State of Washington
POLLUTION LIABILITY INSURANCE AGENCY
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November 7, 2023

Wade Melton - Operations Project Manager
Remediation Management Services Company
4 Centerpointe Drive, Suite 200
La Palma, CA 90623

Re: No Further Action (NFA) at the Following Site:

- **Facility/Site (owner) Name:** ARCO 5300
- **Facility/Site Address:** 710 15th Ave., Longview, WA 98632
- **Technical Assistance Program No.:** PSW113

Dear Wade Melton:

The Washington State Pollution Liability Insurance Agency (PLIA) received your August 18, 2023 Technical Memorandum with request for opinion of the ARCO 5300/PSW113 project located at 710 15th Ave., Longview, WA 98632 (Site).

This letter provides our opinion made under the authority of Chapter 70A.330 RCW and Chapter 374-80 WAC. PLIA appreciates your initiative in pursuing this administrative option for cleaning up a contaminated site under the Model Toxics Control Act (MTCA), Chapter 70A.305 RCW.

Opinion on Cleanup

PLIA has determined that **no further remedial action is necessary** to clean up petroleum contamination at the Site based on analytical data from soil, groundwater and air sampling.

Cleanup levels (CULs) applied to the Site are those that were established by Ecology to meet the substantive requirements of MTCA when used for this type of Site. PLIA has determined **the CULs applied to Site specific conditions meet the substantive requirements of MTCA**.

The concentrations listed as CULs were developed under MTCA to be protective of human health and the environment for current and future property use. **The Site meets the selected CULs for all potential pathways of exposure. Based on this Site condition,**

engineering controls under a restrictive covenant are deemed unnecessary as the CULs used under MTCA for the Site are protective of all potential pathways of exposure.

This opinion is based on the remedial action meeting the substantive requirements of MTCA, Chapter 70A.305 RCW, and its implementing regulations, Chapter 173-340 WAC (collectively "substantive requirements of MTCA"). Our analysis is provided below.

Description of the Site

This opinion applies only to the identified petroleum release at the Site located at 710 15th Ave., Longview, WA 98632 and includes Cowlitz County tax parcel: 02203. This opinion does not apply to any other hazardous substance release(s) that may affect the Property (parcel).

1. Description of the Site:

The Site is defined by the nature and extent of contamination associated with the following release(s):

- Total petroleum hydrocarbons (TPH): TPH-g (gasoline), total lead, 1,2-dibromoethane, and 1,2-dichloroethane into the soil/groundwater/air.
- Volatile organic compounds: benzene, toluene, ethylbenzene and total xylenes (BTEX); and methyl-tertiary-butyl ether (MTBE) into the soil/groundwater/air.

Basis of the Opinion

This opinion is based on the information contained in the following documents:

1. *Request for No Further Action Determination*, Prepared by Antea Group. May 2, 2023.
2. *Technical Memorandum – Supplement to the Request for No Further Action Determination report dated May 2, 2023.* Prepared by Antea Group. August 18, 2023.
3. *Soil Vapor Investigation Report*. Prepared by Antea Group. April 27, 2022. Received April 29, 2022.
4. *Subsurface Investigation Report*. Prepared by Antea Group. November 24, 2021. Received November 24, 2021.

Documents submitted to PLIA are subject to the Public Records Act (Chapter 42.56 RCW). To make a request for public records, please email pliamail@plia.wa.gov.

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

Establishment of Cleanup Standards and Points of Compliance

The CULs for the Site were established in accordance with WAC 173-340-700(5) and WAC 173-340-700(6).

The points of compliance (POCs) for the Site were established in accordance with WAC 173-340-720(8) for groundwater, WAC 173-340-740(6) for soil, and WAC 173-340-750(6) for air.

PLIA has determined the CULs and POCs established for the Site meet the substantive requirements of MTCA. It is presumed that if the cleanup standards under MTCA are met, the Site will be protective of human health and the environment for current and future Property use.

The proposed Method A CULs for groundwater and Method B CULs for soil and air must be met at the standard POCs.

- For **soil**, the CUL is based on direct contact and is set "*…throughout the site from the ground surface to fifteen feet below the ground surface.*" This is in compliance with WAC 173-340-740(6)(d) and represents a reasonable estimate of the depth of soil that could be excavated and distributed at the soil surface as a result of Site development activities.

- For **groundwater**, the standard POC as established under WAC 173-340-720(8) 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.*"

- For the **air** pathway, the CULs established must be attained in the ambient air throughout the Site, including indoor air within the lateral and vertical inclusion zone (WAC 173-340-750[6]).

An empirical demonstration was performed (pursuant to MTCA) with Site-specific data to show that the highest measured soil concentrations remaining will not cause any exceedances of the applicable groundwater CULs established under WAC 173-340-720.

Using this method, CULs used considered the measured or predicted ability of the fractions to migrate from one medium to other media. Method B CULs for TPH were determined using the fractionated analytical approach for petroleum as described in the Department of Ecology's Analytical Methods for Petroleum Hydrocarbons, publication number 97-602, dated June 1997. **The generic Method B soil CULs also were evaluated using Site-specific data and conditions to determine the measured or predicted ability of the hydrocarbon fractions to migrate from one medium to other media (soil to groundwater through leaching).**

For soil contamination, the direct contact and leaching pathways were considered potential exposure pathways. **However, the Site does meet the selected CULs for all potential pathways. Based on this Site condition, engineering controls under a restrictive covenant are deemed unnecessary as the CULs used under MTCA for the Site are protective of the soil direct contact and groundwater leaching pathways.**

Analysis of the Cleanup

PLIA has concluded that **no further remedial action** is necessary at the Site. Our conclusion is based on the analysis and data discussed herein.

According to the Model Remedies for Sites with Petroleum Impacts to Groundwater (Washington State Department of Ecology Publication No. 16-09-057, revised December 2017), **the Site qualifies for a No Further Action (NFA) determination using Model Remedy #5.** This conclusion is based on the fact that **all groundwater monitoring wells associated with the Site currently meet the MTCA Method A CUL standard** (defined as two quarters of results below laboratory detection limits or four quarters of results above laboratory detection limits but below MTCA Method A CULs). **Use of the model remedy with the associated groundwater data precludes the necessity of developing a feasibility study and a disproportionate cost analysis of cleanup options.**

All remaining soil on the Site with any impacts to petroleum hydrocarbons **are below MTCA Method B CULs for each individual corresponding contaminant compound (TPH-g constituents). These Site conditions provide empirical demonstration that the residual TPH-g contamination in soil is, in effect, low enough to be protective of groundwater, pursuant to the MTCA Method B values for each of the individual contaminant constituents of TPH-g (BTEX).**

In addition, as the soil vapor pathway has been assessed and determined to be incomplete; an environmental covenant is not necessary to support this NFA determination. Soil Analytical Table comparing historical results to the **generic Method B CUL** for TPH and Ecology's Cleanup Level and Risk Calculations (CLARC) has been included as Appendix - A Table X.

Cleanup of the Site:

In December 2009, ARCO subcontracted dispenser upgrade activities. The upgrade activities included the installation of four new dispensers with under dispenser containment (UDC) vaults, installation of new product distribution piping and vapor lines. On December 3, 2009, the contractor collected compliance soil samples during the upgrade activities.

Field screening indicated a photoionization detector (PID) reading of 1,004 parts per million (ppm) in the soil sample (NW-Disp-W) collected beneath the northwest

dispenser. Over-excavation activities were conducted at this sample location, and the area was excavated to a depth of approximately 8' below ground surface (bgs).

Confirmatory soil sample NW-Disp-8 was collected from the bottom of the excavation. A total of 16 soil samples were collected and submitted to Test America in Tacoma, Washington for quantitative chemical analysis. Laboratory analytical results indicated petroleum hydrocarbon concentrations in excess of the MTCA Method A CULs in confirmation soil sample NW-Disp-W and the confirmatory soil sample collected from the over-excavation activities indicated the concentration for TPH-g was detected slightly above MTCA Method A CUL of 30 milligrams per kilograms (mg/kg) (results - 36 mg/kg). MTCA Method B values for each of the individual contaminant constituents of TPH-g in soil (BTEX) was less than the MTCA Method B CUL (commercial values).

A summary of previous assessments and remedial activities are described below. Historical soil data, historical groundwater elevation data, historical groundwater analytical data, and historical soil vapor data are summarized on Tables 1 through Table 4 respectively of Antea's May 2, 2023, *Request for No Further Action Determination* Report. A Site map detailing historical soil sampling locations is presented as Enclosure A - Figure 2.

The following cleanup actions have been performed at the Site:

i. Soil:

Historic soil sample laboratory results from the Site indicated a limited and defined area of soil contamination concentrations that was **above MTCA Method A CUL for TPH-g and below the Method B CUL.** Soil contamination is within the Property boundary and capped by asphalt and concrete (Figure 2 of Enclosure A).

On behalf of ARCO, Belshire Environmental Services, Inc. (Belshire) of Foothills Ranch, California coordinated the transportation and disposal of 9.19 tons of soils from the upgrade and over-excavation activities to Cemex in Everett, Washington.

- Remedial actions taken at the Site consisted of the excavation and disposal of approximately 9.19 tons of petroleum contaminated soil (PCS).
- Confirmation samples demonstrate that all known PCS, above the applicable CULs, was removed from the Site.
- Groundwater was not encountered during Site characterization or remedial action.
- Soil sampling results are listed in Figure 2 of Enclosure A.

Historic soil data (December/2009) from beneath the leaking northwest dispenser had the chemical characteristics of an "aged" release, with the most volatile contaminants having concentrations below MTCA Method A. The highest concentrations in soil beneath the northwest dispenser were in the soil sample collected at 3.5' bgs. This sample had no detections of MTBE (high relative volatility) and low benzene concentrations in relation to the TPH-g detection.

This indicates adequate time has passed since the release that the most volatile and, correspondingly, the highest risk-related (cancer risk) compounds (MTBE and BTEX) had already gone through volatilization into the upper vadose zone and atmosphere.

The area represented by this sample was then removed by excavation in an effort to remediate the contaminated soil in the area of the NW dispenser. The confirmation soil sample collected after excavation of this same area indicated the **MTBE and BTEX compounds were not present at concentrations above Method A CULs.** The **only detections in the excavation confirmation sample was a TPH-g concentration of 36 mg/kg vs. the most stringent MTCA Method A CUL of 30 mg/kg.** If benzene is detected, 100 mg/kg is used as the CUL. Benzene was not detected above MTCA Method A (30 mg/kg) in any other soil samples. Two other sample locations in this area had detections of TPH-g above Method A CULs and below Method B CULs. **No BTEX compounds were detected at any of these locations.**

The only detections in soil above Method A CULs was TPH-g. These concentrations were below generic Method A CULs. The CLARC *Method B Direct Contact for Cancer* Values has no concentration listed for TPH-g detections, only its constituent compounds (i.e, BTEX, MTBE and lead).

A sufficient amount of time has also elapsed for the potential leaching of residual petroleum substances from the known impacted soil into groundwater to occur. The characteristics of the Site (e.g., depth to groundwater, depth to soil impacts and relatively low infiltration rates in Site soil) are representative of both the current and future Site conditions.

These conditions, in conjunction with the lack of detections of Site contaminants of concern (COCs) in groundwater, demonstrate the attenuating capacity of soil between the remaining soil source of the hazardous substance and the groundwater is sufficient to be protective of groundwater, using site-specific data under MTCA Method B soil values that are considered by Ecology to be protective of groundwater.

These conditions also demonstrate low-to-no risks exist for the remaining, degraded contaminated soil to now leach any remaining contaminants to groundwater, even if infiltration of precipitation were greater than current conditions. Therefore,

engineering controls under a restrictive covenant are not necessary to protect groundwater. The surface is currently paved for traffic, as it is an active commercial store and fuel station. No changes are planned to change the Site use; it is zoned for commercial usage and planned to remain as such.

PLIA has determined that the cleanup action(s) performed meet(s) the cleanup standards that are applicable for the Site. Based on this, no engineering controls are required through the use of an environmental covenant.

Result: **The data indicate there is no longer an unacceptable risk presented by either the soil direct contact exposure or the groundwater leaching pathway at the Site.** The remedial action(s) removed the potential for PCS above CULs to come into contact with human or ecological receptors.

ii. Groundwater:

Groundwater flow at the Site is to the southwest. Groundwater contamination slightly above MTCA Method A CULs was detected at MW-10 and MW-11 in August 2021. These wells were installed on the west (downgradient) side of the Site, per PLIA's requirement to have downgradient wells that define the extent of groundwater contamination in this direction (downgradient).

Regional well logs indicate the groundwater depth varies greatly in the area. Well logs indicate groundwater at both 7' and 14' bgs within the vicinity of the Site. Routine groundwater monitoring and sampling events have been conducted since September 2012 at the Site. Up until the 2019 PetroFix™ injection event, concentrations of TPH-g in excess of the MTCA Method A CUL had consistently been detected only in groundwater samples collected from MW-4. Following the PetroFix™ injection event, TPH-g was not detected in samples collected at MW-4 (10/28/2019, 1/6/2020, 3/18/2020, 6/18/2020, 9/1/2020, and 12/2/20) in excess of MTCA Method A CULs or laboratory Method Reporting Limits (MRLs).

Recent groundwater data, in conjunction with both historic and decreasing groundwater trends and with soil data collected throughout the Site to date, strongly suggest the on-Site groundwater contaminant plume has effectively attenuated and has continued to attenuate after the following remedial actions:

- August 2018 - Antea Group personnel completed two hydrogen peroxide injection events. Over the course of three days, a total of 670 gallons of hydrogen peroxide was injected into wells IW-1 through IW-4 (approval from Ecology's Underground Injection Control [UIC] program was obtained). However, due to the minimal flow rates, the hydrogen peroxide pilot study was suspended indefinitely.

- September 2019 - Antea Group personnel completed a PetroFix™ amendment injection event. The objective of the injection was to remediate low level concentrations of TPH-g in groundwater in MW-4 (approval from Ecology's UIC program was obtained). Approximately 400 pounds of PetroFix™ solution was mixed with approximately 1,310 gallons of potable water and injected into six injection points on the west side of the Site. Approximately 218 gallons of PetroFix™ solution was injected into each point between 10' to 20' bgs.

- Post-injection groundwater monitoring events clearly demonstrated the PetroFix™ injections were successful in remediating concentrations of TPH-g within the area of MW-4 to below MTCA Method A CULs. Following PetroFix™ injections, four consecutive quarters of groundwater concentrations below MTCA Method A CULs were achieved in this well.

- Since that remedial action, the Site groundwater contaminant plume **has showed marked decreases in concentrations measured in wells throughout the Site,** with minor expected, seasonal fluctuations during the monitoring period.

- **Groundwater analytical data from monitoring wells MW-13 and MW-14, groundwater contamination has been adequately delineated, and no additional monitoring wells or groundwater data collection points will need to be installed at the Site.**

- **Groundwater data from the current PLIA-approved monitoring well network continues to indicate MTCA compliance.**

- **Groundwater has continued to demonstrate compliance with MTCA**. The most recent results together with existing data provides a sufficient dataset (4 quarters of data <CULs) to complete the remedial investigation (RI) for groundwater.

- Currently, the PLIA-approved RI monitoring well network consists of two "key" downgradient wells (MW-10 and MW-11) near the western property boundary. **These wells consistently have indicated compliance, with no exceedances of Site COCs above CULs. The off-Site downgradient well (MW-5) has been sampled multiple times and has never exceeded MTCA standards. Additional MW-5 data is not required at this time.**

- The dataset acquired to date demonstrates the downgradient extent of groundwater contamination has been delineated, as discussed below.

- **These Site conditions demonstrate a determination of NFA is warranted for the Site.**

Currently, the PLIA-approved RI monitoring well network consists of the two "key" downgradient wells (MW-10 and MW-11) near the western property boundary. These wells consistently have indicated compliance, with no exceedances of Site COCs above CULs. The off-Site downgradient well (MW-5) has been sampled multiple times and has never exceeded MTCA standards. Additional MW-5 data is not required at this time.

Since fall of 2019, dissolved-phase contaminants of concern (COCs) concentrations on the Site have fluctuated within a range that suggests these increases/decreases in concentrations of TPH-g (without benzene) are attributable to seasonal variations that occur and affect the shallow water bearing zone (WBZ) beneath the Site.

This plume "behavior" suggests that natural attenuation rates are currently steady and this indicates (an obviously) minor amount of remaining contaminant mass available to partition to groundwater. This is based on the low concentrations of TPH-g detected (without benzene) in the current PLIA-approved monitoring well network that consists of RI downgradient, on-Site wells MW-10 and MW-11.

The overall Site dataset (off-Site and on-Site) indicates that the outer boundary of the groundwater contaminant plume has not advanced off the Site and is not currently off the Property (into the downgradient area of the 15th Ave./Tennant Way intersection right-of-way [ROW]). Conversely, the groundwater plume has attenuated, based on regular groundwater monitoring.

PLIA has required ongoing monitoring of downgradient wells (MW-10 and MW-11) near the western property boundary. Downgradient key wells MW-10 and MW-11 initially contained concentrations of TPH-g above the MTCA Method A CUL. However, this single exceedance at each location could possibly be attributed to well development procedures that were not sufficient to provide data representative of actual chemical conditions within the aquifer. Figure 4 of Antea's *Request for No Further Action* report presents analytical results from sampling events completed to achieve the MTCA standard at each well location. Groundwater analytical data reported from samples collected at monitoring wells associated with the Site is summarized in Table 3 of Antea's *Request for No Further Action* report.

Use of the non-benzene TPH-g concentration of 100 mg/kg for these wells, is also arguably appropriate, as benzene has never been detected in either of these wells, though it was detected within the former source area of the Site in historic groundwater data. However, throughout the monitoring period for these downgradient wells, **the dataset consistency indicates a lack of any unacceptable risk to potential off-Site receptors due to groundwater conditions. TPH-g concentrations have been within compliance of MTCA for four consecutive quarters of monitoring for both of these downgradient wells. This indicates that Site conditions are not such that soil to groundwater**

contaminant leaching is occurring.

The historic and current downgradient extent of contamination has been delineated. The plume does not extend off-Site. All groundwater monitoring wells associated with the Site meet the MTCA standard (defined as two quarters of results below laboratory detection limits or four quarters of results above laboratory detection limits but below MTCA Method A CULs). Data from the current PLIA-approved monitoring well network continued to indicate MTCA compliance.

As such, PLIA will not require installing any additional downgradient wells due to a sufficient dataset that meets MTCA compliance and demonstrates no contamination is migrating toward potential receptors. Data collected from the Site demonstrates MTCA compliance and the groundwater pathway does not pose an unacceptable risk to potential receptors. Therefore, the groundwater pathway is incomplete.

Result: The data indicate there is no longer an unacceptable risk presented by the groundwater exposure pathway at this Site. The remedial action removed the potential for PCS above CULs to come into contact with, and leach into, groundwater at the Site.

iii. Air (Soil or Groundwater to Vapor):

One soil vapor point (SV-1) was also installed in July of 2021. On September 2, 2021, and March 9, 2022, Antea Group collected soil vapor samples from SV-1. Laboratory analytical results and sampling details from the September 2, 2021, sampling event were reported to PLIA within Antea Group's *Subsurface Investigation Report* dated November 24, 2021. Details and results from the March 9, 2022, sampling event were reported to PLIA within Antea Group's *Soil Vapor Investigation Report* dated April 29, 2022. The investigation concluded that the two soil vapor sampling events were conducted appropriately, and that all laboratory reported detections of analytes were at concentrations below MTCA Method B sub-slab or deep soil gas screening levels. PLIA subsequently agreed with this conclusion in an Opinion Letter dated June 14, 2022

Sub-Slab soil vapor sampling events in September 2021 and March 2022 showed concentration of COCs below MTCA Method B sub-slab CULs. The two sampling events accounted for seasonal variability at the Site. After groundwater monitoring was completed (4th quarter 2022), a determination was made regarding any additional vapor sampling that may be required.

The 4th quarter groundwater monitoring of the current RI wells (MW-10 and MW-11) has generated groundwater data that indicates groundwater conditions are such, that, additional vapor monitoring is not warranted**. Groundwater monitoring data (collected in 4th quarter of 2023) does not warrant additional or long-**

term vapor monitoring under an environmental covenant. This aligns with soil data results and with the **September 2021 and March 2022 sub-slab data that showed concentration of COCs were below MTCA Method B CULs.**

Result: The data indicate there is no longer an unacceptable risk presented by the soil or groundwater to vapor exposure pathway(s) at this Site. The remedial action removed the potential for vapors from PCS or petroleum contaminated groundwater (PCGW) to enter nearby commercial or residential structures.

iv. Surface Water:

- Not applicable for the Site. The nearest surface water, Lake Washington, is approximately 480' southeast of the Site.

A Simplified Terrestrial Ecological Evaluation was submitted on August 18, 2023 by Antea Group on behalf of Remediation Management Services Company (RMSC, an affiliate of BP) in a Technical Memorandum to supplement the *Request for No Further Action Determination* report dated May 2, 2023.

Result: The surface water exposure pathway did not exist at this Site. This means that, based on current data, petroleum contamination has not spread to surface water.

Limitations of the Opinion

1. Opinion does not settle liability with the state.

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

- Change the boundaries of the Site.
- 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 the Office of the Attorney General and the Department of Ecology under RCW 70A.305.040(4).

2. Opinion does not constitute a determination of substantial equivalence.

To recover remedial action costs from other liable persons under the 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 equivalent. Courts make that determination (RCW 70A.305.080 and WAC 173-340-545).

3. State is immune from liability.

The state, PLIA, 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.

Termination of Agreement

This opinion terminates the Technical Assistance Program (TAP) agreement for Project No. PSW113.

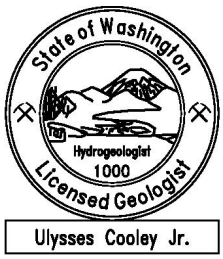
Contact Information

Thank you for choosing to clean up your Site under PLIA's TAP. If you have any questions about this opinion, please contact me by phone at 1-800-822-3905, or by email at pliamail@plia.wa.gov.

Sincerely,

DocuSigned by:
Ulysses Cooley Jr.
569D5AC8B883494...

Ulysses Cooley, LG, LHG
Lead Hydrogeologist



Enclosure A: Figure 1: Aerial Site Map
Figure 2: Sample Locations with Soil Detections < Method B CULs
Figure 3: Groundwater Flow Direction with Historic Detections of COCs
Figure 4: Historic Groundwater Detections (MW-10 & MW-11)

Table 1: Soil Data Compared to MTCA Cleanup Levels
Table 2: Soil Residual Saturation Screening Level Values

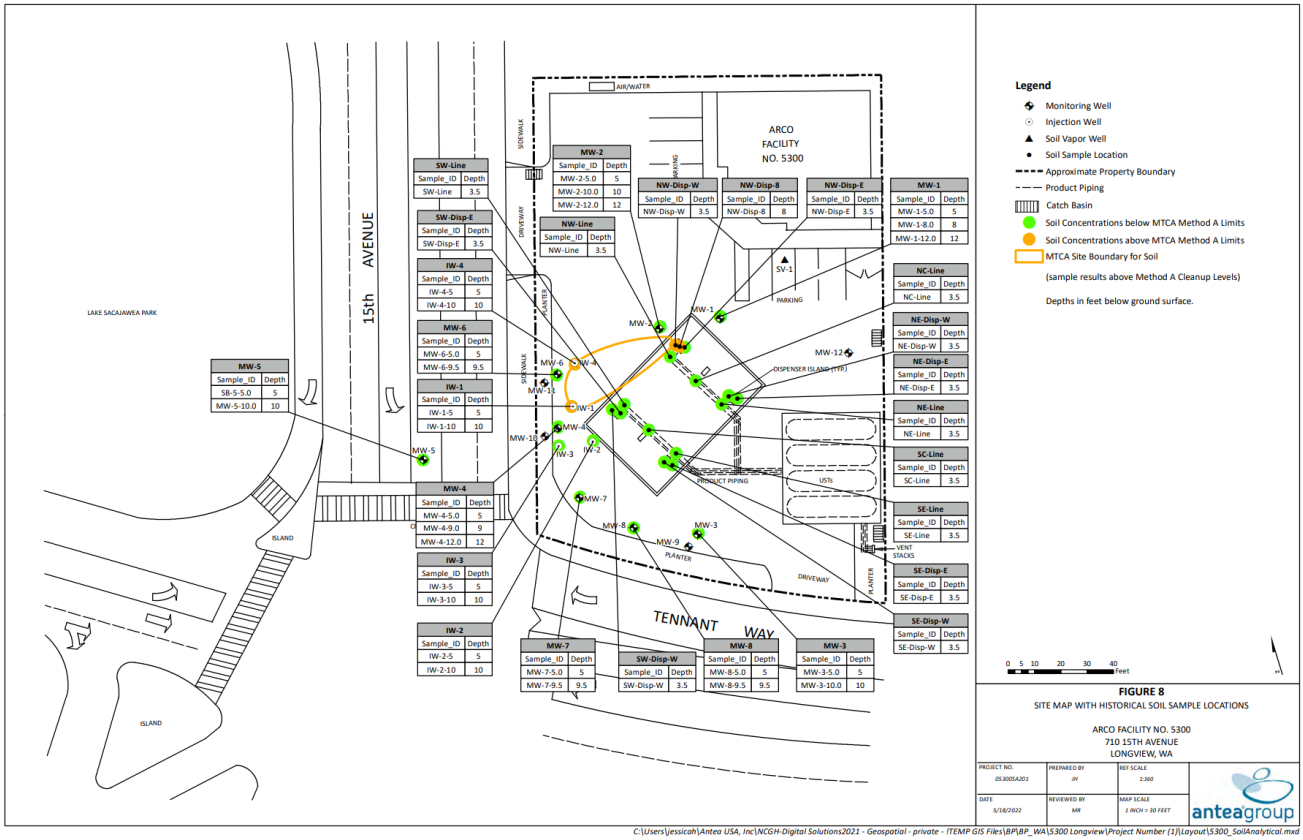
Enclosure A:

TAP Project No. PSW113
710 15th Ave., Longview, WA 98632

Figure 1: Aerial Site Map

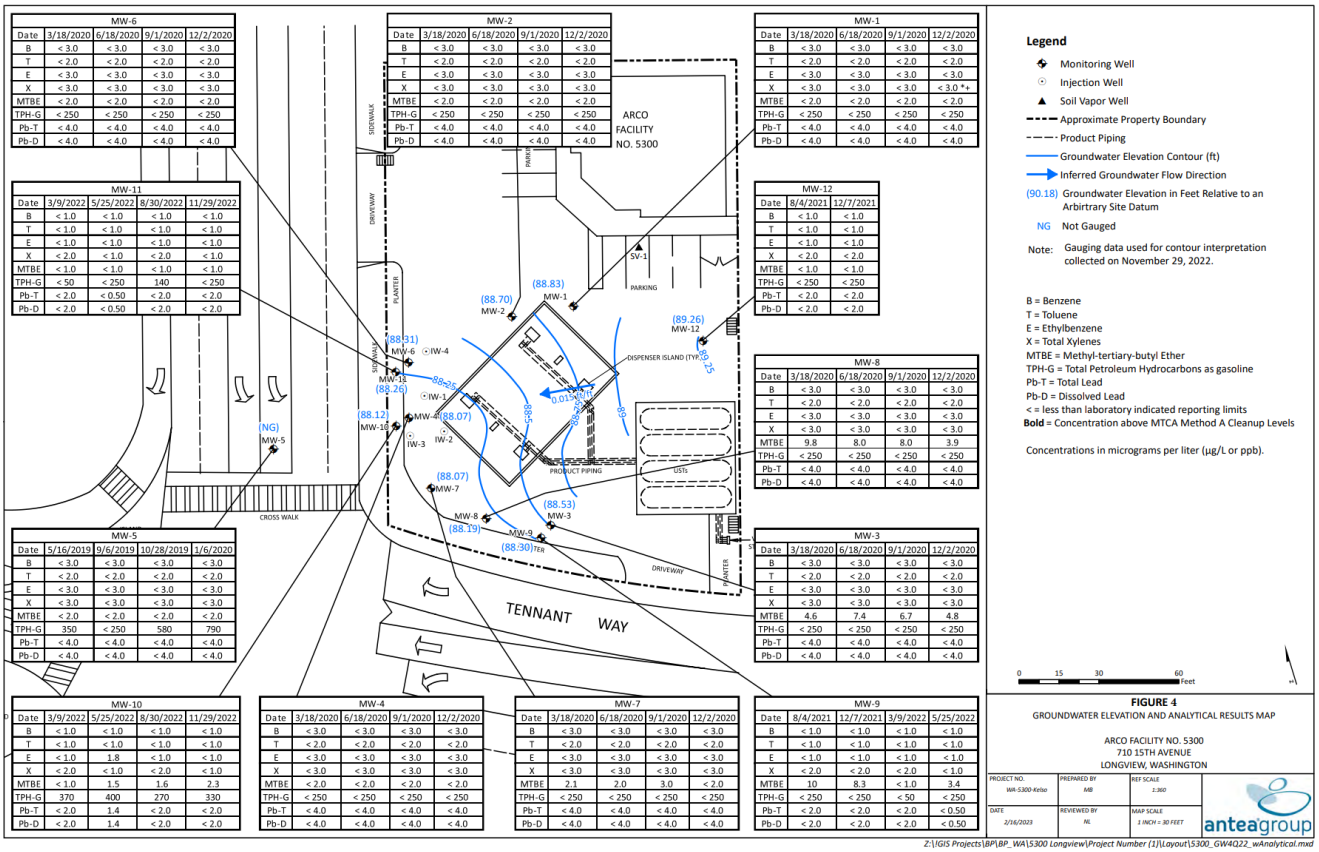
Source: ***Technical Memorandum – Supplement to the Request for No Further Action Determination*** **report dated May 2, 2023. Prepared by Antea Group August 18, 2023.**

Figure 2: Sample Locations with Soil Detections < Method B CULs



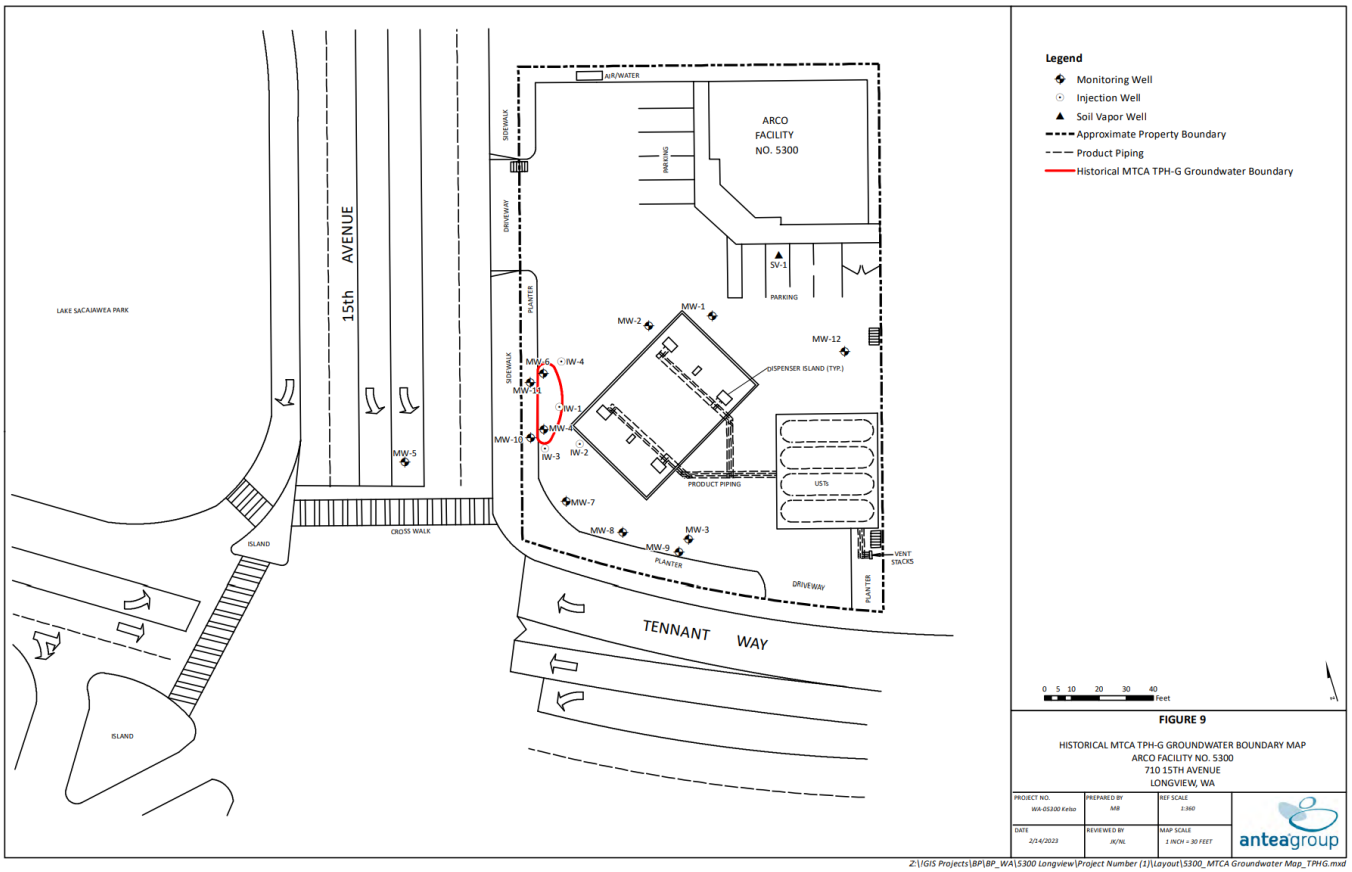
Source: ***Technical Memorandum – Supplement to the Request for No Further Action Determination*** **report dated May 2, 2023. Prepared by Antea Group August 18, 2023.**

Figure 3: Groundwater Flow Direction with Historic Detections of COCs



Source: ***Technical Memorandum – Supplement to the Request for No Further Action Determination*** **report dated May 2, 2023. Prepared by Antea Group August 18, 2023.**

Figure 4: Historic Groundwater Detections (MW-10 & MW-11)



Source: ***Technical Memorandum – Supplement to the Request for No Further Action Determination*** **report dated May 2, 2023. Prepared by Antea Group August 18, 2023.**

Table 1: Soil Data Compared to MTCA Cleanup Levels

Table 1 (Revised)
Soil Analytical Data
ARCO Facility No. 5300
710 15th Avenue, Longview, Washington

		CONSTITUENT	B	T	E	X	MTBE	EDB	EDC	TPH-G	Total Lead
		UNIT	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
MTCA METHOD A Cleanup Level			0.03	7	6	9	0.1	0.005	--	30	250
MTCA METHOD B Cleanup Level			18	6,400	8,000	16,000	560	0.5	11	1,500	--
Sample ID	Date	Depth									
NC-Line	12/3/2009	3.5	<0.011	<3.3	<3.3	<4.4	<0.0011	<0.0011	<0.0011	<5.9	3.5
NE-Disp-E	12/3/2009	3.5	<0.011	<3.4	<3.4	<4.5	<0.0011	<0.0011	<0.0011	<5.1	3.8
NE-Disp-W	12/3/2009	3.5	<0.011	<3.2	<3.2	<4.2	<0.0011	<0.0011	<0.0011	<6.1	3.3
NE-Line	12/3/2009	3.5	<0.011	<3.2	<3.2	<4.3	<0.0011	<0.0011	<0.0011	<5.6	3.3
NW-Disp-E	12/3/2009	3.5	<0.012	<3.7	<3.7	<5.0	<0.0012	<0.0012	<0.0012	<6.8	3.1
NW-Disp-W **	12/3/2009	3.5	**2.9**	**550**	**840**	**1200**	<0.60	<0.60	<0.60	**21000**	4.7
NW-Disp-8	12/3/2009	8	<0.013	<4.0	<4.0	<5.3	<0.0013	<0.0013	<0.0013	**36**	4.4
NW-Line	12/3/2009	3.5	<0.011	>3.3	<3.3	<4.4	<0.0011	<0.0011	<0.0011	<4.8	4.4
SC-Line	12/3/2009	3.5	<0.011	<3.4	<3.4	<4.5	<0.0011	<0.0011	<0.0011	<5.8	3.3
SE-Disp-E	12/3/2009	3.5	<0.011	<3.3	<3.3	<4.5	<0.0011	<0.0011	<0.0011	<5.5	32
SE-Disp-W	12/3/2009	3.5	<0.011	<3.4	<3.4	<4.5	<0.0011	<0.0011	<0.0011	<6.1	3.2
SE-Line	12/3/2009	3.5	<0.012	<3.6	<3.6	<4.8	<0.0012	<0.0012	<0.0012	<5.9	3.2
SW-Disp-E	12/3/2009	3.5	<0.011	<3.3	<3.3	<4.4	<0.0011	<0.0011	<0.0011	<5.2	5.1
SW-Disp-W	12/3/2009	3.5	<0.011	<3.3	<33	<4.5	<0.0011	<0.0011	<0.0011	<5.4	6.4
SW-Line	12/3/2009	3.5	<0.012	<3.5	<3.5	<4.7	<0.0012	<0.0012	<0.0012	<5.0	14
SP-1	12/3/2009	NA	0.019	29	23	43	<0.0011	<0.0011	<0.0011	**730**	4.9
MW-1-5.0	8/2/2012	5	<0.0036	<0.0036	<0.0036	<0.011	<0.0036	--	--	<7.7	3.5
MW-1-8.0	8/2/2012	8	<0.0035	<0.0035	<0.0035	<0.011	<0.0035	--	--	<7.9	5.2
MW-1-12.0	8/2/2012	12	<0.0036	<0.0036	<0.0036	<0.011	<0.0036	--	--	<8.2	3.6
MW-2-5.0	8/2/2012	5	<0.0039	<0.0039	<0.0039	<0.012	<0.0039	--	--	<7.5	3.9
MW-2-10.0	8/2/2012	10	<0.0041	<0.0041	<0.0041	<0.012	<0.0041	--	--	<9.0	4.4
MW-2-12.0	8/2/2012	12	<0.0035	<0.0035	<0.0035	<0.011	<0.0035	--	--	<7.2	2.5
MW-3-5.0	8/2/2012	5	<0.0038	<0.0038	<0.0038	<0.011	<0.0038	--	--	<8.3	2.9
MW-3-10.0	8/2/2012	10	<0.0036	<0.0036	<0.0036	<0.011	<0.0036	--	--	<8.2	5.3
MW-4-5.0	8/3/2012	5	<0.0034	<0.0034	<0.0034	<0.010	<0.0034	--	--	<6.8	4.1
MW-4-9.0	8/3/2012	9	<0.0038	<0.0038	<0.0038	<0.011	<0.0038	--	--	<8.5	5.0
MW-4-12.0	8/3/2012	12	<0.0033	<0.0033	0.0079	<0.010	<0.0033	--	--	<7.2	4.8
SB-5-5.0	8/14/2013	5	<0.0054	<0.0054	<0.0054	<0.011	<0.0054	<0.00011	<0.0054	<6.7	3.54
MW-5-10.0	3/28/2016	10	<0.021	<0.052	<0.052	<0.312	<0.052	--	--	<5.2	5.0

Source: ***Technical Memorandum – Supplement to the Request for No Further Action Determination*** **report dated May 2, 2023. Prepared by Antea Group August 18, 2023.**

Table 1 (cont'd): Soil Data Compared to MTCA Cleanup Levels

Table 1 (Revised)
Soil Analytical Data
ARCO Facility No. 5300
710 15th Avenue, Longview, Washington

CONSTITUENT			B	T	E	X	MTBE	EDB	EDC	TPH-G	Total Lead
UNIT			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
MTCA METHOD A Cleanup Level			0.03	7	6	9	0.1	0.005	--	30	250
MTCA METHOD B Cleanup Level			18	6,400	8,000	16,000	560	0.5	11	1,500	--
Sample ID	Date	Depth									
MW-6-5.0	8/15/2013	5	<0.0061	0.0088	<0.0061	<0.012	<0.0061	<0.00012	<0.0061	<8.5	6.07
MW-6-9.5	8/15/2013	9.5	<0.0063	0.0064	<0.0063	<0.013	<0.0063	<0.00012	<0.0063	<9.2	4.82
MW-7-5.0	8/15/2013	5	<0.0054	0.0087	<0.0054	<0.011	<0.0054	<0.00011	<0.0054	<7.3	3.61
MW-7-9.5	8/15/2013	9.5	<0.0065	<0.0065	<0.0065	<0.013	<0.0065	<0.00013	<0.0065	<7.6	4.25
MW-8-5.0	8/15/2013	5	<0.0061	0.0081	<0.0061	<0.012	<0.0061	<0.00012	<0.0061	<9.4	3.23
MW-8-9.5	8/15/2013	9.5	<0.0063	<0.0063	<0.0063	<0.013	<0.0063	<0.00012	<0.0063	<8.6	4.33
IW-1-5	3/28/2016	5	<0.019	<0.048	<0.048	<0.288	<0.048	--	--	<4.8	8.6
IW-1-10	3/29/2016	10	<0.019	<0.046	3.1	5.6	<0.046	--	--	**320**	5.1
IW-2-5	3/28/2016	5	<0.022	<0.055	<0.055	<0.325	<0.055	--	--	<5.5	4.4
IW-2-10	3/29/2016	10	<0.022	<0.056	<0.056	<0.336	<0.056	--	--	<5.6	4.9
IW-3-5	3/29/2016	5	<0.021	<0.052	<0.052	<0.312	<0.052	--	--	<5.2	3.8
IW-3-10	3/29/2016	10	<0.023	<0.059	<0.059	<0.349	<0.059	--	--	<5.9	4.2
IW-4-5	3/28/2016	5	<0.019	<0.048	<0.048	<0.288	<0.048	--	--	<4.8	7.5
IW-4-10	3/29/2016	10	<0.020	<0.051	<0.051	<0.311	<0.051	--	--	**420**	3.8

Notes:
B = Benzene
T = Toluene
E = Ethylbenzene
X = Xylenes, Total
MTBE = Methyl-tertiary-butyl ether
TPH-G = Total petroleum hydrocarbons as gasoline by Northwest Method NWTPH-Gx
mg/kg = Milligrams per killogram
NE = Not evaluated
-- = No value given/Not analyzed/Not applicable
MTCA = Model Toxics Control Act
Results in **bold** indicate concentrations in excess of MTCA Method A Cleanup Levels
* = RPD of the LCS and LCSD exceeds the control limits
**= sample location overexcavated

Source: ***Technical Memorandum – Supplement to the Request for No Further Action Determination*** **report dated May 2, 2023. Prepared by Antea Group August 18, 2023.**

Table 2: Soil Residual Saturation Screening Level Values

Step 7. Adjust the median soil concentration for residual saturation.

For the site as a whole or each sector with similar product types, compare the median TPH soil cleanup level to the residual saturation maximum allowed screening concentrations in Table 8.8.

Table 8.8 TPH Residual Saturation Screening Levels	
Petroleum Product	**Screening Level (mg/kg)**
Weathered Gasoline	1,000
Middle Distillates	2,000
Heavy Oils	2,000
Mineral Oil	4,000
Unknown Composition	1,000
Source: Table 747-5 in WAC 173-340-900	

Table 8.8 TPH residual saturation screening levels.

This comparison should be made to the appropriate product type present at the site or sector of the site. ***If the median soil cleanup level exceeds these screening concentrations, the median cleanup level must be adjusted downward to the screening concentration or site-specific data must be presented demonstrating that higher concentrations will be protective of the groundwater.***

Source: *User's Manual: Natural Attenuation Analysis Tool Package for Petroleum-Contaminated Ground Water,* Washington State Department of Ecology Toxics Cleanup Program July 2005 Publication No. 05-09-091A (Version 1.0) (User's Manual).