons and petroleum VOCs are not present in soil at concentrations exceeding MTCA Method A cleanup levels, except for an exceedance of ORO in shallow soil in boring A-2, and a exceedances of benzene in shallow soil in boring A-22. However, Farallon identified exceedances of HVOCs in shallow soil proximate to boring FB-05 and monitoring well FMW-10 in the central and northern portions of the Property, respectively, which is consistent with the findings of the passive soil gas survey.

Groundwater analytical results indicate concentrations of petroleum hydrocarbons and benzene have declined significantly since the initial groundwater monitoring event conducted by Atlas in November 2021. In addition, based on the additional data collected by Farallon, exceedances of DRO, ORO, and benzene identified in reconnaissance groundwater samples collected by Atlas are not representative of current groundwater conditions. Farallon installed monitoring wells FMW-9 through FMW-12 proximate to borings A-15, A-21, A-23, A-24, A-33, and A-38, which contained concentrations of DRO, ORO, and/or benzene at concentrations exceeding MTCA Method A cleanup levels in reconnaissance groundwater samples collected by Atlas between November 2021 and March 2022. Groundwater samples collected from Farallon's newly installed wells did not contain petroleum hydrocarbons or benzene at concentrations exceeding MTCA Method A cleanup levels, except for FMW-9 which contained benzene at a concentration slightly exceeding the MTCA Method A cleanup level proximate to boring A-23 (Figure 7). Groundwater samples collected from Atlas monitoring wells MW-3 through MW-5, located proximate to reconnaissance groundwater exceedances, also did not contain petroleum hydrocarbons or benzene at concentrations exceeding MTCA Method A cleanup levels. Current groundwater analytical results indicate that petroleum hydrocarbon and/or benzene impacts in groundwater are limited to the northern portion of the Property proximate to monitoring wells MW-1, MW-7, and FMW-9.

Groundwater analytical results indicate that HVOC impacts in groundwater exceeding MTCA Method A cleanup levels are limited to the northern portion of the Property proximate to monitoring well FMW-10. HVOCs were not detected at concentrations exceeding MTCA Method A cleanup levels in any other monitoring wells on the Property (Figure 8). The lateral extent of HVOC exceedances in groundwater east and north of FMW-10 has not been defined.

Planned Work

Farallon anticipates that the cleanup action alternative for soil at the Property will include localized source removal excavations proximate to borings A-2, A-22, FB-05, and monitoring FMW-10 to remove shallow soil containing petroleum hydrocarbons, benzene, and/or HVOCs at concentrations exceeding MTCA Method A cleanup levels.

The planned cleanup alternative for groundwater will include remedial injections in the northern portion of the Property proximate to monitoring wells MW-1, MW-7, FMW-9, and FMW-10 to minimize potential migration and promote degradation of petroleum hydrocarbons, benzene, and HVOCs in groundwater. Farallon currently is working with an injection vendor to design a scope of work for injection activities.

Additional investigation is warranted to evaluate the downgradient extent of benzene and HVOC exceedances in groundwater proximate to monitoring wells FMW-9 and FMW-10. Evaluation of downgradient impacts of benzene and HVOCs in groundwater will require an access agreement to install one or more monitoring wells on the north-adjointing property.

Due to the development schedule at the Property, Farallon plans to implement cleanup action activities to address on-Property impacts to soil and groundwater before fully evaluating the downgradient extent of contaminated groundwater. Injection activities are planned to be conducted

in April or May 2023, and source removal excavation activities are anticipated to be conducted prior to or during Property redevelopment. Implementation of cleanup activities as soon as possible will minimize the potential for petroleum hydrocarbons, benzene, and HVOCs to migrate off the Property.

Farallon also anticipates that a vapor barrier may be necessary beneath portions of the proposed building to address the potential vapor intrusion pathway associated with contaminated groundwater. Contaminated groundwater appears limited to the northern portion of the Property, and development plans indicate that the proposed building on the Property may not extend over areas of contaminated groundwater. Hotspots of petroleum hydrocarbons, benzene, and HVOCs identified during the passive soil gas survey as exceeding MTCA Method B subsurface soil gas screening levels did not correlate with MTCA exceedances in soil and/or groundwater, except for exceedances of HVOCs in soil at FB-05 and in soil and groundwater at FMW-10. A vapor barrier would be installed beneath portions of the building that are located within the horizontal separation distance for vapor intrusion evaluation as established in Ecology's *Guidance for Evaluating Vapor Intrusion in Washington State* dated March 2022.

Please feel free to reach out if you have any questions, or if you would like to set up a call to discuss these analytical results and Farallon's planned work at the Property.

Thank you

Yusuf Pehlivan, L.G. (WA), Associate Geologist

Farallon Consulting | 975 5th Avenue Northwest | Issaquah, WA 98027

D: 425-394-4415 | C: 949-351-6163 | [Bio](#) | [LinkedIn](#)

Please note my updated phone number!



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