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DEPARTMENT OF ECOLOGY
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December 4, 2024

Branislav Jurista
Farallon Consulting, LLC
975 5th Ave. NW, Ste 100
Issaquah, WA 98027
bjurista@farallonconsulting.com

Re: Technical Assistance to Complete the Remedial Investigation at the following contaminated Site:

- **Site Name:** Woodworth & Co Inc. Lakeview Plant
- **Site Address:** 2800 104th St Ct S, Tacoma, Pierce County, WA 98499
- **Facility/Site ID:** 1372
- **Cleanup Site ID:** 165
- **VCP Project ID:** SW1012

Dear Branislav Jurista:

The Washington State Department of Ecology (Ecology) hereby provides this technical assistance letter (TAL) that is responding to your recent September 4, 2024 Technical Memorandum for Site Status and Summary of May 2023 through August 2024 Data Collection – Woodworth & Co, Inc. (Woodworth) Lakeview Plant in Lakewood, WA (Response). Accordingly, and in concert with the requests made in your Response, Ecology's recommendations in this TAL are provided to both further complete the remedial investigation (RI) at the Site and collect the necessary data to inform the feasibility study (FS)/disproportionate cost analysis (DCA) process. However, to facilitate realization of these goals, it is incumbent upon the VCP customer team to execute Ecology's recommendations.

We are providing this letter under the authority of the Model Toxics Control Act (MTCA),[1] chapter 70A.305 Revised Code of Washington (RCW).[2]

[1] https://apps.ecology.wa.gov/publications/SummaryPages/9406.html
[2] https://app.leg.wa.gov/RCW/default.aspx?cite=70A.305

Issue Presented and Opinion

Farallon Consulting, L.L.C. (Farallon) has submitted the Response to facilitate discussions between Ecology and Woodworth to define a scope of work that would lead to issuance of a No Further Action (NFA) determination. The environmental work presented in the Response was also conducted to provide additional information in response to Ecology's prior June 2023 Technical Assistance Letter.[3]

Of note, the term "Site" used in the following sections, as defined under the Washington State Model Toxics Control Act Cleanup Regulation (MTCA), refers to the portions of the Lakeview Facility where hazardous substances have come to be located. In support of the aforementioned objective, Ecology supports issuance of an NFA determination, but needs additional data to demonstrate the following:

- Releases of hazardous substances are appropriately delineated and remediated at the Site and providing assurances that future releases of hazardous substances will be prevented;
- Contamination within the shallow, deep, and regional aquifers will not enter the Lakewood Water District drinking water system;
- Existence of sufficient data for Ecology to adequately evaluate groundwater contaminant trends and restoration timeframes; and
- Adequate definition of the lateral and vertical extents of contamination in select areas of the Site identified by Ecology.

As a result, Ecology is submitting this TAL to address statements made in the Response**.** The TAL is based on an analysis of whether the activities conducted at the Site to date meets the substantive requirements of MTCA, Chapter 70A.305 RCW, and its implementing regulations, Washington Administrative Code (WAC) Chapter 173-340 (collectively "substantive requirements of MTCA").

Description of the Site

This TAL applies only to the Site described below. The Site is defined by the nature and extent of contamination associated with the following releases:

- Diesel and Heavy oil petroleum hydrocarbons, polycyclic aromatic hydrocarbons, halogenated volatile organic compounds (VOC), and heavy metals into the Soil and Groundwater.

The parcel(s) of real property associated with this Site are located within the projected boundaries of

[3] Ecology, Letter Regarding Technical Assistance on Further Investigation for the Woodworth & Co. Lakeview Plant, June 20, 2023.

the Tacoma Smelter Plume facility (FSID #89267963). At this time, we have no information that those parcel(s) are actually affected. This opinion does not apply to any contamination associated with the Tacoma Smelter Plume facility.

Basis for the Opinion

This TAL is based on comments contained in the documents listed as follows:

1. Farallon Consulting, LLC*, Technical Memorandum – Site Status and Summary of May 2023 through August 2024 Data Collection; Woodworth & Co, Inc. Lakeview Plant, 2800 104th Street Court South, Lakewood, Washington*, September 4, 2024.

2. Ecology, *Letter Regarding Technical Assistance on Further Investigation for the Woodworth & Co. Lakeview Plant*, June 20, 2023.

3. Farallon Consulting, LLC*, Response to October 21, 2022 Letter Regarding Further Action At Woodworth & Co, Inc. Lakeview Plant, 2800 104th Street Court South, Lakewood, Washington*, April 18, 2023.

You can request this and any other documents in the project file by filing a records request.[4] For help making a request, contact the Public Records Officer at publicrecordsofficer@ecy.wa.gov or call 360-407-6040. Before making a request, check whether the documents are available on Ecology's Cleanup Site Search web page.[5]

This technical assistance is void if any of the information contained in this document is materially false or misleading.

Technical Assistance

We intend for this TAL to be comprehensive, at your request. Ecology's TAL as presented below is four-fold. First, it includes relevant points from Ecology VCP Supervisor Tim Mullin's October 7, 2024 email to the VCP Customer Team's attorney John Houlihan, which discussed Ecology's overarching technical and legal processes within VCP and provided pertinent regulations relative to the Site and the current Response. Secondly, it presents selected remedial investigation (RI), feasibility study (FS), and disproportionate cost analysis (DCA) recommendations relative to the Site to adequately characterize the Site.

[4] https://ecology.wa.gov/About-us/Accountability-transparency/Public-records-requests
[5] https://apps.ecology.wa.gov/gsp/Sitepage.aspx?csid=14894

Thirdly, it presents Ecology's comments regarding Farallon's Summary and Conclusions section from the current Response. And lastly, it presents a hierarchal summary of the prior Ecology October 2022 opinion comments, Farallon's April 2023 responses to Ecology's opinion comments (RTC's), Ecology 's June 2023 TAL responses to Farallon's RTC's, and Ecology's October 2024 comments that augment our prior June 2023 TAL.

A. VCP/II-SHA/LUST Unit Supervisor's Email to Attorney John Houlihan, October 7, 2024

Good afternoon, John:

I received the attached email thread regarding your repeated requests for a meeting with Kathryn Wyatt, AAG, and Joe Hunt, Ecology VCP's Site Manager for the Woodworth & Co Inc Lakeview Plant cleanup site (Woodworth; CSID: 165; VCP SW1012). As the VCP Unit (and Joe's) Supervisor, I thought it best I respond to you on this occasion. I have also cced Marian Abbett, TCP-SWRO Acting Section Manager on this email.

Background
First, Ecology appreciates the site investigation and interim actions taken to reduce contaminant concentrations in the environment at the Woodworth cleanup site. Additionally, I acknowledge the challenge and frustration dealing with a complex cleanup site like Woodworth.

In reviewing both Joe's September 10, 2024 email to Farallon Consulting LLC (Farallon) and Kathryn's subsequent September 12, 2024 email to you, they were both clear as to our technical and legal processes within VCP. To that end, VCP does not conduct oversight or approval of a cleanup, per WAC 173-340-515(1). Under the VCP, Ecology provides non-binding informal advice and technical assistance, typically via opinion letters. Please note that Joe is currently assigned 52 VCP sites, which, like Woodworth, are all currently and actively conducting cleanup and periodically requesting technical assistance.

Going forward, please work with Joe Hunt as the assigned VCP cleanup project manager.

Ecology's Response to Proposed Cleanup Remedy
Since October 2015, Ecology has issued seven opinion letters for Woodworth, in order to provide technical assistance at the Site. Ecology is currently drafting another technical assistance opinion that is responding to the most recent Response received, as well as outstanding and unfulfilled recommendations from past opinions. However, it is the responsibility of the VCP customer team to implement the opinion recommendations in order to move the cleanup forward to NFA. As a result, a meeting request is not appropriate at this time as it won't resolve the outstanding cleanup recommendations

At a high level, it is Ecology's current opinion that the proposed cleanup remedy of bringing in approximately 30 feet of fill to cover the Site does not meet the minimum substantive requirements of MTCA. Further, it is Ecology's opinion that, though many site investigation and interim actions have been completed to date, we cannot concur with the proposed cleanup remedy because:

1) The remedial investigation remains to be finalized. Please see WAC 173-340-350 for requirements.

2) There are insufficient data for Ecology to concur that the various plumes in groundwater are adequately laterally and vertically delineated to understand the plumes' geometry and calculate plume volumes, in order to evaluate potential cleanup remedies.

    a. Effectively, wherever there are dashed lines for a contaminant plume boundary presented on applicable figure(s) in the Response, sufficient horizontal and vertical data in affected media must be collected to determine the geometry and volume of that plume.

    b. Of note, the updated figures in the Response area helpful for depicting Site data and our review.

3) We request sufficient data to define the TCE plume within the regional aquifer (RA) and in the Site proper and along the western property boundary.

4) We request sufficient data to confirm how the RA is protected and what contaminant concentrations may exist between the deep water-bearing zone (DWBZ) TCE plume and the western property boundary as well as along the western property boundary to ensure drinking water supplies for the City of Lakewood are not impacted.

5) We recommend collecting needed data in a high-resolution source area characterization to best inform on cleanup remedy selection.

6) There remain outstanding recommendations for further Site investigation in Ecology's past opinion letters.

Selected WAC 173-340-360 Requirements

Contaminated soil is currently generally accessible, and available technology can remedy Site contaminant concentrations. Groundwater contamination remains to be both characterized further and remediated.

1) Covering up contamination with fill at the Site would not:

    a. Meet the requirement for the cleanup to be completed to the maximum extent practicable per WAC 173-340-360(5).

    b. Meet the requirement under MTCA for permanent cleanup solutions per WAC 173-340-360(3)(a)(x).

    c. Meet the reasonable restoration timeframe requirement per WAC 173-340-360(3) and 360(4).

    d. Meet other various requirements under WAC 173-340-360(3). Groundwater is considered potable at the Site, unless demonstrated to be not potable per WAC 173-340-720(2).

Additionally, please submit complete reports for our opinion review, such as attaching analytical data reports to the current Farallon Response. Also, please keep in mind the limits to cleanup cost considerations under MTCA, per WAC 173-340-702(6).

We anticipate that Joe's in progress technical assistance opinion letter should be issued by about December 9, 2024. This is consistent with the 90-day goal in VCP to issue opinions. Thank you for the continued cleanup efforts under VCP SW1012.

Sincerely,
Tim

B. Ecology RI/FS/DCA Considerations Relative to the Site

Consistent with Farallon's request in the current Response, Ecology includes the following recommendations below to provide direction and guidance for further Site investigation and remediation:

Remedial Investigation

1) The various plumes in soil and groundwater should be adequately defined both horizontally and vertically.

    a. Shallow water-bearing zone (SWBZ) DRO/ORO plume extents above MTCA potential cleanup levels are estimated and not laterally delineated. For example, the upper and lower boundaries (with respect to depth) of the two larger plumes depicted in Response Figure 4A are not bounded by well data. Similarly, the circular extent of DRO/ORO centered on SWBZ well MW-9R and DWBZ well MW-16R are similarly configured without corroborating analytical data. Given the vertical gradient from the SWBZ to DWBZ between wells 9R and 16R and the apparent inward and downward flow of contaminants, additional DWBZ wells should be installed in this area to monitor future DWBZ plume migration and dynamics.

2) The contaminant plumes should be laterally and vertically defined to ensure the RA is protected.
3) Additional interim actions could be taken to reduce contaminant concentrations at the Site, especially to reduce soil source areas from recharging groundwater contaminant plumes.
4) Source areas should be adequately characterized (both horizontally and vertically) to both facilitate continued interim actions and/or help inform the FS/DCA and dCAP processes.

5) The Response figures provided are adequate for plan view depiction of contaminant plumes and groundwater contours. After collecting data to complete the Site RI and characterize the source areas, three dimensional models could be generated to determine the total volume of the both the source area and dissolved phase groundwater plumes.

6) An adequate RI needs to be completed to meet the requirements under WAC 173-340-350 prior to generating a FS/DCA. A sufficient RI is needed to properly inform the FS/DCA and to that end, Ecology recommendations from the current Farallon Response **and** past opinions that remain uncompleted are included in sections C and D of this document.

FS/DCA Considerations

1) A reasonable restoration timeframe should be considered and estimated for the Site.

2) After completing the RI, the FS/DCA should facilitate choosing the cleanup remedy with the greatest likelihood of meeting cleanup standards.

3) Permanent and active remedial technologies or combinations of technologies should be evaluated. For example, dig and haul would be considered a permanent remedy.

4) Contaminants that are accessible in soil should be cleaned up to the maximum extent practicable.

5) Environmental covenants cannot be used to extend the reasonable restoration timeframe.[6]

6) If MNA is considered for one or more plumes in groundwater, demonstrate how the MNA will be conducted and included in the FS/DCA.

7) Implementation Memo Nos. 25 and 26 (currently under development) are to inform the revised FS/DCA process under the MTCA rule revision, effective 1/1/2024. During the interim, you should proceed relying upon WAC 173-340-350 and -360.

C. Ecology Responses to Farallon's Response Summary and Conclusions

Groundwater Gradient/Flow Direction

1. Farallon - Groundwater in the shallow water-bearing zone (SWBZ) flows radially inward toward the center of the Site where it flows under the natural gradient vertically into the deep water-bearing zone (DWBZ). Groundwater in the DWBZ flows predominantly to the north in the southern portion and to the northeast in the central and northern portions of the Lakeview Facility.

1a. Ecology – Groundwater from the DWBZ also flows to the underlying regional aquifer (RA) and flow direction and gradient in the RA beneath the Site remains to be adequately characterized. Ecology recommends that other RA wells should be installed between the DWBZ TCE plume and said western boundary and that would be necessary to both further characterize the RA and determine the seasonal

[6] WAC 173-340-360(4)(c)(ii)

groundwater flow direction and gradient. Of note, and assuming that groundwater cleanup may require an extended length of time, Ecology also recommends that several RA sentinel wells be completed along the Sites western boundary to assess the extent of groundwater contaminant plumes along the western property boundary and to ensure that drinking water supplies are not at risk.

DRO/ORO/PAH Extent

1. Farallon. DRO plus ORO impacts exceeding the MTCA Method A cleanup level are present in discrete areas in the SWBZ and in two discrete areas in the DWBZ.

1a. Ecology. SWBZ DRO/ORO plume extents above MTCA are estimated and not laterally delineated. For example, the upper and lower depth boundaries of the two larger plumes depicted in Response Figure 4A are not bounded by well data. Similarly, the circular extent of DRO/ORO centered on shallow well MW-9R and deep well MW-16R are similarly configured without corroborating analytical data. Given the vertical gradient from the SWBZ to the DWBZ between wells 9R and 16R and the apparent inward and downward flow of contaminants, additional DWBZ wells should be installed in this area to monitor future plume migration and dynamics. In addition, an RA well should be installed here to assess potential impacts conveyed to the RA.

2. Farallon. Because of the groundwater flow direction in the SWBZ trending to the interior of the Site, the extent of DRO plus ORO contamination is defined and confined to the Site property boundary.
2a. Ecology. Please see comment 1a.

3. Farallon. The extent of DRO plus ORO contamination at two areas within the DWBZ is contained within the property boundaries based on the results for the downgradient monitoring wells screened in the DWBZ.

3a. Ecology. Please see comment 1a.

4. Farallon. The sampling results using silica gel cleanup indicate that DRO and ORO are highly weathered and have undergone significant natural attenuation processes where only polar metabolites currently remain at the Site.

4a. Ecology. The data appears relevant and ranged from ND although some method reporting limits were above 250 milligrams per kilogram (mg/Kg) to detected levels below 500 mg/Kg.

5. Farallon. PAHs, including both carcinogenic cPAHs and non-carcinogenic PAHs, were not detected at concentrations exceeding MTCA Method A cleanup levels in any of the groundwater samples analyzed and should not be retained as constituents of concern for the Site.

5a. Ecology. We generally concur for the existing wells although groundwater characterization via additional DWBZ and RA wells should initially incorporate cPAH analysis.

DRO/ORO-Compromised Well Seals

1. Farallon. The detections of DRO plus ORO at several wells were attributed to compromised well seals and were mitigated by performing well repairs, cleaning, and redevelopment.
1a. Ecology. Thank you for repairing the well monuments/seals. Additional quarterly monitoring and analyses should confirm your conclusion.

Off-Site TCE Impacting Property

1. Farallon. Based on the assessment the Site/regional hydrogeology and contaminant fate and transport presented herein and the historical investigation and cleanup work performed, there is no apparent evidence of TCE migration from an off-Site source on to the Site at this time.

1a. Ecology. We concur.

2. Farallon. The TCE occurrence in the RA near the location of the on-Site industrial water well is more likely than not associated with the historical release from the WSDOT mobile testing lab that formerly operated at the Lakeview Facility.

2a. Ecology. We concur.

3. Farallon. TCE has migrated vertically from the SWBZ into the DWBZ and penetrated through the silt and silty gravel aquitard into the RA.

3a. Ecology. We concur. However, the remedial investigation will not be complete until TCE extent and groundwater flow direction in the RA beneath the Site has been determined.

4. Farallon. The construction and current operation of the on-Site industrial water well does not appear to exacerbate the vertical migration of TCE into the RA. The silt and silty gravel aquitard is likely transmissive at some locations and the low-level TCE appears to have migrated to the RA under natural conditions induced by a vertical gradient.

4a. Ecology. As stated above, the remedial investigation for the Site needs to determine the TCE extent and flow direction within the RA.

TCE in DWBZ and RA

1. Farallon. Concentrations of TCE at the base of the DWBZ and within the RA do not exceed the MTCA Method A cleanup level.

1a. Ecology. See above responses.

2. Farallon. A review of sampling data for the nearby water supply wells within and outside the Lakewood Water District demonstrates that these wells are not impacted by TCE and are not at future risk by TCE present at the Site.
2a. Ecology. We do not concur, as the number of RA wells are limited especially west/northwest of the DWBZ TCE plume. Installation and sampling of additional RA wells and confirmation of groundwater flow direction and gradient across a full seasonal cycle is needed.

WBZ Impacts at the SITE

1. Farallon. Based upon the historical data and the work completed in 2023 to 2024, the groundwater impacts in the SWBZ, DWBZ, and RA are confined to the Lakeview Facility property boundary.
1a. Ecology. Ecology concurs that the DRO/ORO/TCE extents in the S/DWBZ's appear to be currently confined within the property boundary but cannot concur that the extents and seasonal flow direction and gradients are delineated within the RA and which will need to be defined via additional RA wells.

2. Farallon. Of particular note, the recent work confirms that TCE impacts in the RA are below MTCA Method A concentrations and not at risk of impacting potable water supply wells in the area.
2a. Ecology. Ecology does not concur that TCE concentrations/extent and groundwater flow direction and gradient in the RA have been adequately delineated.

Soil Sources

1. Farallon. As noted in prior reports, significant soil source removal has occurred in numerous areas at the Site. There are limited areas of remaining soil impacted with concentrations exceeding MTCA Method A levels.

1a. Ecology. Ecology has previously recommended that specific boring locations harboring contamination above MTCA be further investigated and delineated (see detailed list provided later in this letter).

2. Farallon. All of the remaining soil impacts are within the boundaries of the property.
2a. Ecology. We do not concur as the detections in MW-6 and MW-24T may indicate undetected soil impacts west of the property boundary.

3. Farallon. Moreover, as discussed in previous Farallon reports submitted to Ecology, the closure requirements for the on-going sand and gravel mining operation require placement of 30 feet of clean fill to bring the Site back to required elevations.

3a. Ecology. Per discussion presented under Section A. above, Ecology does not concur that this is an acceptable remedial solution under MTCA. Accessible soil above MTCA CULs should always be cleaned up to the maximum extent practicable under a reasonable restoration timeframe.

4. Farallon. Any soil impacts are either currently under paved surfaces or that will be at a depth of more than 15 feet bgs upon completion of the reclamation process, which is the vertical separation considered reasonable under MTCA as the point of compliance for potential exposure to contaminated soil via a direct contact.

4a. Ecology. Ecology does not concur based on the groundwater protection point of compliance, the existence of contaminated groundwater that is not adequately delineated, and that this is not an acceptable remedial solution under MTCA. Accessible soil above MTCA CULs should always be cleaned up to the maximum extent practicable under a reasonable restoration timeframe to meet requirements under WAC 173-340-360 and/or other relevant citations.

5. Ecology. Ecology recommends that based on Figure 5C, locations AS-9, SVE-10, AS-10, and SVE-11 be sampled upon removal of the gravel stockpiles that cover them. Lack of sample data in these areas constitutes a data gap that should be filled.

NFA/Limited Work Scope

1. Farallon. Based on the soil and groundwater conditions at the Site, we look forward to discussing a defined and limited scope of work to move the Site to issuance of a conditional NFA letter with the following elements:

- Institutional controls to preclude the extraction of groundwater for domestic purposes;
- A materials management plan to address the handling and proper disposal of any remaining soil impacted above MTCA Method A cleanup levels which may be disturbed by on-going sand and gravel operations;
- A groundwater conditional point of compliance at the down-gradient property boundary;
- Installation of a limited number of additional groundwater monitoring wells at the conditional point of compliance; and
- Periodic groundwater monitoring to confirm MTCA Method A concentrations are achieved at the conditional point of compliance.

1a. Ecology. We look forward to moving the Site towards NFA and feel the scopes of work identified in the items above and in prior Ecology opinions should move the Site further towards that goal.

D. Summary of Ecology Opinion/TAL Comments and Farallon Responses

The following hierarchy of prior Ecology 10/2022 opinion comments, Farallon 4/2023 responses to Ecology comments, and Ecology's 6/2023 TAL responses to Farallon's comments are included below. Ecology continues to support our 6/2023 TAL comments under each category and recommends that they be accordingly implemented.

SOIL. The contaminants and media of concern in soil by area are summarized below:

General

- **Ecology Opinion Comment (10/2022):** MTCA Method B could not be used at a site if MTCA Method A is proposed elsewhere at the site. In addition, calculations should be redone because new contamination was discovered and MTCA Method B should be then used for both soil and groundwater within the same area.

- **Farallon Response (4/2023)*:*** The recent guidance published by Ecology in December 2022, discusses that mixing various methods for total petroleum hydrocarbon (TPH) sites is allowed. Farallon requests that Ecology allows applying MTCA Method A cleanup levels for certain areas of concern and MTCA Method B for other areas, assuming that whichever method selected applies to both soil and groundwater within the specific area of concern. If Ecology concurs with mixing MTCA Method A and Method B cleanup levels at the Lakeview Facility, Farallon would like Ecology to clarify how many soil and/or groundwater samples would be required to be used in the MTCA Method B calculation workbook for a specific area of concern and whether the average value or most stringent result be applied to that specific area of concern. Upon receiving input from Ecology, Farallon will recalculate the MTCA Method B Site-specific cleanup levels or collect new data to perform calculations, as necessary.

- **Ecology TAL Response (6/2023):** Excluding application of cleanup action alternatives that involve specific remediation levels, Ecology does not concur with using different MTCA Method A/B cleanup levels (CUL) for different areas of the Site. Further, a CUL typically applies to a specific media for the entire site and cannot be divided up as a function of different site areas with different CULs for the same media and exposure pathway (see definition of points of compliance). Method B CULs needs to be used for both soil and groundwater because as explained in the 2023 Concise Explanatory Statement, if a Method B CUL is used for soil, then a Method B CUL must be used for groundwater as well. Please be aware that in general, Method B CULs for soil are typically less stringent than Method A while Method B CULs for groundwater are typically more stringent than Method A CULs. In terms of sample numbers for calculation of a Method B CUL, Ecology suggests consulting the petroleum guidance for the methodology for calculating Method B CULs.

- **Ecology Farallon TM Response (10/2024):** Please provide an update to this recommendation.

Area-Specific:

• **Equipment Parking Area:** Based on the 2010 excavation of DRO/ORO-impacted soil to levels below the MTCA A CUL of 2,000 mg/Kg[7] and/or Ecology-approved calculated MTCA B CUL of 3,699 mg/Kg[8] and the analytical results for soil samples from boring B-10[9], TPH-impacted soil in this area appears to have been mostly remediated. However, the TPH groundwater concentrations in well MW-13[10] continue to both the exceed the MTCA A CUL and previously-calculated MTCA B CUL for TPH of 614.50 micrograms per liter (µg/L). As a result, both impacted soil (as yet undetected) and groundwater in this area continue to both comprise media of concern.

- **Ecology Opinion Comment (10/2022):** Based on the analytical results for soil samples, the calculated concentration of TPH in groundwater from monitoring well MW-13 exceeds the Method A cleanup level. Ecology recommends that additional delineation be conducted to evaluate and define the contaminant source at monitoring well MW-13.

- **Farallon Response (4/2023)*:*** Farallon seeks clarification from Ecology if MTCA Method A or Method B is applicable to the Equipment Parking Area and/or the Site as a whole. The calculated TPH concentration in groundwater did not exceed the site-specific MTCA Method B cleanup level for TPH for this area of concern. Based on Ecology's response, Farallon will review the existing information and reevaluate if any additional delineation is warranted to further define the contaminant source and nature and extent of contamination at monitoring well MW-13. Additional borings for collection of soil and reconnaissance groundwater samples may be advanced to locally define the nature and extent of contamination, if warranted.

- **Ecology TAL Response (6/2023):**

    - **i.** Ecology does not concur with use of area-specific Method A/B CULs. CULs need to be applied on a site-wide basis for the same media and exposure pathway.

    - **ii.** Ecology encourages delineation of the TPH impact at MW-13 as no other assessment has occurred at/near this location.

[7] Farallon, Soil Excavation Cleanup Action Completion Report, Table 2/Figure 4, March 28, 2011.
[8] Ecology, Letter Regarding Opinion on Proposed Cleanup of the Woodworth Lakeview Plant, February 15, 2011.
[9] Farallon, Addendum to Focused Feasibility Study and Disproportionate Cost analysis Report - Figure 7/Tables 2, 4, and 5, August 3, 2018.
[10] Farallon, Technical Memorandum – Site Status and Summary of May 2023 through August 2024 Data Collection, Figure 4B, September 4, 2024.

- **Ecology Farallon TM Response (10/2024)*:*** Please provide an update to this recommendation.

• **Former Recycled Stockpile Area:** The contaminants and medium of concern are DRO and ORO in the SWBZ groundwater. TPH concentrations in soil do not exceed the calculated Site-specific MTCA B cleanup level for the Former Recycled Stockpile Area previously approved by Ecology. However, the potential exists for undetected soil sources given the observed groundwater contamination.

- **Ecology Opinion Comment (10/2022):** In the western area near MW-24, Ecology recommends that additional soil samples be analyzed for cPAH in the borings where soil samples were positive for DRO and/or ORO. Further given the groundwater results in this area, additional investigation of TPH source material should be conducted to facilitate excavation and removal.

- **Farallon Response (4/2023)*:*** Farallon concurs and will plan on collecting additional soil samples for carcinogenic polycyclic aromatic hydrocarbon (cPAH) analysis to further define/refine the extent of impacts in soil in this area. The soil sampling will be limited to proposed borings and monitoring well borings shown on Figure 3. **However, any additional excavation would be subject to groundwater analysis and trends and to a feasibility study (FS) that includes a disproportionate cost analysis (DCA). The soil removal may not be practicable due to several tens of feet of overlying reclamation fill that was placed on top of the former ground surface in this area.**

- **Ecology TAL Responses (6/2023):**

    - **i.** Ecology cannot concur with the distribution of proposed monitoring wells as depicted on Figure 3 until the well depth(s) and anticipated analytes are specified. Currently, only SWBZ wells exist in the area. Further, as called out in Farallon's response above regarding soil sampling being limited to "proposed borings and monitoring well borings", Figure 3 does not contain a legend designation for proposed borings nor are they located on Figure 3. Please explain/advise.
    - **ii.** Ecology concurs that additional excavation would be subject to groundwater analysis/trends and an FS that includes a DCA.

- **Ecology Farallon TM Response (10/2024):** Please provide an update to this recommendation.

• **Hot-Mix Storage Area:** The contaminant and medium of concern remain limited to ORO in shallow soil. ORO-impacted soil occurs in the Hot-Mix Storage Area exists in an area approximately 30 by 45 feet to a maximum depth of approximately 10 feet bgs.

- **Ecology Opinion Comment (10/2022)*:*** Ecology recommends, that as a contaminant of concern, cPAHs should be analyzed at terminal depths in soil samples from all soil borings even though DRO and ORO are non-detect.
- **Farallon Response (4/2023):** Farallon will resample soil for cPAH analysis in areas proximate to borings B-19, B-30, and B-31 in the Hot Mix Storage Area, as recommended by Ecology. The soil sampling will be limited to proposed borings shown on Figure 4.
- **Ecology TAL Response (6/2023)*:*** Ecology concurs with evaluation at borings B-19, B-30, and B-31 but also suggests boring B-34 be included given the detections at 3 feet below ground surface. PAH analysis should reflect petroleum-impacted soil at each boring location at the depths of prior impacts.
- **Ecology Response (10/2024):** Ecology recommends that emphasis be placed on delineating the area around the B-19 soil boring hotspot. Such delineation could both direct an interim removal action and further inform the FS/DCA.

• **Equipment Storage Carport Area:** The contaminants and media of concern are ORO and cPAHs in soil, and DRO and ORO in shallow groundwater. ORO- and cPAH-impacted soil occurs in the Equipment Storage Carport Area in an area approximately 30 by 45 feet to a depth of approximately 15 feet bgs.

- **Ecology Opinion Comment (10/2022):** Ecology states that areal and vertical extent of the B-12 soil contamination needs to be further defined. Boring B-12 exhibited 12,000 mg/Kg ORO @ 9' bgs above both MTCA A and B; total cPAH 0.196 mg/Kg above MTCA A of 0.1 mg/Kg.

- **Farallon Response (4/2023)*:*** The vertical extent of total petroleum hydrocarbons as oil-range organics (ORO) and cPAH contamination in soil at boring B-12 has been defined by the analytical results for deeper soil samples collected from boring B-27, which was advanced adjacent to boring B-12 (Figure 5). Soil sample results for borings B-28 and B-35 define the lateral extent to the north, boring B-26 to the east, boring B-25 to the southeast, and boring B-29 to the west. Both the vertical and lateral extent of contamination has been defined by the analytical results for the soil samples collected from these borings. Farallon is requesting further clarification from Ecology regarding the rationale for further evaluation of the extents of contamination based on the clarification herein.

    - The cleanup action by excavation conducted in 2010 in the Equipment Storage Carport Area removed soil containing DRO and ORO at concentrations exceeding MTCA Method B cleanup levels, which was approved by Ecology (2011a) to be the applicable cleanup level for this area of the Lakeview Facility. ORO and cPAHs were detected at concentrations exceeding the MTCA Method A and/or Method B cleanup levels in the soil sample recently collected from the Equipment Storage Carport Area. **It is unclear to Farallon why this area would be impacted by ORO and cPAHs several years after the completed remediation. The soil sample was analyzed for ORO with and without using**

the sulfuric acid/silica gel cleanup procedure, and results were similar, suggesting that ORO concentrations are not indicative of polar organics associated with degraded fuel. These data instead suggest a more recent release.

- **Area is covered with asphalt paving with infilling covering the area with an additional 20 feet of fill. EC proposed with IC against gw use.**

- **Ecology TAL Response (6/2023):** Boring B-12 represents a hotspot of elevated ORO and cPAH contamination that needs further localized delineation. Given that soil is a heterogenous medium with contaminant concentrations typically being anisotropically distributed over short lateral and vertical distances, the remaining borings in the area are not reflective of localized conditions relative to B-12, especially so given they are located well over 20 feet distant (excluding B-27). **Ecology suggests expanding the assessment of the B-12 location for the identified contaminants of concern.**

- **Ecology Response (10/2024)*:*** Given the contamination is less than 10 feet below ground surface (bgs) and is in excess of the MTCA CULs, Ecology supports both the requested characterization to direct an interim removal action. Such an action would constitute a permanent solution.

• **Former Asphalt-Testing Laboratory Area:** The contaminants and media of concern are ORO and cPAHs in shallow soil, and TCE in shallow and deep water-bearing zone groundwater. ORO- and cPAH-impacted soil occurs in the Former Asphalt-Testing Laboratory Area in an area approximately 25 by 50 feet to a maximum depth of approximately 10 feet bgs.

- **Ecology Opinion Comment (10/2022)*:*** Ecology states that further delineation of ORO impacts in the easterly and southerly directions of boring B-16 are necessary, and the vertical extent should be defined in more detail between 3 and 10 feet bgs.

- **Farallon Response (4/2023):** Boring B-22 was advanced adjacent to boring B-16 to define the vertical extent of cPAH contamination previously detected at 3 feet below ground surface (bgs) (Figure 6). The vertical extent of ORO impacts was previously defined with data for deeper soil samples from boring B-16. The lateral extent of ORO and cPAH contamination has been defined by soil sample data for boring B-24 to the north; for borings B-17 and B-23 to the east; for borings B-14, B-15, and B-21 to the south; and for boring B-13 to the west. Farallon is seeking clarification from Ecology why further delineation was requested, and regarding the necessity for sampling between 3 and 10 feet bgs.

- **Ecology TAL Response (6/2023)*:*** Boring B-16 represents a hotspot of elevated ORO and cPAH contamination that needs further delineation. Given soil is a heterogenous medium with contaminant concentrations typically being anisotropically distributed over short lateral and vertical distances, the remaining area borings are not reflective of localized conditions relative to B-16, especially so given they are located well over 20 feet distant (excluding B22). Ecology suggests expanding the assessment of the B-16 location at 3 feet bgs and deeper for the identified contaminants of concern.

- **Ecology Farallon TM Response (10/2024)*:*** Given the contamination is less than 10 feet below bgs and is in excess of the MTCA CULs, Ecology supports the requested characterization to direct an interim removal action. Such an action would constitute a permanent solution.

GROUNDWATER.

General.

- **Ecology Opinion Comment (10/2022)*:*** Ecology states that it has requested that water samples be collected from both the Laurel Lane and Majestic Oaks domestic supply wells for analysis of VOCs.

- **Farallon Response (4/2023*):*** As discussed with Ecology in the meeting on June 28, 2017, Farallon and Woodworth provided evidence that the trichloroethene (TCE) plume in groundwater is fully delineated, in a stable to shrinking state, and contained in a centrally located area within the Lakeview Facility property boundary. Additional supporting information was provided in the August 31, 2021, Response Letter. Both Laurel Lane and Majestic Oaks domestic supply wells are significantly distant from the Lakeview Facility and the areas of existing TCE contamination in groundwater, with the Laurel Lane well located over 2,000 feet northeast and Majestic Oaks well located over 2,500 feet northwest of the downgradient limit of the TCE plume (Figure 7). Existing groundwater data for the property fully define the extent of TCE plume in groundwater. If the water testing results for these wells are available from the Lakeview Water District or Tacoma-Pierce County Health Department, Farallon will provide such results in the next report for evaluation.

- **Ecology TAL Response (6/2023):** Please provide the analytical data as/if available from either the Lakeview Water District or Pierce County Health Department. Based on the DWBZ monitoring wells at the site having last been sampled in the 2017 and 2020 timeframes, Ecology suggests collecting additional deep monitoring well samples and analyzing it for the contaminants of concern to update the groundwater database. Based on that data, Ecology will reassess its request for VOC analyses from the Laurel Lane and Majestic Oaks water supply wells. Ecology also recommends working with the Lakewood Water District to evaluate the release of TCE detected at the Site. Public water supply wells 88th and Pine J-1 and J-2 are located less than 1-mile north of the Site and groundwater flow in the DWBZ is reported in a

north-northeasterly direction from the Site. Lakewood well pumping rates and capture zones should be evaluated and included to determine if TCE released from this Site is either impacting or could impact the water supply wells.

- **Ecology Farallon TM Response (10/2024)*:*** Thank you for providing the updated 2023/2024 quarterly groundwater data from the SWBZ and DWBZ wells as well as the analytical data summary for the nearby Lakewood Water district supply wells. Please supply Ecology with the requested analytical data from the supply wells for our review. Further, until the RA beneath the Site is delineated and sampled for the Site contaminants of concern across a full seasonal cycle, Ecology cannot concur that RA groundwater is unimpacted by Site releases or that is not a potential future source of contamination to the off-Site water supply wells.

Specific:

Northern Parcel Arsenic/Lead Plume Area and Regional Aquifer

- **Ecology Opinion Comment (10/2022):** Ecology requests further groundwater monitoring in this area.

- **Farallon Response (4/2023)*:*** Two groundwater monitoring events will be conducted 6 months apart in 2023 to evaluate contaminant concentrations in groundwater and flow direction with respect to seasonal fluctuations.
- **Ecology TAL Response (6/2023):** Ecology suggests groundwater sampling be conducted on a quarterly basis.
- **Farallon TM Response (9/2024)*:*** Ecology previously concurred with Farallon that dissolved arsenic and dissolved lead are the applicable results for comparison to MTCA Method A cleanup levels. Dissolved arsenic was detected at concentrations exceeding the MTCA Method A cleanup level and the natural background threshold value for the Puget Sound Basin of 8 micrograms per liter (µg/L) in the groundwater samples collected from monitoring well MW-31 and also once in a groundwater sample from monitoring well MW-12 (Table 5, Figure 7). Dissolved lead was not detected at concentrations exceeding the MTCA Method A cleanup level in any of the groundwater samples.
- **Ecology Farallon TM Response (10/2024)*:*** Thank you for conducting quarterly monitoring in the on-Site wells from late 2023 through 2024. Based on the most recent monitoring events, dissolved arsenic that exceeds the screening levels appears to be coincident with elevated pH in groundwater at monitoring wells MW-12 and MW-31, but not with neutral pH at monitoring well MW-35. The extent of fill material potentially causing naturally-occurring arsenic and lead to leach into shallow groundwater is limited to the easternmost area of the Lakeview Facility proximate to monitoring wells MW-12 and MW-31.

Former Recycled Stockpile Area (Western MW-24 Area):

- **Ecology Opinion Comment (10/2022*:*** Ecology requests further groundwater characterization to fully define the nature and extent of TPH contamination in this area.

- **Farallon Response (4/2023)** Farallon agrees to perform further characterization to fully define the extent of total petroleum hydrocarbons as DRO and ORO impacts in this area. Up to seven additional monitoring wells (including the two wells at the former temporary well MW-24T and boring B-36 locations will be advanced to address Ecology's comment as illustrated in Figure 3 of the Farallon response.

- **Ecology TAL Response (6/2023)*:*** Ecology concurs with the proposed monitoring well installation in this area.

- **Ecology Farallon TM Response (10/2024)*:*** Please provide an update to this recommendation.

Eastern MW-9R/MW16R Area

- **Ecology Opinion Comment (10/2022):** Ecology requests recalculation of the site-specific MTCA Method B cleanup level for this area and additional data points for each WBZ.
- **Farallon Response (4/2023)*:*** Farallon agrees to recalculate the site-specific MTCA Method B cleanup level for this area. Farallon seeks further input from Ecology to clarify how many groundwater samples would be required to be used in the MTCA Method B calculation workbook for each water-bearing zone and each area of concern.

- ***Ecology TAL Response (6/2023):*** Ecology does not concur with calculation of CULs for individual WBZs nor specific areas of the site. A single groundwater CUL should be determined for the entire Site.
- **Ecology Farallon TM Response (10/2024)*:*** Please provide an update to this recommendation.

Equipment Storage Carport Area:

- **Ecology Opinion Comment (10/2022*:*** Ecology requests evaluation of shallow groundwater proximate to boring B-12 to assess the potential for groundwater impact.

- **Farallon Response (4/2023):** A shallow up-gradient monitoring well (MW-11) exists near the southern end of the equipment storage carport, and additional wells exist downgradient of this area (monitoring wells MW-13 and MW-19). Farallon is requesting further explanation from Ecology why additional evaluation is needed in this area.

- **Ecology TAL Response (6/2023)*:*** Boring B-12 represents a hotspot of elevated ORO and cPAH contamination that needs further localized soil and groundwater delineation. Upgradient well MW-11 is approximately 80 feet distant while wells MW-13 and MW-19 are at a distance of 200

feet and greater. These wells may not be reflective of localized groundwater and stratigraphic impacts from the B-12 location.

- **Ecology Farallon TM Response (10/2024)*:*** Please provide an update to this recommendation.

Former Asphalt Testing/Laboratory/Roofer Shredder Area (Middle of Page 8 of the Ecology Opinion):

- **Ecology Opinion Comment (10/2022)*:*** Ecology requests further characterization and evaluation of groundwater in the vicinity of boring B-16.

- **Farallon Response (4/2023)*:*** DRO, ORO, and cPAHs have not been detected at concentrations exceeding MTCA Method A cleanup levels in any of the soil samples collected from depths ranging from 5 to 20 feet bgs in this area of concern, including the DRO and ORO results for soil samples collected from 10 and 17.5 feet in boring B-16 and cPAH results for a soil sample from 10 feet in boring B-22, adjacent to boring B-16 (Figure 6). MTCA Method A cleanup levels for soil are protective of the groundwater. The depth to groundwater in the Former Asphalt Testing/Laboratory/Roofing Shredder Area is 12 to 15 feet bgs. Therefore, sufficient soil information exists to demonstrate that the soil-to-groundwater pathway is incomplete, and that the additional groundwater characterization is not necessary.

- **Ecology TAL Response (6/2023):** Ecology does not concur that sufficient soil information exists and that the soil-to-groundwater pathway is incomplete. Boring B-16 represents a hotspot of elevated ORO and cPAH contamination that needs further localized soil and groundwater delineation. Given soil impacts in the B-16 area are undelineated, the potential exists that other higher ORO/cPAH concentrations may exist at depth which are as yet undetected, and which may have subsequently impacted shallow groundwater. Ecology suggests evaluating shallow groundwater in the B-16 area for potential impacts from impacted soil.

- **Ecology Farallon TM Response (10/2024):** Please provide an update to this recommendation.

OTHER COMMENTS

Deep Groundwater Delineation:

- **Ecology Opinion Comment (10/2022)*:*** Ecology suggests that more wells be installed in the deep groundwater zone to complete evaluation of nature and extent across the site.

- **Farallon Response (4/2023)*:*** A substantial number of wells screened within the deep water-bearing zone currently exists at the Lakeview Facility, including wells that are located hydraulically down-gradient of the contaminant plumes in groundwater. The downgradient wells screened in the deep water-bearing zone do not exhibit exceedances of MTCA cleanup levels for groundwater; therefore, installation of additional wells is not warranted. Farallon

seeks additional clarification from Ecology regarding their comment requesting installation of additional wells in the deep water-bearing zone.

- **Ecology TAL Response (6/2023):** Ecology does not concur that groundwater in the deep water-bearing zone has been adequately delineated across the site. Beyond MW-12B, no deep wells exist at westerly, northwesterly, north, and northeasterly locations of well MW-16R. As a result, Ecology recommends groundwater beneath this area of the site be assessed.

- **Ecology Farallon TM Response (10/2024)*:*** Please provide an update to this recommendation.

Groundwater Monitoring:

- **Ecology Opinion Comment (10/2022*):*** Ecology recommends sampling Site monitoring wells at regular intervals.

- **Farallon Response (4/2023)*:*** Farallon plans to sample Site monitoring wells twice, 6 months apart in 2023.

- **Ecology TAL Response (6/2023)*:*** Groundwater should be sampled on a quarterly basis to assess conditions across a full seasonal cycle.

- **Ecology Farallon TM Response (10/2024)*:*** Thank you for sampling the on-Site monitoring well suite on a quarterly basis during mid-2023 through mid-2024. The aggregate results indicate that DRO/ORO impacts exceeding the MTCA A CUL level are present in discrete areas in the SWBZ and in two discrete areas in the DWBZ (wells MW-16R and SVE-2). The DRO/ORO contamination within the DWBZ was concluded by Farallon to be contained within the property boundaries based on the results from the downgradient DWBZ monitoring wells.[11] Further, the sampling results using silica gel cleanup (SGC) indicate that the DRO/ORO are highly weathered and where only polar metabolites currently remain at the Site. PAHs, including both cPAHs and non-carcinogenic PAHs, were not detected at concentrations exceeding MTCA Method A cleanup levels in any of the groundwater samples analyzed and was suggested to not be retained as constituents of concern for the Site. Regarding TCE, it was concluded that there is no apparent evidence of TCE migration from an off-Site source on to the Site at this time. The occurrence of TCE in the RA near the location of the on-Site industrial water well is more likely than not associated with the historical release from the WSDOT mobile testing lab that formerly operated at the Lakeview Facility. TCE has migrated vertically from the SWBZ into DWBZ and penetrated through the likely transmissive silt and silty gravel aquitard into the RA, likely under natural conditions induced by a vertical gradient. Further, the construction and current operation of the on-Site industrial water well does not appear to exacerbate the vertical

[11] Farallon, Technical Memorandum on Site Status and Summary of May 2023 through August 2024 Data Collection, Woodworth Lakeview Facility, Summary and Conclusions, September 4, 2024.

migration of TCE into the regional aquifer. Concentrations of TCE at the base of the DWBZ and within the RA do not exceed the MTCA Method A cleanup level.

Monitored Natural Attenuation:

- **Ecology Opinion Comment (10/2022)*:*** Ecology requests reassessment of the natural attenuation at the Site.

- **Farallon Response (4/2023):** Farallon plans to sample Site monitoring wells twice, 6 months apart in 2023. Farallon will reassess natural attenuation of contaminants of concern at the Site, including DRO, ORO, and TCE, after additional groundwater monitoring is completed in 2023.

- **Ecology TAL Response (6/2023)*:*** Groundwater should be sampled on a quarterly basis to assess conditions across a full seasonal cycle.

- **Ecology Farallon TM Response (10/2024):** Please provide an update to this recommendation.

Cleanup Alternative 1

- **Ecology Opinion Comment (10/2022):** Ecology states that Cleanup Alternative 1 (institutional and engineering controls) does not protect human health and the environment or provide for a reasonable restoration time frame.

- **Farallon Response (4/2023):** Active cleanup was previously performed at the Site. After detailed evaluation of technically feasible cleanup alternatives and costs to clean up residual contamination, the disproportionate cost analysis process indicated that institutional and engineering controls with compliance groundwater monitoring are the most practicable cleanup action alternative that fully protects human health and the environment. Prior Ecology Opinion Letters from 2019 and older specifically stated that Ecology supports pursuing a No Further Action determination with institutional and engineering controls for this Site. Farallon seeks further explanation from Ecology why institutional and engineering controls do not comply with MTCA.

- ***Ecology TAL Response (6/2023):*** Ecology often supports NFA determinations with I/EC's although according to Table 11 in Farallon's Response, it indicates that Cleanup Alternative 1 (CA1; institutional and engineering controls) would have an "indefinite" and "long-term" restoration time frame. As a result, CA1 does not meet the minimum requirements for cleanup actions in WAC 173-340-360(2) and cannot technically be considered protective of human health and the environment via not providing for a reasonable restoration time frame. Also, as stated in WAC 173-340-360(2)(e)(iii), cleanup actions shall not rely primarily on institutional controls and monitoring where it is technically possible to implement a more permanent cleanup action for all or a portion of the site. As stated in Ecology's October 21, 2022, Opinion,

while CA1 was the most cost-effective by several orders of magnitude, Ecology suggested the 3 selected CA's be repackaged such that worthwhile alternatives would not be disproportionately skewed and thereby worth considering. Prior estimates of CA3 (Source Removal) by Farallon has an estimated cost between $3.3-4M and has the potential to greatly improve TPH groundwater concentrations. However, CA3 became disproportionate when it was combined with the other CA3 Subareas for a total cost of $30.59M. Further, given Ecology's suggested additional delineation of both on-site soil and groundwater, the components of the FS CA's may both change and need to be reevaluated.

- **Ecology Farallon TM Response (10/2024):** Please provide an update to this recommendation.

Vapor Intrusion/TCE:

- **Ecology Opinion Comment (10/2022)*:*** Ecology states that the Site must formalize an industrial use status in perpetuity via an environmental covenant (EC) or require an additional vapor intrusion assessment once reclamation is complete and before any land use designation changes via an EC.
- **Farallon Response (4/2023):** Farallon understands these concepts and will include a vapor intrusion assessment provision in the environmental covenant.

- **Ecology TAL Comment (6/2023):** Thank you for agreeing to incorporate our comment.

- **Ecology Farallon TM Response (10/2024):** No comment needed.

Groundwater Geochemistry:

- **Ecology Opinion Comment (10/2022)*:*** Ecology concurs with using dissolved arsenic and lead concentrations as representative of Site groundwater.

- **Farallon Response (4/2023):** Farallon agrees with Ecology and will continue sampling groundwater for these dissolved metals in wells that have historically had detections of these contaminants of concern (Figure 8).

- **Ecology TAL Comment (6/2023):** Thank you for agreeing to incorporate our comment.

- **Ecology Farallon TM Response (10/2024):** Please provide an update to this recommendation.

Monitoring Wells (Top of Page 11 of the Opinion Letter):

- **Ecology Opinion Comment (10/2022):** Ecology recommends further evaluation of the lateral and vertical extent of TPH contamination in the deep aquifer near MW-16R.

- **Farallon Response (4/2023):** Farallon will reevaluate the Method B calculations for groundwater in this area. However, a sufficient number of monitoring wells in both shallow and deep water-bearing zones exist up-, cross-, and down-gradient of monitoring wells MW-9R and MW-16R (Figures 11 and 12). Therefore, additional well installation and sampling is unnecessary.

- **Ecology TAL Responses (6/2023):**

    - Thank you for agreeing to reevaluate the groundwater Method B groundwater calculations. As indicated above, please note that a CUL typically applies to a specific media for the entire site and cannot be divided up as a function of different site areas with different CULs for the same media and exposure pathway.

    - Ecology does not concur that sufficient deep zone monitoring wells exist in the vicinity of MW-16R, hence our suggestion that additional delineation should occur. MW-16R exceeded the MTCA Method A cleanup level for both diesel/oil-range hydrocarbons and no deep water-bearing zone wells exist either west or north of this well or between it and well MW-12B at the northeast corner of the property. Ecology recommends that additional delineation of groundwater be completed in these areas.

- **Ecology Farallon TM Response (10/2024)*:*** Please provide an update to this recommendation.

SVE 5 Area

- **Ecology Opinion Comment (10/2022):** Ecology states that well SVE-5 was decommissioned due to concerns regarding aquifer intercommunication and because SVE has been discontinued. There are other SVE wells that are or may be screened across the two WBZs (for example SVE-3, -5, -6, -7, -8, -9, and -10). To meet WAC 173-160-420(2), Ecology recommends decommissioning any other SVE wells that are interconnecting aquifers.

- **Farallon Response (4/2023):** Farallon will evaluate which soil vapor extraction (SVE) wells are screened across two water-bearing zones and will conduct decommissioning, as necessary.

- **Ecology TAL Response (6/2023):** Ecology is concerned that such wells were potentially screened across the SWBZ and DWBZ. As you know, the Chambers-Clover Creek Watershed underlies the Site and has been designated as a sole-source aquifer for approximately 400,000 residents in DuPont, Fircrest, Lakewood, Ruston, Steilacoom, Tacoma, and University Place. This regional aquifer is reported to be separated from the deep water-bearing zone at the Site by a silt and silty gravel aquitard.

- **Ecology Farallon TM Response (10/2024):** Please provide an update to this recommendation.

On-Site Industrial Well

- **Ecology Opinion Comment (10/2022):** An on-site industrial water supply well is currently screened at a depth of 107 to 129 feet below ground surface (bgs), presumably below the aquitard within the RA. This well was reportedly installed during 1969 to a total depth of 187 feet bgs and screened from 167 to 187 feet bgs, and later perforated from 107 to 129 feet bgs. TCE was detected in the well at a concentration of 0.39 micrograms per liter (µg/l) in a groundwater sample collected in December 2017, consistent with previously reported groundwater TCE concentration results. It continues to be unclear to Ecology how TCE is entering this well across the aquitard. Possibilities that Ecology is currently concerned about include i) the industrial well is compromised and leaks between aquifers; ii) the aquitard is not comprehensive in this area of the Site and is transmitting contamination to deeper regional groundwater; and/or iii) the industrial water supply well is screened above the aquitard and shallow groundwater contamination extends to at least 130 feet below ground surface.

- **Farallon TM Response (9/2024):** Based on a 2019 downhole camera survey to assess the accuracy of the driller's log for the industrial water supply well. The results of the survey indicated that the well screen and perforation depths matched what was indicated on the boring log. The screened interval depth ranged from approximately 167 to 187 feet bgs and the perforated depth ranged from 107 to 129 feet bgs, both of which were in the RA. There were no indications of any damage or other protrusions in the well casing and the total depth of the well was 187 feet bgs. Further Farallon evaluated whether the well construction was/is associated with TCE migration from the DWBZ to the RA via preparation of a time-series graph of TCE concentrations detected in the industrial water well over time. The graph indicated that there is no correlation and no evidence that the higher pumping rates during late spring and summer months result in increasing TCE concentrations. The data also indicated that TCE concentrations have been stable since the industrial well was first sampled in 2008. Therefore, the industrial well construction and pumping regime does not appear to affect TCE migration from the DWBZ into the RA. In addition, based on installation and quarterly sampling of an on-Site well MW-45 that is located upgradient of the on-Site industrial well, it is unlikely that migration of TCE on to the Site from an off-site source appears unlikely.

- **Ecology Farallon TM Response (10/2024):** Thank you for providing the analysis. Ecology concurs with your conclusion that neither the well construction, nor placement of screened intervals across the aquitard, nor off-site migration of TCE onto the Site, are the causes of TCE in the well vicinity.

Conceptual Site Model and Nature and Extent of Contamination:

1. Ecology Opinion Comment (Former Recycled Stockpile Area) (10/2022) - Ecology recommends additional investigation to delineate the source of the petroleum contamination area and to assess removal of any remaining contaminated soil that may serve as a source of petroleum detections at MW-24T and B-36.

- **Farallon Response:** Farallon concurs and will conduct additional characterization in this area of concern, as discussed in previous responses. Additional soil removal from this area may not be practicable due to the presence of the aforementioned overlying reclamation fill.
- **Ecology TAL Response:** Ecology concurs with your response.
- **Ecology Farallon TM Response (10/2024):** Please provide an update to this recommendation.

2. Ecology Opinion Comment (Equipment Parking Area) (10/2022) - Based on the analytical results for soil samples, the calculated concentration of TPH in groundwater from monitoring well MW-13 exceeds the Method A cleanup level. Ecology recommends that additional delineation be conducted to evaluate and define the contaminant source at monitoring well MW-13.

- **Farallon Response (4/2023)*:*** Farallon seeks clarification from Ecology if MTCA Method A or Method B is applicable to the Equipment Parking Area and/or the Site as a whole. The calculated TPH concentration in groundwater did not exceed the site-specific MTCA Method B cleanup level for TPH for this area of concern. Based on Ecology's response, Farallon will review the existing information and reevaluate if any additional delineation is warranted to further define the contaminant source and nature and extent of contamination at monitoring well MW-13. Additional borings for collection of soil and reconnaissance groundwater samples may be advanced to locally define the nature and extent of contamination, if warranted.

- **Ecology TAL Responses (6/2023):**
    - Ecology does not concur with use of area-specific Method A/B CULs. CULs need to be applied on a site-wide basis for the same media and exposure pathway.
    - Ecology encourages delineation of the TPH impact at MW-13 as no other assessment has occurred at/near this location.

- **Ecology Farallon TM Response (10/2024):** Please provide an update to this recommendation.

3. Ecology Opinion Comment (Hot Mix Storage Area (10/2022)) - Ecology recommends that cPAH should be evaluated in soil and groundwater in this area to determine if soil contaminants are causing an impact.

- **Farallon Response (4/2023):** Agreed and discussed in previous responses.

- **Ecology TAL Response (6/2023):** Ecology acknowledges this understanding.

- **Ecology Farallon TM Response (10/2024):** Please provide an update to this recommendation.

4. Ecology Opinion Comment (Equipment Storage Carport Area) (10/2022) - The contaminants and media of concern are ORO and cPAHs in soil, and DRO and ORO in shallow groundwater. ORO and cPAH-impacted soil occur in an area approximately 30 feet long by 45 feet wide and to a depth of approximately 15 feet bgs. Given that residual ORO in soil is continuing to impact groundwater and that DRO should be a concern in soil given its presence in groundwater, additional investigation should be conducted in this area to assess those associations.

- **Farallon Response (4/2023):** Response provided in prior sections. No additional soil sampling is warranted, and monitoring wells exist in the general vicinity of this area.

- **Ecology TAL Response (6/2023)*:*** Ecology does not concur that soil and groundwater have been adequately assessed in this area to determine the association between soil and groundwater impacts. As previously mentioned, boring B-12 represents a hotspot of elevated ORO and cPAH contamination that needs further localized delineation. Given soil is a heterogenous medium with contaminant concentrations typically being anisotropically distributed over short lateral and vertical distances, the borings in the area do not adequately represent localized conditions relative to B-12, especially so given they are located well over 20 feet distant (excluding B-27). Ecology suggests locally expanding the assessment of the B-12 location for the identified contaminants of concern. In addition, no monitoring wells exist within the vicinity of B-12 to assess groundwater impacts. Ecology encourages further assessment in this area.

- **Ecology Farallon TM Response (10/2024):** Please provide an update to this recommendation.

5. Ecology Opinion Comment (Former Asphalt-Testing Laboratory Area) (10/2022) - The contaminants and media of concern are ORO and cPAHs in shallow soil, and DRO, ORO, and TCE in shallow (SVE-5, MW-36) and deep water-bearing zone groundwater. ORO and cPAH-impacted soil occur in the Former Asphalt-Testing Laboratory Area in an area approximately 50 feet long by 25 feet wide to a maximum depth of approximately 10 feet bgs. The area around B-16 should be investigated further to facilitate excavation and removal of ORO-impacted soil. In addition, groundwater in the B-16 area should also be assessed for TPH impact.

- **Farallon Response (4/2023):** As discussed previously, the DRO, ORO, and cPAH impacts proximate to boring B-16 are limited to soil only, and sufficient data exist to demonstrate that the soil-to-groundwater pathway is incomplete (Figure 6). Farallon disagrees that additional characterization of soil or groundwater is necessary in this area regarding the DRO, ORO, and cPAH impacts. Farallon will sample Site monitoring wells twice, 6 months apart in 2023.

- **Ecology TAL Response (6/2023)*:*** Ecology does not concur that sufficient soil information exists and that the soil-to-groundwater pathway is incomplete. Boring B-16 represents a hotspot of elevated ORO and cPAH contamination that needs further localized soil and groundwater delineation. Given soil impacts in the B-16 area are undelineated, the potential exists that other higher ORO/cPAH concentrations may exist at depth that may have impacted shallow groundwater. Ecology suggests evaluating shallow groundwater in the B-16 area for potential impacts from impacted soil. Further, Ecology suggests that groundwater be sampled on a quarterly basis.

- **Ecology Farallon TM Response (10/2024):** Please provide an update to this recommendation.

6. Ecology Opinion Comment (Groundwater)(10/2022) - Ecology suggests that further assessment be conducted that assesses the source of ORO impacts to deep groundwater in the MW16R area. This assessment should evaluate vertical migration from the contaminated SWBZ and consider the vapor wells SVE-3 and SVE-6 as potential conduits through the aquitard.

- **Farallon Response (4/2023):** Farallon will conduct additional sampling of SVE wells and evaluate if decommissioning of wells that are screened across multiple water-bearing zones is warranted. After the additional data are obtained, Farallon will reevaluate the preferred cleanup alternative for this area of concern.

- **Ecology TAL Response (6/2023):** Ecology acknowledges this understanding.

- **Ecology Farallon TM Response (10/2024):** Please provide an update to this recommendation. Further, assessment should be given to evaluate the existence of other potential conduits through the aquitard.

7. Feasibility Study/Cleanup Alternative Evaluation/Disproportionate Cost Analysis, Conditional Points of Compliance Update, Environmental Covenant, and Long-Term Monitoring Plan (Page 13 and 14 of the Opinion Letter):

- **Ecology Opinion Comment (10/2022):** Ecology suggests that Feasibility Study, Cleanup Alternative Evaluation, Disproportionate Cost Analysis, Conditional Points of Compliance, Environmental Covenant, and Long-Term Monitoring Plan be updated and reevaluated following completion of the additional characterization.

- **Farallon Response (4/2023):** Farallon concurs and will reevaluate these elements upon completion of the additional characterization.

- **Ecology TAL Response (6/2023):** Ecology acknowledges this understanding.

- **Ecology Farallon TM Response (10/2024):** Please provide an update to this recommendation. The standardized structure that we have agreed to is to finish the RI (which remains to be done) and then subsequently complete the FS/DCA.

Limitations of the Opinion

Technical Assistance Does Not Settle Liability with the State.

Liable persons are strictly liable, jointly and severally, for all remedial action costs and for all natural resource damages resulting from the release or releases of hazardous substances at the Site. This opinion **does not**:

- Resolve or alter a person's liability to the state.

- Protect liable persons from contribution claims by third parties.

To settle liability with the state and obtain protection from contribution claims, a person must enter into a consent decree with Ecology under RCW 70A.305.040(4).

Technical Assistance Does Not Constitute a Determination of Substantial Equivalence.

To recover remedial action costs from other liable persons under MTCA, one must demonstrate that the action is the substantial equivalent of an Ecology-conducted or Ecology-supervised action. This opinion does not determine whether the action a party performs is substantially equivalent. Courts make that determination. *See* RCW 70A.305.080 and WAC 173-340-545.

State is Immune from Liability.

The state, Ecology, and its officers and employees are immune from all liability, and no cause of action of any nature may arise from any act or omission in providing this opinion. *See* RCW 70A.305.170(6).

Contact Information

Thank you for choosing to clean up the Site under the Voluntary Cleanup Program (VCP). Please do not hesitate to request additional services as your investigation and cleanup progresses. We look forward to working with you.

For more information about the VCP and the cleanup process, please visit our Voluntary Cleanup Program web site.[12] If you have any questions about this letter, please contact me at 360-489-5347 or joe.hunt@ecy.wa.gov.

Sincerely,

Joseph B. Hunt, LHG
Toxics Cleanup Program
Southwest Region Office

JH:AT

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Ecology Site File

[12] https://www.ecy.wa.gov/vcp