STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Southwest Region Office
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March 5, 2026

Dr. Peter Y. Chen
Property Owner
4709 Memory Ln W
University Place, WA 98466-1038
yiping10@hotmail.com

Re: No Further Action Likely at the following Contaminated Site

Site name:	Pioneer Museum
Site address:	2301 23rd Ave SE, Puyallup, WA 98372
Facility/Site ID:	9490
Cleanup Site ID:	11739
VCP Project No.:	SW1846

Dear Dr. Peter Y. Chen:

The Washington State Department of Ecology (Ecology) received your request on January 15, 2026, for an opinion regarding the sufficiency of your independent cleanup of the Pioneer Museum (Site) under the Voluntary Cleanup Program (VCP).[1] Acceptance of electronic Site data into Ecology's Environmental Information Management (EIM) database is still pending. This letter provides our opinion and analysis. We are providing this opinion under the authority of the Model Toxics Control Act (MTCA), chapter 70A.305 RCW.[2]

[1] https://ecology.wa.gov/Spills-Cleanup/Contamination-cleanup/Voluntary-Cleanup-Program
[2] https://app.leg.wa.gov/RCW/default.aspx?cite=70A.305

Opinion

Ecology has determined that no further action is likely necessary for this cleanup. This is contingent upon completing the recommendations in this letter.

The areas of remaining cleanup appear to be at B20 to remove petroleum-impacted soils and collecting sufficient groundwater data.

Ecology bases this opinion on an analysis of whether the remedial action meets the substantive requirements of MTCA and its implementing regulations, which are specified in chapter 70A.305 RCW and chapter 173-340 WAC[3] (collectively called "MTCA").

Site Description

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

- Total petroleum hydrocarbons (TPH) as gasoline-range (GRO) organics in the soil.
- TPH as diesel-range (DRO) and heavy oil-range (HRO) organics in the soil.
- Benzene, toluene, ethylbenzene, and total xylenes (BTEX) in soil.
- Lindane and methoxychlor into the soil.
- Arsenic into soil and stormwater retention pond surface water.
- Barium, cadmium, chromium (trivalent and hexavalent), and lead into soil.
- Perfluorooctane sulfonic acid (PFOS) into the soil.

Enclosure A includes a Site description and brief Site history.

A parcel of real property can be affected by multiple sites. At this time, we have no information that the parcel(s) associated with this Site are affected by other sites.

[3] https://apps.leg.wa.gov/WAC/default.aspx?cite=173-340

Basis for the Opinion

This opinion is based on the information contained in the documents listed in **Enclosure B**.

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.[4] Some site documents may be available on Ecology's Cleanup Site Search web page.[5]

This opinion is void if any of the information contained in the documents is materially false or misleading.

Analysis of the Cleanup

Ecology has concluded that no further remedial action is likely necessary to clean up contamination at the Site. Ecology bases its conclusion on the following analysis:

Characterizing the Site

Ecology has determined your completed Site characterization is not sufficient for setting cleanup standards and selecting a cleanup action.

Reporting Requirements

Please ensure that all future deliverables have a summary table of analytical data for soil, groundwater, and surface water. Additionally, please include boring logs for all borings completed to date at the Site. Please ensure that reports including data interpretation are submitted under seal by a licensed geologist, hydrogeologist, or professional engineer to meet RCW 18.220[6] or RCW 18.43.[7]

Interim Action at B20

Contaminant concentrations in soil at B20 at 1 and 3 feet below ground surface (bgs) currently exceed the DRO and HRO in soil cleanup levels (CULs) protective of ecological receptors of 460 milligrams per kilogram (mg/kg). The DRO/HRO in soil appears to remain in place. Please consider excavating the DRO/HRO in soil at B20 with disposal at a landfill.

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[4] https://ecology.wa.gov/About-us/Accountability-transparency/Public-records-requests
[5] https://apps.ecology.wa.gov/cleanupsearch/site/11739
[6] https://app.leg.wa.gov/rcw/default.aspx?cite=18.220
[7] https://app.leg.wa.gov/rcw/default.aspx?cite=18.43

The DRO/HRO in soil CUL protective of ecological receptors from WAC 173-340-900, Table 749-2, appears to still apply based on the results of the terrestrial ecological evaluation (TEE). Ecology notes that the soil CUL that is protective of ecological receptors is more stringent than the MTCA Method A (MTCA A) CUL for DRO/HRO of 2,000 mg/kg, which is protective of the leaching to groundwater pathway.

Per WAC 173-340-430, Ecology supports considering interim actions at this Site. An example of an interim action would be to remove contaminated soil by excavation with disposal at a permitted facility (landfill). Excavation with off-Site disposal at a permitted facility is also considered a permanent cleanup solution. An example of where an interim action would be immediately beneficial is excavation at boring location B20, to a depth of at least 5 feet below ground surface (bgs), to remove the identified DRO/HRO in soil at up to 4 feet bgs.

As the DRO/HRO in soil at B20 is less than the MTCA A CUL of 2,000 mg/kg, this contamination could be removed at the time of Site re-development.

Of note, the heavy oil in soil at B20 is at a concentration which is protective of the leaching pathway to groundwater and direct contact pathway (such as for construction workers).

2025 Soil Sampling

The Site is **not** located within the Tacoma Smelter Plume footprint.

In response to Ecology's recommendations in our January 10, 2025 opinion letter, additional soil sampling for pesticides, herbicides, and PFAS were completed in approximately requested locations. Two rounds of soil sampling were completed, in March-April 2025 and August 2025.

In March and April 2025, extensive soil sampling was completed in the horse barn area, drum fire area, and former museum building area. Discrete soil samples were collected generally adjacent to each concrete pad, where the highest likelihood of contamination would be expected to be found.

Sixteen shallow discrete soil samples were collected in the drum fire area, 54 discrete soil samples in the horse barn area, and 33 discrete soil samples were collected on the south side of the museum building. The depth of sampling ranged up to 12 feet bgs. These soils samples augmented soil previously sampled in these three areas, as well as complimented soil sampling in other areas of the Site (e.g., the stormwater pond). Soil samples were generally analyzed for DRO and HRO to screen for results, with several

samples also being analyzed for gasoline, BTEX, and "MTCA 5 metals" (arsenic, cadmium, chromium, lead, and mercury). All contaminant concentrations in soil sampled were less than the MTCA CULs. Two samples in the drum fire area, C-04 and D-13, were also analyzed for per- and polyfluoroalkyl substances (PFAS). As PFOS was detected in soil, additional soil sampling was performed to evaluate this contamination. Soil sample D-17 was also analyzed for the full list VOCs.

In August 2025, a total of 14 soil samples (MF-1 through MF-14) were collected, with seven of those soil samples being analyzed for PFAS. The areas of concern addressed by this additional focused soil sampling were the burned horse-barn and the former drum areas. All concentrations of DRO, HRO, and metals detected in soil were less than the MTCA CULs. Limited detections of PFOS were identified in shallow soils, but at concentrations less than the most stringent MTCA B CULs for PFOS (MTCA B CUL for cancer protective of the vadose zone). Methoxychlor was the only pesticide detected in soil sampled, and the concentration was less than the most stringent MTCA B CUL.

Lead and arsenic were also analyzed for in soil samples MF-03, MF-04, and MF-06. All concentrations in soil sampled were less than the screening level protective of ecological receptors[8] and the MTCA A CULs.

Ecology notes that the soil samples analyzed for lead and arsenic and analyzed by EPA Method 6020 for total metals, were collected on August 4, 2025, and submitted to the analytical laboratory on September 8, 2025. The hold time for EPA Method 6020 is six months, though storage conditions of the samples between August 4 and September 8, 2025 were not reported. Due to the stability of metals, the delay in transmittal of the samples to the analytical laboratory is unlikely to have had a material impact on the results, which were within quality control standards. However, Ecology strongly recommends submitting samples to the laboratory immediately upon collection to avoid any chain-of-custody or storage issues which may have compromised the integrity of the data obtained.

Ecology notes that the soil samples analyzed for PFAS, pesticides, and herbicides were collected on September 22, 2025 and submitted to the analytical laboratory on September 23, 2025. We encourage this submittal time for samples to the analytical laboratory. Based on the laboratory report, the samples were analyzed within the hold times for EPA Method

[8] WAC 173-340-900, Table 749-2

1633 (PFAS), VOC by EPA Method 8260D, and EPA Method 8081B for pesticides and herbicides. Methoxychlor was the only pesticide detected, in soil sampled at MF-3.

Recommended Areas of Further Evaluation

Based on our previous opinion letter, Ecology recommended additional assessment in five areas. From the previous opinion, the burned horse barn and the former drum areas require no additional assessment. Three areas require warrant additional discussion in this opinion letter.

1) The stormwater retention pond.

2) Groundwater for the Site.

3) The vicinity of boring B20.

Stormwater Retention Pond Evaluation

Ecology initially evaluated the potential for runoff impact for the stormwater pond in our opinion dated January 10, 2025. The additional soil data suggest that the potential for contaminant runoff into the stormwater pond is low. However, during redevelopment, any stormwater that is pumped into holding tanks for disposal should be profiled to ensure that water meets requirements under WAC 173-218, WAC 173-303-090, and any City of Puyallup municipal discharge code.

Based on the current data set, it is Ecology's opinion that no further action is required at this time regarding this cleanup and the stormwater retention pond. New data may change this conclusion.

Please note that the proposed development appears to disturb more than 1 acre, which is expected to require coverage under the Statewide Construction Stormwater General Permit.[9] Ecology's Water Quality Program (Southwest Region Office) manages coverage under this permit.

[9] https://www.ecology.wa.gov/regulations-permits/permits-certifications/stormwater-general-permits/construction-stormwater-permit

Groundwater Evaluation

As the Site is within the 10-year wellhead protection zone of the Well #13, AEF202, Ecology recommends collecting a sufficient number of hydropunch/grab groundwater samples or temporary monitoring well samples within or proximal to the areas of concern to determine Site groundwater quality. Alternatively, the installation of at least three monitoring wells that are sampled using a low flow groundwater sampling methodology are always an option.

Based on the surface water elevation in the stormwater pond, groundwater at the Site is expected to be approximately 10 feet bgs. The compliant soil sampling results in 2025 appear to support an opinion that groundwater has not likely been impacted by the Site, but **Ecology needs sufficient groundwater data to confirm this hypothesis.**

Depending on the analytical results, Stage 2 monitoring requirements from Ecology's Guidance for the Remediation of Petroleum Contaminated Sites, may be appropriate at this Site.

Analysis of groundwater samples should be for the entire contaminant list in the cleanup table below. Analysis for DRO and HRO by NWTPH-Dx should include results both before and after silica gel cleanup treatment. Analysis for metals in groundwater should also include both total and dissolved metals.

Groundwater sampling would ideally be done before Property development commences, though it is feasible to complete the sampling concurrent with Property development.

Terrestrial Ecological Evaluation (TEE)

The Property was partially developed and is currently generally overgrown. There does not appear to be more than 10 acres of native vegetation within 500 feet of the Site.

Ecology requires implementing a simplified TEE for this Site and use Table 749-2 to help set Site CULs. For most potential contaminants, either MTCA A or B CULs (protective of the vadose zone) will be the most stringent cleanup values for Site soil. However, screening/cleanup levels protective of ecological receptors for DRO and HRO in soil should be screened against 460 mg/kg, and lead in soil against 220 mg/kg.

With your next deliverable, please provide the TEE, the TEE form[10], and a figure showing the 500-foot radius for the TEE around the Site. Completion of the TEE form alone is not sufficient to document the evaluation.

Environmental Data

In accordance with WAC 173-340-840 and TCP Policy 840,[11] all Site data collected since August 1, 2005, will need to be confirmed as uploaded, accepted, and approved in Ecology's Environmental Information Management (EIM) database prior to issuing a no further action (NFA) determination. Please continue to work with your EIM data coordinator to finalize your submittal.

Setting Cleanup Standards

Ecology has determined the CULs and points of compliance (POC) you set for the Site will likely meet the requirements of MTCA.

Previous soil and pond water concentrations at the Site were screened against the MTCA CULs illustrated in the table below.

Ecology concurs with these POCs as they apply to the Site:

[10] https://apps.ecology.wa.gov/publications/SummaryPages/ECY090300.html
[11] https://apps.ecology.wa.gov/publications/SummaryPages/1609050

Media	POC
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. *WAC 173-340-740 (6)(d)* **Not met – pending additional evaluation or interim actions.**
Soil- Protection of Groundwater	Based on the protection of groundwater, the standard point of compliance is throughout the Site. *WAC 173-340-740(6)(b)* **Not met -- pending additional evaluation.**
Soil- Protection of Ecological Receptors	Based on the protection of groundwater, the standard point of compliance is throughout the Site. *WAC 173-340-740(6)(b)* **Not met – additional evaluation or interim actions needed.**
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. *WAC 173-340-720(8)(b)* **Not met – pending additional evaluation.**

The standard POC for soil and groundwater apply at the Site. The air/soil vapor and sediment pathways appear to be incomplete for the Site. Based on sampling data, the surface water pathway at the Site also appears to be incomplete.

Unless new data suggest more stringent CULs are needed, Ecology concurs with the following CULs for the Site:

Hazardous Substance[12]	**MTCA Soil Cleanup Level** (mg/kg)	**MTCA Groundwater Cleanup Level** (µg/L)
GRO	30	800
DRO/HRO	460[13]	500
Benzene	0.03	5
Ethylbenzene	6	700
Toluene	7	1,000
Total Xylenes	9	1,000
Arsenic	20	8
Cadmium	2	2
Barium	1,600	2,000
Trivalent chromium	2,000	50
Hexavalent chromium	19	50
Lead	220[14]	15
Lindane	0.01	0.08
Methoxychlor	64	40
PFOS	0.025	0.0022
cPAHs (as benzo[a]pyrene)	0.1	0.1

The arsenic in groundwater CUL is protective of groundwater for the Pierce County area, established by Ecology.[15]

No adjustments to the cleanup standards were needed based on consideration of applicable state and federal laws.[16]

[12] Based on exceedance of screening or cleanup level identified at the Site, per data collected to date.
[13] WAC 173-340-900, Table 749-2, protective of ecological receptors.
[14] WAC 173-340-900, Table 749-2, protective of ecological receptors.
[15] Ecology publication no. 14-09-044, Natural Background Groundwater Arsenic Concentrations in Washington State, January 2022. https://apps.ecology.wa.gov/publications/documents/1409044.pdf
[16] Generally, the Toxics Cleanup Program does not regulate asbestos under MTCA. Typically, HWTR or Solid Waste Management Programs do that at Ecology, and the local regional clean air agency. https://ecology.wa.gov/regulations-permits/guidance-technical-assistance/dangerous-waste-guidance/common-dangerous-waste/asbestos

Selecting and Implementing the Cleanup Action

Ecology has determined the cleanup completed to date does not meet the substantive requirements of MTCA.

However, implementing the recommendations in this letter will likely result in a no further action determination, should soil and groundwater data show no contaminants in Site groundwater and the contamination at B20 is removed.

Excavation with off-Site disposal at a landfill as an interim or cleanup action is a permanent cleanup solution to the maximum extent practicable and would be the most practicable approach. Alternately, you can consider completing a feasibility study with disproportionate cost analysis to evaluate other cleanup technologies for the Site.

As the property may be re-developed in the future, Ecology recommends that a contaminated media management plan (CMMP) be developed to manage any potentially contaminated soils encountered during any property re-development. Analytes should include Table 830-1, herbicides, pesticides, and PFAS, based on past Property uses. Please note that the re-use of petroleum-contaminated soils under section 12 (Tables 12.1 and 12.2) in the *Guidance for Remediation of Petroleum Contaminated Sites*[17], are more stringent than the MTCA A CULs.

The City of Puyallup, as the local government, makes the decision to issue permits (e.g., grading) for any Property development. However, it is Ecology's opinion that the additional data requested needed to continue moving the Site towards no further action could mostly be acquired or addressed during Property development and that sufficient data have been collected to allow development to proceed. The remaining cleanup and site investigation could be done either before or in conjunction with redevelopment. However, new data may indicate additional cleanup at the Site is needed.

[17] Ecology publication 10-09-057, revised June 2016.

Limitations of the Opinion

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 70A.305.040 4).[18]

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 70A.305.080[19] and WAC 173-340-545. [20]**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).

Questions

If you have any questions about this opinion, please contact me at (360) 999-9589 or tim.mullin@ecy.wa.gov.

Sincerely,

Tim Mullin, LHG
Toxics Cleanup Program
Southwest Region Office

[18] https://app.leg.wa.gov/RCW/default.aspx?cite=70A.305.040
[19] https://app.leg.wa.gov/RCW/default.aspx?cite=70A.305.080
[20] https://apps.leg.wa.gov/WAC/default.aspx?cite=173-340-545

TCM: kw

Enclosure: A – Site Description and Brief Site History
B – Documents List

cc by email: Alan Blotch, Aerotech Environmental Consulting Inc, alan@dirtydirt.us
Dawn Sinagra, CES-NW, Inc., dsinagra@cesnwinc.com
Chris Beale, AICP, City of Puyallup, CBeale@PuyallupWA.gov
Marian Abbett, PE, Ecology, marian.abbett@ecy.wa.gov
Ecology Site File

Enclosure A

Site Description and Brief Site History

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Site Description and Brief Site History

The Site is located at 2301 23rd Ave SE, Puyallup, Washington 98372. The Site appears to be contained with Pierce County parcel 0420353027, which is 9.09 acres in size.

Property History and Current Use: The property is currently vacant, and reportedly being prepared for re-development as residences. The Pioneer Museum used to occupy the southern end of the Property before being demolished.

Property Vicinity: The Site is located in east-central Puyallup, an urban area of Pierce County. Surrounding properties are residential.

Soils and Geology: To the maximum depth explored of approximately 22 feet below ground surface (bgs), soils are generally dark gray to brown and comprised of sand with silts and clays.

Groundwater: Site groundwater is estimated at approximately 14-16 feet below ground surface. The facility is located within the 10-year wellhead travel time zone for City of Puyallup supply well #13, AEF202. The supply well is located about 0.9 miles northwest of the Site. The New Haven W System Group A/B wells are closer to the Site, at about 0.5 miles northwest; however, the Site is not located within a wellhead protection zone for this well group.

Surface/Storm Water/Septic Systems/Wetlands: No mapped wetlands are present at the Site, but there is an unpermitted stormwater retention pond. Stormwater at the Site and Property is managed in that unpermitted stormwater retention pond. After development, stormwater management is expected to follow City of Puyallup requirements. The property is expected to be connected to municipal water and sewer upon development.

SHARP: Ecology previously completed a site hazard assessment ranking process (SHARP) analysis as a part of this cleanup. The evaluation concluded that the overall rank of the Site is Low signifying the risk to human health and the environment is not imminent or immediate.

Brief Site History: EAI completed a Phase I Environmental Site Assessment (ESA) in 2005. Recognized environmental conditions (RECs) were:

The Tacoma Pierce County Health Department, on behalf of Ecology, completed an initial investigation on May 10, 2011, under ERTS 620837. Three soil samples collected around drums identified in a burned down horse barn, identified petroleum, metals, and pesticides in soil.

In January and March 2024, Aerotech completed a Phase II ESA at the property. A total of 33 soil borings were sampled and one surface water sample was collected. Analyses varied depending on the area of concern, though the WAC 173-340-900, Table 830-1 sampling requirements were generally met.

In March and April 2025, extensive soil sampling was completed in the horse barn area, drum fire area, and former museum building area. Discrete soil samples were collected in grid patterns adjacent to each concrete pad, where the highest likelihood of contamination would be expected to be found.

Sixteen shallow discrete soil samples were collected in the drum fire area, 54 discrete soil samples in the horse barn area, and 33 discrete soil samples were collected on the south side of the museum building. The depth of sampling ranged up to 12 feet bgs. These soils samples augmented soil sampled previously in these three areas, as well as complimented soil sampling in other areas of the Site (e.g., the stormwater pond). Soil samples were generally analyzed for diesel and heavy oil to screen for results, with several samples also being analyzed for gasoline, BTEX, and “MTCA 5 metals” (arsenic, cadmium, chromium, lead, and mercury). All contaminant concentrations in soil sampled were less than the MTCA cleanup levels. Two samples in the drum fire area, C-04 and D-13, were also analyzed for PFAS. As PFOS was detected in soil, additional soil sampling was performed to evaluate this contamination. Soil sample D-17 was also analyzed for full list VOCs.

In August 2025, Aerotech sampled soils in response to Ecology’s January 10, 2025 further action opinion letter. A total of 14 soil samples (MF-1 through MF-14) and seven additional soil samples for PFAS. The areas of concern addressed by the soil sampling were the burned horse-barn and the former drum areas. Limited detections of PFOS were identified in shallow soils, but at concentrations less than the most stringent MTCA Method B cleanup level for PFOS (MTCA Method B cancer protective of the vadose zone).

Methoxychlor was the only pesticide detected in soil sampled, and the concentration was less than the most stringent MTCA Method B cleanup level.

Lead and arsenic were also analyzed for in soil samples MF-03, MF-04, and MF-06. All concentrations in soil sampled were less than the screening level protective of ecological receptors[21] or the MTCA Method A cleanup levels.

[21] WAC 173-340-900, Table 749-2

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Enclosure B

Documents List

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Documents List

1. Aerotech Environmental Consulting, Inc. (Aerotech), Final Investigation Submittal for Subsurface Soils, January 9, 2026.
2. Aerotech, Limited Targeted Phase II Subsurface Investigation, August 7, 2025.
3. Aerotech, Limited Phase II Targeted Subsurface Investigation, May 22, 2024.
4. Aerotech, Pioneer Museum, Limited Phase I Environmental Site Assessment, May 6, 2024.
5. Tacoma Pierce County Health Department, Initial Investigation Field Report, May 27, 2011.
6. Environmental Associates, Inc. (EAI), Phase I Environmental Audit, January 14, 2005.
7. Atlas, Focused Phase II Subsurface Investigation, May 22, 2019.