STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 47600 • Olympia, WA 98504-7600 • 360-407-6000
711 for Washington Relay Service • Persons with a speech disability can call 877-833-6341

August 17, 2012

Mr. Alexander Lopez III
Arcadis U.S., Inc.
111 Southwest Columbia Street, Suite 725
Portland, Oregon 97201-5856

Re: Further Action at the following Site:

- **Site Name:** ARCO 6008 (aka KT Kanso AM/PM)
- **Site Address:** 212 Fifteenth Street, Washougal, Washington 98671
- **Facility/Site No.:** 46212644
- **Cleanup Site ID:** 9311
- **VCP Project No.:** 1182

Dear Mr. Lopez:

The Washington State Department of Ecology (Ecology) received your request for an opinion on your independent cleanup of the ARCO 6008 facility (Site). This letter provides our opinion. We are providing this opinion under the authority of the Model Toxics Control Act (MTCA), Chapter 70.105D RCW.

Issue Presented and Opinion

Is further remedial action necessary to clean up contamination at the Site?

YES. Ecology has determined that further remedial action is necessary to clean up contamination at the Site.

This opinion is based on an analysis of whether the remedial action meets the substantive requirements of MTCA, Chapter 70.105D RCW, and its implementing regulations, Chapter 173-340 WAC (collectively "substantive requirements of MTCA"). The analysis is provided below.

Description of the Site

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:

- Total petroleum hydrocarbons (TPH) in the gasoline-range (TPH-G) into the Soil and Groundwater.
- TPH in the diesel-range (TPH-D) and TPH in the heavy oil range (TPH-O) into the Groundwater.
- TPH-D into the Soil.
- Volatile Organic Compounds (VOCs) into the Soil and Groundwater.

Enclosure A includes a detailed description and diagram of the Site, as currently known to Ecology.

Please note 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.

Basis for the Opinion

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

1. ARCADIS U. S., Inc. (ARCADIS), **Closure Report, BP Facility No. 6008,** dated June 30, 2011.

2. ARCADIS, **Site Assessment Work Plan, ARCO Facility No. 6008,** dated July 26, 2010.

3. Delta Environmental Consultants, Inc. (Delta), **Environmental Oversight during Retail Facility Upgrade Activities,** dated October 25, 2007.

4. Sweet-Edwards/EMCON, Inc. (SE/E), **UST Decommissioning and Vapor Treatment Gallery Construction: ARCO Service Station 6008, Washougal, Washington,** dated September 10, 1991.

Those documents are kept in the Central Files of the Southwest Regional Office of Ecology (SWRO) for review by appointment only. You can make an appointment by calling the SWRO resource contact at (360) 407-6365.

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

Analysis of the Cleanup

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.

Ecology has determined your characterization of the Site is not sufficient to establish cleanup standards and select a cleanup action. The Site is described above and in **Enclosure A.**

The Site is located at 212 Fifteenth Street, Washougal, Washington. The Site is operated as a convenience store and retail automotive refueling station. The business currently operates four 10,000-gallon fiberglass gasoline and diesel underground storage tanks (USTs) at the Site.

In January 1990, SE/E decommissioned and removed from the Site four USTs: two 6,000-gallon and two 4,000-gallon steel USTs. SE/E observed one of the 4,000 USTs (Tank 2) to have a small hole in the UST sidewall (no soil sample was collected from below this location). SE/E collected eight soil samples from the former UST excavation and analyzed them for TPH-G, TPH-D, and benzene, toluene, ethylbenzene, and total xylenes (BTEX) (see Figure 2 and Table 3). These samples, collected in February 1990, appeared to have been confirmation samples as the laboratory analytical results indicated no constituents of concern (COCs) were above their applicable MTCA Method A Soil Cleanup Levels (CULs) for unrestricted land uses. Excavated soil stockpile samples, however, did indicate concentrations of TPH-G at 1,670 milligrams per kilogram (mg/kg) and BTEX at less than 0.1 mg/kg, 6,690 mg/kg, 4,250 mg/kg, and 195,000 mg/kg, respectively (see Table 3). The MTCA Method A CUL for TPH-G is 30 mg/kg and for BTEX are 0.03 mg/kg, 7 mg/kg, 6 mg/kg and 9 mg/kg, respectively. SE/E reported a leaking underground storage tank (LUST) in January 1990 (LUST number 1266). SE/E treated the petroleum-contaminated soil (PCS) from the UST excavation and dispenser islands in an on-Site treatment gallery using a soil vapor extraction (SVE) system.

Starting in January 1994, the SVE system operated for eight months. SE/E also analyzed soil confirmation samples collected from the treatment gallery in January 1994 for lead in addition to the above-mentioned COCs. Analytical results indicated none of the COCs were above their applicable MTCA Method A CULs. In June 1995, Ecology changed the Site status to "Reported Clean Up".

In 1998, Pinnacle Environmental Solutions oversaw upgrades to the fuel delivery system. They collected two soil samples from just below the pavement-soil interface, Sample-1 and Sample-2, from the westernmost fuel dispenser island. Analytical results indicated PCS above the applicable MTCA CULs was present in both samples. Ecology's review of the submitted information did not indicate that the PCS had been excavated or treated.

In April 2007, Delta completed facility upgrades to the fuel dispenser pumps. Delta collected soil samples from beneath the dispenser pumps at six locations. Analytical results from both westernmost dispenser island sample locations indicated PCS above the applicable MTCA CUL was still present at those locations. A second LUST report was received by Ecology in October 2007. Ecology's review of the submitted information did not indicate that the PCS had been excavated or treated.

In January 2011, ARCADIS advanced three borings around the westernmost dispenser island to further delineate the PCS. The maximum depth investigated was 40 feet below ground surface (bgs). Nine soil samples were collected and analyzed for TPH-G, BTEX, methyl tertiary-butyl ether (MTBE), and lead (see Table 1). The COCs were either not detected at the laboratory reporting limit or were below their applicable MTCA CULs. ARCADIS reported that groundwater was encountered at 32 feet to 35 feet bgs. ARCADIS collected a grab groundwater sample and analyzed the groundwater for TPH-G, TPH-D, TPH-O, BTEX, MTBE, and total lead. Analytical results indicated TPH-O and total lead exceeded their applicable MTCA Method A Groundwater CULs. The results indicated groundwater had a TPH-O concentration of 550 micrograms per liter (µg/L) and a total lead concentration of 108 µg/L (see Table 2). The MTCA Method A Groundwater CULs for TPH-O and total lead are 500 µg/L and 15 µg/L, respectively.

Based on a review of the available information, Ecology has the following comments:

1. During the UST decommissioning activities, no soil sample was collected from below the UST (Tank 2) with a documented hole in it. Further investigation is needed at several Site locations to delineate PCS and the effectiveness of the soil treatment area:
    a. Additional investigation needs to be completed at the E-T2-5 location to fully characterize the vertical and horizontal extents of PCS in this area.

    b. The PCS in the areas around locations PR-1, Sample-1, Sample-2, D-3, and D-4 need to be fully delineated in the vertical and horizontal extents.

    c. The center of the soil treatment gallery was not evaluated to determine the sufficiency of the SVE remedy at that location. An additional soil boring should be advanced at this location to fully delineate the vertical profile of that treatment area location.

The COCs for the Site soil shall be TPH-G, TPH-D, TPH-O, BTEX, and lead.

2. The groundwater grab sample from SB-3W indicated groundwater contamination above the applicable Method A CULs for TPH-O and total lead. Groundwater was encountered at approximately 32 feet bgs on the Site. Ecology well logs indicated groundwater to be between 23.5 feet and 32 feet bgs within 0.15 miles of the Site. Ecology recommends groundwater monitoring wells be installed at three locations to determine the groundwater gradient and impacts to groundwater. The well locations should be in the soil treatment area, at location E-T2-5, and at location SB-3. The COCs for groundwater shall be TPH-G, TPH-D, TPH-O, BTEX, MTBE, ethylene dibromide (EDB), 1,2-dicloroethane (EDC), and total lead. Ecology recommends using U.S. EPA Method 8011 when analyzing groundwater for EDB. If EDB, EDC, or MTBE are present in groundwater above its respective MTCA Method A CUL, then the Site soil will also need to be evaluated for that compound.

   Please note that Ecology requires *at least* four consecutive quarters of clean groundwater monitoring analytical results to demonstrate compliance with the MTCA cleanup regulations. The reason for this is to determine any seasonal variations or long-term patterns in the contaminant concentration fluctuations, so that Ecology can determine whether the implemented remedy is permanent.

3. MTCA requires the use of United States Geological Survey (USGS) datum as a basis for all elevations. Please survey all monitoring well elevation points used in the investigation to a known USGS datum point per *WAC 173-340-840 General Submittal Requirements.*

4. Please provide Ecology with an updated work plan for the remedial activities identified above for review and approval to ensure that the proposed activities will likely meet the substantive requirements of MTCA.

5. MTCA requires the submittal of three copies of a plan or report. Please submit two bound hard copies and one electronic copy (portable document format [pdf]) for future plans or reports provided to Ecology for review per *WAC 173-340-840 General Submittal Requirements.*

6. In accordance with *WAC 173-340-840(5)* and Ecology Toxics Cleanup Program *Policy 840 (Data Submittal Requirements)*, all data generated for Independent Remedial Actions shall be submitted simultaneously in both a written and electronic format. For additional information regarding electronic format requirements, see the website http://www.ecy.wa.gov/eim. Be advised that according to the policy, any reports containing sampling data that are submitted

for Ecology review are considered incomplete until the electronic data has been entered. Please ensure that data generated during on-site activities is submitted pursuant to this policy. **Data must be submitted to Ecology in this format for Ecology to issue a No Further Action determination.** Please be sure to submit all soil and groundwater data collected to date, as well as any future data, in this format. Data collected prior to August 2005 (effective date of this policy) is not required to be submitted; however, you are encouraged to do so if it is available. Be advised that Ecology requires up to two weeks to process the data once it is received.

2. Establishment of cleanup standards.

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

Applicable MTCA Method A CULs for soil and groundwater shall be used to characterize the Site. Standard points of compliance are being used for the Site. The point of compliance for protection of groundwater shall be established in the soils throughout the Site. For soil cleanup levels based on human exposure via direct contact or other exposure pathways where contact with the soil is required to complete the pathway, the point of compliance shall be established in the soils throughout the Site from the ground surface to 15 feet bgs. In addition, the point of compliance for the groundwater shall be established throughout the Site from the uppermost level of the saturated zone extending vertically to the lowest most depth that could potentially be affected by the Site.

3. Selection of cleanup action.

Ecology has determined the cleanup action you selected for the Site does not meet the substantive requirements of MTCA.

The affected Site media must be fully characterized prior to selecting any final cleanup action. For a Site cleanup action to qualify for a no further action opinion, it must meet one or more of the minimum cleanup requirements in WAC 173-340-360(2). MTCA requires the use of permanent solutions to the maximum extent practicable. If permanent solutions are not part of the remedy, it will be necessary to develop a feasibility study based on the information collected in the characterization phase. The feasibility study should include all practicable methods of treatment in addressing the Site cleanup. Please note that monitored natural attenuation is a cleanup alternative that must be approved by Ecology before implementation.

4. Cleanup.

Ecology has determined the cleanup you performed does not meet any cleanup standards at the Site.

The Site was not fully characterized prior to initiating cleanup activities. A soil treatment gallery was collocated with the UST excavation and consisted of a SVE system. No documentation was provided on the operation of that system other than it operated for eight months. According to the 1991 SE/E report, a total of 496 cubic yards of PCS was excavated and treated in the SVE gallery.

Limitations of the Opinion

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

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 web site: www.ecy.wa.gov/programs/tcp/vcp/vcpmain.htm. If you have any questions about this opinion, please contact me by phone at (360) 407-7404 or e-mail at erad461@ecy.wa.gov.

Sincerely,

Eugene Radcliff, L.G.
Site Manager
SWRO Toxics Cleanup Program

GER/ksc:ARCO 6008 FA Opinion SW1182 08172012

Enclosures (10): A – Description and Diagrams of the Site

Figure 1	Site Location Map
Figure 2	Site Plan with Soil Boring and Soil Sample Locations
Table 1	2011 Soil Analytical Results
Table 2	Grab Groundwater Analytical Results
Table 3	Historical Soil Analytical Results

By certified mail: (7009 3410 0000 1273 2405)

cc: Mr. Kamel Kanso, KTK Kanso LLC
Mr. Bryan DeDoncker, Clark County Health
Mr. Scott Rose – Ecology
Ms. Dolores Mitchell – Ecology (without enclosures)

Enclosure A

Description and Diagrams of the Site

Site Description

Media of Concern: Soil and Groundwater

The ARCO 6008 (Site) is located at 212 Fifteenth Street, Washougal, Clark County, Washington (see Figure 1). The convenience store and automotive refueling operation is situated on four parcels. The Site and surrounding parcels are both commercial and residential. C Street borders the Site to the north, a vacant lot and two residential parcels borders to the east, B Street borders the Site to the south, and the Washougal River Road borders the Site to the west. Residential and commercial parcels are down gradient (south) of the identified soil and groundwater contamination source areas. The Columbia River is approximately 1000 feet to the south of the Site. The 0.25-acre Site is covered by a building and the rest of the Site is covered by concrete and asphalt pavement. The Clark County Geographic Information System webpage[1] (CCGIS) notes the Site operations as being comprised of five parcels with the affected parcels having an assigned tax parcel numbers of 73611000, 73620000, and 73625000.

The CCGIS notes the abbreviated legal description for the parcels as:

- 73611000 - WASHOUGAL #2 OF LOT 3, BLK 7
- 73620000 - WASHOUGAL LOT 5 BLK 7
- 73625000 - WASHOUGAL LOT 6 BLK 7

Use District Codes for the Site are:

- TC-C – town center core

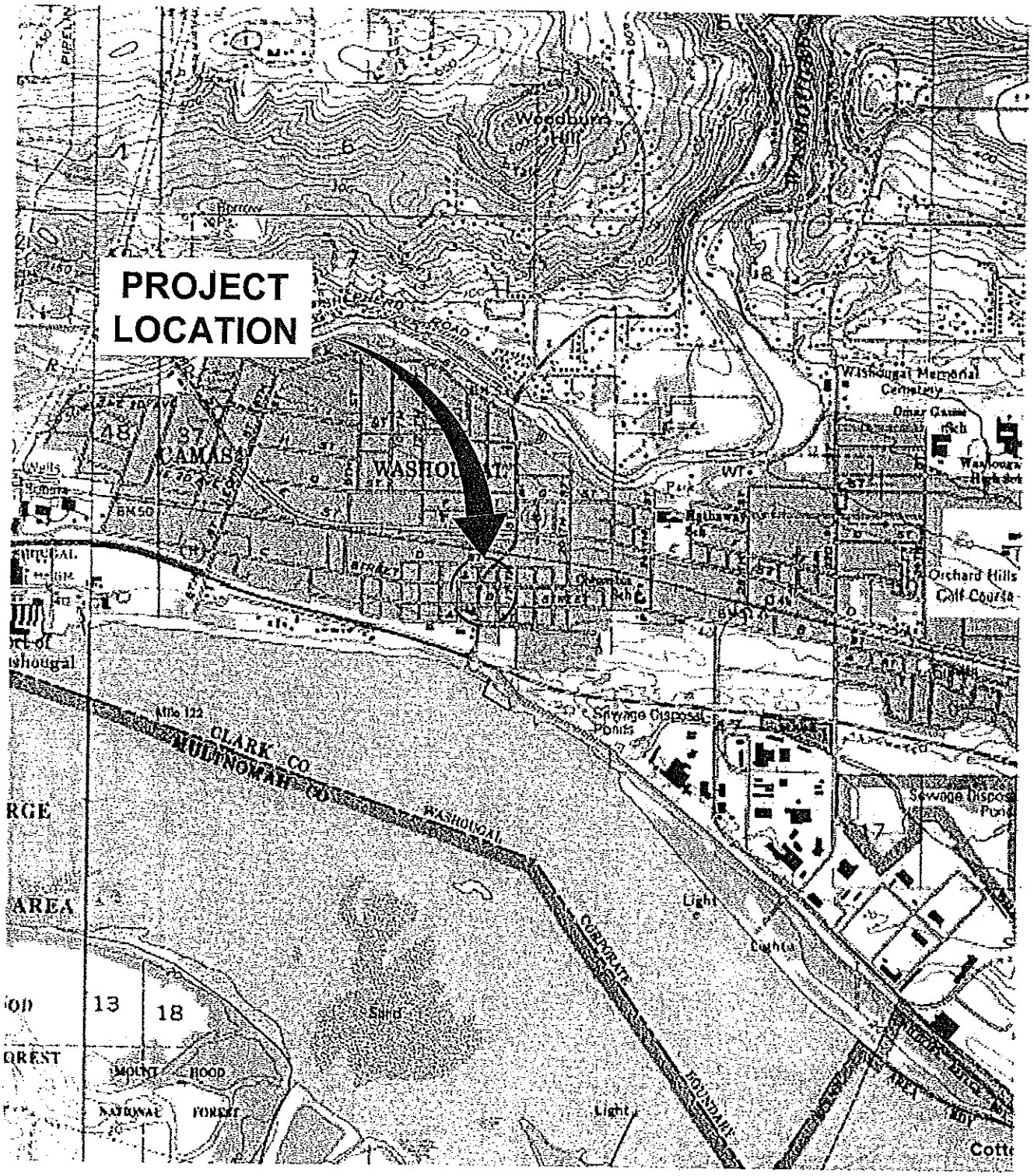
The CCGIS rates the Site *very low* for liquefaction potential. The site is in a Category 2 Aquifer Recharge Area and is in the Washougal River watershed.

Previous investigations have attributed the Site soil and groundwater contamination to historic discharge(s) of gasoline into the surrounding soil from a leaking underground storage tank and associated fuel distribution piping. The Site is approximately 46 feet above sea level. A review of boring log SB-3 indicated that core samples became saturated around 32 feet to 35 feet bgs and the groundwater table was reported to be in that range. The Columbia River surface elevation is around 10 feet above sea level. No water supply wells were reported to be within 0.25 miles of the Site.

The United States Department of Agriculture, Natural Resources Conservation Service (NRCS) website[2] identifies the Site soil as Hillsboro silt loam. The Hillsboro is described as being terraces structures with one to three percent slopes. The Hillsboro is reported to be derived from alluvium parent material and being well drained. The typical profile for the Hillsboro is 0 to 7 inches - silt loam, 7 to 17 silt loam, 17 to 55 inches – silt loam, and 55 to 60 inches – silt loam. Boring logs from the Site investigations indicate interbedded fine sands and fine gravels down to a depth of 40 feet bgs (Boring log SB-3) locally underlie the Site.

---

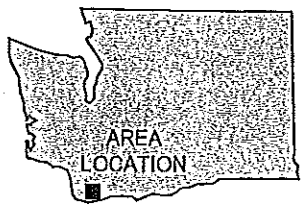
[1] http://maps.clark.wa.gov/imfmol/imf.jsp?site=pub_mapsonline
[2] http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx



REFERENCE: BASE MAP USGS 7.5. MIN. TOPO., WASHOUGAL, WA. QUAD 1994

0 2000' 4000'

Approximate Scale: 1 In. = 2000 ft.



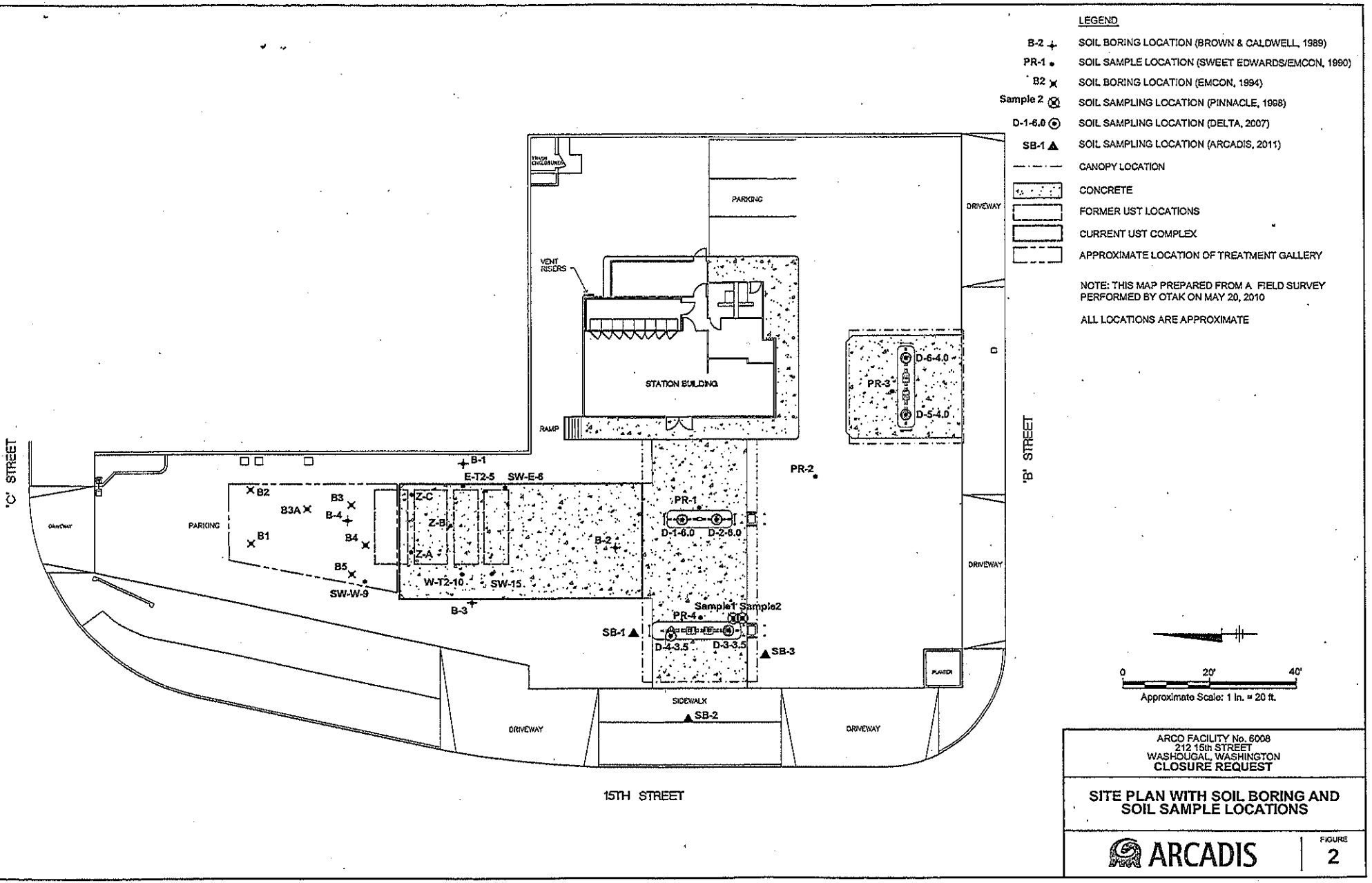
WASHINGTON

ARCO FACILITY No. 6008
212 15th STREET
WASHOUGAL, WASHINGTON
CLOSURE REQUEST

SITE LOCATION MAP

ARCADIS

FIGURE 1



ARCO FACILITY No. 6008
212 15th STREET
WASHOUGAL, WASHINGTON
CLOSURE REQUEST

SITE PLAN WITH SOIL BORING AND SOIL SAMPLE LOCATIONS

ARCADIS

FIGURE 2

Table 1

2011 Soil Analytical Results
January 2011
Closure Request
ARCO Facility No. 6008
212 15th Street
Washougal, Washington

Sample Identification	Depth (feet bgs)	Date Collected	Analysis						
			Benzene mg/kg	Toluene mg/kg	Ethylbenzene mg/kg	Total Xylenes mg/kg	MTBE mg/kg	TPH-GRO mg/kg	Total Lead mg/kg
SB-1-3	(3 - 5)	1/27/2011	<0.0029	<0.0029	<0.0029	<0.0088	<0.0029	<17.2	3.8
SB-1-8	(8 - 10)	1/27/2011	<0.0038	<0.0038	<0.0038	<0.0113	<0.0038	<6.8	3.4
SB-2-3	(3 - 5)	1/27/2011	<0.0027	<0.0027	<0.0027	<0.0082	<0.0027	<6.4	2.9
SB-2-8	(8 - 10)	1/27/2011	<0.0034	<0.0034	<0.0034	<0.0103	<0.0034	<7.8	4.3
SB-2-19.5	(19 - 19.5)	1/27/2011	<0.0021	<0.0021	<0.0021	<0.0063	<0.0021	<4.4	3.8
SB-3-3	(3 - 4)	1/28/2011	<0.0023	<0.0023	<0.0023	<0.0069	<0.0023	<5.7	4.4
SB-3-8	(8 - 9)	1/28/2011	<0.0033	<0.0033	<0.0033	<0.0098	<0.0033	<8.4	6.2
SB-3-30	(30 - 30.5)	1/28/2011	<0.0024	<0.0024	<0.0024	<0.0071	<0.0024	<4.7	5.5
SB-3-40	(39 - 40)	1/28/2011	<0.0030	<0.0030	<0.0030	<0.0091	<0.0030	<4.9	3.5
MTCA Method A Cleanup Levels (mg/kg)			0.03	7	6	9	0.1	30	250

Notes

Concentrations compared to the Model Toxics Control Act (MTCA) Method A Soil Cleanup Levels for Unrestricted Land Uses presented in Table 740-1 of Chapter 173-340 of the Washington Administrative Code (WAC)

< = Concentration is below specified laboratory reporting limt

mg/kg = milligrams per kilogram

bgs = below ground surface

Bold = Chemical detected at a concentration above the laboratory reporting limit (LRL) but below MTCA Method A cleanup level

MTBE = Methyl tertiary-butyl ether

TPH-GRO = Total petroleum hydrocarbons - gasoline range organics analyzed via Northwest Method NWTPH-Gx

Benzene, toluene, ethylbenzene, total xylenes and MTBE analyzed via U.S. Environmental Protection Agency (USEPA) Method 8260

Total lead analyzed by USEPA Method 6020

Table 2

Grab Groundwater Analytical Results
January 2011
Site Assessment Report
ARCO Facility No. 6008
212 15th Street
Washougal, Washington

Sample Identification	Date Collected	Analysis									
		Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE	TPH-GRO	TPH-DRO	TPH-HO	T-Pb	D-Pb
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
SB-3-W	1/28/2011	<0.20	<1.0	<1.0	<3.0	<1.0	<50.0	**110**	**550**	**108**	<10.0
MTCA Cleanup Levels (µg/L)		5	1,000	700	1,000	20	800	500	500	15	

Notes

Concentrations compared to the Model Toxics Control Act (MTCA) Method A Cleanup Levels for Groundwater presented in Table 720-1 of Chapter 173-340 of the Washington Administrative Code (WAC)

< = Concentration is below laboratory reporting limt

µg/L = micrograms per liter

bgs = below ground surface

Bold = Chemical detected at a concentration above the laboratory reporting limit

Bold Highlighted = Results are above the MTCA Method A cleanup level

MTBE = Methyl tertiary-butyl ether

TPH-GRO = Total petroleum hydrocarbons - gasoline range organics analyzed via Northwest Method NWTPH-Gx

TPH-DRO = Total petroleum hydrocarbons - diesel range organics analyzed via Northwest Method NWTPH-Dx

TPH-HO = Total petroleum hydrocarbons - heavy oil range organics analyzed via Northwest Method NWTPH-Dx

Benzene, toluene, ethylbenzene, total-xylenes and MTBE analyzed via United States Environmental Protection Agency (USEPA) Method 8260

Total lead (T-Pb) analyzed by USEPA Method 6010

Dissolved lead (D-Pb) analyzed by USEPA Method 6010

Table 3

Historical Soil Analytical Results
Closure Request
ARCO Facility No. 6008
212 15th Street
Washougal, Washington

Sample Identification	Depth (feet bgs)	Date Collected	Analysis								
			Benzene mg/kg	Toluene mg/kg	Ethylbenzene mg/kg	Total Xylenes mg/kg	MTBE mg/kg	TPH mg/kg	TPH-GRO mg/kg	TPH-DRO mg/kg	Total Lead mg/kg
B-1	0.7	7/24/1989	--	--	--	--	--	--	--	--	--
B-2	1.5	7/24/1989	--	--	--	--	--	--	--	--	--
B-3	1.5	7/24/1989	--	--	--	--	--	--	--	--	--
B-3	2.5	7/24/1989	--	--	--	--	--	--	--	--	--
B-4	2	7/24/1989	--	--	--	--	--	<10	--	--	--
SW-15	15	1/31/1990	<0.20	<0.50	<0.20	<0.40	--	--	<10	<20	--
E-T2-5	5	2/1/1990	<0.20	<0.50	<0.20	1.7	--	--	<10	<20	--
W-T2-10	10	2/2/1990	<0.20	<0.50	<0.20	<0.40	--	--	<10	<20	--
Z-A	16	2/2/1990	<0.20	<0.50	<0.20	<0.40	--	--	<10	<20	--
Z-B	16	2/2/1990	<0.20	<0.50	<0.20	<0.40	--	--	<10	<20	--
Z-C	16	2/2/1990	<0.20	<0.50	<0.20	<0.40	--	--	<10	<20	--
SW-W-9	9	2/8/1990	<0.050	<0.050	<0.050	<0.050	--	--	<1	<0.5	--
SW-E-6	6	2/8/1990	<0.050	<0.050	<0.050	<0.050	--	--	<1	<0.5	--
PR-1	5.5	2/14/1990	<0.050	0.00074	0.00058	0.00532	--	--	35	--	--
PR-2	3	2/14/1990	<0.050	<0.050	<0.050	<0.050	--	--	<1	--	--
PR-3	3	2/14/1990	<0.050	<0.050	<0.050	<0.050	--	--	<1	--	--
PR-4	3	2/14/1990	<0.050	<0.050	<0.050	0.000230	--	--	3	--	--
B1-3.5-4	3.5-4	1/6/1994	<0.05	<0.1	<0.1	<0.1	--	--	<5	--	6
B1-4-6	4-6	1/6/1994	--	--	--	--	--	--	--	--	--
B1-6-8	6-8	1/6/1994	--	--	--	--	--	--	--	--	--
B1-8-10	8-10	1/6/1994	--	--	--	--	--	--	--	--	--
B1-10-12	10-12	1/6/1994	<0.05	<0.1	<0.1	<0.1	--	--	<5	--	18
B1-12-14	12-14	1/6/1994	<0.05	<0.1	<0.1	<0.1	--	--	<5	--	8
B1-14-15	14-15	1/6/1994	--	--	--	--	--	--	--	--	--
B2-2-4	2-4	1/6/1994	<0.05	<0.1	<0.1	0.2	--	--	<5	--	14
B2-6-8	6-8	1/6/1994	--	--	--	--	--	--	--	--	--
MTCA Method A Cleanup Levels (mg/kg)			0.03	7	6	9	0.1	NE	30	2,000	250

Table 3

Historical Soil Analytical Results
Closure Request
ARCO Facility No. 6008
212 15th Street
Washougal, Washington

Sample Identification	Depth (feet bgs)	Date Collected	Analysis								
			Benzene mg/kg	Toluene mg/kg	Ethylbenzene mg/kg	Total Xylenes mg/kg	MTBE mg/kg	TPH mg/kg	TPH-GRO mg/kg	TPH-DRO mg/kg	Total Lead mg/kg
B2-10-12	10-12	1/6/1994	<0.05	<0.1	<0.1	<0.1	--	--	<5	--	<3
B2-13.5-14	13.5-14	1/6/1994	--	--	--	--	--	--	--	--	--
B3-2-4	2-4	1/6/1994	<0.05	<0.1	<0.1	0.2	--	--	<5	--	37
B5-2.5-4.5	2.5-4.5	1/6/1994	--	--	--	--	--	--	--	--	--
B5-6-8	6-8	1/6/1994	<0.05	<0.1	<0.1	<0.1	--	--	5	--	<3
B5-10-12	10-12	1/6/1994	<0.05	<0.1	<0.1	<0.1	--	--	<5	--	7
B5-14-16	14-16	1/6/1994	--	--	--	--	--	--	--	--	--
Sample-1	0.4-0.6	3/31/1998	<0.500	<0.500	<0.500	258	--	--	513	--	--
Sample-2	0.4-0.6*	3/31/1998	<0.0500	<0.0500	<0.0500	0.0874	--	--	6.69	--	--
D-1-6.0	6	4/10/2007	<0.0233	<0.117	<0.117	<0.350	<0.583	--	<5.83	--	25.0
D-2-6.0	6	4/10/2007	<0.0214	<0.107	<0.107	0.526	<0.534	--	7.50	--	62.3
D-3-3.5	3.5	4/10/2007	0.429	0.521	<0.113	<0.340	<0.566	--	<5.66	--	56.7
D-4-3.5	3.5	4/10/2007	0.102	0.126	<0.114	<0.341	<0.568	--	<5.68	--	64.3
D-5-4.0	4	4/10/2007	<0.0201	<0.0502	<0.0502	<0.100	<0.100	--	<5.02	--	8.96
D-6-4.0	4	4/10/2007	<0.0269	0.361	0.167	1.14	<0.0896	--	9.06	--	12.3
MTCA Method A Cleanup Levels (mg/kg)			0.03	7	6	9	0.1	NE	30	2,000	250

Notes

Concentrations compared to the Model Toxics Control Act (MTCA) Method A Soil Cleanup Levels for Unrestricted Land Uses presented in Table 740-1 of Chapter 173-340 of the Washington Administrative Code (WAC)

< = Concentration is below specified laboratory reporting limit

mg/kg = milligrams per kilogram

bgs = below ground surface

* = The specific depth of this sample was not reported; however, Figure 2 and Photograph 3 of Pinnacle's 1998 letter report illustrate the sample location immediately below the concrete surface.

Bold = Chemical detected at a concentration above the laboratory reporting limit (LRL) but below MTCA Method A cleanup level

Bold Highlighted = Results are above the MTCA Method A cleanup level

NE = Cleanup level not established under MTCA.

MTBE = Methyl tertiary-butyl ether

TPH-GRO = Total petroleum hydrocarbons - gasoline range organics analyzed via Northwest Method NWTPH-Gx, Washington Department of Ecology Method WTPH-G or EPA Method 8015.

TPH-DRO = Total petroleum hydrocarbons - diesel range organics analyzed via Northwest Method NWTPH-Dx or EPA Method 8015.

Benzene, toluene, ethylbenzene, total xylenes and MTBE analyzed via U.S. Environmental Protection Agency (USEPA) Method 8260B or 5030/8020.

Total lead analyzed by USEPA Method 6020 or 7420.