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November 14, 2019

Scott Hooton
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Re: Comments on Summary of Sub-Slab Soil Vapor Assessment, Response to Submittal of Draft Environmental Covenant, and List of Remaining Deliverables

- **Site Name:** Taylor Way and Alexander Avenue Fill Area (TWAAFA)
- **Site Address:** 1514 Taylor Way
- **Facility/Site No:** 1403183
- **Cleanup Site ID No.:** 4692
- **Agreed Order No.:** DE13921

Dear Scott Hooton:

Thank you for submitting the *Sub-Slab Soil Vapor Assessment Memorandum* (memo)[1] for our review. The Department of Ecology (Ecology) has the following comments on the memo:

1. The first paragraph of the memo states the assessment was performed in accordance with the Ecology approved sampling addendum[2] (addendum). This statement is not completely accurate. The addendum was submitted to Ecology on August 13, 2018. On August 21, 2018, Ecology provided comments on the addendum by email.[3] Ecology's comments included the following requests/recommendations:

   a. Revise the sub-slab sampling locations.

[1] *Memorandum Re: Summary of Sub-Slab Soil Vapor Assessment, 1514 Taylor Way, Tacoma, Washington*. Prepared by Floyd|Snider, dated December 4, 2018.
[2] *Memorandum Re: Sampling Plan Addendum for Vapor Intrusion Assessment, 1514 Taylor Way, Tacoma, Washington*. Prepared by Floyd|Snider, dated August 10, 2018.
[3] *RE: Addendum for VI assessment at Taylor Way site*. Email from Steve Teel, Ecology, to Tom Colligan, Floyd|Snider, dated August 21, 2018.

b. Increase the number of air sample locations and provide a map with proposed locations to Ecology for review and approval. A pre-sampling building survey should be conducted and used in planning sample locations.

c. Field quality control (QC) duplicate samples need to be included.

d. For the first year, at least two indoor air sampling rounds are required (winter and summer).

e. The building should not be occupied until Ecology agrees that the vapor intrusion mitigation system is working adequately.

f. Ambient air samples should be collected upwind and Tedlar bags are not recommended.

g. The constituent list for analysis should include all compounds previously detected in all air media.

h. Differential pressures shall be measured to assess fluctuations in cross-slab differential pressure.

i. A standard photoionization detector is generally not sensitive enough for vapor intrusion investigations.

Floyd|Snider provided an email response on August 23, 2018,[4] further updated on August 31, 2018,[5] in which they agreed to update the work plan as indicated in redline responses following each Ecology comment. For example, Floyd|Snider provided that they understood and/or agreed with above comments a, b, c, and e through i.

Regarding comment d, Floyd|Snider responded that they planned to discuss indoor air sample locations with Ecology following the results of the September sub-slab sampling event. The August 31, 2018, response also stated that they would have results from sub-slab and indoor air before the building was occupied and suggested that the need for a second round of indoor air sampling be conditional depending on the results from sub-slab and initial indoor air. A revised work plan was not submitted to Ecology for review.

The assessment summarized in the memo was not consistent with the workplan because no indoor air samples were collected prior to building occupancy.

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[4] *RE: Addendum for VI assessment at Taylor Way site*. Email from Tom Colligan, Floyd|Snider, to Steve Teel, Ecology, dated August 23, 2018.

[5] *RE: Addendum for VI assessment at Taylor Way site*. Email from Tom Colligan, Floyd|Snider, to Steve Teel, Ecology, dated August 31, 2018.

Differential pressure measurements were also not collected. The last sentence of the first paragraph of the memo states, "*the results from the sub-slab sampling will be used to determine if further evaluation of indoor air quality is needed.*" This is contrary to the workplan as described by Floyd|Snider and as understood by Ecology.

2. The first sub-slab sampling event on September 12, 2018, showed detections for the following constituents at Building A, Building B, or both that exceeded the Model Toxics Control Act (MTCA) Method C sub-slab screening levels shown on Ecology's Cleanup Levels and Risk Calculation (CLARC) website:[6]

    - 1.2.4-trimethylbenzene.
    - 1,3-butadiene.
    - Acetaldehyde.
    - Acrylonitrile.
    - Air phase hydrocarbon (APH) – equivalent carbon (EC) 9-12.
    - Naphthalene.
    - Trichloroethene (TCE).

    Ecology was not consulted regarding these results. Instead, the consultant performed a second sub-slab sampling event on October 24, 2018. According to the memo, the results of the second sub-slab sampling event were all below the screening levels for the above constituents. However, the reporting limits for acrolein were greater than the screening level for both sampling events.

    Helium leak checks were performed during the September sampling. Because there was no helium detected, the consultant concluded that helium leak checks were no longer necessary and so it was not performed during the October sampling event. Ecology does not agree with this rationale.

    According to the Interstate Technology Regulatory Council (ITRC) guidance,[7] two methods of leak detection are recommended: (1) performing a "shut-in" test of the sampling train and applying a leak detection compound or water to the vapor probe at the surface, or (2) applying a tracer gas over the probe and over the entire sampling apparatus. Based on the description in the memo, it does not appear that a leak detection compound or water was applied to the vapor pin at the surface during the October sampling event. Therefore, Ecology does not have confidence in the October 2018 results.

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[6] Website available at: https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Contamination-clean-up-tools/CLARC/Guidance

[7] *Petroleum Vapor Intrusion, Fundamentals of Screening, Investigation, and Management*. Interstate Technology Regulatory Council, available at: https://www.itrcweb.org/PetroleumVI-Guidance/

3. The memo references Ecology's vapor intrusion (VI) guidance[8] with a 2018 date; this is incorrect. Ecology's VI guidance was published as a draft document in 2009. Because of the evolving nature of VI science, Ecology has published several implementation memorandum (IM) updates as a supplemental guide to the 2009 guidance until the VI guidance document can be revised and finalized. These updates include petroleum VI guidance (IM-18),[9] a frequently asked questions document (IM-21),[10] and guidance regarding TCE short-term toxicity (IM-22).[11]

4. Please note that CLARC was updated in 2019, so the screening levels in Table 1 need to be updated accordingly. In particular, the MTCA Method C sub-slab screening level of 10,000 micrograms per cubic meter (µg/m^3) is no longer in CLARC. As stated in IM-18, for sites that qualify under Washington Administrative Code (WAC) 173-340-706 to use Method C cleanup levels, either the Method B indoor air cleanup level of 140 µg/m^3 (sub-slab TPH screening level of 4,700 µg/m^3) or a site-specific approach can be used.

5. Table 3, Reduced Analytes List: Ecology agrees with the reduced analytes list provided that methylene chloride and 1,2-dibromoethane (EDB) are added to the list. Methylene chloride needs to be added because it was detected and EDB needs to be added because a similar fuel additive and lead scavenger (1,2-dichloroethane, EDC) was detected and the fact that there is only a relatively small difference between the screening level for EDB and the laboratory reporting limit.

6. Use of the Johnson and Ettinger Model: As stated in IM-21, Ecology no longer recommends VI modeling (such as the Johnson and Ettinger Model, JEM) as the sole method to support a "screen-out" decision. Paired indoor air and sub-slab data are therefore necessary to confirm the modeling results.

7. Soil Gas and JEM Results Discussion: The results of the JEM model in conjunction with the installation of the passive vapor mitigation system beneath the office nodes of the buildings are not sufficient enough actions to eliminate concern for the potential for VI at the Site. Additional sampling events are needed to collect indoor air, sub-slab, and ambient air samples along with cross-slab barometric pressure measurements. Ecology recommends that seasonal sampling occurs in winter (cold weather) and summer (warm weather).

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[8] *Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action*. Washington State Department of Ecology. October 2009 Review Draft.

[9] *Petroleum Vapor Intrusion (PVI): Updated Screening Levels, Cleanup Levels, and Assessing PVI Threats to Future Buildings*. Washington State Department of Ecology, Implementation Memorandum No. 18, January 10, 2018.

[10] *Frequently Asked Questions (FAQs) Regarding Vapor Intrusion (VI) and Ecology's 2009 Draft VI Guidance*. Washington State Department of Ecology, Implementation Memorandum No. 21, November 15, 2018.

[11] Vapor Intrusion (VI) Investigations and Short-Term Trichloroethene (TCE) Toxicity. Washington State Department of Ecology, Implementation Memorandum No. 22, Publication No. 18-09-047, October 1, 2019.

Response to Draft Environmental (Restrictive Covenant) Submittal:

Thank you for submitting the draft Environmental (Restrictive) Covenant (EC) by email[12] for the portion of the Site that was included in the interim action area under the above-referenced Agreed Order (AO). Ecology has the following response to the draft EC.

1. The current draft EC does not include any restrictions or requirements related to vapor intrusion. Because the vapor assessment data collected to date is inconclusive, it is not known if EC restrictions pertaining to vapor intrusion are necessary for the Interim Action area at the site. Therefore, Ecology does not agree that preparation of an EC is appropriate at this time because additional vapor assessment is necessary to answer this question. Ecology recommends that sub-slab, ambient, and indoor air samples are collected and analyzed as soon as possible for the vapor assessment. Please prepare a vapor assessment work plan to Ecology for review and approval.

Remaining Deliverables:

Below is a summary of the remaining deliverables required before Agreed Order DE 13921 can be considered complete:

1. Vapor assessment work plan: Submittal of a vapor assessment work plan for Ecology review and approval. The work plan needs to include a pre-sampling survey as noted in our August 21, 2018 email.

2. Completion of the VI assessment and submittal of the vapor intrusion assessment report: The assessment shall include indoor air, sub-slab, and ambient air samples along with cross-slab barometric pressure measurements. Ecology recommends that seasonal sampling occurs in winter (cold weather) and summer (warm weather).

3. Revised Interim Action Report: Ecology's May 21, 2019 email[13] included comments that the report needs to include some discussion on the thickness of fill that was placed at the site and provide one (or more) cross-sections. Additionally, as stated in AO section VII.C, the report shall include a description of the as-built vapor mitigation system, its design and performance specifications, and data and observations collected to demonstrate that the system is performing as designed.

4. Operation and Maintenance and Sampling and Analysis Plan: Since the vapor mitigation system was installed, an operation and maintenance (O&M) and sampling and analysis plan shall be prepared as described in AO section VII.D.

[12] *FW: we need to close out the AO for Portside Interim Action*. Email from Scott Hooton, Port of Tacoma, to Steve Teel, Dept. of Ecology, dated September 9, 2019.
[13] *RE: we need to close out the AO for Portside Interim Action*. Email from Andy Smith, Dept. of Ecology to Scott Hooton, Port of Tacoma, dated May 21, 2019.

5. Finalization and Recording of the Environmental Covenant: See above comment. Also, please note that the covenant required by this Order may eventually need to be either amended or superseded by a new covenant, depending on the nature of the final cleanup action selected for the entire TWAAFA Site.

6. Submittal of electronic data to Ecology's Environmental Information Management System database: Submittal of Site data to Ecology's Environmental Information Management System (EIM) database is required by Agreed Order section VIII.E. It does not appear that data collected after December 28, 2016, have been entered into EIM.

Please also note that because the scope of this Order was limited to performing an interim action on a portion of the TWAAFA Site, satisfaction of the Order's requirements will not necessarily mean that no additional remedial action will be required. Ecology expects the Port will be a Party to a new Agreed Order requiring completion of a site-wide remedial investigation/feasibility study and preparation of a preliminary draft Cleanup Action Plan.

If you have any questions about this letter, please contact me at (360) 407-6247 or steve.teel@ecy.wa.gov.

Sincerely,

SSTeel

Steve Teel, LHG
Toxics Cleanup Program
Southwest Regional Office

SST/tam

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