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August 30, 2019

Branislav Jurista  
Farallon Consulting, LLC  
975 5th Ave NW, Ste 100  
Issaquah, WA 98027

**Re: Further Action at the following Site:**

- **Site Name:** Woodworth & Co Inc. Lakeview Plant
- **Site Address:** 2800 104th Street 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) received your request for an opinion on your independent cleanup of the Woodworth & Co Inc. Lakeview Plant facility (Site). This letter provides our opinion. We are providing this opinion under the authority of the [Model Toxics Control Act \(MTCA\)](#),<sup>1</sup> chapter 70.105D Revised Code of Washington (RCW).

## Issue Presented and Opinion

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In this opinion, Ecology is responding to a request for no further action with an environmental covenant at the Site.

***Ecology supports pursuing a no further action determination with an environmental covenant at this Site. However, Ecology needs additional reporting and evaluation before we can concur with closure with an environmental covenant. A summary of some needed additional reporting and evaluation discussed in detail in this opinion includes:***

- *Ecology is concerned that recently reported soil and groundwater sampling results indicate a new or previously undetected release(s) at the Site. Prior to concurring with a no further action determination, Ecology needs additional data supporting that recently discovered releases are appropriately delineated and remediated at the Site and confidence that future releases will be prevented.*

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<sup>1</sup> <https://fortress.wa.gov/ecy/publications/SummaryPages/9406.html>

- *This Site sits atop a sole-source aquifer used as a public drinking water source. Trichloroethene (TCE) continues to be detected in the reported shallow and deep aquifers and in the industrial well, screened within the regional aquifer. Ecology needs additional reporting and evaluation within these aquifers to ensure that contamination will not enter the Lakewood Water District drinking water system.*
- *Limited and irregular groundwater monitoring events at the Site are not sufficient for Ecology to adequately evaluate groundwater contaminant trends or restoration timeframes.*
- *The lateral and vertical extents of contamination in some areas of the Site are not defined.*

## Description of the Site

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

- Volatile organic compounds (VOCs) including TCE, petroleum hydrocarbons and related constituents, metals, and carcinogenic polycyclic aromatic hydrocarbons (cPAHs) into the Soil and Groundwater.

The parcel of real property associated with this Site is also located within the projected boundaries of the Asarco Tacoma Smelter facility (# 89267963). At this time, we have no information that the parcel is actually affected. This opinion does not apply to any contamination associated with the Asarco Tacoma Smelter facility.

## Basis for the Opinion

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1. Farallon Consulting LLC, (Farallon), *Addendum to Focused Feasibility Study and Disproportionate Cost Analysis Report*, August 3, 2018.
2. Ecology, *Approval of September 25, 2017, Sampling and Analysis Work Plan and November 3, 2017, Revised Addendum to Sampling and Analysis Work Plan*, November 16, 2017.
3. Farallon, *Revised Addendum to Sampling and Analysis Work Plan*, November 3, 2017.
4. Farallon, *Addendum to Sampling and Analysis Work Plan*, October 30, 2017.
5. Ecology, *Review of September 25, 2017, Sampling and Analysis Work Plan*, October 12, 2017.
6. Farallon, *Sampling and Analysis Work Plan*, September 25, 2017.
7. Woodworth Capitol, Inc., *Woodworth Lakeview Facility*, July 5, 2016.

8. Farallon, *Response to Letter Regarding Ecology Comments and Corrections on Farallon Meeting Summary*, June 28, 2016.
9. Ecology, *Opinion on Proposed Cleanup for the Site*, October 6, 2015.
10. Ecology, *Letter to Ransavage and Lewis regarding July 25, 2015, Compliance Inspection*, August 25, 2015.
11. Farallon, *Focused Feasibility Study and Disproportionate Cost Analysis Report*, April 14, 2015.
12. Farallon, *Cleanup Action Status Report, September 2009 through February 2011*, June 2, 2011.
13. Farallon, *Soil Excavation Cleanup Action Report Completion Report*, March 28, 2011.
14. USGS, *Hydrogeologic Framework, Groundwater Movement, and Water Budget in the Chambers–Clover Creek Watershed and Vicinity, Pierce County, Scientific Investigations Report 2010–5055* (USGS 2010).
15. Farallon, *Remedial Investigation/Feasibility Study Report*, August 19, 2009.

Those documents are kept in the Central Files of the Southwest Regional Office of Ecology (SWRO) for review by appointment only. Information on obtaining those records can be found on [Ecology's public records requests web page](#).<sup>2</sup> Some site documents may be available on [Ecology's Cleanup Site Search web page](#).<sup>3</sup>

## Analysis of the Cleanup

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Ecology has concluded that **further remedial action** is necessary to clean up contamination at the Site. That conclusion is based on the following analysis:

### 1. Characterization of the Site.

The Woodworth & Co Inc. Lakeview Plant is a toxic cleanup Site located at 2800 104<sup>th</sup> Street Ct S, Tacoma, Washington (the Property, including Pierce County tax parcels 0319061135, 0319062075, 0319062076, 031906208, and 0319061142). The Property is surrounded to the north by commercial and residential properties, to the east by multi-tenant apartment complexes, to the south by State Route 512 and industrial properties, and to the west by the Interstate-5 right-of-way. The Site includes a portion of the Property.

The Property is currently used for recycling imported asphalt and concrete debris<sup>4</sup> and for producing hot- and cold-mix asphalt. Former uses of the Lakeview Facility included sand and gravel mining, asphalt production, stockpiling, and permitted thermal desorption treatment of petroleum-contaminated soil.

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<sup>2</sup> <https://ecology.wa.gov/About-us/Accountability-transparency/Public-records-requests>

<sup>3</sup> <https://fortress.wa.gov/ecy/gsp/SiteSearchPage.aspx?csid165>

<sup>4</sup> [https://www.shinglerecycling.org/sites/www.shinglerecycling.org/files/shingle\\_PDF/EPA%20Shingle%20Report\\_Final.pdf](https://www.shinglerecycling.org/sites/www.shinglerecycling.org/files/shingle_PDF/EPA%20Shingle%20Report_Final.pdf)

The reports and documents listed for the basis for the opinion, above, provide a record of historical Site characterization.

For this opinion, Ecology is responding to Farallon's August 3, 2018, *Addendum to Focused Feasibility Study and Disproportionate Cost Analysis Report* (the Report). Between November and December 2017, Farallon advanced soil borings (B-10 through B-20, and MW-24T), and collected groundwater from shallow monitoring wells (MW-3, MW-5, MW-13, MW-26, MW-30 through MW-34, SVE-3, SVE-5, SVE-6, and SVE-12), deep monitoring wells (MW-2, MW-10B, MW-11B, MW-14, MW-14C, MW-15, MW-16, MW-18 through MW-21, MW-23, MW-25, MW-28, MW-29 AS-1, SVE-1, SVE-2, SVE-7, SVE-9), temporary shallow well (MW-24T), and the industrial well.

Ecology has determined your characterization of the Site is not sufficient to establish cleanup standards and select a cleanup action. Ecology's comments and suggestions in this opinion are intended to help you collect and evaluate sufficient data for Ecology to concur that site characterization is sufficient to establish cleanup standards and select a cleanup action.

### ***Site Characterization Comments:***

#### **Petroleum Hydrocarbons:**

Remedial investigation in 2017 detected petroleum hydrocarbons in several areas of the Site, including the equipment parking area, equipment storage area, hot mix area, and the former recycled stockpile area.

Ecology is particularly concerned with the results at the equipment storage carport area where petroleum hydrocarbons were detected at *12,000 milligrams per kilograms (mg/kg)* following remedial activities.<sup>5</sup> Other areas of concern include the hot mix storage area, where a heavy sheen was observed,<sup>6</sup> and the area surrounding monitoring well MW-16, where petroleum hydrocarbons were released to the deep aquifer.<sup>7</sup>

These results show an increase of petroleum concentrations in soil and groundwater since the completion of remedial actions. Ecology is concerned that the increase in contaminant concentrations may be attributable to recent or ongoing releases of hazardous substances into the environment, potentially due to poor best management practices.

For the remedial investigation, ensure sufficient information has been collected to determine the lateral and vertical extents of contamination throughout the Site, including the areas of newly discovered contamination. Provide to Ecology both plan view and geologic cross section concentration isopleth maps of the Site. Include the extents of contamination with respect to surface and subsurface features, geologic strata, and groundwater elevations and flows at the Site.

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<sup>5</sup> *Addendum to the Focused Feasibility Study and Disproportionate Cost Analysis Report*, August 3, 2018, page 4-3

<sup>6</sup> *Addendum to the Focused Feasibility Study and Disproportionate Cost Analysis Report*, August 3, 2018, page 4-5

<sup>7</sup> *Addendum to the Focused Feasibility Study and Disproportionate Cost Analysis Report*, August 3, 2018, page 4-9

To support an environmental covenant, clearly indicate in plan view and cross section the extents of the Site, and indicate the specific volumes and areas where cleanup standards are exceeded. Ensure that the feasibility study addresses all contamination at the Site.

**Carcinogenic Polycyclic Aromatic Hydrocarbons (cPAHs):**

Due to concerns about air emissions from historical hot asphalt mixing operations, Ecology previously requested that Site soils be analyzed for cPAHs.<sup>8</sup> Based on Ecology's request, additional soil analysis was completed for cPAHs at several areas across the Site.

Concentrations of cPAHs were detected at multiple locations above Ecology's MTCA Method A cleanup screening levels for soil, including the equipment storage carport area, the roofing shredder building, and the former asphalt-testing laboratory area.

These results indicate that a new release or a previously undiscovered release may have been identified. Since the cPAH release and transport mechanisms are not yet identified,<sup>9</sup> additional investigation is warranted to determine the nature and extent of contamination.

Ecology suggests including delineation of cPAHs at the Site in plan view concentration isopleth maps and geologic cross sections for the remedial investigation and site conceptual model, and evaluating remediation of areas of cPAHs in the remedial investigation and feasibility study as appropriate.

**Groundwater Monitoring:**

Groundwater sampling has been completed infrequently and is insufficient for Ecology to evaluate trends at particular monitoring wells or areas.<sup>10</sup> To collect sufficient information for Ecology to evaluate trends, we recommend sampling Site monitoring wells at regular intervals. Use the groundwater monitoring results to evaluate and report on the lateral and vertical extents of contamination and concentration trends.

Continue to measure geochemical parameters including temperature, pH, oxygen reduction potential (ORP), and conductivity. Provide contaminant concentration isopleth maps in plan view and geologic cross section delineating the Site. Plan view and geologic cross section concentration isopleth maps will be necessary to determine appropriate conditional points of compliance for any environmental covenant, and will be included as attachments to any environmental covenant determined appropriate for the Site.

**Aquifer(s):**

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.<sup>11</sup>

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<sup>8</sup> Response to Comments for the Woodworth & Co. Lakeview Plant, May, 2017, page 4

<sup>9</sup> Addendum to Focused Feasibility Study and Disproportionate Cost Analysis Report, August 3, 2018, page 4-4

<sup>10</sup> Response to Comments for the Woodworth & Co. Lakeview Plant, May, 2017, pages 8-9

<sup>11</sup> Addendum to Focused Feasibility Study and Disproportionate Cost Analysis Report, August 3, 2018, page 2-2

An 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 regional aquifer.<sup>12</sup> The industrial supply 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.<sup>13</sup>

TCE was detected in the industrial water supply 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 is unclear to Ecology how TCE is entering the industrial water supply well across the aquitard. Possibilities that Ecology is currently concerned about include:

- The industrial well is compromised and leaks between aquifers.
- The aquitard is not comprehensive in this area of the Site and is transmitting contamination to deeper regional groundwater.
- The industrial water supply well is screened above the aquitard and shallow groundwater contamination extends to at least 130 feet below ground surface.

Ecology will need additional reporting and analyses evaluating subsurface strata, groundwater flow, and contamination in groundwater throughout the Site.<sup>14</sup> Plan view and geologic cross section concentration isopleth maps will likely support an analyses demonstrating with boring logs, groundwater elevations, and contaminant chemistry how the Site impacts the regional aquifer.

Ecology also recommends working with the Lakewood Water District to evaluate the release of TCE detected at the Site. Public water supply wells 88<sup>th</sup> and Pine J-1 and J-2 are located less than 1-mile north of the Site. The deeper water-bearing unit flow is reported to the north-northeast from the Site.<sup>15</sup>

Lakewood well pumping rates and capture zones should be evaluated and included in the remedial investigation. For the remedial investigation, determine if TCE released from this Site is impacting or could impact water supply wells.

Finally, to support an environmental covenant at the Site, appropriate conditional points of compliance will need to be determined and proposed for all aquifers at the Site. Collect sufficient data from proposed conditional points of compliance to support their use for the long term groundwater monitoring that will be needed with the environmental covenant.

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<sup>12</sup> Addendum to Focused Feasibility Study and Disproportionate Cost Analysis Report, August 3, 2018, page 4-10

<sup>13</sup> Remedial Feasibility Study and Disproportionate Cost Analysis Report, August 3, 2018, page 4-10

<sup>14</sup> Response to Comments for the Woodworth & Co. Lakeview Plant, May, 2017, pages 10-11

<sup>15</sup> Addendum to Focused Feasibility Study and Disproportionate Cost Analysis Report, August 3, 2018, page 2-2

When proposing conditional points of compliance, it is up to you to provide sufficient information<sup>16</sup> for Ecology to concur that:

- You have demonstrated under WAC 173-340-350 through 173-340-390 that it is not practicable to meet the cleanup level throughout the site within a reasonable restoration time frame.<sup>17</sup>
- Proposed conditional point of compliances are as close as practicable to the source of hazardous substances.
- All practicable methods of treatment are to be used in the site cleanup. "All practicable methods of treatment," means all technologies and/or methods currently available and demonstrated to work under similar site circumstances or through pilot studies, and applicable to the site at reasonable cost. These include "all known available and reasonable methods of treatment" (AKART) for discharges or potential discharges to waters of the state, and "best available control technologies" for releases of hazardous substances into the air resulting from cleanup actions.<sup>18</sup>
- Except as provided under WAC 173-340-720(8)(d), proposed conditional points of compliance do not exceed the property boundary.

#### **Monitored Natural Attenuation:**

Ecology previously requested that non-parametric statistical methods (Mann Kendall) be used to support a natural attenuation assessment.<sup>19</sup> This information was not provided in the most recent feasibility study. Please assess natural attenuation at the Site.<sup>20</sup> Use the information to assess predicted restoration timeframes and support use of conditional points of compliance for the cleanup. Ecology recommends using EPA's *Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Ground Water* (EPA/600/R-98/128; September 1998) as a guide to evaluate MNA.<sup>21</sup>

#### **Vapor Intrusion/TCE:**

The vapor intrusion assessment was revised to evaluate the potential for migration of TCE from soil gas into future buildings under an industrial exposure scenario based on the current site use as a gravel mine. The vapor intrusion assessment concluded that TCE contaminated groundwater does not pose a vapor intrusion risk.<sup>22</sup>

Based on the analysis provided, Ecology will need soil gas sample results from the Site to complete the assessment prior to reconstruction and redevelopment of the property.

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<sup>16</sup> WAC 173-340-702(14)(d)

<sup>17</sup> WAC 173-340-720(8)(c)

<sup>18</sup> WAC 173-340-200

<sup>19</sup> *Response to Comments for the Woodworth & Co. Lakeview Plant*, May, 2017, page 7

<sup>20</sup> *Response to Comments for the Woodworth & Co. Lakeview Plant*, May, 2017, page 7

<sup>21</sup> <https://semspub.epa.gov/work/HQ/100000022.pdf>

<sup>22</sup> *Addendum to the Focused Feasibility Study and Disproportionate Cost Analysis Report*, August 3, 2018, page 5-1

Because only an industrial exposure scenario has been evaluated, current Site use will need to be institutionalized in an environmental covenant limiting future use of the Property to similar industrial uses. Ecology suggests it may be beneficial for you to evaluate additional possible Site uses, and therefore not limit future Site use.

Please also evaluate and report on the *acute* risks of TCE as part of the overall Site risk using guidelines from US EPA.<sup>23</sup> Consider if pregnant women or children risk exposure from indoor air. Ecology's Toxic Cleanup Program has recently drafted an implementation memo providing guidance on this issue.<sup>24</sup>

### **Groundwater Geochemistry:**

Ecology previously provided that stockpiling of recycled concrete aggregate at the Site likely has increased the pH of shallow groundwater. During the December 2017 groundwater monitoring event, pH was detected as high as 13.01 (MW-9B) in the deep aquifer and as high as 12.52 in the shallow aquifer (MW-31). High levels of lead and arsenic have been detected in shallow groundwater in this area (MW-12 and MW-31), potentially a result of elevated pH in this area of the Site leaching those metals from soil into groundwater.

Based on the pH levels identified during the December 2017 groundwater sampling event (13.01 MW-9B deep aquifer and 12.52 MW-31 shallow aquifer) groundwater appears to classify as Dangerous Waste per WAC 173-303. Ecology recommends working with Ecology's Hazardous Waste & Toxics Reduction Program to ensure purge water generated is properly handled.<sup>25</sup>

Groundwater oxygen reduction potential (ORP) values less than 50 millivolts (mV) are indicative of reduced geochemical conditions.<sup>26</sup> Reduced groundwater as low as -400.5 mV correlated with arsenic has been measured in Site monitoring wells (MW-12 and MW-31).

The shallow groundwater unit flows into a low elevation area within the center of the Property. Large stockpiles of recycled concrete aggregate have also been reported in this area. It appears likely that rainwater infiltration through recycled concrete aggregate piles may have caused reaction with the concrete lime and altered both pH and ORP in this area of the Site. The nature and extents of groundwater contamination in this area are unknown, as the downgradient monitoring well (MW-30) has been dry during sampling events.

Ecology suggests evaluating groundwater chemistry throughout the Site, and delineating areas where geochemical conditions are conducive to metals or other contaminant mobilization, and areas where metals or other contaminant mobilization has been detected. Include these areas in the remedial investigation and feasibility study, and delineate them in plan view and geologic cross section.

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<sup>23</sup> <https://archive.epa.gov/region9/superfund/web/pdf/r9-tce-interim-action-levels-response-recs-memo-2014.pdf>

<sup>24</sup> <https://fortress.wa.gov/ecy/publications/documents/1809047.pdf>

<sup>25</sup> <https://fortress.wa.gov/ecy/publications/documents/96436.pdf>, <https://fortress.wa.gov/ecy/publications/documents/96412.pdf>

<sup>26</sup> Whitlock and Kelly, *Relationship Between Subsurface Landfill Gas and Arsenic Mobilization into Groundwater*. Ground Water Monitoring & Remediation 30, no. 2/ Spring 2010/pages 86–96.



Additional groundwater monitoring data are also needed to define the extent of arsenic and lead in groundwater. Ecology further recommends, if not already done so, to implement best management practices (BMPs).<sup>27</sup>

### **Monitoring Wells:**

Monitoring well MW-16 (screened within the reported deep water bearing zone) was observed to have been damaged prior to the December 2017 sampling event and concentrations of petroleum hydrocarbons subsequently observed in the monitoring well were reported to not be representative of groundwater quality.<sup>28</sup> Groundwater monitoring wells can act as a conduit in which contamination is transmitted downward into an aquifer.

Based on recently reported data results, it appears that the deep aquifer in the vicinity of MW-16 is currently impacted with petroleum hydrocarbons. Please evaluate the lateral and vertical extents of contamination in the area of MW-16 in the deep water-bearing zone.

Please note that any monitoring well destroyed or abandoned must be located and properly decommissioned in accordance with WAC 173-160-381 and 173-160-460. RCW 18.104.040 provides Ecology's authority. Ecology recommends working with Ecology's Water Resources Program to ensure monitoring wells abandoned or destroyed are properly decommissioned.<sup>29</sup>

### **Terrestrial Ecological Evaluation:**

Ecology concurs that no further consideration of ecological impacts is required.<sup>30</sup>

### **Rules Regarding Cleanup Levels:**

Ecology does not concur with the Report's statement that silica gel cleanup results from recent sampling meet compliance standards based on the intent of WAC 173-340-702(12)(b).<sup>31</sup> WAC173-340-702(12)(b) refers to cleanup levels, not to the appropriateness of specific analytical methods.

### **Silica Gel:**

Ecology's May 25, 2017, opinion letter requested that silica gel cleanup be discontinued; nonetheless samples collected in 2017 were analyzed using silica gel cleanup (B-12, MW-24T, etc.).<sup>32</sup> Data for this Site to support the use of silica gel cleanup of analytical samples has not been provided for the remedial investigation. With the data currently available, Ecology considers reported concentrations using silica gel cleanup at this Site to be minimum estimates of contamination present at those locations. Additional information will be necessary to evaluate the use of silica gel cleanup of this Site's analytical samples.

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<sup>27</sup> Response to Comments for the Woodworth & Co. Lakeview Plant, May, 2017, pages 12-13

<sup>28</sup> Response to Comments for the Woodworth & Co. Lakeview Plant, May, 2017, page 4

<sup>29</sup> WAC 173-160

<sup>30</sup> Focused Feasibility Study and Disproportionate Cost Analysis Report, April 14, 2015, page 2-6

<sup>31</sup> Addendum to Focused Feasibility Study and Disproportionate Cost Analysis Report, August 3, 2018, page 4-7

<sup>32</sup> Response to Comments for the Woodworth & Co. Lakeview Plant, May, 2017, page 3

**If you choose to use silica gel cleanup on any samples used for delineation or MTCA compliance purposes, Ecology will need you to provide the following supporting information:**

- Reporting of both pre- and post-silica gel treatment results at all locations.
- Chromatograms, calculations, and numerical estimations of variability or laboratory measurements based on laboratory QA/QC, and supporting evidence and criteria for use of the method on a location-by-location basis.
- Sample results for this remedial investigation reported without the use of silica gel cleanup in plan view and cross section concentration isopleth maps.
- Results reported with and without silica gel treatment in tables.
- Evaluation of the impact of silica gel cleanup in both contaminated and non-contaminated areas. This will be especially important to understand the biogenic influence of organic matter at the Site.
- Justify and calculate the risk of polar breakdown metabolites as part of the site-specific cumulative risk.<sup>33</sup>

When used inappropriately, the use of silica gel cleanup of samples can artificially reduce the concentration of petroleum detected in a sample. Ecology is concerned that petroleum results at the Site are greater than what you reported using silica gel cleanup.

Ecology recognizes that there are situations where the use of silica gel treatment is appropriate at cleanup sites. An example is for sites with highly organic soils, such as peat, where very high concentrations of naturally occurring organic carbon impacts analytical results.

An example of data that may be useful for Ecology to support the use of silica gel cleanup is high measured soil sample carbon fractions both in impacted areas and upgradient of the Site, in adjacent unimpacted areas. Delineation of total and dissolved organic carbon in samples obtained at the Site and upgradient may provide support for use of silica gel cleanup.

It may alternately be appropriate to obtain sufficient upgradient samples not impacted by the release, and determine the amount that silica gel cleanup impacts those sample results. If a statistically significant difference is detected between upgradient samples with and without silica gel treatment, it may be appropriate to subtract that amount from sample results not analyzed with silica gel, but determined by other means to be impacted by the release.

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<sup>33</sup> For example: *Petroleum Metabolites Literature Review and Assessment Framework Technical Resource Document*, San Francisco Bay Regional Water Quality Control Board, June 27, 2016 accessed February 4, 2019 at [https://www.waterboards.ca.gov/sanfranciscobay/publications\\_forms/documents/SF\\_WB\\_Petroleum\\_Metabolites.pdf](https://www.waterboards.ca.gov/sanfranciscobay/publications_forms/documents/SF_WB_Petroleum_Metabolites.pdf)

If this approach is appropriate, be sure to carefully address how the Site was delineated, how the specific background samples were selected, and how the results were determined to be statistically significant. Ensure that you also report on organic carbon fractions in all samples.

Additional site reporting may provide sufficient information for Ecology to concur with the use of silica gel cleanup of samples at this Site. Until that analysis is provided, Ecology strongly suggests you avoid additional silica gel cleanup of analytical samples.

### **Feasibility Study:**

The feasibility study submitted in 2018 evaluated two cleanup alternatives; 1) institutional controls to prevent exposure to TCE, arsenic, and lead in groundwater by implementation of an environmental covenant to prohibit the use of groundwater as a potable water source at the Site,<sup>34</sup> and 2) active cleanup of soil and groundwater.<sup>35</sup> Alternative 1 was proposed as the recommended cleanup alternative, similar to a previous 2015 feasibility study and disproportionate cost analysis.<sup>36</sup>

Conditional points of compliance were proposed for shallow groundwater at MW-3 (TCE), MW-9 (petroleum, lead, and arsenic), MW-32 (lead and arsenic), and MW-34 (lead and arsenic) and deeper groundwater MW-12B (TCE, lead, and arsenic). Monitoring wells MW-12, MW-13, MW-20, MW-31, SVE-5, and SVE-12 were additionally proposed to be sampled for natural attenuation.<sup>37</sup> Monitoring well MW-9B was originally proposed as a conditional point of compliance, but was not included in the most recent feasibility study.

In the 2015 Feasibility Study, alternative 1 did not address the direct contact pathway for shallow soil contamination; however the revised feasibility study indicates that the environmental covenant will include engineering controls for shallow soil petroleum and cPAH soil contamination.<sup>38</sup>

Ecology recommends updating the cleanup alternatives evaluation and disproportionate cost analysis based on recently collected data, evaluate at least three cleanup alternatives including at least one permanent cleanup alternative. Ecology needs to ensure that each remedial alternative evaluated:

- Includes all contamination and pathways at the Site at all points of compliance.
- Meets minimum requirements for cleanup actions.<sup>39</sup>
- Uses permanent solutions to the maximum extent practicable.<sup>40</sup>
- Provides for a reasonable restoration timeframe.<sup>41</sup>

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<sup>34</sup> *Focused Feasibility Study and Disproportionate Cost Analysis Report*, April 14, 2015, pages 5-3 and 5-4

<sup>35</sup> *Focused Feasibility Study and Disproportionate Cost Analysis Report*, August 3, 2018, pages 5-4 – 5-9

<sup>36</sup> *Addendum to Focused Feasibility Study and Disproportionate Cost Analysis Report*, August 3, 2018, page 7-1

<sup>37</sup> *Addendum to Focused Feasibility Study and Disproportionate Cost Analysis Report*, August 3, 2018, page 7-2

<sup>38</sup> *Addendum to Focused Feasibility Study and Disproportionate Cost Analysis Report*, August 3, 2018, page 4-12

<sup>39</sup> WAC 173-340-360(2)

<sup>40</sup> WAC 173-340-360(3).

<sup>41</sup> WAC 173-340-360(4).

### **Environmental Covenant:**

The recommended cleanup alternative is proposed as an institutional control with an environmental covenant to restrict groundwater from being used for potable water and engineering controls for shallow soil contamination. A draft Environmental Covenant was submitted to Ecology as Appendix D in the August 3, 2018, *Addendum to the Focused Feasibility Study and Disproportionate Cost Analysis Report*.

Ecology suggests that you reevaluate the preferred remedial alternative and the need for institutional controls after you complete the additional investigation and analyses suggested in this opinion. If institutional or engineered controls remain an appropriate part of the preferred remedial alternative determined through the feasibility study and disproportionate cost analysis, update the draft environmental covenant to manage implementation of needed institutional or engineered controls with consideration to the following requirements:<sup>42</sup>

- Review Toxic Cleanup Program's [Procedure 440A: Establishing Environmental Covenants under the Model Toxics Control Act](#), Revised December 22, 2016.<sup>43</sup>
- The following will be needed for Ecology review:
  - A revised draft covenant in electronic format memorializing proposed institutional and engineered controls for all impacted properties.
  - As determined necessary, a long term groundwater, indoor air, and/or containment cap monitoring and reporting plan to verify continued protection, including contingency planning.
  - Delineated concentration (1) isopleth plan view maps and (2) geologic cross sections showing the extents of remaining contamination at the Site in plan view and cross section. Include the boundaries of the MTCA facility. Indicate where insufficient data are available to delineate to natural background concentrations.
  - A complete title search as part of Exhibit A, legal description.
  - A land survey of impacted properties and rights-of-way, including platting and dedications. If contamination is proposed to be left in rights-of-way exceeding cleanup standards, or exceeding soil vapor cleanup screening levels where an engineered control such as a building foundation is needed to reduce human exposure to contaminated soil vapor, a subordination agreement with the right-of-way holder would be required for implementing an environmental covenant. Grantor and/or subordinate agreements may be required with adjacent Property owners or right-of-way holders, determined by the extents of the Site.

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<sup>42</sup> WAC 173-340-440(4)

<sup>43</sup> <https://fortress.wa.gov/ecy/publications/documents/1509054.pdf>

- Any needed financial assurance mechanisms and implementation of financial assurances based on the requirements of WAC 173-340-440(11). Financial assurances may not be necessary at this Site; however, if the terms of an environmental covenant were not followed, Ecology may rescind the no further action opinion without prior notification. If no financial assurances are needed, include sufficient explanation for Ecology to concur.
- Document how the local government notification requirements of WAC 173-340-440(10) were completed. Ecology suggests providing the updated draft covenant and enclosure package to the local land use planning authority for review and comment. If comments are provided, update the draft covenant based on comments, and provide Ecology the correspondence, local government comments, and how those comments were addressed.
- Ensure any needed grantor or subordination agreements are completed and included with the draft environmental covenant.

#### **Long Term Monitoring Plan (LTM):**

The August 3, 2018, draft covenant included long term groundwater monitoring. It did not include long term soil vapor, indoor air monitoring, or cap monitoring:

- **Groundwater:** The long term groundwater monitoring plan included proposed sampling groundwater on an 18-month frequency for the first five years. Insufficient monitoring data has been provided for Ecology to concur with an 18-month frequency.
- **Monitoring Well Network:** Ecology recommends including the following additional wells in any long term monitoring proposal: MW-2, MW-7, MW-14, MW-15, MW-16, MW-18, MW-22, MW-23, MW-25, SVE-1, SVE-2, SVE-3, SVE-6, and SVE-8.
- **Cap Monitoring:** A long term cap inspection plan would be necessary to ensure any remedy involving capping remains effective.
- **Soil Vapor / Indoor Air:** Insufficient protection and performance sampling has been completed to determine if long-term soil vapor and/or indoor air monitoring schedule should also be proposed.
- **Contingency Plan Needed:** A long term monitoring contingency plan is needed describing those actions that will be conducted if:
  - Long term monitoring results exceed applicable cleanup up levels in groundwater or indoor air or soil vapor screening levels.
  - Cap maintenance or other maintenance or repair of the remedy is required such as repairing monitoring wells.
  - Contaminated soil is discovered during operations or property re-development activities.

If exceedances are detected during long term monitoring, additional confirmation sampling should be performed within 30 days of the initial receipt of results. Include proposed analytes for contingency sampling in the contingency plan analytical schedule.

**Reporting:** Results of performance and confirmation sampling for a contingency plan should be provided to Ecology within 90 days of the laboratory result date if no exceedances of criteria are detected, or within 30 days of the laboratory report result date if exceedances are detected, or for follow-up confirmation sampling.

If confirmation sampling reveals the continued presence of contaminants above their respective cleanup levels, a work plan to further evaluate conditions beneath the Site shall be submitted to Ecology within 60 days of receipt of results of confirmation sampling. Ensure all environmental data is provided in accordance with WAC 173-340-840(5) and Ecology Toxics Cleanup Program Policy 840 (Data Submittal Requirements).

## 2. Establishment of Cleanup Standards.

Under MTCA, cleanup standards consist of three primary components; (a.) points of compliance,<sup>44</sup> (b.) cleanup levels,<sup>45</sup> and (c.) applicable local, state, and federal laws.<sup>46</sup>

- a. **Points of Compliance:** Ecology would likely concur with the appropriate use of the following points of compliance, that you need to propose for the Site:

Media	Points of Compliance
Soil-Direct Contact	Based on human exposure via direct contact, the standard point of compliance is throughout the Site from ground surface to fifteen feet below the ground surface. <sup>47</sup>
Soil-Protection of Groundwater	Based on the protection of groundwater, the standard point of compliance is throughout the Site. <sup>48</sup>
Soil-Protection of Plants, Animals, and Soil Biota	Based on ecological protection, the standard point of compliance is throughout the Site from ground surface to fifteen feet below the ground surface. <sup>49</sup>
Groundwater	Based on the protection of groundwater quality, the standard point of compliance is throughout the site from the uppermost level of the saturated zone extending vertically to the lowest most depth which could potentially be affected by the site. <sup>50</sup>
Groundwater-Surface Water Protection	Based on the protection of surface water, the standard point of compliance is all locations where hazardous substances are released to surface water. <sup>51</sup>
Air Quality	Based on the protection of air quality, the point of compliance is indoor and ambient air throughout the Site. <sup>52</sup>
Sediment	Based on the protection of sediment quality, compliance with the requirements of 173-204 WAC. <sup>53</sup>

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<sup>44</sup> WAC 173-340-200 "Point of Compliance"

<sup>45</sup> WAC 173-340-200 "Cleanup level"

<sup>46</sup> WAC 173-340-200 "Applicable state and federal laws," WAC 173-340-700(3)(c)

<sup>47</sup> WAC 173-340-740 (6)(d)

<sup>48</sup> WAC 173-340-747

<sup>49</sup> WAC 173-340-7490(4)(b)

<sup>50</sup> WAC 173-340-720(8)(b)

<sup>51</sup> WAC 173-340-730(6)

<sup>52</sup> WAC 173-340-750(6)

<sup>53</sup> WAC 173-340-760

- b. Cleanup Levels:** For each media and point of compliance above that you determine applicable to the Site, please provide appropriate cleanup levels for each hazardous substance detected in the remedial investigation. Apply the proposed cleanup levels at the appropriate points of compliance.
- c. Applicable Laws and Regulations:** In addition to establishing minimum requirements for cleanup standards, applicable local, state, and federal laws may also impose certain technical and procedural requirements for performing cleanup actions. These requirements are described in WAC 173-340-710.
- All cleanup actions conducted under MTCA shall comply with applicable local, state, and federal laws.<sup>54</sup>
  - The person conducting a cleanup action shall identify all applicable local, state, and federal laws. The department shall make the final interpretation on whether these requirements have been correctly identified and are legally applicable or relevant and appropriate.<sup>55</sup>
  - There are three general groups of applicable local, state, and federal laws for you to identify:
    - **Chemical-Specific:** Examples of chemical-specific laws include promulgated concentrations from another rule that result in adjusting proposed cleanup levels. Method A is inclusive of these laws. For Methods B or C, additional evaluation of chemical-specific applicable state and federal laws is required.
    - **Action-Specific:** Examples of action-specific laws include requirements for obtaining local permits to excavate and/or dispose of contaminated soil, stormwater construction permits, or the requirement to notify in case human remains are discovered during excavation. All MTCA cleanups require evaluation of action-specific applicable state and federal laws.
    - **Location-Specific:** Examples of location-specific laws include specific requirements for working near wetlands or archeologically important areas. All MTCA cleanups require evaluation of location-specific applicable state and federal laws.

After you have selected appropriate applicable local, state, and federal laws, justify in reporting the applicable local, state, and federal laws selections you made and how those laws and regulations impact proposed cleanup levels, points of compliance, or the cleanup, if at all. Provide all permits obtained for the cleanup action.<sup>56</sup>

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<sup>54</sup> WAC 173-340-710(1)

<sup>55</sup> WAC 173-340-710(2)

<sup>56</sup> WAC 173-340-710(9)(a)

Ecology has determined the cleanup levels and points of compliance you established for the Site do not meet the substantive requirements of MTCA.

### **3. Selection of Cleanup Action.**

Ecology has determined that additional remedial investigation is necessary at the Site before selecting a cleanup action.

## **Limitations of the Opinion**

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### **1. Opinion 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 70.105D.040(4).

### **2. Opinion 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 you performed is substantially equivalent. Courts make that determination. See RCW 70.105D.080 and WAC 173-340-545.

### **3. 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 70.105D.030(1)(i).



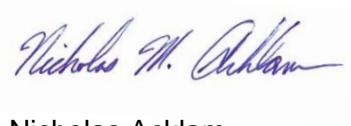
## Contact Information

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Thank you for choosing to clean up the Site under the Voluntary Cleanup Program (VCP). After you have addressed our concerns, you may request another review of your cleanup. Please do not hesitate to request additional services as your 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](https://www.ecy.wa.gov/vcp).<sup>57</sup> If you have any questions about this opinion, please contact me by phone at (360) 407-6347 or [nicholas.acklam@ecy.wa.gov](mailto:nicholas.acklam@ecy.wa.gov).

Sincerely,



Nicholas Acklam  
VCP/II-SHA/LUST Unit Supervisor  
Toxics Cleanup Program  
Southwest Regional Office

NMA: tam

cc: Jeff Woodworth, Woodworth Capital Inc.  
Randall Black, Lakewood Water District  
Rebecca S. Lawson, Ecology Toxics Cleanup Program (by email)  
Joseph Kasperski, Ecology Water Quality Program (by email)  
John Pearch, Ecology Water Resources Program (by email)  
Andy Rippert, Ecology Hazardous Waste & Toxics Reduction Program (by email)  
Ecology Site File

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<sup>57</sup> <https://www.ecy.wa.gov/vcp>