ARCADIS U.S., Inc.
111 SW Columbia Street
Suite 670
Portland
Oregon 97201
Tel 503.220.8201
Fax 503.220.8209
www.arcadis-us.com

Mr. Steve Teel
Washington Department of Ecology
300 Desmond Drive
Lacey, Washington 98503

Re: Revised Feasibility Study Report, Former ARCO Olympia Bulk Terminal, Industrial Petroleum Distributors Site, 1120 West Bay Drive, Olympia, Washington 98502, Facility Identification No. 1436

ENVIRONMENTAL

Dear Mr. Teel,

Date:
February 8, 2013

Contact:
Alexander Lopez III

Phone:
503.220.8201 x 1122

Email:
alex.lopez.iii@arcadis-us.com

Our ref:
GP09BPNA.WA60.E0000

On behalf of BP West Coast Products, LLC, ARCADIS U.S. Inc. (ARCADIS) is pleased to present the enclosed revised Feasibility Study Report for Former ARCO Olympia Bulk Terminal, Industrial Petroleum Distributors Site, Facility Identification No. 1436. The feasibility study was revised at the request of the State of Washington Department of Ecology in a letter dated December 6, 2012 and performed in accordance with Agreed Order No. DE 8953.

If you have questions or comments regarding this report, please contact Alexander Lopez at 503.220.8201 x1122 or by email at alex.lopez.iii@arcadis-us.com.

Sincerely,

ARCADIS U.S., Inc.

Alexander Lopez III, L.G.
Project Geologist

Copies:

Mr. Bob May, Trust Representative, Disclaimer Trust of John J. O'Connell, 18047 NE 99th Ct., Redmond, WA 98502
Ms. Alexandra K. Smith, Sr. Environmental Program Mgr./Environmental Legal Counsel, Port of Olympia, 915 Washington Street NE, Olympia, WA 98501,
Mr. Tom Morrill, City Attorney, City of Olympia, 900 Plum Street SE, P.O. Box 1967, Olympia, WA 98507-1967
Mr. Steve Wise, Code Enforcement Officer, City of Olympia, Public Works Dept., P.O. Box 1967, Olympia, WA 98507-1967
Mr. Bruce A. Sheppard, Environmental Remediation, BNSF Railway Company, 2454 Occidental Avenue South, Suite 1A, Seattle, WA 98134

ARCADIS
Infrastructure · Water · Environment · Buildings

Imagine the result

BP West Coast Products, LLC

Feasibility Study Report

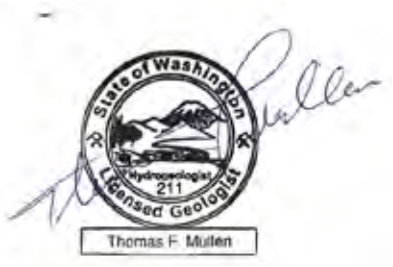
Former ARCO Olympia Bulk Terminal
Industrial Petroleum Distributors Site
1120 West Bay Drive
Olympia, Washington 98502
Facility Identification No. 1436

February 8, 2013

ARCADIS

Alexander Lopez III, LG
Project Geologist

2/8/2013



Thomas F. Mullen, LHG
Senior Hydrogeologist

Feasibility Study Report

Former ARCO Olympia Bulk Terminal
Industrial Petroleum Distributors Site
1120 West Bay Drive
Olympia, Washington 98502
Facility Identification No. 1436

Prepared for:

BP West Coast Products, LLC

Prepared by:
ARCADIS U.S., Inc.
111 SW Columbia Street
Suite 670
Portland, Oregon 97201
Tel 503.220.8201
Fax 503.220.8209

Our Ref.:
GP09BPNA.WA60.E0000

Date:
February 8, 2013

Table of Contents

Tables

Figures

Appendix

ARAR	Applicable or Relevant and Appropriate Requirement
ARCADIS	ARCADIS U.S., Inc.
ARCO	Atlantic Richfield Company
bulk plant	bulk petroleum storage facility
CAAE	cleanup action alternatives evaluation
CFR	Code of Federal Regulations
COC	constituent of concern
cPAH	carcinogenic polycyclic aromatic hydrocarbon
CSM	conceptual site model
CUL	cleanup level
DRO	diesel range organics
Ecology	Washington State Department of Ecology
FS Report	Feasibility Study Report
GRO	gasoline range organics
HO	heavy oil range organics
IDW	investigation-derived waste
IPD	Industrial Petroleum Distributors
mg/kg	milligrams per kilogram
MTCA	Model Toxics Control Act
OSHA	Occupational Safety and Health Act
PCB	polychlorinated biphenyl
RCRA	Resource Conservation and Recovery Act

Acronyms and Abbreviations

RI	remedial investigation
RI Report	Remedial Investigation Report
Site	former Industrial Petroleum Distributors Site located at 1120 West Bay Drive in Olympia, Washington
U.S.C.	United States Code
µg/L	micrograms per liter

1. Introduction

On behalf of BP West Coast Products, LLC, ARCADIS U.S., Inc. (ARCADIS) has prepared this Feasibility Study Report (FS Report) for the lowland portion of the former Industrial Petroleum Distributors (IPD) Site located at 1120 West Bay Drive in Olympia, Washington (the "Site"). This FS Report evaluates potential corrective actions and identifies the most appropriate corrective action to address impacted soil exceeding the Model Toxics Control Act (MTCA) Method A cleanup levels (CULs). This FS Report was prepared in accordance with Agreed Order No. DE 8953, effective September 17, 2012. ARCADIS originally presented the analytical data included in this FS Report to the Washington State Department of Ecology (Ecology) in a Remedial Investigation Report (RI Report; ARCADIS 2012), which was also prepared in accordance with Agreed Order No. DE 8953.

2. Site Location and Description

The Site includes two parcels of land (Parcel Nos. 0903-000-5000 and 0903-000-3000) on the west side of West Bay Drive and is affiliated with a lowland area, which is not explicitly listed in the Agreed Order. This FS Report addresses the lowland parcel, which is located at 1120 West Bay Drive in Olympia, Washington on the east side of West Bay Drive. The Site appears to have been assigned Parcel No. 0903-000-1000 by Thurston County; however, ARCADIS is currently reviewing a 2010 line adjustment to confirm the current parcel number. The majority of the Site is currently owned by the Port of Olympia, but a 0.02-acre parcel located on the west side of the Site is owned by Burlington Northern Santa Fe Railway Company (BNSF). A site location map is presented on Figure 1.

The Site was formerly used as a bulk petroleum distribution facility by Atlantic Richfield Company (ARCO) and IPD which provided infrastructure for a bulk petroleum storage facility (bulk plant) operated on the upland portion of the Site. IPD owned the upland portion of the Site. An underground pipeline on the north side of the Site was used to transfer petroleum products (gasoline and oil) from barges into aboveground storage tanks located at the bulk plant. An abandoned pier originating on site extends approximately 400 feet into West Bay. The Site is currently vacant. A site plan showing monitoring well and boring locations associated with the 2010 remedial investigation (RI) is presented on Figure 2. The upland portion of the Site was issued a No Further Action letter on June 25, 2003 and reports pertaining to the RI conducted at the Site are available in public record through Ecology.

3. Environmental Conditions

This section examines environmental characteristics of the Site and vicinity.

3.1 Geology and Hydrogeology

The Site is situated in the Puget Trough, which is bordered by the Cascade Range to the east and the Pacific Coast Range to the west. The site elevation is approximately at mean sea level, and the topography of the immediate area is generally flat. The Site is located on West Bay in a geographic area known as the Puget Sound lowlands, on an area of Pleistocene-age recessional outwash. The recessional outwash forms a layer ranging from a few feet to 150 feet thick and is characterized as poorly sorted, discontinuously bedded loose gravel with some sand, silt, and clay (Washington State Department of Water Resources 1970). Additionally, surficial soil at the Site is anticipated to be comprised of fine-grained deposits associated with West Bay.

Subsurface material observed during site investigation activities generally consisted of silty clays and sandy silt to approximately 6 feet below ground surface (bgs) and fine to medium sand and fine gravel between 6 and 13 feet bgs. Wood debris and bark dust were observed between 3 and 9 feet bgs. Observed subsurface conditions are consistent with the location of the Site adjacent to Budd Inlet as well as in an environment of historical glacial deposition.

Historical groundwater elevations, tidal stages during sampling events, and groundwater electrical conductivity readings have been evaluated to determine if brackish bay water is intruding into groundwater on site. ARCADIS presented a detailed evaluation of tidal influence on the hydrology of the Site in the RI Report (ARCADIS 2012). Groundwater flow at the Site is generally toward the southeast towards Budd Inlet at a hydraulic gradient of approximately 0.033 and 0.031 foot/foot (ft/ft) at high and low tides, respectively. Groundwater elevations recorded from each well during subsequent high and low tide events demonstrated fluctuations ranging from 0.04 to 0.28 foot. Groundwater elevations are plotted on Cross Section A-A' (Figure 3), providing a cross-sectional view of apparent groundwater flow direction as measured during well gauging. Figure 4 depicts a plan view of cross sections discussed in this FS Report. Figure 5 shows a contour map depicting high and low tide potentiometric groundwater surfaces. Groundwater elevation data is presented in Table 1. Based on this line of evidence alone, there is no apparent correlation in groundwater level fluctuations and proximity to Budd Inlet. However, measurements of historical groundwater electrical conductivity were compared with tidal times. Groundwater

conductivity data is presented in Table 2. Groundwater in wells MW-7, MW-8, and MW-9 are likely experiencing influence from tidal fluctuation based on an evaluation of electrical conductivity.

3.2 Land and Water Use

The majority of the Site is zoned as industrial, according to the Thurston County Geodata Center. The Site is located within a mixed commercial/industrial and residential district of Olympia, Washington. Adjacent properties include West Bay Drive and a residential and commercial condominium complex to the west, commercial/ industrial properties to the north, and West Bay to the south and east. Based on information provided by Ecology, the city of Olympia may redevelop the Site for use as a future public park. However, no definite plan for site redevelopment has been created. In the interest of conservative estimation, future land use at the Site is considered unrestricted.

Water is the only known site resource. The Site is located within the city of Olympia water service area. No drinking water wells are located on site. Groundwater at the Site is not currently used for potable purposes and, based on the location of the Site within the city of Olympia water service area, future use of groundwater at the Site for potable purposes is unlikely. However, the future installation of a drinking water well at the Site would not be prohibited by the city of Olympia. Thus, as a conservative estimate, it is assumed that groundwater use at the Site may include drinking water beneficial uses in the future.

3.3 Terrestrial Ecological Evaluation

A terrestrial ecological evaluation was conducted for the Site in accordance with WAC 173-340-7491. Per subsection 7491(c)(i) of Chapter 173-340 WAC, the Site qualifies for an exclusion from terrestrial ecological evaluation because there are less than 1.5 acres of contiguous undeveloped land on or within 500 feet of the Site. The Terrestrial Ecological Evaluation Form is included in the RI Report (ARCADIS 2012).

4. Summary and Results of Sediment Investigations

In August 2009, Integral Consulting, Inc. investigated marine sediments bordering the Site. Results of the sediment investigation indicated no measureable levels of petroleum hydrocarbons at the four sampling locations (ARCADIS 2012).

5. Summary and Results of Upland Investigations

5.1 Historical Investigations

The bulk terminal and site infrastructure have been out of use since approximately 1989. The former storage tanks associated with the bulk plant, which were located west of the Site, were decommissioned and removed in 1999 (SECOR 2001). Several independent consultants have performed subsurface investigations at the Site between 2000 and 2004, following the completion of a Limited Environmental Site Assessment conducted by SECOR in 2000 (SECOR 2000) on behalf of ARCO Products, Inc. The approximate historical soil and groundwater sampling locations are presented on Figure 6 and results are summarized on Figures 7, 8 and 9. Results of historical soil samples collected at the Site are included in Table 3; historical groundwater sample results are included in Table 4. Details of the historical investigations conducted at the Site are described in the RI Report (ARCADIS 2012).

5.2 ARCADIS Remedial Investigation

ARCADIS conducted a site investigation between August and October 2010. The objective of the investigation was to complete site characterization and define the extent of impacted soil and groundwater. ARCADIS installed 16 soil borings to characterize the extent of petroleum hydrocarbon-impacted soil at the Site. Seven borings were completed as monitoring wells from which both soil and groundwater samples were collected. Subsequently, groundwater samples were collected from the newly installed wells during five additional quarters. The details of the boring and well installation methods, procedures, and data validation of current and historical soil and groundwater data were presented to Ecology in the RI Report (ARCADIS 2012).

Soil analytical results were compared to the MTCA Method A Soil Cleanup Levels for Unrestricted Land Uses presented in Table 740-1 of Chapter 173-340 WAC. Naphthalenes, carcinogenic polycyclic aromatic hydrocarbons (cPAHs), gasoline range organics (GRO) and diesel range organics (DRO) were detected above the applicable MTCA Method A CULs in soil samples collected from several locations in the northwest

corner of the Site. Results of the soil analysis are presented in Table 5; results that exceed the applicable CULs are presented in bold and highlighted. Figures 10, 11 and 12 summarize the results of soil analytical data.

Groundwater analytical results for the Site are compared to the MTCA Method A Cleanup Levels for Ground Water presented in Table 720-1 of Chapter 173-340 WAC. Groundwater samples did not exhibit concentrations of analyzed chemicals in exceedance of the MTCA Method A groundwater CULs. Results of groundwater sample analyses for October 2010 through December 2011 are summarized in Table 6. Groundwater analytical results from the initial site investigation in October 2010 are presented on Figure 13. Laboratory analytical reports are included in the RI Report (ARCADIS 2012).

6. Conceptual Site Model

A conceptual site model (CSM) was developed in accordance with the methods and procedures described in the MTCA (WAC 173-340-708) and presented in the RI Report (ARCADIS 2012). The source of contamination was identified as the former bulk plant operations, including the storage of gasoline, diesel and/or oil. Based on current and future land use, which may include the use of the Site as a public park, potential future receptors may include on-site residents, children, recreational users, commercial workers, industrial workers and construction workers. Potentially complete pathways are presented in Figure 14 and summarized below.

Potential on-site receptors may be exposed to constituents in surface and subsurface soils by direct contact. Routes of exposure by direct contact include incidental ingestion of soil and/or dermal contact with soil. The Site is not currently improved, thus no current on-site human receptors have been identified. However, it is assumed that the Site may be redeveloped in the future to industrial, occupational, residential, or public park land use. Thus, potential future receptors that may be directly exposed to constituents in surface and/or subsurface soil at the Site may include on-site residents, children, recreational users, commercial workers, industrial workers, and construction workers.

Constituents may leach from soil to groundwater beneath the Site by percolation, resulting in potential direct contact exposures to constituents in groundwater. Routes of exposure by direct contact include ingestion of tap water, dermal contact with tap water, and inhalation of volatile constituents released from tap water. However, groundwater at the Site is not currently used as a potable water source. Therefore, tap

water ingestion, dermal contact with tap water, and inhalation of volatile constituents in tap water are not complete exposure pathways for current on-site and off-site receptors. However, exposure pathways are potentially complete for future on-site and off-site receptors provided that the groundwater at the Site is considered potable under WAC 173-340-720(2).

Groundwater at the Site is generally encountered at depths ranging from approximately 3 to 5 feet bgs. In the future, it is possible that the Site or properties immediately adjacent to the Site may be redeveloped and construction workers may encounter groundwater at shallow depths. Thus, direct contact (e.g., incidental ingestion and dermal contact) with groundwater may be a complete exposure pathway for construction workers.

Another potential release mechanism at the Site may include volatilization of constituents in soil and/or groundwater to outdoor air and/or indoor air of future on-site or off-site buildings, or air within a trench used by future on-site or off-site construction workers. Because the Site is not currently developed, no human receptors are likely to be affected under the current site use. However, assuming hypothetical redevelopment for residential, commercial or industrial uses, the potential receptors that may be directly exposed to constituents in outdoor and/or indoor air at the Site in the future may include on-site residents/children, commercial workers, industrial workers and construction workers.

A terrestrial ecological evaluation was conducted for the Site in accordance with WAC 173-340-7491. The purpose of the terrestrial ecological evaluation includes determining whether a release to soil threatens the terrestrial environment, to characterize potential threats to terrestrial plants and animals, and to establish site-specific cleanup standards for the protection of terrestrial plants and animals. Per subsection 7491(c)(i) of Chapter 173-340 WAC, the Site qualifies for an exclusion from terrestrial ecological evaluation because there are less than 1.5 acres of contiguous undeveloped land on or within 500 feet of the Site. Based on the small size of the Site and because the vicinity is generally developed for residential, commercial and industrial purposes, terrestrial receptors (e.g., soil biota, plants, and animals) are unlikely to have direct contact with surface soil or groundwater.

Potential on-site receptors may be exposed to constituents in surface water and sediments by direct contact. Routes of exposure by direct contact include incidental ingestion of and/or dermal contact with surface water and/or sediments. The Site is not currently developed, thus residents, children and recreational users are not likely to

have direct contact with surface water or sediment. However, assuming hypothetical future development of the Site for residential purposes, residents, children, and recreational users could have direct contact with surface water and/or sediments in the future. Benthic organisms and fish may have direct contact with surface water and/or sediments based on current site use.

7. Site Cleanup Levels

This section evaluates CULs appropriate for the Site.

7.1 Method A Cleanup Levels

Ecology issued CULs under the MTCA. Method A defines CULs for common hazardous substances, such as petroleum hydrocarbons. Methods A CULs for Unrestricted Land Use will be used for groundwater and soil at the Site.

The Method A CULs may be used if they meet one of two criteria under WAC-173-340-704:

- *"Sites undergoing a routine cleanup action as defined in WAC 173-340-200"*
- *"Sites where numerical standards are available in this chapter or applicable state and federal laws for all indicator hazardous substances in the media for which the Method A cleanup level is being used."*

According to WAC-173-340-200, routine cleanup actions must meet the following criteria:

- "*Cleanup standards for each hazardous substance addressed by the cleanup are obvious and undisputed, and allow for an adequate margin of safety for protection of human health and the environment*"
- *"It involves an obvious and limited choice among cleanup action alternatives and uses an alternative that is reliable, has proven capable of accomplishing cleanup standards, and with which the department has experience"*
- *"The cleanup action does not require preparation of an environmental impact statement"*

- *"The site qualifies under WAC 173-340-7491 for an exclusion from conducting a simplified or site-specific terrestrial ecological evaluation, or if the site qualifies for a simplified ecological evaluation, the evaluation is ended under WAC 173-340-7492(2) or the values in Table 749-2 are used."*

Historical investigations indicate that petroleum hydrocarbons and their constituents are the only constituents detected in soil and groundwater at the Site. Furthermore, numerical standards for the COCs are available for soil and groundwater under MTCA Method A for Unrestricted Land Use. Therefore, a combination of Method A CULs for Unrestricted Land Use is appropriate and was used for the Site. MTCA Method A CULs for Unrestricted Land Use of at the Site are listed below, according to Tables 720-1 and 740-1 of the MTCA Statute and Regulation.

Groundwater [1]

Constituent	Cleanup Criteria (µg/L)[3]
GRO	800/1,000 [5]
DRO	500
HO	500
EDB	0.01
EDC	5
Benzene	5
Toluene	1,000
Ethylbenzene	700
Total xylenes	1,000
MTBE	20
n-Hexane	--[6]
cPAHs	0.1[7]
Total Naphthalenes	160
PCBs	0.1[8]
Lead	15

Soil [2]

Constituent	Cleanup Criteria (mg/kg)[4]
GRO	30/100 [5]
DRO	2,000
HO	2,000
EDB	0.005
EDC	--[6]
Benzene	0.03
Toluene	7
Ethylbenzene	6
Total xylenes	9
MTBE	0.1
n-Hexane	--[6]
cPAHs	0.1[7]
Total Naphthalenes	5
PCBs	1[8]
Lead	250

Notes:

[1] CULs from Ecology's MTCA Method A Cleanup Levels for Ground Water (WAC 173-340-900, Table 720-1).

[2] CULs from Ecology's MTCA Method A Soil Cleanup Levels for Unrestricted Land Uses (WAC 173-340-900, Table 740-1).

[3] µg/L = Micrograms per liter.

[4] mg/kg = Milligrams per kilogram.

[5] Method A CULs for GRO are determined based on the presence of benzene.
[6] -- = Ecology Method A CUL not established.
[7] Based on benzo(a)pyrene equivalencies (WAC 173-340-900, Table 740-1).
[8] Total value for all polychlorinated biphenyls (PCBs) (mixtures).
EDB = Ethylene dibromide.
EDC = Ethylene dichloride..
MTBE = Methyl tertiary butyl ether.

Groundwater CULs were selected based on an estimation of the highest beneficial use for current and future use at the Site. According to WAC-173-340-720(1)(a), "*The department has determined that most sites use of ground water as a source of drinking water is the beneficial use requiring the highest quality of ground water and that exposure to hazardous substances through ingestion of drinking water and other domestic uses represents the reasonable maximum exposure*." Therefore, CULs established under MTCA Method A are protective for the beneficial use of groundwater as a current and/or future potable water source at the Site.

Soil CULs were based on estimates of the reasonable maximum exposure scenario expected to occur, given current and/or future use of the Site. According to WAC-173-340-740(1)(a), "*The department has determined that residential land use is generally the site use requiring the most protective cleanup levels and that exposure to hazardous substances under residential land use conditions represents the reasonable maximum exposure scenario*." Therefore, CULs established under MTCA Method A are protective for the maximum exposure scenario for impacted soil, given current and/or future anticipated land use at the Site.

Additionally, Ecology designated a screening level of 100 mg/kg for evaluation of hydrocarbon identification for all petroleum ranges in sediments (Ecology 2006).

7.2 Points of Compliance

The points of compliance are defined under the MTCA as the point or points on a site where the selected CULs are attained. Such points are further divided to include standard and conditional points of compliance. A standard point of compliance requires CULs to be met for every location sampled, and therefore throughout the entire site. A conditional point of compliance requires CULs to be met only at some locations sampled, provided regulatory requirements are met according to WAC 173-340-720 through 173-340-760. Typically, sites that establish a conditional point of compliance place an environmental covenant on the affected properties, thereby limiting future uses of the properties (Ecology 2010).

Standard points of compliance were established for soil and groundwater at the Site. The soil point of compliance is defined as throughout the Site from the ground surface to fifteen feet below the ground surface. The vertical and lateral boundaries of the soil point of compliance were designated for the Site based on human exposure via direct contact or other exposure pathways where the soil is required to complete the pathway, as outlined in WAC 173-340-740(6)(d). The groundwater point of compliance is defined as throughout the Site, from the uppermost depth of the saturated zone extending vertically to the lowest depth that could potentially be affected. The vertical and lateral boundaries of the groundwater point of compliance were designated for the Site based on the standard point of compliance for all sites, as outlined in WAC 173-340-720(8)(b). The point of compliance for each COC in soil and groundwater is summarized in Tables 7A and 7B, respectively.

7.3 Applicable Relevant and Appropriate Regulations

According to WAC 173-340-360(2), all cleanup actions under the MTCA must comply with applicable state and federal laws. Such laws are defined under the MTCA as including Applicable or Relevant and Appropriate Requirements (ARARs). ARARs for the Site are discussed in Sections 7.3.1 and 7.3.2.

7.3.1 Federal

- *Safe Drinking Water Act (National Primary and Secondary Drinking Water Regulations) (42 United States Code [U.S.C.] 300f, 40 Code of Federal Regulations [CFR] Part 141, 40 CFR Part 143)*. Petroleum hydrocarbon CULs are based on the beneficial use of groundwater as a current and/or future potable water source at the Site.

- *Resource Conservation and Recovery Act (RCRA) (42 U.S.C. 6901-6992, 40 CFR Part 260-268)*. Investigation-derived waste (IDW) and any other waste produced during activities at the Site will be handled per RCRA regulations and implemented according to WAC 173-303.

- *Occupational Safety and Health Act (OSHA) (29 CFR 1910)*. Site activities will be conducted in a manner compliant with OSHA standards and regulations.

- *Rules for Transport of Hazardous Waste (49 CFR 107, 171)*. Hazardous waste generated at the Site will be appropriately characterized to determine package, transportation and transportation requirements.

7.3.2 State

- *MTCA (WAC 173-340)*. Site activities will occur in accordance with MTCA statutes and regulations.

- *Dangerous Waste Regulations (WAC 173-303)*. IDW and any other waste produced during activities at the Site will be handled per RCRA regulations and implemented according to WAC 173-303.

- *Minimum Standards for Construction and Maintenance of Wells, Regulation and Licensing of Well Contractors and Operators (Revised Code of Washington 18.104, WAC 173-160, 162)*. Resource protection wells will be constructed and maintained according to the appropriate regulations.

- *Washington Industrial Safety and Health Act, Chapter 296-62 WAC*. Site activities will be conducted in a manner compliant with Washington Industrial Safety and Health Act standards and regulations.

- *Maximum Environmental Noise Levels (WAC 173-60)*. Site activities will be conducted at appropriate noise levels, according to WAC 173-60.

7.4 Cleanup Action Alternatives Evaluation

The purpose of the cleanup action alternatives evaluation (CAAE) is to identify, develop and evaluate potential remedial alternatives and to recommend remedial measures for the site. The CAAE follows applicable state and federal regulations for remedial action projects. The CAAE approach is based on discussions with Ecology and considers information from recently collected data as well as historical reports as detailed in the RI Report (ARCADIS 2012).

The selection of appropriate remedial actions must consider cleanup standards and technologies that protect human health and the environment by eliminating, reducing or otherwise controlling risks posed through each exposure pathway and migration route. The number and types of cleanup alternatives to be evaluated must consider the characteristics and complexity of the site. The evaluation of cleanup alternatives also recognizes the need for a phased approach to reduce the number of potential remedies and allowing for better-informed decisions.

Ecology has established the following thresholds and other basic requirements pertaining to cleanup actions:

- Protect human health and the environment
- Comply with cleanup standards
- Comply with applicable and relevant state and federal laws
- Provide for compliance monitoring
- Use permanent solutions to the maximum extent practicable
- Provide for a reasonable restoration time frame
- Consider public concerns, if applicable to the project status and conditions.

When selecting a cleanup action, preference must be given to permanent solutions to the maximum extent practical. A permanent solution is one in which cleanup standards can be met without further action being required, other than the approved disposal of residue from preferred treatment technologies. Ecology does recognize that permanent solutions may not be practical for all sites. The proposed cleanup action(s) are evaluated based on criteria outlined in the MTCA Chapter 173-340-360(3), as follows:

- Protectiveness of human health and the environment
- Permanence in reduction of toxicity, mobility and volume
- Cost
- Effectiveness over the long term
- Management of short-term risks
- Technical and administrative implementability
- Consideration of public concerns.

The cleanup action selected will also provide for a reasonable restoration time frame and will include the following criteria:

- Potential risks posed to human health and the environment
- Practicability of achieving a shorter restoration time frame
- Current site and surrounding area use
- Potential future site and surrounding area use
- Availability of alternative water supplies, as applicable
- Effectiveness and reliability of institutional controls
- Ability to control and monitor migration of hazardous substances
- Toxicity of the hazardous substances remaining at the site
- Natural attenuation and biodegradation.

The cleanup of contaminant-affected sites will be conducted using technologies that minimize the amount of untreated hazardous substances remaining at a site. Ecology established the following scale of preference for cleanup technologies, in descending order:

- Reuse or recycling
- Destruction or detoxification
- Separation or volume reduction
- Immobilization of hazardous substances
- On- or off-site disposal
- Isolation or containment
- Institutional controls and monitoring.

The cleanup action alternatives will be evaluated for their ability to meet the following standards:

- MTCA cleanup standards for the protection of human health (Method A Soil CULs for Unrestricted Land Use).
- Attainment of established soil CULs (for current and potential future land uses).
- To the extent practicable, remediation of the sources of releases to reduce or eliminate further release that might pose threats to human health or the environment.
- Compliance with applicable federal, state and local standards for management of wastes.

A combination of technologies is often used, with preference given to the use of higher listed alternatives. Ecology anticipates that lower options will be appropriate for some sites. In consideration of the MTCA standards and preferences regarding cleanup technology selection, proposed soil cleanup technologies were evaluated. The final cleanup technologies to be implemented toward the goal of reaching site closure were assessed using the permanent solution criteria and a reasonable restoration time-frame as key considerations.

7.5 Site Contaminant Characterization

Residual constituents of concern (COCs), likely sources, and areas of concern in soil are discussed in detail in the RI Report (ARCADIS 2012). In summary, residual impacts from GRO, DRO, HO and PAHs are present in soil, predominantly in the northwest corner of the Site.

7.6 Cleanup Action Alternatives

This section identifies, screens and evaluates alternatives for corrective action at the site.

7.6.1 Initial Screening

Multiple technologies are currently employed in the remediation of environmental sites, often being combined to achieve cleanup goals. These technologies include methods

that manage exposure through administrative and engineered controls, removal of contaminated media, as well as alternatives that use focused remediation to detoxify and degrade media contaminants. The current property owner has expressed interest in redevelopment of the property and has communicated concerns regarding leaving contaminated media in place. In addition to the requirements outlined in WAC 173-340-360, the property owner's concerns regrading residual media contamination was taken into account in the initial screening. An initial screening of remedial alternatives and a brief description of each technology evaluated is included below:

- Deed Restriction

An administrative control, such as a deed restriction, would be an effective means of managing exposure to site contaminants. The deed restriction would limit the future uses of the site and therefore limit exposure. This alternative meets the minimum requirements of WAC 173 -340-360; however, the remedy was not selected for further evaluation due to the property owner's intention to redevelop the site as a park.

- Soil Capping

An engineered control, such as a soil cap, would implement a physical barrier to eliminate the potential risks associated with exposure to impacted Site media. Soil capping would be an effective means to limit exposure; however, the remedy would leave impacted media in place and would not address the soil point of compliance for the Site. This alternative meets the minimum requirements of WAC 173-340-360. However, this alternative would leave contamination in place and would likely require long-term compliance monitoring. This alternative was not selected for further evaluation because alternatives exist that would provide a more permanent remedy with readily quantifiable results.

- Anaerobic Biological Oxidation via Soil Amendments

Anaerobic biological oxidation (ABOx) of petroleum hydrocarbons relies on the use of non-oxygen electron accepting processes such as nitrate reduction, ferric iron reduction, sulfate reduction and methanogenesis to facilitate cellular respiration where the hydrocarbons are used as electron donors. This alternative would include the addition of relatively inert agents to site soil to stimulate the production of naturally occurring sulfate reducing bacteria. This alternative meets the

minimum requirements of WAC 173 -340-360 and was selected for further evaluation.

· In Situ Chemical Oxidation via Persulfate Injection

The goal of in situ chemical oxidation (ISCO) is to destroy organic compounds through thermal or oxidative means. This alternative would inject a persulfate solution into the subsurface via a network of injection wells and would include pre-implementation work such as biogechemical characterization, hydrostratigraphic investigation and persulfate pre-design testing. This alternative meets the minimum requirements of WAC 173 -340-360 and was selected for further evaluation.

· In-Situ Vitrification

In-situ vitrification is a process in which subsurface soils are subjected to high temperatures to melt and solidify its components thereby either volatilizing compounds that remain in the soil or encasing them within a solid matrix. This technology would be an effective means of treatment; however, its implementation is costly and would potentially generate excessive heat in adjacent Budd Inlet. This technology was not selected for further evaluation due to its cost and potential for causing additional environmental impacts to a surface water body

· Monitored Natural Attenuation

This alternative will leave the site in its current condition, and no activities will be implemented to remove, treat, or contain COCs at the site. Under this alternative, natural attenuation processes will continue to reduce COC concentrations over time and routine groundwater monitoring will be performed to document reductions in COC concentrations. Long-term monitoring of natural attenuation parameters and COC concentrations would be required to ensure that site contaminants are immobile and decreasing in concentrations. This alternative was not selected for further evaluation because it does not meet the minimum requirements of WAC 173-340-360.

· Excavation and Off-Site Disposal

Excavation and off-site disposal of impacted site soils would remove soil impacts from the site permanently. This remedial alternative would consist of a combination of soil excavation and soil sampling to remove impacted soil and to confirm

remaining COC concentrations are below CULs within the soil point of compliance. This is a viable option given its simplicity, implementability, and relative cost. This alternative meets the minimums requirements of WAC 173-340-360 and was selected for further evaluation.

- No Action

The no action alternative would not require further remediation at the Site. This option is not feasible given the concentrations that have historically been detected in site soil. This alternative was not selected for further evaluation because it does not meet the minimum requirements of WAC 173-340-360.

7.6.2 Detailed Evaluation of Alternatives

The following cleanup action alternatives were selected for further evaluation to address residual petroleum hydrocarbons and PAHs in site soil:

- Excavation and Off-Site Disposal
- Anaerobic Biological Oxidation via Soil Amendments
- ISCO via Persulfate Injection

Details of the proposed cleanup action alternatives are described in the following sections. Alternatives were compared to solution criteria as outlined in WAC 173-340-360(d). The remedial alternatives were chosen for further evaluation based on the remedy's ability to permanently address contamination in site media. Evaluation criteria was assigned a numerical score from 1 (lowest benefit) to 5 (highest benefit) based on the effectiveness of the alternative meeting the solution criteria. Total scores for each alternative were assigned based on the summation of the points allocated to the evaluation criteria. The total scores were then compared to overall costs associated with implementation of the cleanup alternative.

7.6.2.1 Preferred Alternative - Excavation and Off-Site Disposal

ARCADIS has evaluated the approximate horizontal and vertical extent of soil impacts above CULs using methods detailed in the RI Report (ARCADIS 2012). ARCADIS estimates that the horizontal extent of impacts is approximately 7,573 square feet and the vertical extent of impacts is approximately 8 feet bgs. Prior to excavation,

ARCADIS would install approximately six confirmatory soil borings to confirm the accuracy of the proposed excavation limits. To determine the appropriate depth of the excavation, confirmation sampling would be conducted throughout the soil point of compliance from ground surface to 15 feet below ground surface. Impacted soil will be excavated from the site to the depth at which soil concentrations are below MTCA A CULs. Confirmation sampling will ensure that COCs remaining onsite are at concentrations protective of human health and the environment. Depending on the results of the conformation sampling, a minimum of 841 cubic yards (CY) and up to 4,200 CY of impacted soil would be excavated and disposed of offsite. Figure 15 illustrates a plan view of the proposed excavation limits and approximate confirmation soil sample locations. Figures 16 and 17 illustrate cross-sectional views of the proposed excavation area and the extents of the soil point of compliance. Table 8 presents the estimated cost to complete confirmation sampling and soil excavation. Additional supporting documentation for the cost estimate is included in Appendix A.

This activity would include the implementation of an agency-approved Remedial Action Plan, including an air monitoring plan and traffic control plan. The air monitoring plan would set forth action levels for dust and airborne contaminants and would establish construction requirements with regard to dust suppression. Backfilling with clean soil would return the site to the current grade. A traffic control plan would be prepared to minimize any potential impact to the local community. A minimum of 42 and a maximum of two hundred and ten 20-cubic yard truckloads of material would be removed and transported through the local community.

Excavation and off-site disposal addresses the permanent solution criteria outlined in WAC 173-340-360(d), as follows:

- *Protection of human health and the environment – Score 5*. Permanent removal of human health and ecological receptor threat from the Site. A score of 5 (highest benefit) was assigned due to the permanent nature of the alternative meeting the criteria.

- *Permanence in reduction of toxicity, mobility and volume – Score 5*. COC volume removed from the Site. A score of 5 (highest benefit) was assigned due to the permanent nature of the alternative meeting the criteria.

- *Cost – Score 3*. A minimum of $100,000 to $500,000 would be required to complete this alternative. The ultimate costs to complete the excavation would be dependent of the final excavation depth as determined by confirmation sampling.

Additional costs associated with extensive shoring and site dewatering would also be dependant of the final excavation depth. For the purposes of this feasibility study, an average cost of $ 300,000 will be assumed. A score of 3 (moderate benefit) was assigned due the high costs associated with the alternative meeting the criteria.

- *Long-term effectiveness – Score 5*. Permanent removal of impacted material. A score of 5 (highest benefit) was assigned due to the permanent nature of the alternative meeting the criteria.

- *Management of Short-Term Risks – Score 3*. Material can be removed from the Site in a short time frame, eliminating impacts. The potential exists for airborne suspension of COCs during the excavation process and loading trucks. Additionally, soil erosion and runoff presents environmental risks associated with this alternative. Fugitive emissions during transportation of impacted soils may also impact the greater community. A score of 3 (moderate benefit) was assigned due to the risks associated with potential short term exposure to COCs and site soil erosion and runoff.

- *Implementability – Score 3*. The equipment and resources required for this alternative are available. Landfill space is available. Lead time is required to schedule and coordinate resources. Seasonal weather conditions will limit the implementation time frame. A score of 3 (moderate benefit) was assigned due to the availability of resources to implement the alternative; however, the benefit is offset by the implementation lead time and seasonal weather restrictions.

- *Consideration of public concerns – Score 3*. Permanent long-term reduction in toxicity, mobility and volume. Possible short-term risk to the local community due to transportation of impacted materials to an off-site landfill. A score of 3 (moderate benefit) was assigned due to the risks associated with potential short term exposure to COCs off set by the overall time fame associated with those exposures.

- *Restoration Time Frame – Score 5.* Implementation of this alternative would be impacted by seasonal weather conditions; however, the alternative could be implemented within the year from approval of the final Corrective Action Plan (CAP). A score of 5 (highest benefit) was assigned due to the relatively short implementation time frame.

Total Score – 32

Total Implementation Costs – $ 300,000 average ($100,000 to $500,000)

7.6.2.2 Anaerobic Biological Oxidation via Sulfate Application

This alternative would enhance ABOx at the site through surface application of powdered gypsum ($CaSO_4$) and Epsom salt ($MgSO_4*7H_2O$) to act as a sulfate source to stimulate the growth of naturally occurring, sulfate reducing bacterial populations. The reaction provides an energy source to the bacteria and results in the oxidation and degradation of petroleum hydrocarbons.

As shown in the chemical reaction below, anaerobic biodegradation with sulfate as the electron acceptor yields various forms of sulfide.

$$C_{12}H_{26} + 9.25\ SO_4^{2-} + 1.875\ H^+ \rightarrow 4.625\ H_2S + 4.625\ HS^- + 12HCO_3^- + H_2O$$

The sulfide ion participates in acid-base reactions, and the form of sulfide produced is pH dependent. At near neutral pH levels associated with most groundwater, the dominant form of sulfide is hydrogen sulfide (H_2S). Sulfide is not anticipated to negatively impact groundwater quality because it will be removed from the water through precipitation reactions. The precipitation reaction between sulfide and ferrous iron is anticipated to be an important control on sulfide generation during anaerobic biological oxidation of petroleum hydrocarbons. In anaerobic conditions, naturally occurring iron-bearing minerals will be reduced, and will dissolve ferrous iron into groundwater, which will readily react with sulfide to precipitate iron sulfide minerals.

Calcium, magnesium and sulfate do not have established maximum contaminant levels (i.e. they do not pose significant risk to human health) but can impact water quality from an aesthetic standpoint. Secondary maximum contaminant levels (SMCLs) are established for sulfate and total dissolved solids, which includes calcium. However, SMCLs are established for odor and taste considerations, and as such should not be considered applicable at this site. Additionally, attenuation of these constituents is rapid, as precipitation of sulfide solids is rapid and scavenging.

This alternative addresses the permanent solution criteria outlined in WAC 173-340-360(d), as follows:

- *Protection of human health and the environment – Score 3.* It is anticipated that this remedial alternative would reduce COC concentrations in the treatment area to to concentrations below CULs. However, residual COCs may remain at the site. Therefore, a score of 3 (moderate benefit) is warranted.

- *Permanence in reduction of toxicity, mobility and volume – Score 3.* . This alternative would reduce contaminant mass through biological oxidation. The alternative was assigned a score of 3 (moderate benefit) due to its ability to reduce COC concentrations in Site media; however, residual COCs may remain at the site at concentrations below CULs.

- *Cost – Score 3.* Costs to implement this alternative would be approximately $50,000 to $75,000 per application, dependent on the application depth and application density. Three applications are assumed for the purposes of this comparison. The costs associated with this alternative are moderate; therefore, a score of 3 (moderate benefit) was chosen.

- *Long-term effectiveness – Score 3*. The alternative would provide a long-term solution to site contaminants; however, residual contaminant may remain on site at concentrations below CULs. A score of 3 (moderate benefit) was assigned to reflect the potential for residual contamination.

- *Management of Short-Term Risks – Score 2*. The remedial alternative could be implemented quickly; however, the potential exists for airborne suspension of COCs and particulates during the application process. Soil erosion and runoff risks are associated with this alternative as well. Additionally, site groundwater may show a temporary decrease in aesthetic water quality due to the presence of sulfate reduction species. A score of 2 (low-moderate benefit) was assigned due to the risks associated site soil erosion and runoff and the potential for short-term decreases in site groundwater quality.

- *Implementability – Score 3*. This alternative could be easily implemented. However, its initiation would be limited by seasonal weather conditions and multiple applications may be necessary to achieve remedial goals. A score of 3 (moderate benefit) was chosen to reflect the potential for multiple applications and the seasonal application limitations.

- *Consideration of public concerns – Score 3*. Possible short-term risk to the local community may be present as a result of the airborne suspension of COCs and

particulates during the application process. A score of 3 (moderate benefit) was assigned due to the risks associated with potential short term exposure to COCs off set by the overall time fame associated with those exposures.

- *Restoration Time Frame – Score 2.* This alternative could be implemented in a short time frame. However, the establishment of populations sulfate reducing bacteria may require additional soil amendments. Additionally, confirmation sampling would be required to confirm the efficacy of the remedial alternative. This alternative was assigned a score of 2 (low-moderate benefit)

  Total Score – 22

  Total Implementation Cost – up to $225,000

7.6.2.3 ISCO via Persulfate Injection

The ISCO alternative would involve routine injections of a persulfate solution that will enhance oxidation and promote transfer of electrons by producing sulfate radicals, thus accelerating petroleum hydrocarbon degradation. Implementation of this alternative would consist of injection pilot testing followed by full scale remedial design and implementation, and confirmation sampling to confirm the efficacy of the injections. The pilot testing would consist of the installation of three injection wells, hydraulic conductivity testing, an initial persulfate injection, and performance monitoring from the existing monitoring well network. Following the pilot test, two additional injection wells and two additional groundwater monitoring wells would be installed to facilitate injections and ongoing performance monitoring. Four additional injection events would be conducted following full scale remedial design. This remedial alternative would require a pilot test to collect data necessary to estimate the anticipated remedial timeframe; however, remedial operation including performance and groundwater monitoring is assumed to continue for 2 years.

This alternative addresses the permanent solution criteria outlined in WAC 173-340-360(d), as follows:

- *Protection of human health and the environment – Score 3.* It is anticipated that this remedial alternative would reduce COC concentrations in the treatment area to concentrations below CULs. However, residual COCs may remain at the site. Therefore, a score of 3 (moderate benefit) is warranted.

- *Permanence in reduction of toxicity, mobility and volume – Score 3.* This alternative would reduce contaminant mass through chemical oxidation. The alternative was assigned a score of 3 (moderate benefit) due to its ability to reduce COC concentrations in Site media; however, residual COCs may remain at the site at concentrations below CULs.

- *Cost – Score 2.* Implementation of this alternative would be approximately $350,000, inclusive of the pilot testing and four subsequent injections. The costs associated with this alternative are high; therefore, a score of 2 (low-moderate benefit) was chosen.

- *Long-term effectiveness – Score 3*. The alternative would provide a long term solution to site contaminants; however, residual contaminant may remain on site at concentrations below CULs. A score of 3 (moderate benefit) was assigned to reflect the potential for residual contamination.

- *Management of Short-Term Risks – Score 3*. Short term risks associated with this alternative include a temporary decrease in groundwater quality resulting from the persulfate injections. A score of 3 (moderate benefit) was assigned due to the risks associated with the decreases in site groundwater quality.

- *Implementability – Score 2*. Pilot testing could be easily implemented. However, successful full scale implementation of the remedial alternative would require evaluation of the results of the pilot test. Additionally, results of the pilot test may indicate technical limitations associated with this cleanup remedy Therefore, a score of 2 (low-moderate benefit) is warranted.

- *Consideration of public concerns – Score 4*. Short term risks to the local community are minimal; however, A score of 4 (moderate-high benefit) was assigned due to the few short risks associated with the pilot test implementation and subsequent injections

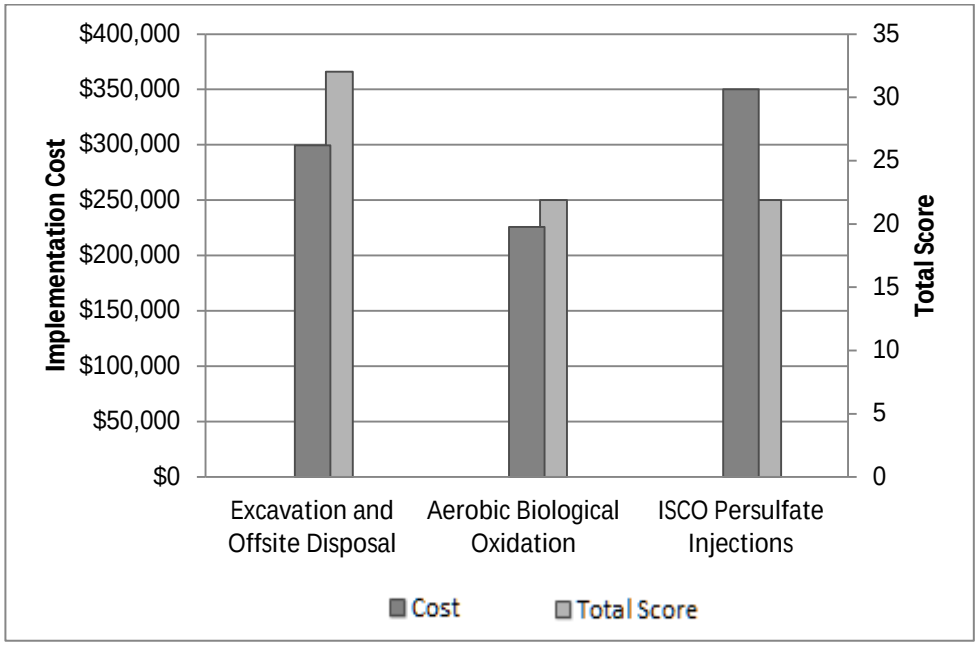
- *Restoration Time Frame – Score 2.* This alternative could be implemented in a short time frame. However, additional injections would be required to achieve remedial goals. Additionally, confirmation sampling would be required following the injections to confirm the efficacy of the remedial alternative. This alternative was assigned a score of 2 (low-moderate benefit)

  Total Score – 22

Total Implementation Cost – $350,000

7.7 Comparison and Recommended Corrective Action Alternative

A comparison of the corrective action alternatives is presented below.



Excavation and offsite disposal is the preferred remedial alternative. This remedy received the highest total score based on the evaluation criteria as defined in WAC 173-340-360. This score is due primarily to the permanent nature of the remedy and the ability to remove impacted media from the site entirely. Costs associated with the excavation alternative are generally in line with those associated with the other remedies that were evaluated. ABOx soil amendments and ISCO injections scored the same regards to total score; however implementation of an ISCO injection program would be more costly due to the installation the injection infrastructure. Both ABOx and ISCO would require multiple treatments to achieve remedial goals. Alternatively, the excavation and offsite disposal alternative would produce immediate results without the need for additional treatments or long term monitoring to ensure efficacy of cleanup.

ARCADIS recommends the excavation and off-site disposal alternative to address potential risk to receptors at the Site. The proposed strategy is consistent with Ecology

expectations provided in WAC 173-340-360. Excavation and off-site disposal satisfies the requirement to use permanent solutions to the maximum extent practicable based upon several criteria, including:

- Meeting MTCA cleanup standards for the protection of human health and terrestrial ecological receptors.
- Attaining established soil CULs (for current and potential future land uses).
- Eliminating further release that might pose threats to human health or the environment.
- Complying with applicable federal, state and local standards for management of wastes

8. Conclusions

ARCADIS has performed a feasibility study at the former IPD site at 1120 West Bay Drive, Olympia, Washington. Site investigation activities conducted by ARCADIS and others confirm that residual petroleum hydrocarbons and related constituents in soil from previous operation of the bulk plant pose a potential risk to human health and the environment as assessed under MTCA Method A. Groundwater and sediment investigations have not indicated impacts to these site media. ARCADIS recommends Excavation and off-site disposal of contaminated soil to remediate the Site.

9. References

ARCADIS U.S., Inc. (ARCADIS) 2012. Remedial Investigation Report, Former ARCO Olympia Bulk Terminal, Industrial Petroleum Distributors Site (Facility Identification No. 1436), 1120 West Bay Drive, Olympia, Washington. January 30.

SECOR 2000. Limited Environmental Site Assessment Report, Former Industrial Petroleum Distributors, 1117 West Bay Drive, Olympia, Washington. March 20.

SECOR 2001. Final Remedial Investigation and Feasibility Study, Former Industrial Petroleum Distributors, 1117 West Bay Drive, Olympia, Washington. October 30.

Washington State Department of Ecology (Ecology). 2006. Letter from Steve Teel to Bob May and Scott Hooton Re: Sediment Screening Requirement and Potential Interim Action Former Industrial Petroleum Distributors (IPD) Site, Olympia, WA. July 31.

Washington State Department of Ecology (Ecology). 2010. Draft Guidance for Remediation of Petroleum Contaminated Sites. Publication No. 10-09-057. December 2010.

Washington State Department of Water Resources. 1970. Geology and Related Groundwater Occurrence, Southeastern Mason County, Washington.

ARCADIS

Tables

TABLE 1
GROUNDWATER ELEVATION DATA
FEASIBILITY STUDY REPORT
Former ARCO Olympia Bulk Terminal
Industrial Petroleum Distributors Site
1120 West Bay Drive
Olympia, Washington

Groundwater Elevation Data	High or Low Tide	Well ID						
Date Measured		MW-6R feet	MW-7 feet	MW-8 feet	MW-9 feet	MW-10 feet	MW-11 feet	MW-12 feet
10/1/2010	Low	11.92	9.74	10.05	11.41	11.47	13.00	12.97
12/29/2010	High	12.34	12.33	11.73	12.12	12.33	13.65	13.65
3/17/2011	High	12.54	12.30	11.79	12.34	12.11	14.01	14.04
4/19/2011	Low	12.38	10.93	11.30	11.41	11.95	13.81	13.74
6/2/2011	High	12.33	9.74	10.37	10.65	11.84	13.79	13.71
6/2/2011	Low	12.26	9.64	10.34	10.93	11.91	13.63	13.59

Notes
The groundwater elevation data measured approximately at high or low tides.

TABLE 2
ELECTRICAL CONDUCTIVITY VERSUS HIGH AND LOW TIDE
FEASIBILITY STUDY REPORT
Former ARCO Olympia Bulk Terminal
Industrial Petroleum Distributors Site
1120 West Bay Drive
Olympia, Washington

Electrical Conductivity	High or Low Tide	Well ID						
Date Measured		MW-6R mS/cm	MW-7 mS/cm	MW-8 mS/cm	MW-9 mS/cm	MW-10 mS/cm	MW-11 mS/cm	MW-12 mS/cm
10/1/2010	High	0.145	1.795	2.71	0.220	0.185	0.175	0.174
10/1/2010	Low	--	--	--	--	--	--	--
12/30/2010	High	0.175	0.774	2.51	0.358	0.241	--	0.240
12/30/2010	Low	--	--	--	--	--	--	--
3/17/2011	High	0.189	0.359	3.051	0.496	0.276	0.313	0.278
3/17/2011	Low	--	--	--	--	--	--	--
6/3/2011	High	--	--	--	--	--	--	--
6/3/2011	Low	0.166	1.520	3.17	0.363	0.215	0.202	0.192

Notes
mS/cm millisiemens per centimeter
-- not recorded

TABLE 3
HISTORICAL SOIL ANALYTICAL RESULTS
FEASIBILITY STUDY REPORT
Former ARCO Olympia Bulk Terminal
Industrial Petroleum Distributors Site
1120 West Bay Drive
Olympia, Washington

Analysis	MTCA Method A Soil Cleanup Levels	Sample ID / Depth (bgs) / Date Collected																			
		S-1 5' 9/20/2000	S-2 7' 9/20/2000	S-3 6.5' 9/20/2000	S-4 5' 9/20/2000	S-5 5.5' 9/20/2000	S-6 5.5' 9/20/2000	IPD-1-3 3' 11/1/2001	IPD-2-4 4' 11/1/2001	IPD-3-2.5 2.5' 11/1/2001	IPD-4-4.5 4.5' 11/1/2001	IPD-5-4.5 4.5' 11/1/2001	IPD-6-5 5' 11/1/2001	WBTP-01 NS 3/9/2004	WBTP-02 NS 3/9/2004	WBTP-03 NS 3/9/2004	MW-IP-1 (MW-6) 1' 8/10/2004	MW-IP-3 (MW-6) 3' 8/10/2004	MW-IP-5 (MW-6) 5' 8/10/2004	MW-IP-7 (MW-6) 7' 8/10/2004	MW-IP-9 (MW-6) 9' 8/10/2004
Volatile Organic Compounds	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**
Benzene	0.03	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.100	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Naphthalene	5	--	--	--	--	--	--	<0.200	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,4-Trimethylbenzene	NE	--	--	--	--	--	--	<0.100	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,3,5-Trimethylbenzene	NE	--	--	--	--	--	--	<0.100	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Xylenes	9	<0.05	<0.05	<0.05	<0.05	<0.05	**23.9**	<0.200	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TPH - HCID																						
Gasoline Range Organics	NE	--	--	--	--	--	--	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--
Diesel Range Organics	NE	--	--	--	--	--	--	ND	ND	ND	ND	ND	ND	DET	ND	ND	--	--	--	--	--	--
Heavy Oil Range Organics	NE	--	--	--	--	--	--	**DET**	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--
TPH-NWTPH	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**
Gasoline Range Organics	30	<10	--	--	--	--	<10	--	--	--	--	--	--	--	--	--	<20	<20	<20	<20	<20	<20
Diesel Range Organics	2,000	**330**	<20	<20	<20	<20	**14,000**	<25	--	--	--	--	--	**570**	**1,100**	--	<50	<50	<50	<50	<50	<50
Heavy Oil Range Organics	2,000	<40	<40	<40	<40	<40	<40	**296**	--	--	--	--	--	--	--	--	<100	<100	<100	<100	<100	<100
PCBs	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**
PCB-1016	(d)	**--**	--	--	--	--	**--**	--	--	--	--	--	--	<0.05	**--**	--	--	--	--	--	--	--
PCB-1221	(d)	**--**	--	--	--	--	**--**	--	--	--	--	--	--	<0.05	**--**	--	--	--	--	--	--	--
PCB-1232	(d)	**--**	--	--	--	--	**--**	--	--	--	--	--	--	<0.05	**--**	--	--	--	--	--	--	--
PCB-1242	(d)	**--**	--	--	--	--	**--**	--	--	--	--	--	--	<0.05	**--**	--	--	--	--	--	--	--
PCB-1248	(d)	**--**	--	--	--	--	**--**	--	--	--	--	--	--	<0.05	**--**	--	--	--	--	--	--	--
PCB-1254	(d)	**--**	--	--	--	--	**--**	--	--	--	--	--	--	<0.05	**--**	--	--	--	--	--	--	--
PCB-1260	(d)	**--**	--	--	--	--	**--**	--	--	--	--	--	--	<0.05	**--**	--	--	--	--	--	--	--
PCB Mixtures	1	**--**	--	--	--	--	**--**	--	--	--	--	--	--	*0.175*	**--**	--	--	--	--	--	--	--
Metals	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**
Antimony	NE	--	--	--	--	--	--	--	--	--	--	--	--	ND^	ND^	ND^	--	--	--	--	--	--
Arsenic	20	--	--	--	--	--	--	**2.35**	--	**--**	**--**	--	--	ND^	ND^	ND^	--	--	--	--	--	--
Barium	NE	--	--	--	--	--	--	**64.5**	**--**	**--**	**--**	**--**	**--**	ND^	ND^	ND^	**--**	**--**	--	--	--	--
Cadmium	2	--	--	--	--	--	--	--	--	--	--	--	--	ND^	ND^	ND^	--	--	--	--	--	--
Chromium	(a)	--	--	--	--	--	--	**17.6**	**--**	**--**	**--**	**--**	**--**	ND^	**10**	ND^	**--**	**--**	--	--	--	--
Copper	NE	--	--	--	--	--	--	**25.1**	**--**	**--**	**--**	**--**	**--**	ND^	ND^	ND^	**--**	**--**	--	--	--	--
Lead (Total)	250	**11**	--	--	--	--	**30**	**27.4**	**--**	**--**	**--**	**--**	**--**	**8**	ND^	ND^	**50.3**	**51**	**724**	**8.28**	**2.46**	
Mercury	2	--	--	--	--	--	--	--	--	--	--	--	--	ND^	ND^	ND^	--	--	--	--	--	--
Nickel	NE	--	--	--	--	--	--	**23.0**	**--**	**--**	**--**	**--**	**--**	ND^	ND^	**16**	**--**	**--**	--	--	--	--
Selenium	NE	--	--	--	--	--	--	--	--	--	--	--	--	ND^	ND^	ND^	--	--	--	--	--	--
Silver	NE	--	--	--	--	--	--	--	--	--	--	--	--	ND^	ND^	ND^	--	--	--	--	--	--
Thallium	NE	--	--	--	--	--	--	--	--	--	--	--	--	ND^	ND^	ND^	--	--	--	--	--	--
Zinc	NE	--	--	--	--	--	--	**39.5**	**--**	**--**	**--**	**--**	**--**	ND^	ND^	ND^	**--**	**--**	--	--	--	--
c-Polyaromatic Hydrocarbons	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**	**mg/Kg**
Naphthalene	(b)	--	--	--	--	--	--	<0.134	--	**--**	--	**--**	**--**	--	**--**	**--**	**--**	**--**	--	--	--	--
1-Methylnaphthalene	(b)	--	--	--	--	--	--	<0.134	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2-Methylnaphthalene	(b)	--	--	--	--	--	--	<0.134	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Naphthalenes	5	--	--	--	--	--	--	*0.201*	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Acenaphthene	NE	--	--	--	--	--	--	<0.134	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Acenaphthylene	NE	--	--	--	--	--	--	<0.134	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Anthracene	NE	--	--	--	--	--	--	<0.134	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzo (a) anthracene	(c)	--	--	--	--	--	--	<0.134	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzo (a) pyrene	0.1	--	--	--	--	--	--	<0.134*	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzo (b) fluoranthene	(c)	--	--	--	--	--	--	**0.188**	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzo (g,h,i) perylene	NE	--	--	--	--	--	--	<0.134	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzo (k) fluoranthene	(c)	--	--	--	--	--	--	<0.134	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chrysene	(c)	--	--	--	--	--	--	**0.185**	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dibenzo (a,h) anthracene	(c)	--	--	--	--	--	--	<0.134	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fluoranthene	NE	--	--	--	--	--	--	<0.134	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fluorene	NE	--	--	--	--	--	--	**0.312**	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Indeno (1,2,3-cd) pyrene	(c)	--	--	--	--	--	--	<0.134	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Phenanthrene	NE	--	--	--	--	--	--	**0.212**	--	**--**	--	--	--	--	--	--	--	--	--	--	--	--
Pyrene	NE	--	--	--	--	--	--	**0.235**	--	--	--	--	--	--	--	--	--	--	--	--	--	--
cPAH B(a)P Equivalents	0.1	--	--	--	--	--	--	***0.11***	--	--	--	--	--	--	--	--	--	--	--	--	--	--

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)

TABLE 3
HISTORICAL SOIL ANALYTICAL RESULTS
FEASIBILITY STUDY REPORT
Former ARCO Olympia Bulk Terminal
Industrial Petroleum Distributors Site
1120 West Bay Drive
Olympia, Washington

The MTCA Method A cleanup level for gasoline range total petroleum hydrocarbons is 100-mg/kg without benzene and 30-mg/kg with benzene present. Benzene was observed in groundwater collected from sample ID-4 in 2001, thus the cleanup level of 30-mg/kg was utilized.
ft = feet
bgs = below ground surface
mg/kg = milligram per kilogram
NS = Depth not specified. Previous consultant stated that test pit soil samples were collected above the highest apparent water level. Water level was not specified.
NE = Cleanup level not evaluated under MTCA
ND = Not Detected (Hydrocarbon Identification Method)
ND^ = Reported by previous consultant as "Not Detected". Reporting and/or detection limit was not specified.
-- not analyzed
TPH = Total Petroleum Hydrocarbons
HCID = Laboratory analysis by Hydrocarbon Identification
NWTPH = Laboratory analysis by Northwest Method Total Petroleum Hydrocarbons
cPAH = Carcinogenic polyaromatic hydrocarbons
B(a)P = Benzo(a)pyrene
< = Not detected above the laboratory reporting limit (RL) and/or method detection limit
Bold = Chemical detected at a concentration above the laboratory reporting limit
Bolded and highlighted font indicates results above the MTCA Method A cleanup level
(a) = Analysis is for total chromium. No MTCA cleanup level has been established for total chromium.
(b) = MTCA cleanup level is 5-mg/kg for total concentration of naphthalene, 1-methylnaphthalene and 2-methylnaphthalene. Total concentration conservatively assumed to be the sum any detected concentration and/or of half of the value of each RL if not detected
(c) = See MTCA cleanup level for B(a)P. Total concentration of cPAHs calculated using the toxicity equivalency method in WAC 173-340-708(8)
(d) = See MTCA cleanup level for PCB Mixtures. Per MTCA, cleanup level based on applicable federal law (40 CFR 761.61). This is a total value for all PCBs, conservatively assumed to be the sum any detected concentration and/or of half of the value of each RL if not detected.
NA = Not applicable
* = Laboratory practical quantitation limit is elevated above the MTCA Method A cleanup level, but chemical was not observed above the laboratory method detection limit

TABLE 4
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
FEASIBILITY STUDY REPORT
Former ARCO Olympia Bulk Terminal
Industrial Petroleum Distributors Site
1120 West Bay Drive
Olympia, Washington

Analysis	MTCA Method A Cleanup Levels	Sample ID Sample Location Type Date Collected											
		W-1 9/20/2000	W-2 9/20/2000	IPD-1 TP 2001	IPD-2 TP 2001	IPD-3 TP 2001	IPD-4 TP 2001	IPD-5 TP 2001	WBTP-01 TP 3/9/2004	WBTP-02 TP 3/9/2004	MW-6 MW 8/26/2004	MW-6 MW 11/12/2004	MW-6 MW 1/10/2005
Volatile Organic Compounds	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Benzene	5	<1'	<1'	<1.00	<1.00	<1.00	**1.64**	<1.00	--	--	--	--	--
Ethylbenzene	700	<1	<1	<1.00	<1.00	<1.00	<1.00	<1.00	--	--	--	--	--
Toluene	1,000	<1	<1	<1.00	<1.00	**4.38**	<1.00	<1.00	--	--	--	--	--
Total Xylenes	1,000	<1	**170**	<2.00	<2.00	<2.00	**31.1**	**6.9**	--	--	--	--	--
TPH - HCID													
Gasoline Range Organics	--	--	--	ND	--	ND	ND	ND	--	--	<250	<250	<250
Diesel Range Organics	--	--	--	ND	DET	DET	ND	ND	--	--	<500	<500	<500
Heavy Oil Range Organics	--	--	--	ND	ND	DET	ND	ND	--	--	<500	<500	<500
TPH-NWTPH	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			mg/L
Gasoline Range Organics	800	<100	<100	<80	--	**1,930**	**149**	**254**	--	--	--	--	--
Diesel Range Organics	500	**35,000**	**280,000**	<333	**1,020**	**14,100**	<250	<250	<200**	<400**	--	--	--
Heavy Oil Range Organics	500	<400	<400	<240	<500	**590**	<500	<500	<200	<400	--	--	--
Metals	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			mg/L
Antimony	NE	--	--	**1.10**	<1.00	<1.00	<1.00	<1.00	<2.5	<2.5	--	--	--
Arsenic	5	--	--	**21.9**	<1.00	**2.01**	**1.32**	<1.00	**2.74**	**0.865**	--	--	--
Barium	NE	--	--	**112**	**18.6**	**72.2**	**31.40**	**27.9**	--	--	--	--	--
Beryllium	NE	--	--	<1.00	<1.00	<1.00	<1.00	<1.00	<0.5	<0.5	--	--	--
Cadmium	5	--	--	<1.00	<1.00	<1.00	<1.00	<1.00	<0.5	<0.5	--	--	--
Chromium	50	--	--	**24.0**	**4.92**	**20.7**	**7.76**	**6.33**	**3.57**	**6.05**	--	--	--
Copper	NE	--	--	**44.5**	**5.22**	**20.4**	**8.34**	**6.12**	<0.5	<0.5	--	--	--
Lead (Total)	15	<1	--	**49.9**	**2.64**	**5.15**	**1.78**	**1.40**	**0.535**	<0.5	ND^	--	--
Lead (Dissolved)	15	--	--	--	--	--	--	--	--	--	ND^	--	--
Mercury	2	--	--	--	--	--	--	--	<0.2	<0.2	--	--	--
Nickel	NE	--	--	**28.0**	**4.75**	**20.3**	**8.77**	**6.13**	**2.44**	**3.85**	--	--	--
Selenium	NE	--	--	**1.15**	<1.00	<1.00	<1.00	<1.00	<1	<1	--	--	--
Silver	NE	--	--	--	--	--	--	--	<0.5	<0.5	--	--	--
Thallium	NE	--	--	--	--	--	--	--	<0.5	<0.5	--	--	--
Zinc	NE	--	--	**85.7**	**18.3**	**35.6**	**21.5**	**11.7**	**7.89**	**8.58**	--	--	--
c-Polyaromatic Hydrocarbons	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			mg/L
Naphthalene	(a)	--	--	<1.33	**10.6**	**6.30**	<1.00	**5.73**	<0.1	<0.1	--	--	--
1-Methylnaphthalene	(a)	--	--	--	--	--	--	--	**3.4**	**28**	--	--	--
2-Methylnaphthalene	(a)	--	--	--	--	--	--	--	**11**	**33**	--	--	--
Naphthalenes	160	--	--	*0.67*	*10.6*	*6.30*	*0.50*	*5.73*	--	--	--	--	--
Acenaphthene	NE	--	--	<1.33	<1.00	<1.00	<1.00	<1.00	<0.1	<0.1	--	--	--
Acenaphthylene	NE	--	--	<1.33	<1.00	<1.00	<1.00	<1.00	<0.1	<0.1	--	--	--
Anthracene	NE	--	--	<1.33	<1.00	<1.00	<1.00	<1.00	<0.1	<0.1	--	--	--
Benzo (a) anthracene	(b)	--	--	<1.33	<1.00	<1.00	<1.00	<1.00	<0.1	<0.1	--	--	--
Benzo (a) pyrene	0.1	--	--	<1.33*	<1.00*	<1.00*	<1.00*	<1.00*	<0.1	<0.1	--	--	--
Benzo (b) fluoranthene	(b)	--	--	<1.33	<1.00	<1.00	<1.00	<1.00	<0.1	<0.1	--	--	--
Benzo (g,h,i) perylene	NE	--	--	<1.33	<1.00	<1.00	<1.00	<1.00	<0.1	<0.1	--	--	--
Benzo (k) fluoranthene	(b)	--	--	<1.33	<1.00	<1.00	<1.00	<1.00	<0.1	<0.1	--	--	--
Chrysene	(b)	--	--	<1.33	<1.00	<1.00	<1.00	<1.00	<0.1	<0.1	--	--	--
Dibenzo (a,h) anthracene	(b)	--	--	<2.67	<2.00	<2.00	<2.00	<2.00	<0.1	<0.1	--	--	--
Fluoranthene	NE	--	--	<1.33	<1.00	<1.00	<1.00	<1.00	<0.1	<0.1	--	--	--
Fluorene	NE	--	--	<1.33	<1.00	<1.00	<1.00	<1.00	<0.1	<0.1	--	--	--
Indeno (1,2,3-cd) pyrene	(b)	--	--	<1.33	<1.00	<1.00	<1.00	<1.00	<0.1	<0.1	--	--	--
Phenanthrene	NE	--	--	<1.33	<1.00	**2.28**	<1.00	<1.00	<0.1	<0.1	--	--	--
Pyrene	NE	--	--	<1.33	<1.00	<1.00	<1.00	<1.00	<0.1	<0.1	--	--	--
cPAH B(a)P Equivalents	0.1	--	--	*1.88*	*0.86*	*0.81*	*0.81*	*0.81*	--	--	--	--	--

TABLE 4
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
FEASIBILITY STUDY REPORT
Former ARCO Olympia Bulk Terminal
Industrial Petroleum Distributors Site
1120 West Bay Drive
Olympia, Washington

Notes:
Concentrations compared to the Model Toxics Control Act (MTCA) Method A groundwater cleanup levels presented in Table 720-1 of Chapter 173-340 of the Washington Administrative Code (WAC)
The MTCA cleanup level for gasoline range total petroleum hydrocarbons is 1000-µg/kg without benzene and 800-µg/kg with benzene present. Benzene was observed in groundwater collected from sample ID-4 in 2001, thus the cleanup level of 800-µg/kg was utilized.
TP = test pit
MW = monitoring well
mg/L = micrograms per kilogram
NE = Cleanup level not established under MTCA
cPAH = Carcinogenic polyaromatic hydrocarbons
B(a)P = Benzo(a)pyrene
ND = Not Detected (Hydrocarbon Identification Method)
ND^ = Reported by previous consultant as "Not Detected". Reporting and/or detection limit was not specified.
** Laboratory report in Appendix B of Parametrix's 2004 West Bay Phase II ESA indicated these constituents were ND. Table 2 of Delta's 2008 Remedial Investigation Work Plan reported TPH-D concentrations as 10,000 and 59,000 µg/L (WBTP-01 and WBTP-02, respectively). The 2008 RIWP did not provide a laboratory report.
-- = not applicable or analyzed
< = Chemical not detected above the laboratory reporting limit, method detection limit, or practical quantitation limit
Italics = Value calculated for comparison to MTCA cleanup level
ND' = Laboratory practical quantitation limit is elevated above the MTCA Method A cleanup level, but chemical was not observed above the laboratory reporting limit
Bold = Chemical detected at a concentration above the laboratory reporting limit
Bolded and highlighted font indicates results above the MTCA Method A cleanup level
(a) = See MTCA cleanup level for naphthalene. This is a total value for naphthalene, 1-methylnaphthalene and 2-methylnaphthalene
(b) = See MTCA cleanup level for B(a)P. Total concentration of cPAHs calculated using the toxicity equivalency method in WAC 173-340-708(8)

TABLE 5
SOIL ANALYTICAL RESULTS - AUGUST 23-25, 2010
FEASIBILITY STUDY REPORT
Former ARCO Olympia Bulk Terminal
Industrial Petroleum Distributors Site
1120 West Bay Drive
Olympia, Washington

Analysis	MTCA Method A Cleanup Levels	Sample ID (Depth below ground surface in feet) Date Collected						
		GP-1 (2-2.5) 8/25/2010	GP-1 (4-4.5) 8/25/2010	GP-1 (6-6.5) 8/25/2010	GP-2 (2-2.5) 8/25/2010	GP-2 (4-4.5) 8/25/2010	GP-3 (2-2.5) 8/24/2010	GP-3 (4-4.5) 8/24/2010
Volatile Organic Compounds	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
Benzene	0.03	<0.0047	<0.019	--	<0.0042	<0.0086	<0.0034	<0.0038
Ethylbenzene	6	<0.0047	<0.019	--	<0.0042	<0.0086	<0.0034	<0.0038
Toluene	7	<0.0047	**0.0342**	--	<0.0042	<0.0086	<0.0034	<0.0038
Total Xylenes	9	<0.014	<0.0567	--	<0.0126	<0.0259	<0.0101	<0.0113
Total Petroleum Hydrocarbons	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
Gasoline Range Hydrocarbons	30	<8.6	<47*	--	<9.8	**264**	<6.2	<8.6
Diesel Range Organics	2,000	**30.4**	**60.9**	--	**732**	**3,120**	<21.8	**31.1**
Residual Range/Heavy Oil Organics	2,000	**198**	**481**	--	<124	**296**	<87.1	<103
RCRA 8 Metals	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
Arsenic	20	<12.3	<4.8	--	<13.3	<4.4	<10.9	<12.4
Barium	NE	**80.6**	**52.7**	--	**53.6**	**50.0**	**107**	**101**
Cadmium	2	<6.2*	<2.4*	--	<6.6*	<2.2*	<5.5*	<6.2*
Chromium (total)	(a)	**26.7**	**10.4**	--	**24.6**	**17.5**	**34.5**	**40.4**
Lead	250	**4.7**	**5.2**	--	**4.1**	**4.9**	**5.2**	**4.0**
Mercury	2	<0.12	<0.27	--	<0.15	<0.24	<0.11	<0.12
Selenium	NE	<6.2	<2.4	--	<6.6	<2.2	<5.5	<6.2
Silver	NE	<6.2	<2.4	--	<6.6	<2.2	<5.5	<6.2
c-Polyaromatic Hydrocarbons	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
Naphthalene	(b)	**0.0087**	<0.0178	<0.0451	<0.0104	**0.192**	<0.0075	<0.0087
1-Methylnaphthalene	(b)	<0.0087	<0.0178	<0.0451	**0.0217**	**0.449**	<0.0075	**0.0143**
2-Methylnaphthalene	(b)	**0.0111**	<0.0178	<0.0451	**0.0228**	**0.463**	<0.0075	**0.0199**
Naphthalenes	5	*0.0242*	*0.0267*	*0.0677*	*0.0497*	*1.10*	*0.011*	*0.039*
Acenaphthene	NE	<0.0087	<0.0178	<0.0451	<0.0104	**0.0896**	<0.0075	<0.0087
Acenaphthylene	NE	<0.0087	<0.0178	<0.0451	**0.0107**	**0.0688**	<0.0075	<0.0087
Anthracene	NE	<0.0087	<0.0178	<0.0451	<0.0104	**0.194**	<0.0075	<0.0087
Benzo (a) anthracene	(c)	<0.0087	<0.0178	<0.0451	<0.0104	**0.315**	<0.0075	<0.0087
Benzo (a) pyrene	0.1	<0.0087	<0.0178	<0.0451	<0.0104	**0.233**	<0.0075	<0.0087
Benzo (b) fluoranthene	(c)	<0.0087	<0.0178	<0.0451	<0.0104	**0.165**	<0.0075	<0.0087
Benzo (g,h,i) perylene	NE	<0.0087	<0.0178	<0.0451	<0.0104	**0.0429**	<0.0075	<0.0087
Benzo (k) fluoranthene	(c)	<0.0087	<0.0178	<0.0451	<0.0104	**0.205**	<0.0075	<0.0087
Chrysene	(c)	<0.0087	<0.0178	<0.0451	<0.0104	**0.338**	<0.0075	<0.0087
Dibenzo (a,h) anthracene	(c)	<0.0087	<0.0178	<0.0451	<0.0104	**0.0498**	<0.0075	<0.0087
Fluoranthene	NE	<0.0087	**0.0237**	**0.0540**	<0.0104	**0.488**	<0.0075	<0.0087
Fluorene	NE	<0.0087	<0.0178	<0.0451	**0.0136**	**0.294**	<0.0075	<0.0087
Indeno (1,2,3-cd) pyrene	(c)	<0.0087	<0.0178	<0.0451	<0.0104	**0.0550**	<0.0075	<0.0087
Phenanthrene	NE	**0.0114**	**0.0302**	<0.0451	**0.0383**	**0.999**	<0.0075	**0.0103**
Pyrene	NE	<0.0087	<0.0178	**0.0625**	<0.0104	**0.522**	<0.0075	<0.0087
cPAH B(a)P Equivalents	0.1	*0.0044*	*0.0089*	*0.0226*	*0.00785*	***0.315***	*0.0038*	*0.0044*

TABLE 5
SOIL ANALYTICAL RESULTS - AUGUST 23-25, 2010
FEASIBILITY STUDY REPORT
Former ARCO Olympia Bulk Terminal
Industrial Petroleum Distributors Site
1120 West Bay Drive
Olympia, Washington

Analysis	MTCA Method A Cleanup Levels	Sample ID (Depth below ground surface in feet) Date Collected						
		GP-4 (2-2.5) 8/23/2010	GP-4 (4-4.5) 8/23/2010	GP-5 (2-2.5) 8/23/2010	GP-5 (4-4.5) 8/23/2010	GP-5 (6-6.5) 8/23/2010	GP-6 (2-2.5) 8/25/2010	GP-6 (4-4.5) 8/25/2010
Volatile Organic Compounds	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
Benzene	0.03	<0.0033	<0.0033	<0.0034	<0.0095	--	<0.0031	<0.0029
Ethylbenzene	6	<0.0033	<0.0033	<0.0034	<0.0095	--	<0.0031	<0.0029
Toluene	7	<0.0033	<0.0033	<0.0034	<0.0095	--	<0.0031	<0.0029
Total Xylenes	9	<0.0099	<0.0099	<0.0102	**0.107**	--	<0.0094	<0.0087
Total Petroleum Hydrocarbons	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
Gasoline Range Hydrocarbons	30	<7.6	<7.4	<7.2	**875**	--	<6.6	**486**
Diesel Range Organics	2,000	<24.7	<26.2	**31.8**	**3,780**	--	<23.3	**899**
Residual Range/Heavy Oil Organics	2,000	<98.6	<105	<98.8	**1,040**	--	<93.1	<98.7
RCRA 8 Metals	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
Arsenic	20	<13.1	<12.6	<12.4	<21.0*	--	<11.5	<12.1
Barium	NE	**120**	**115**	**107**	**130**	--	**127**	**139**
Cadmium	2	<6.5*	<6.3*	<6.2*	<10.5*	--	<5.7*	<6.1*
Chromium (total)	(a)	**48.1**	**48.3**	**35.1**	**40.7**	--	**41.5**	**42.4**
Lead	250	**4.6**	**7.1**	**8.6**	**31.0**	--	**6.4**	**6.3**
Mercury	2	<0.13	<0.13	<0.11	<0.17	--	<0.093	<0.11
Selenium	NE	<6.5	<6.3	<6.2	<10.5	--	<5.7	<6.1
Silver	NE	<6.5	<6.3	<6.2	<10.5	--	<5.7	<6.1
c-Polyaromatic Hydrocarbons	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
Naphthalene	(b)	<0.0086	<0.0089	**0.0556**	**4.090**	**0.988**	<0.0079	**0.141**
1-Methylnaphthalene	(b)	<0.0086	<0.0089	**0.0397**	**9.56**	**2.580**	<0.0079	**0.532**
2-Methylnaphthalene	(b)	<0.0086	<0.0089	**0.0771**	**12.300**	**2.840**	<0.0079	**0.627**
Naphthalenes	5	*0.013*	*0.013*	*0.172*	***25.95***	***6.408***	*0.019*	*1.30*
Acenaphthene	NE	<0.0086	<0.0089	<0.0083	**0.205**	**0.0646**	<0.0079	**0.0331**
Acenaphthylene	NE	<0.0086	<0.0089	**0.0105**	**0.155**	**0.0524**	<0.0079	**0.0323**
Anthracene	NE	<0.0086	<0.0089	**0.0214**	**0.0802**	<0.0288	<0.0079	**0.0113**
Benzo (a) anthracene	(c)	<0.0086	<0.0089	**0.0227**	**0.0231**	<0.0288	<0.0079	**0.0177**
Benzo (a) pyrene	0.1	<0.0086	<0.0089	**0.0216**	<0.0147	<0.0288	<0.0079	**0.0124**
Benzo (b) fluoranthene	(c)	<0.0086	<0.0089	**0.0269**	**0.0152**	<0.0288	<0.0079	**0.0081**
Benzo (g,h,i) perylene	NE	<0.0086	<0.0089	**0.0185**	<0.0147	<0.0288	<0.0079	<0.0077
Benzo (k) fluoranthene	(c)	<0.0086	<0.0089	**0.0219**	<0.0147	<0.0288	<0.0079	**0.0120**
Chrysene	(c)	<0.0086	<0.0089	**0.0312**	**0.0352**	<0.0288	<0.0079	**0.0202**
Dibenzo (a,h) anthracene	(c)	<0.0086	<0.0089	<0.0083	<0.0147	<0.0288	<0.0079	<0.0077
Fluoranthene	NE	<0.0086	<0.0089	**0.0645**	**0.0864**	**0.0517**	**0.0140**	**0.0359**
Fluorene	NE	<0.0086	<0.0089	<0.0083	**0.856**	**0.262**	<0.0079	**0.113**
Indeno (1,2,3-cd) pyrene	(c)	<0.0086	<0.0089	**0.0164**	<0.0147	<0.0288	<0.0079	<0.0077
Phenanthrene	NE	<0.0086	<0.0089	**0.0594**	**1.460**	**0.289**	**0.0109**	**0.152**
Pyrene	NE	<0.0086	<0.0089	**0.0530**	**0.125**	**0.048**	**0.0100**	**0.0426**
cPAH B(a)P Equivalents	0.1	*0.0043*	*0.0045*	*0.0307*	*0.0123*	*0.022*	*0.0056*	*0.016*

TABLE 5
SOIL ANALYTICAL RESULTS - AUGUST 23-25, 2010
FEASIBILITY STUDY REPORT
Former ARCO Olympia Bulk Terminal
Industrial Petroleum Distributors Site
1120 West Bay Drive
Olympia, Washington

Analysis	MTCA Method A Cleanup Levels	Sample ID (Depth below ground surface in feet) Date Collected						
		GP-6 (6-6.5) 8/25/2010	GP-7 (2-2.5) 8/24/2010	GP-7 (6-6.5) 8/24/2010	GP-8 (2-2.5) 8/25/2010	GP-8 (4-4.5) 8/25/2010	GP-8 (6-6.5) 8/25/2010	GP-9 (2-2.5) 8/24/2010
Volatile Organic Compounds	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
Benzene	0.03	<0.0038	<0.0041	<0.0031	<0.003	--	<0.0031	<0.0031
Ethylbenzene	6	<0.0038	<0.0041	<0.0031	<0.003	--	<0.0031	<0.0031
Toluene	7	<0.0038	<0.0041	<0.0031	<0.003	--	<0.0031	<0.0031
Total Xylenes	9	<0.0114	<0.0122	<0.0093	<0.009	--	<0.0093	<0.0092
Total Petroleum Hydrocarbons	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
Gasoline Range Hydrocarbons	30	**94.4**	<7.3	<7.2	<6.2	--	<6.6	<7.2
Diesel Range Organics	2,000	**57.1**	<23	<24.5	<19.3	--	<22.3	<24.9
Residual Range/Heavy Oil Organics	2,000	<108	<92.1	<98.2	<77.1	--	<89.3	<99.6
RCRA 8 Metals	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
Arsenic	20	<13.9	<11.5	<12.7	<10.3	--	<11.8	12.4
Barium	NE	**112**	**154**	**113**	**51**	--	**71.8**	**129**
Cadmium	2	<7.0*	<5.8*	<6.3*	<5.2*	--	<5.9*	<6.2*
Chromium (total)	(a)	**44.2**	**45**	**39.9**	**26.7**	--	**32.8**	**42.7**
Lead	250	**7.1**	**6.8**	**4.3**	**8.8**	--	**10.1**	**7.3**
Mercury	2	<0.11	<0.11	<0.12	<0.096	--	<0.10	<0.12
Selenium	NE	<7.0	<5.8	<6.3	<5.2	--	<5.9	<6.2
Silver	NE	<7.0	<5.8	<6.3	<5.2	--	<5.9	<6.2
c-Polyaromatic Hydrocarbons	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
Naphthalene	(b)	**0.0135**	<0.0081	<0.0085	**0.0092**	**0.0089**	**0.0112**	**0.0181**
1-Methylnaphthalene	(b)	**0.0218**	<0.0081	<0.0085	**0.0090**	**0.0075**	**0.0102**	**0.0162**
2-Methylnaphthalene	(b)	**0.0217**	<0.0081	<0.0085	**0.0125**	**0.0109**	**0.0148**	**0.0248**
Naphthalenes	5	*0.0570*	*0.012*	*0.013*	*0.031*	*0.027*	*0.0362*	*0.0591*
Acenaphthene	NE	<0.0097	<0.0081	<0.0085	<0.0070	<0.0071	<0.0077	<0.0084
Acenaphthylene	NE	<0.0097	<0.0081	<0.0085	<0.0070	<0.0071	<0.0077	<0.0084
Anthracene	NE	<0.0097	<0.0081	<0.0085	<0.0070	<0.0071	<0.0077	**0.0126**
Benzo (a) anthracene	(c)	<0.0097	<0.0081	<0.0085	<0.0070	<0.0071	<0.0077	**0.0162**
Benzo (a) pyrene	0.1	<0.0097	<0.0081	<0.0085	<0.0070	<0.0071	<0.0077	**0.0147**
Benzo (b) fluoranthene	(c)	<0.0097	<0.0081	<0.0085	**0.0105**	**0.0085**	**0.0089**	**0.0239**
Benzo (g,h,i) perylene	NE	<0.0097	<0.0081	<0.0085	<0.0070	<0.0071	<0.0077	**0.0113**
Benzo (k) fluoranthene	(c)	<0.0097	<0.0081	<0.0085	**0.0078**	<0.0071	<0.0077	**0.0139**
Chrysene	(c)	<0.0097	<0.0081	<0.0085	**0.0111**	**0.0089**	**0.0092**	**0.0220**
Dibenzo (a,h) anthracene	(c)	<0.0097	<0.0081	<0.0085	<0.0070	<0.0071	<0.0077	<0.0084
Fluoranthene	NE	<0.0097	<0.0081	<0.0085	**0.0158**	**0.0143**	**0.0142**	**0.0424**
Fluorene	NE	<0.0097	<0.0081	<0.0085	<0.0070	<0.0071	<0.0077	<0.0084
Indeno (1,2,3-cd) pyrene	(c)	<0.0097	<0.0081	<0.0085	<0.0070	<0.0071	<0.0077	**0.0112**
Phenanthrene	NE	<0.0097	<0.0081	<0.0085	**0.0127**	**0.0122**	**0.0134**	**0.0323**
Pyrene	NE	<0.0097	<0.0081	<0.0085	**0.0124**	**0.0120**	**0.0110**	**0.0290**
cPAH B(a)P Equivalents	0.1	*0.0064*	*0.0041*	*0.0043*	*0.0054*	*0.0048*	*0.0052*	*0.0214*

TABLE 5
SOIL ANALYTICAL RESULTS - AUGUST 23-25, 2010
FEASIBILITY STUDY REPORT
Former ARCO Olympia Bulk Terminal
Industrial Petroleum Distributors Site
1120 West Bay Drive
Olympia, Washington

Analysis	MTCA Method A Cleanup Levels	Sample ID (Depth below ground surface in feet) Date Collected						
		GP-9 (4-4.5) 8/24/2010	GP-9 (5.5-6) 8/24/2010	MW-6R (2-2.5) 8/23/2010	MW-6R (4-4.5) 8/23/2010	MW-6R (6-6.5) 8/23/2010	MW-7 (2-2.5) 8/24/2010	MW-7 (6-6.5) 8/24/2010
Volatile Organic Compounds	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
Benzene	0.03	--	<0.0031	<0.0031	<0.0215	--	<0.0030	<0.0031
Ethylbenzene	6	--	<0.0031	<0.0031	<0.0215	--	<0.0030	<0.0031
Toluene	7	--	<0.0031	<0.0031	<0.0215	--	<0.0030	<0.0031
Total Xylenes	9	--	<0.0092	<0.0094	<0.0644	--	<0.0090	<0.0094
Total Petroleum Hydrocarbons	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
Gasoline Range Hydrocarbons	30	--	**13.8**	<6.5	**665**	--	<4.9	<6.8
Diesel Range Organics	2,000	--	<25.0	<22.5	**7,060**	--	<20.3	<24.3
Residual Range/Heavy Oil Organics	2,000	--	<100	<89.9	**1,360**	--	<81.0	<97.4
RCRA 8 Metals	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
Arsenic	20	--	<13.0	<12.0	<10.0	--	<10.5	<12.5
Barium	NE	--	**102**	**110**	<100	--	**84.1**	**123**
Cadmium	2	--	<6.5*	<6.0*	<5.0*	--	<5.2*	<6.2*
Chromium (total)	(a)	--	**36.5**	**39.4**	**5.0**	--	**22.8**	**34.4**
Lead	250	--	**10.7**	**4.3**	**12.6**	--	**6.6**	**10.7**
Mercury	2	--	<0.11	<0.11	<0.43	--	<0.11	<0.12
Selenium	NE	--	<6.5	<6.0	<5.0	--	<5.2	<6.2
Silver	NE	--	<6.5	<6.0	<5.0	--	<5.2	<6.2
c-Polyaromatic Hydrocarbons	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
Naphthalene	(b)	**0.0110**	**0.0184**	<0.0080	**2.4800**	**0.0177**	<0.0072	**0.0092**
1-Methylnaphthalene	(b)	<0.0089	**0.0108**	<0.0080	**13.0000**	**0.0623**	<0.0072	<0.0085
2-Methylnaphthalene	(b)	**0.0123**	**0.018**	<0.0080	**16.7000**	**0.0568**	<0.0072	<0.0085
Naphthalenes	5	*0.028*	*0.047*	*0.012*	***32.18***	*0.137*	*0.0108*	*0.0170*
Acenaphthene	NE	<0.0089	<0.0086	<0.0080	**0.4860**	<0.0101	<0.0072	<0.0085
Acenaphthylene	NE	<0.0089	**0.0086**	<0.0080	**0.3300**	<0.0101	<0.0072	<0.0085
Anthracene	NE	<0.0089	**0.0205**	<0.0080	**0.1190**	<0.0101	<0.0072	<0.0085
Benzo (a) anthracene	(c)	**0.0143**	**0.0339**	<0.0080	<0.0358	<0.0101	<0.0072	<0.0085
Benzo (a) pyrene	0.1	**0.0142**	**0.0317**	<0.0080	<0.0358	<0.0101	<0.0072	<0.0085
Benzo (b) fluoranthene	(c)	**0.0163**	**0.0277**	<0.0080	<0.0358	<0.0101	<0.0072	<0.0085
Benzo (g,h,i) perylene	NE	<0.0089	**0.0177**	<0.0080	<0.0358	<0.0101	<0.0072	<0.0085
Benzo (k) fluoranthene	(c)	**0.0148**	**0.029**	<0.0080	<0.0358	<0.0101	<0.0072	<0.0085
Chrysene	(c)	**0.0184**	**0.0334**	<0.0080	**0.0395**	<0.0101	<0.0072	<0.0085
Dibenzo (a,h) anthracene	(c)	<0.0089	<0.0086	<0.0080	<0.0358	<0.0101	<0.0072	<0.0085
Fluoranthene	NE	**0.0405**	**0.0932**	<0.0080	**0.0544**	<0.0101	<0.0072	<0.0085
Fluorene	NE	<0.0089	**0.0167**	<0.0080	**1.6900**	<0.0101	<0.0072	<0.0085
Indeno (1,2,3-cd) pyrene	(c)	**0.0093**	**0.0172**	<0.0080	<0.0358	<0.0101	<0.0072	<0.0085
Phenanthrene	NE	**0.0253**	**0.0877**	<0.0080	**2.9000**	<0.0101	<0.0072	<0.0085
Pyrene	NE	**0.0290**	**0.0652**	<0.0080	**0.2120**	<0.0101	<0.0072	<0.0085
cPAH B(a)P Equivalents	0.1	*0.0199*	*0.0428*	*0.0040*	*0.0183*	*0.00510*	*0.0036*	*0.0043*

TABLE 5
SOIL ANALYTICAL RESULTS - AUGUST 23-25, 2010
FEASIBILITY STUDY REPORT
Former ARCO Olympia Bulk Terminal
Industrial Petroleum Distributors Site
1120 West Bay Drive
Olympia, Washington

Analysis	MTCA Method A Cleanup Levels	Sample ID (Depth below ground surface in feet) Date Collected						
		MW-8 (2-2.5) 8/24/2010	MW-8 (6-6.5) 8/24/2010	MW-9 (2-2.5) 8/24/2010	MW-9 (6-6.5) 8/24/2010	MW-10 (2-2.5) 8/24/2010	MW-10 (4-4.5) 8/24/2010	MW-11 (2-2.5) 8/25/2010
Volatile Organic Compounds	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
Benzene	0.03	<0.0036	<0.0036	<0.0042	<0.0032	<0.0039	<0.0033	<0.0033
Ethylbenzene	6	<0.0036	<0.0036	<0.0042	<0.0032	<0.0039	<0.0033	<0.0033
Toluene	7	<0.0036	<0.0036	<0.0042	<0.0032	<0.0039	<0.0033	<0.0033
Total Xylenes	9	<0.011	<0.0109	<0.013	<0.0097	<0.0116	<0.010	<0.010
Total Petroleum Hydrocarbons	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
Gasoline Range Hydrocarbons	30	<7.0	<7.9	<9.0	<8.36	<8.1	<7.8	<7.0
Diesel Range Organics	2,000	<21.6	<25.4	<24.7	<25.6	<23.4	<26.9	**72.3**
Residual Range/Heavy Oil Organics	2,000	<86.3	<102	<98.7	<102	<93.4	<107	**176**
RCRA 8 Metals	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
Arsenic	20	<10.9	<13.1	<10.0	<11.1	<12.4	<13.2	<11.2
Barium	NE	**131**	**140**	**156**	**126**	**118**	**126**	**131**
Cadmium	2	<5.5*	<6.6*	<5.0*	<5.6*	<6.2*	<6.6*	<5.6*
Chromium (total)	(a)	**41.7**	**41.9**	**49.0**	**46.0**	**45.8**	**42.0**	**28**
Lead	250	**5**	**4.1**	**7.7**	**6.1**	**4.9**	**14.0**	**58.3**
Mercury	2	<0.11	<0.12	<0.13	<0.11	<0.12	<0.14	**0.12**
Selenium	NE	<5.5	<6.6	<5.0	<5.6	<6.2	<6.6	<5.6
Silver	NE	<5.5	<6.6	<5.0	<5.6	<6.2	<6.6	<5.6
c-Polyaromatic Hydrocarbons	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
Naphthalene	(b)	<0.0074	<0.0090	<0.0087	<0.0089	<0.0081	<0.0089	**0.106**
1-Methylnaphthalene	(b)	<0.0074	<0.0090	<0.0087	<0.0089	<0.0081	<0.0089	**0.146**
2-Methylnaphthalene	(b)	<0.0074	<0.0090	<0.0087	<0.0089	<0.0081	<0.0089	**0.180**
Naphthalenes	5	*0.011*	*0.014*	*0.013*	*0.014*	*0.012*	*0.014*	*0.432*
Acenaphthene	NE	<0.0074	<0.0090	<0.0087	<0.0089	<0.0081	<0.0089	<0.0076
Acenaphthylene	NE	<0.0074	<0.0090	<0.0087	<0.0089	<0.0081	<0.0089	**0.0147**
Anthracene	NE	<0.0074	<0.0090	<0.0087	<0.0089	<0.0081	<0.0089	**0.0277**
Benzo (a) anthracene	(c)	<0.0074	<0.0090	<0.0087	<0.0089	<0.0081	<0.0089	**0.0461**
Benzo (a) pyrene	0.1	<0.0074	<0.0090	<0.0087	<0.0089	<0.0081	<0.0089	**0.0460**
Benzo (b) fluoranthene	(c)	<0.0074	<0.0090	<0.0087	<0.0089	<0.0081	<0.0089	**0.0566**
Benzo (g,h,i) perylene	NE	<0.0074	<0.0090	<0.0087	<0.0089	<0.0081	<0.0089	**0.0231**
Benzo (k) fluoranthene	(c)	<0.0074	<0.0090	<0.0087	<0.0089	<0.0081	<0.0089	**0.0356**
Chrysene	(c)	<0.0074	<0.0090	<0.0087	<0.0089	<0.0081	<0.0089	**0.0701**
Dibenzo (a,h) anthracene	(c)	<0.0074	<0.0090	<0.0087	<0.0089	<0.0081	<0.0089	**0.0087**
Fluoranthene	NE	<0.0074	<0.0090	<0.0087	<0.0089	<0.0081	<0.0089	**0.0943**
Fluorene	NE	<0.0074	<0.0090	<0.0087	<0.0089	<0.0081	<0.0089	**0.0120**
Indeno (1,2,3-cd) pyrene	(c)	<0.0074	<0.0090	<0.0087	<0.0089	<0.0081	<0.0089	**0.0210**
Phenanthrene	NE	<0.0074	<0.0090	<0.0087	<0.0089	<0.0081	<0.0089	**0.125**
Pyrene	NE	<0.0074	<0.0090	<0.0087	<0.0089	<0.0081	<0.0089	**0.0860**
cPAH B(a)P Equivalents	0.1	*0.0037*	*0.0045*	*0.0044*	*0.0045*	*0.0041*	*0.0045*	*0.0635*

TABLE 5
SOIL ANALYTICAL RESULTS - AUGUST 23-25, 2010
FEASIBILITY STUDY REPORT
Former ARCO Olympia Bulk Terminal
Industrial Petroleum Distributors Site
1120 West Bay Drive
Olympia, Washington

Analysis	MTCA Method A Cleanup Levels	Sample ID (Depth below ground surface in feet) Date Collected				
		MW-11 (4-4.5) 8/25/2010	MW-11 (6-6.5) 8/25/2010	MW-12 (2-2.5) 8/25/2010	MW-12 (4-4.5) 8/25/2010	MW-12 (6-6.5) 8/25/2010
Volatile Organic Compounds	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
Benzene	0.03	<0.0036	--	<0.0034	<0.0035	--
Ethylbenzene	6	<0.0036	--	<0.0034	<0.0035	--
Toluene	7	<0.0036	--	<0.0034	<0.0035	--
Total Xylenes	9	<0.0108	--	<0.010	<0.011	--
Total Petroleum Hydrocarbons	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
Gasoline Range Hydrocarbons	30	<7.4	--	<6.9	<7.2	--
Diesel Range Organics	2,000	**52.9**	--	**75.7**	**43.1**	--
Residual Range/Heavy Oil Organics	2,000	**142**	--	**153**	**154**	--
RCRA 8 Metals	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
Arsenic	20	<11.5	--	<12.3	<11.4	--
Barium	NE	**132**	--	**146**	**103**	--
Cadmium	2	<5.8*	--	<6.2*	<5.7*	--
Chromium (total)	(a)	**31.6**	--	**39.9**	**27.9**	--
Lead	250	**55.2**	--	**17.0**	**49.7**	--
Mercury	2	**0.2**	--	<0.12	<0.11	--
Selenium	NE	<5.8	--	<6.2	<5.7	--
Silver	NE	<5.8	--	<6.2	<5.7	--
c-Polyaromatic Hydrocarbons	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
Naphthalene	(b)	**0.0585**	**0.0891**	**0.147**	**0.101**	**0.0785**
1-Methylnaphthalene	(b)	**0.0814**	**0.105**	**0.141**	**0.110**	**0.0282**
2-Methylnaphthalene	(b)	**0.101**	**0.134**	**0.194**	**0.149**	**0.0458**
Naphthalenes	5	*0.241*	*0.3281*	*0.482*	*0.360*	*0.153*
Acenaphthene	NE	<0.0078	**0.0726**	**0.0186**	**0.0093**	<0.0117
Acenaphthylene	NE	**0.0105**	**0.0210**	**0.0205**	**0.0232**	<0.0117
Anthracene	NE	**0.0209**	**0.112**	**0.0517**	**0.0561**	**0.0225**
Benzo (a) anthracene	(c)	**0.0314**	**0.154**	**0.0871**	**0.0849**	**0.108**
Benzo (a) pyrene	0.1	**0.0328**	**0.168**	**0.0941**	**0.0861**	**0.114**
Benzo (b) fluoranthene	(c)	**0.0445**	**0.181**	**0.118**	**0.136**	**0.106**
Benzo (g,h,i) perylene	NE	**0.0181**	**0.0745**	**0.0504**	**0.0472**	**0.0548**
Benzo (k) fluoranthene	(c)	**0.0352**	**0.120**	**0.0866**	**0.0877**	**0.0882**
Chrysene	(c)	**0.0477**	**0.171**	**0.146**	**0.134**	**0.116**
Dibenzo (a,h) anthracene	(c)	<0.0078	**0.0270**	**0.0198**	**0.0174**	**0.0231**
Fluoranthene	NE	**0.0690**	**0.415**	**0.292**	**0.219**	**0.244**
Fluorene	NE	<0.0078	**0.0367**	**0.0206**	**0.0136**	**0.0126**
Indeno (1,2,3-cd) pyrene	(c)	**0.0173**	**0.0708**	**0.0480**	**0.0492**	**0.0532**
Phenanthrene	NE	**0.0733**	**0.426**	**0.257**	**0.143**	**0.0945**
Pyrene	NE	**0.0564**	**0.358**	**0.228**	**0.165**	**0.195**
cPAH B(a)P Equivalents	0.1	*0.0465*	***0.225***	***0.132***	***0.125***	***0.153***

TABLE 5
SOIL ANALYTICAL RESULTS - AUGUST 23-25, 2010
FEASIBILITY STUDY REPORT
Former ARCO Olympia Bulk Terminal
Industrial Petroleum Distributors Site
1120 West Bay Drive
Olympia, Washington

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)
The MTCA cleanup level for gasoline range total petroleum hydrocarbons is 100-mg/kg without benzene and 30-mg/kg with benzene present. Benzene was observed in groundwater collected from sample ID-4 in 2001, thus the cleanup level of 30-mg/kg was utilized.
ft = Feet
bgs = Below ground surface
mg/kg = milligram per kilogram
NE = Cleanup level not established under MTCA
-- = not applicable or analyzed
cPAH = Carcinogenic polyaromatic hydrocarbons
B(a)P = Benzo(a)pyrene
< = Chemical not detected above the laboratory reporting limit
* = Laboratory practical quantitation limit is elevated above the MTCA Method A cleanup level, but chemical was not observed above the laboratory method detection limit
Italics = Value calculated for comparison to MTCA cleanup level
Bold = Chemical detected at a concentration above the laboratory reporting limit
Bolded and highlighted font indicates results above the MTCA Method A cleanup level
(a) = Analysis is for total chromium. No MTCA cleanup level has been established for total chromium.
(b) = MTCA cleanup level is 5-mg/kg for total concentration of naphthalene, 1-methylnaphthalene and 2-methylnaphthalene
(c) = See MTCA cleanup level for B(a)P. Total concentration of cPAHs calculated using the toxicity equivalency method in WAC 173-340-708(8)
Lab QA/QC surrogate recovery was outside control limits due to matrix interference for samples GP1-4-4.5, GP1-6-6.5, GP2-4-4.5, GP5-4-4.5, GP6-4-4.5, GP6-6-6.5

TABLE 6
SELECT GROUNDWATER ANALYTICAL RESULTS - OCTOBER 2010 TO SEPTEMBER 2011
FEASIBILITY STUDY REPORT
Former ARCO Olympia Bulk Terminal
Industrial Petroleum Distributors Site
1120 West Bay Drive
Olympia, Washington

Analysis	MTCA Method A Groundwater Cleanup Levels	MW-6R					
		Date Collected					
		10/1/2010	12/30/2010	3/17/2011	6/11/2011	9/22/2011	12/22/2011
Volatile Organic Compounds	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**
Benzene	5	<1.0	<0.20	<1.0	<0.20	<0.20	<0.20
Toluene	1,000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Ethylbenzene	700	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Total Xylenes	1,000	<2.0	<3.0	<2.0	<3.0	<3.0	<3.0
Total Petroleum Hydrocarbons	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**
Gasoline Range Organics	800	<50	<50.0	<50	<50.0	<50.0	<50.0
Diesel Range Organics	500	<120	<76	<120	<85	<75	<91
Residual Range/Heavy Oil Organics	500	<240	<380	<240^	<430	<380	<450
Metals	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**
Lead (Total)	15	<2.0^	<10.0	**5.4**	<10.0	<10.0	<10.0
Lead (Dissolved)	NE	<2.0^	<10.0	<2.0	<10.0	<10.0	<10.0
c-Polyaromatic Hydrocarbons	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**
Naphthalene	(a)	**0.010**	<0.095	<0.47	<0.11	<0.094	<0.10
1-Methylnaphthalene	(a)	<0.0097	<0.095	<0.14	<0.11	<0.094	<0.10
2-Methylnaphthalene	(a)	<0.013	<0.095	<0.094	<0.11	<0.094	<0.10
Naphthalenes	160	*0.0210*	*0.143*	*0.352*	*0.165*	*0.141*	*0.150*
Acenaphthene	NE	<0.0097	<0.095	<0.094	<0.11	<0.094	<0.10
Acenaphthylene	NE	<0.0097	<0.095	<0.094	<0.11	<0.094	<0.10
Anthracene	NE	<0.0097	<0.095	<0.047	<0.11	<0.094	<0.10
Benzo (a) anthracene	(b)	<0.0097	<0.095	<0.094	<0.11	<0.094	<0.10
Benzo (a) pyrene	0.1	**0.019**	<0.095	<0.094	<0.11	<0.094	<0.10
Benzo (b) fluoranthene	(b)	**0.017**	<0.095	<0.094	<0.11	<0.094	<0.10
Benzo (g,h,i) perylene	NE	**0.013**	<0.095	<0.094	<0.11	<0.094	<0.10
Benzo (k) fluoranthene	(b)	<0.0097	<0.095	<0.094	<0.11	<0.094	<0.10
Chrysene	(b)	**0.011**	<0.095	<0.061	<0.11	<0.094	<0.10
Dibenzo (a,h) anthracene	(b)	<0.0097	<0.095	<0.094	<0.11	<0.094	<0.10
Fluoranthene	NE	**0.013**	<0.095	<0.061	<0.11	<0.094	<0.10
Fluorene	NE	<0.0097	<0.095	<0.094	<0.11	<0.094	<0.10
Indeno (1,2,3-cd) pyrene	(b)	**0.011**	<0.095	<0.094	<0.11	<0.094	<0.10
Phenanthrene	NE	<0.0097	<0.095	<0.094	<0.11	<0.094	<0.10
Pyrene	NE	**0.017**	<0.095	<0.061	<0.11	<0.094	<0.10
cPAH B(a)P Equivalents	0.1	*0.0234*	*0.0717*	*0.0708*	*0.0831*	*0.0710*	*0.0755*

Notes
Volatile Organic Compounds analyzed by USEPA Method 8260
Total petroleum hydrocarbons-gasoline range organics analyzed by Northwest Method NWTPH-Gx
Total petroleum hydrocarbons-diesel and residual/heavy oil range organics analyzed by Northwest Method NWTPH-Dx
Total and dissolved lead analyzed by USEPA Method 6010
c-Polyaromatic hydrocarbons analyzed by USEPA Method 8270
Concentrations compared to the Model Toxics Control Act (MTCA) Method A groundwater cleanup levels presented in Table 720-1 of Chapter 173-340 of the Washington Administrative Code (WAC)
The MTCA cleanup level for gasoline range total petroleum hydrocarbons is 1000-µg/kg without benzene and 800-µg/kg with benzene present. Benzene was observed in groundwater collected from sample ID-4 in 2001, thus the cleanup level of 800-µg/kg was utilized.
µg/L = micrograms per liter
NE = Cleanup level not established under MTCA
cPAH = Carcinogenic polyaromatic hydrocarbons
B(a)P = Benzo(a)pyrene
< = Chemical not detected above the laboratory reporting limit
Bold = Chemical detected at a concentration above the laboratory reporting limit
Italics = Value calculated for comparison to MTCA cleanup level
(a) = See MTCA cleanup level for naphthalenes. This is a total value for naphthalene, 1-methylnaphthalene and 2-methylnaphthalene
(b) = See MTCA cleanup level for B(a)P. Total concentration of cPAHs calculated using the toxicity equivalency method in WAC 173-340-708(8)
^ = ICV, CCV, ICB, CCB, ISA, ISB, CRI, CRA, DLCK, or MRL standard: Instrument related QC exceeds the control limits

TABLE 6
SELECT GROUNDWATER ANALYTICAL RESULTS - OCTOBER 2010 TO SEPTEMBER 2011
FEASIBILITY STUDY REPORT
Former ARCO Olympia Bulk Terminal
Industrial Petroleum Distributors Site
1120 West Bay Drive
Olympia, Washington

Analysis	MTCA Method A Groundwater Cleanup Levels	MW-7					
		Date Collected					
		10/1/2010	12/29/2010	3/17/2011	6/11/2011	9/22/2011	12/22/2011
Volatile Organic Compounds	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Benzene	5	<1.0	<0.20	<1.0	<0.20	<0.20	<0.20
Toluene	1,000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Ethylbenzene	700	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Total Xylenes	1,000	<2.0	<3.0	<2.0	<3.0	<3.0	<3.0
Total Petroleum Hydrocarbons	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Gasoline Range Organics	800	<50	<50.0	<50	<50.0	<50.0	<50.0
Diesel Range Organics	500	**150**Y	<77	<120	<87	<75	<75
Residual Range/Heavy Oil Organics	500	<250	<380	<240^	<430	<380	<380
Metals	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Lead (Total)	15	<2.0^	<10.0	<2.0	<10.0	<10.0	<10.0
Lead (Dissolved)	NE	<2.0^	<10.0	<2.0	<10.0	<10.0	<10.0
c-Polyaromatic Hydrocarbons	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Naphthalene	(a)	**0.086**	<0.096	<0.47	<0.11	<0.094	<0.094
1-Methylnaphthalene	(a)	**0.23**	<0.096	<0.14	<0.11	**0.16**	**0.11**
2-Methylnaphthalene	(a)	**0.16**	<0.096	<0.094	<0.11	**0.13**	<0.094
Naphthalenes	160	*0.48*	*0.144*	*0.352*	*0.165*	*0.337*	*0.204*
Acenaphthene	NE	**0.051**	<0.096	<0.094	<0.11	<0.094	<0.094
Acenaphthylene	NE	<0.0097	<0.096	<0.094	<0.11	<0.094	<0.094
Anthracene	NE	**0.011**	<0.096	<0.047	<0.11	<0.094	<0.094
Benzo (a) anthracene	(b)	**0.017**	<0.096	<0.094	<0.11	<0.094	<0.094
Benzo (a) pyrene	0.1	0.019	<0.096	<0.094	<0.11	<0.094	<0.094
Benzo (b) fluoranthene	(b)	<0.0097	<0.096	<0.094	<0.11	<0.094	<0.094
Benzo (g,h,i) perylene	NE	<0.0097	<0.096	<0.094	<0.11	<0.094	<0.094
Benzo (k) fluoranthene	(b)	<0.0097	<0.096	<0.094	<0.11	<0.094	<0.094
Chrysene	(b)	<0.0097	<0.096	<0.061	<0.11	<0.094	<0.094
Dibenzo (a,h) anthracene	(b)	<0.0097	<0.096	<0.094	<0.11	<0.094	<0.094
Fluoranthene	NE	**0.010**	<0.096	<0.061	<0.11	<0.094	<0.094
Fluorene	NE	**0.063**	<0.096	<0.094	<0.11	<0.094	<0.094
Indeno (1,2,3-cd) pyrene	(b)	<0.0097	<0.096	<0.094	<0.11	<0.094	<0.094
Phenanthrene	NE	**0.048**	<0.096	<0.094	<0.11	<0.094	<0.094
Pyrene	NE	<0.0097	<0.096	<0.061	<0.11	<0.094	<0.094
cPAH B(a)P Equivalents	0.1	*0.0132*	*0.0725*	*0.0708*	*0.0831*	*0.0710*	*0.0710*

Notes
Volatile Organic Compounds analyzed by USEPA Method 8260
Total petroleum hydrocarbons-gasoline range organics analyzed by Northwest Method NWTPH-Gx
Total petroleum hydrocarbons-diesel and residual/heavy oil range organics analyzed by Northwest Method NWTPH-Dx
Total and dissolved lead analyzed by USEPA Method 6010
c-Polyaromatic hydrocarbons analyzed by USEPA Method 8270
Concentrations compared to the Model Toxics Control Act (MTCA) Method A groundwater cleanup levels presented in Table 720-1 of Chapter 173-340 of the Washington Administrative Code (WAC)
The MTCA cleanup level for gasoline range total petroleum hydrocarbons is 1000-µg/kg without benzene and 800-µg/kg with benzene present. Benzene was observed in groundwater collected from sample ID-4 in 2001, thus the cleanup level of 800-µg/kg was utilized.
µg/L = micrograms per liter
NE = Cleanup level not established under MTCA
cPAH = Carcinogenic polyaromatic hydrocarbons
B(a)P = Benzo(a)pyrene
< = Chemical not detected above the laboratory reporting limit
Bold = Chemical detected at a concentration above the laboratory reporting limit
Italics = Value calculated for comparison to MTCA cleanup level
(a) = See MTCA cleanup level for naphthalenes. This is a total value for naphthalene, 1-methylnaphthalene and 2-methylnaphthalene
(b) = See MTCA cleanup level for B(a)P. Total concentration of cPAHs calculated using the toxicity equivalency method in WAC 173-340-708(8)
^ = ICV, CCV, ICB, CCB, ISA, ISB, CRI, CRA, DLCK, or MRL standard: Instrument related QC exceeds the control limits

TABLE 6
SELECT GROUNDWATER ANALYTICAL RESULTS - OCTOBER 2010 TO SEPTEMBER 2011
FEASIBILITY STUDY REPORT
Former ARCO Olympia Bulk Terminal
Industrial Petroleum Distributors Site
1120 West Bay Drive
Olympia, Washington

Analysis	MTCA Method A Groundwater Cleanup Levels	MW-8					
		Date Collected					
		10/1/2010	12/29/2010	3/17/2011	6/11/2011	9/22/2011	12/22/2011
Volatile Organic Compounds	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Benzene	5	<1.0	**0.21**	<1.0	**0.26**	**0.35**	**0.23**
Toluene	1,000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Ethylbenzene	700	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Total Xylenes	1,000	<2.0	<3.0	<2.0	<3.0	<3.0	<3.0
Total Petroleum Hydrocarbons	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Gasoline Range Hydrocarbons	800	<50	<50.0	<50	<50.0	<50.0	<50.0
Diesel Range Organics	500	**200**Y	<77	<120	<83	<75	<87
Residual Range/Heavy Oil Organics	500	<240	<380	<240^	<420	<380	<430
Metals	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Lead (Total)	15	<2.0^	<10.0	<2.0	<10.0	<10.0	<10.0
Lead (Dissolved)	NE	<2.0^	<10.0	<2.0	<10.0	<10.0	<10.0
c-Polyaromatic Hydrocarbons	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Naphthalene	(a)	**0.085**	<0.096	<0.47	<0.096	**0.12**	<0.11
1-Methylnaphthalene	(a)	**0.11**	<0.096	<0.14	<0.096	**0.13**	<0.11
2-Methylnaphthalene	(a)	**0.038**	<0.096	<0.094	<0.096	<0.094	<0.11
Naphthalenes	160	*0.23*	*0.144*	*0.352*	*0.144*	*0.297*	*0.165*
Acenaphthene	NE	**0.033**	<0.096	<0.094	<0.096	<0.094	<0.11
Acenaphthylene	NE	<0.0097	<0.096	<0.094	<0.096	<0.094	<0.11
Anthracene	NE	**0.018**	<0.096	<0.047	<0.096	<0.094	<0.11
Benzo (a) anthracene	(b)	<0.0097	<0.096	<0.094	<0.096	<0.094	<0.11
Benzo (a) pyrene	0.1	<0.019	<0.096	<0.094	<0.096	<0.094	<0.11
Benzo (b) fluoranthene	(b)	<0.0097	<0.096	<0.094	<0.096	<0.094	<0.11
Benzo (g,h,i) perylene	NE	<0.0097	<0.096	<0.094	<0.096	<0.094	<0.11
Benzo (k) fluoranthene	(b)	<0.0097	<0.096	<0.094	<0.096	<0.094	<0.11
Chrysene	(b)	**0.053**	<0.096	<0.061	<0.096	<0.094	<0.11
Dibenzo (a,h) anthracene	(b)	<0.0097	<0.096	<0.094	<0.096	<0.094	<0.11
Fluoranthene	NE	**0.011**	<0.096	<0.061	<0.096	<0.094	<0.11
Fluorene	NE	**0.029**	<0.096	<0.094	<0.096	<0.094	<0.11
Indeno (1,2,3-cd) pyrene	(b)	<0.0097	<0.096	<0.094	<0.096	<0.094	<0.11
Phenanthrene	NE	**0.028**	<0.096	<0.094	<0.096	<0.094	<0.11
Pyrene	NE	**0.010**	<0.096	<0.061	<0.096	<0.094	<0.11
cPAH B(a)P Equivalents	0.1	*0.0125*	*0.0725*	*0.0708*	*0.0725*	*0.0710*	*0.0831*

Notes
Volatile Organic Compounds analyzed by USEPA Method 8260
Total petroleum hydrocarbons-gasoline range organics analyzed by Northwest Method NWTPH-Gx
Total petroleum hydrocarbons-diesel and residual/heavy oil range organics analyzed by Northwest Method NWTPH-Dx
Total and dissolved lead analyzed by USEPA Method 6010
c-Polyaromatic hydrocarbons analyzed by USEPA Method 8270
Concentrations compared to the Model Toxics Control Act (MTCA) Method A groundwater cleanup levels presented in Table 720-1 of Chapter 173-340 of the Washington Administrative Code (WAC)
The MTCA cleanup level for gasoline range total petroleum hydrocarbons is 1000-µg/kg without benzene and 800-µg/kg with benzene present. Benzene was observed in groundwater collected from sample ID-4 in 2001, thus the cleanup level of 800-µg/kg was utilized.
µg/L = micrograms per liter
NE = Cleanup level not established under MTCA
cPAH = Carcinogenic polyaromatic hydrocarbons
B(a)P = Benzo(a)pyrene
< = Chemical not detected above the laboratory reporting limit
Bold = Chemical detected at a concentration above the laboratory reporting limit
Italics = Value calculated for comparison to MTCA cleanup level
(a) = See MTCA cleanup level for naphthalenes. This is a total value for naphthalene, 1-methylnaphthalene and 2-methylnaphthalene
(b) = See MTCA cleanup level for B(a)P. Total concentration of cPAHs calculated using the toxicity equivalency method in WAC 173-340-708(8)
^ = ICV, CCV, ICB, CCB, ISA, ISB, CRI, CRA, DLCK, or MRL standard: Instrument related QC exceeds the control limits

TABLE 6
SELECT GROUNDWATER ANALYTICAL RESULTS - OCTOBER 2010 TO SEPTEMBER 2011
FEASIBILITY STUDY REPORT
Former ARCO Olympia Bulk Terminal
Industrial Petroleum Distributors Site
1120 West Bay Drive
Olympia, Washington

Analysis	MTCA Method A Groundwater Cleanup Levels	MW-9					
		Date Collected					
		10/1/2010	12/292010	3/17/2002	6/11/2011	9/22/2011	12/22/2011
Volatile Organic Compounds	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**
Benzene	5	<1.0	**0.21**	<1.0	<0.20	**0.37**	**0.3**
Toluene	1,000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Ethylbenzene	700	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Total Xylenes	1,000	<2.0	<3.0	<2.0	<3.0	<3.0	<3.0
Total Petroleum Hydrocarbons	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**
Gasoline Range Hydrocarbons	800	**110**	**56.5**	<50	**84.4**	**241**	**222**
Diesel Range Organics	500	**160**Y	<76	<120	<88	<75	<76
Residual Range/Heavy Oil Organics	500	<250	<380	<240^	<440	<380	<380
Metals	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**
Lead (Total)	15	<2.0^	<10.0	<2.0	<10.0	<10.0	<10.0
Lead (Dissolved)	NE	<2.0^	<10.0	<2.0	<10.0	<10.0	<10.0
c-Polyaromatic Hydrocarbons	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**
Naphthalene	(a)	**0.400**	0.59	<1.9	**0.36**	<0.094	**2.6**
1-Methylnaphthalene	(a)	**0.019**	<0.095	<0.38	<0.11	<0.094	**0.17**
2-Methylnaphthalene	(a)	**0.013**	<0.095	<0.94	<0.11	<0.094	<0.094
Naphthalenes	160	*0.43*	*0.390*	*0.352*	*0.470*	*0.141*	*2.817*
Acenaphthene	NE	<0.0094	<0.095	<0.094	<0.11	<0.094	<0.094
Acenaphthylene	NE	<0.0094	<0.095	<0.094	<0.11	<0.094	<0.094
Anthracene	NE	<0.0094	<0.095	<0.047	<0.11	<0.094	<0.094
Benzo (a) anthracene	(b)	<0.0094	<0.095	<0.094	<0.11	<0.094	<0.094
Benzo (a) pyrene	0.1	<0.019	<0.095	<0.094	<0.11	<0.094	<0.094
Benzo (b) fluoranthene	(b)	<0.0094	<0.095	<0.094	<0.11	<0.094	<0.094
Benzo (g,h,i) perylene	NE	<0.0094	<0.095	<0.094	<0.11	<0.094	<0.094
Benzo (k) fluoranthene	(b)	<0.0094	<0.095	<0.094	<0.11	<0.094	<0.094
Chrysene	(b)	<0.0094	<0.095	<0.061	<0.11	<0.094	<0.094
Dibenzo (a,h) anthracene	(b)	<0.0094	<0.095	<0.094	<0.11	<0.094	<0.094
Fluoranthene	NE	<0.0094	<0.095	<0.061	<0.11	<0.094	<0.094
Fluorene	NE	<0.0094	<0.095	<0.094	<0.11	<0.094	<0.094
Indeno (1,2,3-cd) pyrene	(b)	<0.0094	<0.095	<0.094	<0.11	<0.094	<0.094
Phenanthrene	NE	**0.011**	<0.095	<0.094	<0.11	<0.094	<0.094
Pyrene	NE	<0.0094	<0.095	<0.061	<0.11	<0.094	<0.094
cPAH B(a)P Equivalents	0.1	*0.0119*	*0.0717*	*0.0708*	*0.0831*	*0.0710*	*0.0710*

Notes
Volatile Organic Compounds analyzed by USEPA Method 8260
Total petroleum hydrocarbons-gasoline range organics analyzed by Northwest Method NWTPH-Gx
Total petroleum hydrocarbons-diesel and residual/heavy oil range organics analyzed by Northwest Method NWTPH-Dx
Total and dissolved lead analyzed by USEPA Method 6010
c-Polyaromatic hydrocarbons analyzed by USEPA Method 8270
Concentrations compared to the Model Toxics Control Act (MTCA) Method A groundwater cleanup levels presented in Table 720-1 of Chapter 173-340 of the Washington Administrative Code (WAC)
The MTCA cleanup level for gasoline range total petroleum hydrocarbons is 1000-µg/kg without benzene and 800-µg/kg with benzene present. Benzene was observed in groundwater collected from sample ID-4 in 2001, thus the cleanup level of 800-µg/kg was utilized.
µg/L = micrograms per liter
NE = Cleanup level not established under MTCA
cPAH = Carcinogenic polyaromatic hydrocarbons
B(a)P = Benzo(a)pyrene
< = Chemical not detected above the laboratory reporting limit
Bold = Chemical detected at a concentration above the laboratory reporting limit
Italics = Value calculated for comparison to MTCA cleanup level
(a) = See MTCA cleanup level for naphthalenes. This is a total value for naphthalene, 1-methylnaphthalene and 2-methylnaphthalene
(b) = See MTCA cleanup level for B(a)P. Total concentration of cPAHs calculated using the toxicity equivalency method in WAC 173-340-708(8)
^ = ICV, CCV, ICB, CCB, ISA, ISB, CRI, CRA, DLCK, or MRL standard: Instrument related QC exceeds the control limits

TABLE 6
SELECT GROUNDWATER ANALYTICAL RESULTS - OCTOBER 2010 TO SEPTEMBER 2011
FEASIBILITY STUDY REPORT
Former ARCO Olympia Bulk Terminal
Industrial Petroleum Distributors Site
1120 West Bay Drive
Olympia, Washington

Analysis	MTCA Method A Groundwater Cleanup Levels	MW-10					
		Date Collected					
		10/1/2010	12/29/2010	3/17/2011	6/11/2011	9/22/2011	12/22/2011
Volatile Organic Compounds	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**
Benzene	5	<1.0	<0.20	<1.0	<0.20	<0.20	<0.20
Toluene	1,000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Ethylbenzene	700	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Total Xylenes	1,000	<2.0	<3.0	<2.0	<3.0	<3.0	<3.0
Total Petroleum Hydrocarbons	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**
Gasoline Range Hydrocarbons	800	<50	<50.0	<50	<50.0	<50.0	<50.0
Diesel Range Organics	500	<120	<77	<120	<86	<75	<75
Residual Range/Heavy Oil Organics	500	<240	<380	<240^	<430	<380	<380
Metals	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**
Lead (Total)	15	<2.0^	<10.0	<2.0	<10.0	<10.0	<10.0
Lead (Dissolved)	NE	<2.0^	<10.0	<2.0	<10.0	<10.0	<10.0
c-Polyaromatic Hydrocarbons	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**
Naphthalene	(a)	<0.0094	<0.096	<0.47	<0.11	<0.094	<0.095
1-Methylnaphthalene	(a)	<0.0094	<0.096	<0.14	<0.11	<0.094	<0.095
2-Methylnaphthalene	(a)	<0.012	<0.096	<0.094	<0.11	<0.094	<0.095
Naphthalenes	160	*0.015*	*0.144*	*0.352*	*0.165*	*0.141*	*0.143*
Acenaphthene	NE	<0.0094	<0.096	<0.47	<0.11	<0.094	<0.095
Acenaphthylene	NE	<0.0094	<0.096	<0.38	<0.11	<0.094	<0.095
Anthracene	NE	<0.0094	<0.096	<0.19	<0.11	<0.094	<0.095
Benzo (a) anthracene	(b)	<0.0094	<0.096	<0.28	<0.11	<0.094	<0.095
Benzo (a) pyrene	0.1	<0.019	<0.096	<0.19	<0.11	<0.094	<0.095
Benzo (b) fluoranthene	(b)	<0.0094	<0.096	<0.38	<0.11	<0.094	<0.095
Benzo (g,h,i) perylene	NE	<0.0094	<0.096	<0.28	<0.11	<0.094	<0.095
Benzo (k) fluoranthene	(b)	<0.0094	<0.096	<0.28	<0.11	<0.094	<0.095
Chrysene	(b)	<0.0094	<0.096	<0.19	<0.11	<0.094	<0.095
Dibenzo (a,h) anthracene	(b)	<0.0094	<0.096	<0.28	<0.11	<0.094	<0.095
Fluoranthene	NE	<0.0094	<0.096	<0.24	<0.11	<0.094	<0.095
Fluorene	NE	<0.0094	<0.096	<0.28	<0.11	<0.094	<0.095
Indeno (1,2,3-cd) pyrene	(b)	<0.0094	<0.096	<0.28	<0.11	<0.094	<0.095
Phenanthrene	NE	<0.0094	<0.096	<0.38	<0.11	<0.094	<0.095
Pyrene	NE	<0.0094	<0.096	<0.28	<0.11	<0.094	<0.095
cPAH B(a)P Equivalents	0.1	*0.0119*	*0.0725*	*0.0708*	*0.0831*	*0.0710*	*0.0717*

Notes
Volatile Organic Compounds analyzed by USEPA Method 8260
Total petroleum hydrocarbons-gasoline range organics analyzed by Northwest Method NWTPH-Gx
Total petroleum hydrocarbons-diesel and residual/heavy oil range organics analyzed by Northwest Method NWTPH-Dx
Total and dissolved lead analyzed by USEPA Method 6010
c-Polyaromatic hydrocarbons analyzed by USEPA Method 8270
Concentrations compared to the Model Toxics Control Act (MTCA) Method A groundwater cleanup levels presented in Table 720-1 of Chapter 173-340 of the Washington Administrative Code (WAC)
The MTCA cleanup level for gasoline range total petroleum hydrocarbons is 1000-µg/kg without benzene and 800-µg/kg with benzene present. Benzene was observed in groundwater collected from sample ID-4 in 2001, thus the cleanup level of 800-µg/kg was utilized.
µg/L = micrograms per liter
NE = Cleanup level not established under MTCA
cPAH = Carcinogenic polyaromatic hydrocarbons
B(a)P = Benzo(a)pyrene
< = Chemical not detected above the laboratory reporting limit
Bold = Chemical detected at a concentration above the laboratory reporting limit
Italics = Value calculated for comparison to MTCA cleanup level
(a) = See MTCA cleanup level for naphthalenes. This is a total value for naphthalene, 1-methylnaphthalene and 2-methylnaphthalene
(b) = See MTCA cleanup level for B(a)P. Total concentration of cPAHs calculated using the toxicity equivalency method in WAC 173-340-708(8)
^ = ICV, CCV, ICB, CCB, ISA, ISB, CRI, CRA, DLCK, or MRL standard: Instrument related QC exceeds the control limits

TABLE 6
SELECT GROUNDWATER ANALYTICAL RESULTS - OCTOBER 2010 TO SEPTEMBER 2011
FEASIBILITY STUDY REPORT
Former ARCO Olympia Bulk Terminal
Industrial Petroleum Distributors Site
1120 West Bay Drive
Olympia, Washington

Analysis	MTCA Method A Groundwater Cleanup Levels	MW-11					
		Date Collected					
		10/1/2010	12/30/2010	3/17/2011	6/11/2011	9/22/2011	12/22/2011
Volatile Organic Compounds	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**
Benzene	5	<1.0	<0.20	<1.0	<0.20	<0.20	<0.20
Toluene	1,000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Ethylbenzene	700	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Total Xylenes	1,000	<2.0	<3.0	<2.0	<3.0	<3.0	<3.0
Total Petroleum Hydrocarbons	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**
Gasoline Range Hydrocarbons	800	<50	<50.0	<50	<50.0	<50.0	<50.0
Diesel Range Organics	500	<120	**110**	<120	<84	<75	<86
Residual Range/Heavy Oil Organics	500	<240	<380	<240^	<420	<380	<430
Metals	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**
Lead (Total)	15	<2.0^	<10.0	<2.0	<10.0	<10.0	<10.0
Lead (Dissolved)	NE	<2.0^	<10.0	<2.0	<10.0	<10.0	<10.0
c-Polyaromatic Hydrocarbons	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**
Naphthalene	(a)	**0.012**	<0.095	<0.47	<0.11	<0.094	<0.11
1-Methylnaphthalene	(a)	<0.0098	<0.095	<0.14	<0.11	<0.094	<0.11
2-Methylnaphthalene	(a)	<0.013	<0.095	<0.094	<0.11	<0.094	<0.11
Naphthalenes	160	*0.023*	*0.143*	*0.352*	*0.165*	*0.141*	*0.165*
Acenaphthene	NE	<0.0098	<0.095	<0.094	<0.11	<0.094	<0.11
Acenaphthylene	NE	<0.0098	<0.095	<0.094	<0.11	<0.094	<0.11
Anthracene	NE	<0.0098	<0.095	<0.047	<0.11	<0.094	<0.11
Benzo (a) anthracene	(b)	<0.0098	<0.095	<0.094	<0.11	<0.094	<0.11
Benzo (a) pyrene	0.1	<0.020	<0.095	<0.094	<0.11	<0.094	<0.11
Benzo (b) fluoranthene	(b)	<0.0098	<0.095	<0.094	<0.11	<0.094	<0.11
Benzo (g,h,i) perylene	NE	<0.0098	<0.095	<0.094	<0.11	<0.094	<0.11
Benzo (k) fluoranthene	(b)	<0.0098	<0.095	<0.094	<0.11	<0.094	<0.11
Chrysene	(b)	<0.0098	<0.095	<0.061	<0.11	<0.094	<0.11
Dibenzo (a,h) anthracene	(b)	<0.0098	<0.095	<0.094	<0.11	<0.094	<0.11
Fluoranthene	NE	<0.0098	<0.095	<0.061	<0.11	<0.094	<0.11
Fluorene	NE	<0.0098	<0.095	<0.094	<0.11	<0.094	<0.11
Indeno (1,2,3-cd) pyrene	(b)	<0.0098	<0.095	<0.094	<0.11	<0.094	<0.11
Phenanthrene	NE	<0.0098	<0.095	<0.094	<0.11	<0.094	<0.11
Pyrene	NE	<0.0098	<0.095	<0.061	<0.11	<0.094	<0.11
cPAH B(a)P Equivalents	0.1	*0.0125*	*0.0717*	*0.0708*	*0.0831*	*0.0710*	*0.0831*

Notes
Volatile Organic Compounds analyzed by USEPA Method 8260
Total petroleum hydrocarbons-gasoline range organics analyzed by Northwest Method NWTPH-Gx
Total petroleum hydrocarbons-diesel and residual/heavy oil range organics analyzed by Northwest Method NWTPH-Dx
Total and dissolved lead analyzed by USEPA Method 6010
c-Polyaromatic hydrocarbons analyzed by USEPA Method 8270
Concentrations compared to the Model Toxics Control Act (MTCA) Method A groundwater cleanup levels presented in Table 720-1 of Chapter 173-340 of the Washington Administrative Code (WAC)
The MTCA cleanup level for gasoline range total petroleum hydrocarbons is 1000-µg/kg without benzene and 800-µg/kg with benzene present. Benzene was observed in groundwater collected from sample ID-4 in 2001, thus the cleanup level of 800-µg/kg was utilized.
µg/L = micrograms per liter
NE = Cleanup level not established under MTCA
cPAH = Carcinogenic polyaromatic hydrocarbons
B(a)P = Benzo(a)pyrene
< = Chemical not detected above the laboratory reporting limit
Bold = Chemical detected at a concentration above the laboratory reporting limit
Italics = Value calculated for comparison to MTCA cleanup level
(a) = See MTCA cleanup level for naphthalenes. This is a total value for naphthalene, 1-methylnaphthalene and 2-methylnaphthalene
(b) = See MTCA cleanup level for B(a)P. Total concentration of cPAHs calculated using the toxicity equivalency method in WAC 173-340-708(8)
^ = ICV, CCV, ICB, CCB, ISA, ISB, CRI, CRA, DLCK, or MRL standard: Instrument related QC exceeds the control limits

TABLE 6
SELECT GROUNDWATER ANALYTICAL RESULTS - OCTOBER 2010 TO SEPTEMBER 2011
FEASIBILITY STUDY REPORT
Former ARCO Olympia Bulk Terminal
Industrial Petroleum Distributors Site
1120 West Bay Drive
Olympia, Washington

Analysis	MTCA Method A Groundwater Cleanup Levels	MW-12					
		Date Collected					
		10/1/2010	12/30/2011	3/17/2011	6/11/2011	9/22/2011	12/22/2011
Volatile Organic Compounds	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**
Benzene	5	<1.0	<0.20	<1.0	<0.20	<0.20	<0.20
Toluene	1,000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Ethylbenzene	700	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Total Xylenes	1,000	<2.0	<3.0	<2.0	<3.0	<3.0	<3.0
Total Petroleum Hydrocarbons	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**
Gasoline Range Hydrocarbons	800	<50	<50.0	<50	<50.0	<50.0	<50.0
Diesel Range Organics	500	<120	**89**	<120	<82	<75	<85
Residual Range/Heavy Oil Organics	500	<240	<380	<240^	<410	<380	<430
Metals	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**
Lead (Total)	15	<2.0^	<10.0	<2.0	<10.0	<10.0	<10.0
Lead (Dissolved)	NE	<2.0^	<10.0	<2.0	<10.0	<10.0	<10.0
c-Polyaromatic Hydrocarbons	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**
Naphthalene	(a)	**0.019**	<0.096	<0.47	<0.11	<0.094	<0.11
1-Methylnaphthalene	(a)	<0.0097	<0.096	<0.14	<0.11	<0.094	<0.11
2-Methylnaphthalene	(a)	<0.013	<0.096	<0.094	<0.11	<0.094	<0.11
Naphthalenes	160	*0.031*	*0.144*	*0.352*	*0.165*	*0.141*	*0.165*
Acenaphthene	NE	<0.0097	<0.096	<0.094	<0.11	<0.094	<0.11
Acenaphthylene	NE	<0.0097	<0.096	<0.094	<0.11	<0.094	<0.11
Anthracene	NE	<0.0097	<0.096	<0.047	<0.11	<0.094	<0.11
Benzo (a) anthracene	(b)	<0.0097	<0.096	<0.094	<0.11	<0.094	<0.11
Benzo (a) pyrene	0.1	<0.019	<0.096	<0.094	<0.11	<0.094	<0.11
Benzo (b) fluoranthene	(b)	<0.0097	<0.096	<0.094	<0.11	<0.094	<0.11
Benzo (g,h,i) perylene	NE	<0.0097	<0.096	<0.094	<0.11	<0.094	<0.11
Benzo (k) fluoranthene	(b)	<0.0097	<0.096	<0.094	<0.11	<0.094	<0.11
Chrysene	(b)	<0.0097	<0.096	<0.061	<0.11	<0.094	<0.11
Dibenzo (a,h) anthracene	(b)	<0.0097	<0.096	<0.094	<0.11	<0.094	<0.11
Fluoranthene	NE	<0.0097	<0.096	<0.061	<0.11	<0.094	<0.11
Fluorene	NE	<0.0097	<0.096	<0.094	<0.11	<0.094	<0.11
Indeno (1,2,3-cd) pyrene	(b)	<0.0097	<0.096	<0.094	<0.11	<0.094	<0.11
Phenanthrene	NE	<0.0097	<0.096	<0.094	<0.11	<0.094	<0.11
Pyrene	NE	<0.0097	<0.096	<0.061	<0.11	<0.094	<0.11
cPAH B(a)P Equivalents	0.1	*0.0120*	0.0725	*0.0708*	*0.0831*	*0.0710*	*0.0831*

Notes
Volatile Organic Compounds analyzed by USEPA Method 8260
Total petroleum hydrocarbons-gasoline range organics analyzed by Northwest Method NWTPH-Gx
Total petroleum hydrocarbons-diesel and residual/heavy oil range organics analyzed by Northwest Method NWTPH-Dx
Total and dissolved lead analyzed by USEPA Method 6010
c-Polyaromatic hydrocarbons analyzed by USEPA Method 8270
Concentrations compared to the Model Toxics Control Act (MTCA) Method A groundwater cleanup levels presented in Table 720-1 of Chapter 173-340 of the Washington Administrative Code (WAC)
The MTCA cleanup level for gasoline range total petroleum hydrocarbons is 1000-µg/kg without benzene and 800-µg/kg with benzene present. Benzene was observed in groundwater collected from sample ID-4 in 2001, thus the cleanup level of 800-µg/kg was utilized.
µg/L = micrograms per liter
NE = Cleanup level not established under MTCA
cPAH = Carcinogenic polyaromatic hydrocarbons
B(a)P = Benzo(a)pyrene
< = Chemical not detected above the laboratory reporting limit
Bold = Chemical detected at a concentration above the laboratory reporting limit
Italics = Value calculated for comparison to MTCA cleanup level
(a) = See MTCA cleanup level for naphthalenes. This is a total value for naphthalene, 1-methylnaphthalene and 2-methylnaphthalene
(b) = See MTCA cleanup level for B(a)P. Total concentration of cPAHs calculated using the toxicity equivalency method in WAC 173-340-708(8)
^ = ICV, CCV, ICB, CCB, ISA, ISB, CRI, CRA, DLCK, or MRL standard: Instrument related QC exceeds the control limits

TABLE 7A
SOIL POINTS OF COMPLIANCE
FEASIBILITY STUDY REPORT
Former ARCO Olympia Bulk Terminal
Industrial Petroleum Distributors Site
1120 West Bay Drive
Olympia, Washington

Constituent	Cleanup Level[1] (mg/kg)	Media	Point of Compliance Type	Specific Point of Compliance
GRO	30/100 [2]	soil	standard	ARCADIS analyzed soil for this constituent in 2010 during the remedial investigation. The concentration of GRO exceeded cleanup levels at several locations in the center of the site, but was below cleanup levels in soil samples collected from GP-1, GP-3, GP-4, GP-7 through GP-9, MW-7 through MW-12.
DRO	2000	soil	standard	ARCADIS analyzed soil for this constituent in 2010 during the remedial investigation. The concentration of DRO exceeded cleanup levels at several locations in the center of the site, but was below cleanup levels in soil samples collected from GP-1, GP-3, GP-4, GP-6 through GP-9, MW-7 through MW-12.
HO	2000	soil	standard	ARCADIS analyzed soil samples for this constituent in 2010 during the remedial investigation. Concentrations detected in soil were less than cleanup levels at all boring locations.
EDB	0.005	soil	standard	Full suite USEPA Method 8260B analysis was performed on soil samples in 2001 (samples IPD-1 through IPD-6). The 8260B analysis included assessment of n-hexane, methyl tertiary-butyl ether, EDC, and EDB. None of these compounds were reported to have been detected in soil or groundwater samples collected at the Site[6]
EDC	6	soil	standard	Full suite USEPA Method 8260B analysis was performed on soil samples in 2001 (samples IPD-1 through IPD-6). The 8260B analysis included assessment of n-hexane, methyl tertiary-butyl ether, EDC, and EDB. None of these compounds were reported to have been detected in soil or groundwater samples collected at the Site[6]
Benzene	0.03	soil	standard	ARCADIS analyzed soil samples for this constituent in 2010 during the remedial investigation. Concentrations detected in soil were less than cleanup levels at all boring locations.
Toluene	7	soil	standard	ARCADIS analyzed soil samples for this constituent in 2010 during the remedial investigation. Concentrations detected in soil were less than cleanup levels at all boring locations.
Ethylbenzene	6	soil	standard	ARCADIS analyzed soil samples for this constituent in 2010 during the remedial investigation. Concentrations detected in soil were less than cleanup levels at all boring locations.
Total xylenes	9	soil	standard	ARCADIS analyzed soil samples for this constituent in 2010 during the remedial investigation. Concentrations detected in soil were less than cleanup levels at all boring locations.
MTBE	0.1	soil	standard	Full suite USEPA Method 8260B analysis was performed on soil samples in 2001 (samples IPD-1 through IPD-6). The 8260B analysis included assessment of n-hexane, methyl tertiary-butyl ether, EDC, and EDB. None of these compounds were reported to have been detected in soil or groundwater samples collected at the Site[6]
n-Hexane	6	soil	standard	Full suite USEPA Method 8260B analysis was performed on soil samples in 2001 (samples IPD-1 through IPD-6). The 8260B analysis included assessment of n-hexane, methyl tertiary-butyl ether, EDC, and EDB. None of these compounds were reported to have been detected in soil or groundwater samples collected at the Site[6]
cPAHs	0.1[3]	soil	standard	ARCADIS analyzed soil for this constituent in 2010 during the remedial investigation. The concentration of cPAHs exceeded cleanup levels at several locations in the center of the site, but was below cleanup levels in soil samples collected from GP-1, GP-3 through GP-9, MW-6R, MW-7 through MW-10.
Naphthalenes	5[4]	soil	standard	ARCADIS analyzed soil for this constituent in 2010 during the remedial investigation. The concentration of Naphthalenes exceeded cleanup levels at several locations in the center of the site, but was below cleanup levels in soil samples collected from GP-1 through GP-4 and GP-6 through GP-9, MW-7 through MW-12.
PCBs	1[5]	soil	standard	PCBs were analyzed in soil at the Site in 2004 and were not detected[7]
Lead	250	soil	standard	ARCADIS analyzed soil samples for this constituent in 2010 during the remedial investigation. Concentrations detected in soil were less than cleanup levels at all boring locations.

mg/kg = milligrams per kilogram

[1]Cleanup levels from Ecology's MTCA Method A Cleanup Levels for Soil (WAC 173-340-900, Table 740-1)

[2]Method A CULs for GRO are determined based on the presence of benzene

[3] Based on benzo(a)pyrene equivalencies (WAC 173-340-900, Table 740-1).

[4] Calculated using procedures in WAC 173-340-747(4).

[5] Total value for all PCBs (mixtures)

[6] SECOR 2001. Final Remedial Investigation and Feasibility Study, Former Industrial Petroleum Distributors, 1117 West Bay Drive, Olympia, Washington. October 30.

[7]Parametrix 2004. West Bay Phase II Environmental Site Assessment, Prepared for City of Olympia Parks, Arts, and Recreation Department. June.

TABLE 7B
GROUNDWATER POINTS OF COMPLIANCE
FEASIBILITY STUDY REPORT
Former ARCO Olympia Bulk Terminal
Industrial Petroleum Distributors Site
1120 West Bay Drive
Olympia, Washington

Constituent	Cleanup Level[1] (µg/L)	Media	Point of Compliance Type	Specific Point of Compliance
GRO	800/1,000[2]	groundwater	standard	Groundwater samples collected by ARCADIS from all current on-site wells (MW-6R, MW-7 through MW-12) have indicated concentrations less than the CLs from October 2010 through September 2011
DRO	500	groundwater	standard	Groundwater samples collected by ARCADIS from all current on-site wells (MW-6R, MW-7 through MW-12) have indicated concentrations less than the CLs from October 2010 through September 2011
HO	500	groundwater	standard	Groundwater samples collected by ARCADIS from all current on-site wells (MW-6R, MW-7 through MW-12) have indicated concentrations less than the CLs from October 2010 through September 2011
EDB	0.01	groundwater	standard	Full suite USEPA Method 8260B analysis was performed on groundwater samples in 2001 (samples IPD-1 through IPD-6). The 8260B analysis included assessment of n-hexane, methyl tertiary-butyl ether, EDC, and EDB. None of these compounds were reported to have been detected in soil or groundwater samples collected at the Site[6]
EDC	5	groundwater	standard	Full suite USEPA Method 8260B analysis was performed on groundwater samples in 2001 (samples IPD-1 through IPD-6). The 8260B analysis included assessment of n-hexane, methyl tertiary-butyl ether, EDC, and EDB. None of these compounds were reported to have been detected in soil or groundwater samples collected at the Site[6]
Benzene	5	groundwater	standard	Groundwater samples collected by ARCADIS from all current on-site wells (MW-6R, MW-7 through MW-12) have indicated concentrations less than the CLs from October 2010 through September 2011
Toluene	1,000	groundwater	standard	Groundwater samples collected by ARCADIS from all current on-site wells (MW-6R, MW-7 through MW-12) have indicated concentrations less than the CLs from October 2010 through September 2011
Ethylbenzene	700	groundwater	standard	Groundwater samples collected by ARCADIS from all current on-site wells (MW-6R, MW-7 through MW-12) have indicated concentrations less than the CLs from October 2010 through September 2011
Total xylenes	1,000	groundwater	standard	Groundwater samples collected by ARCADIS from all current on-site wells (MW-6R, MW-7 through MW-12) have indicated concentrations less than the CLs from October 2010 through September 2011
MTBE	20	groundwater	standard	Full suite USEPA Method 8260B analysis was performed on groundwater samples in 2001 (samples IPD-1 through IPD-6). The 8260B analysis included assessment of n-hexane, methyl tertiary-butyl ether, EDC, and EDB. None of these compounds were reported to have been detected in soil or groundwater samples collected at the Site[6]
n-Hexane	6	groundwater	standard	Full suite USEPA Method 8260B analysis was performed on groundwater samples in 2001 (samples IPD-1 through IPD-6). The 8260B analysis included assessment of n-hexane, methyl tertiary-butyl ether, EDC, and EDB. None of these compounds were reported to have been detected in soil or groundwater samples collected at the Site[6]
cPAHs	0.1[3]	groundwater	standard	Groundwater samples collected by ARCADIS from all current on-site wells (MW-6R, MW-7 through MW-12) have indicated concentrations less than the CLs from October 2010 through September 2011
Naphthalenes	160[4]	groundwater	standard	Groundwater samples collected by ARCADIS from all current on-site wells (MW-6R, MW-7 through MW-12) have indicated concentrations less than the CLs from October 2010 through September 2011
PCBs	0.1[5]	groundwater	standard	PCBs were analyzed in groundwater at the Site in 2004 and were not detected[7]
Lead	15	groundwater	standard	Groundwater samples collected by ARCADIS from all current on-site wells (MW-6R, MW-7 through MW-12) have indicated concentrations less than the CLs from October 2010 through September 2011

µg/L = micrograms per liter

[1]Cleanup levels from Ecology's MTCA Method A Cleanup Levels for Ground Water (WAC 173-340-900, Table 720-1)

[2]Method A CULs for GRO are determined based on the presence of benzene

[3] Based on benzo(a)pyrene equivalencies (WAC 173-340-900, Table 740-1).

[4] Calculated using procedures in WAC 173-340-747(4).

[5] Total value for all PCBs (mixtures)

[6] SECOR 2001. Final Remedial Investigation and Feasibility Study, Former Industrial Petroleum Distributors, 1117 West Bay Drive, Olympia, Washington. October 30.

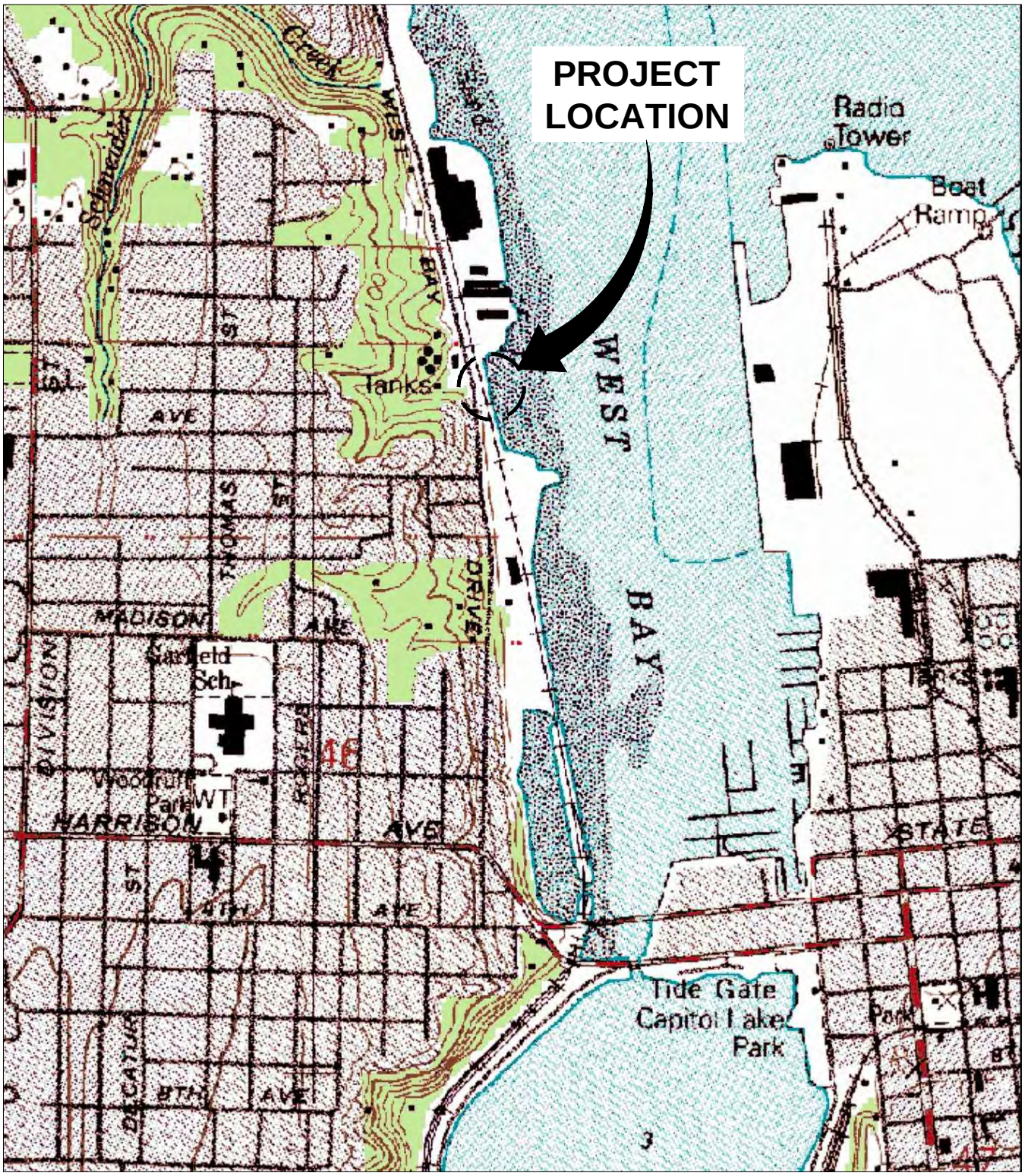
[7]Parametrix 2004. West Bay Phase II Environmental Site Assessment, Prepared for City of Olympia Parks, Arts, and Recreation Department. June.

TABLE 8
SOIL CONFIRMATION SAMPLING AND EXCAVATION COST ESTIMATE
FEASIBILITY STUDY REPORT
Former ARCO Olympia Bulk Terminal
Industrial Petroleum Distributors Site
1120 West Bay Drive
Olympia, Washington

	Quantity	Units	Anticipated Cost
SOIL CONFIRMATION SAMPLING			
Development of Work Plan/HASP Update	1	LS	$ 435
Confirmation Soil Sampling (1 days, 10 soil samples)	1	LS	$ 2,903
Evaluation of Soil Sampling Results	1	LS	$ 404
CONFIRMATION SAMPLING SUBTOTAL			**$ 3,742**
SOIL EXCAVATION			
Soil Excavation Event and Waste Disposal	1	LS	$ 293,427
Technical Report	1	LS	$ 1,578
EXCAVATION SUBTOTAL			**$ 295,005**
TOTAL			**$ 298,747**

ARCADIS

Figures



REFERENCE: BASE MAP USGS 7.5. MIN. TOPO. QUAD., TUMWATER, WASHINGTON, 1959, PHOTOREVISED 1994.

0 1000' 2000'

Approximate Scale: 1 in. = 1000 ft.

FORMER INDUSTRIAL PETROLEUM DISTRIBUTORS
BULK TERMINAL
1120 WEST BAY DRIVE, OLYMPIA, WASHINGTON
FEASIBILITY STUDY REPORT

SITE LOCATION MAP

ARCADIS

FIGURE
1

CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
G:\ENVCAD\Emeryville\ACT\GP09BPNAWA60\C0000RI RptGP09BPNAWA60-N01.dwg LAYOUT: 1 SAVED: 10/19/2011 10:30 AM ACADVER: 18.1S (LMS TECH) PAGESETUP: --- PLOTSTYLETABLE: ARCADIS.CTB PLOTTED: 10/19/2011 10:32 AM BY: REYES, ALEC
XREFS: IMAGES: PROJECTNAME: ---
TOPO BulkTerminal OlympiaWA.jpg

LEGEND

SUBJECT PROPERTY LINE BOUNDARY

MW-7 GROUND WATER MONITORING WELL LOCATION

GP-5 GEOPROBE LOCATION

GP-1

PIPING ELBOWS EMERGING FROM UNDERGROUND

GATE

MW-12

MW-6R

GP-9

GP-5

MW-6

GP-2

GP-3

MW-7

GP-4

GP-6

GP-7

MW-11

MW-8

MW-10

MW-9

TOP OF BANK

WEST BAY DRIVE

RAIL ROAD

GP-8

ABANDONED PIER

0 40' 80'

Approximate Scale: 1 in. = 40 ft.

THIS MAP PREPARED FROM A FIELD SURVEY BY OTAK ON MAY 13, 2010

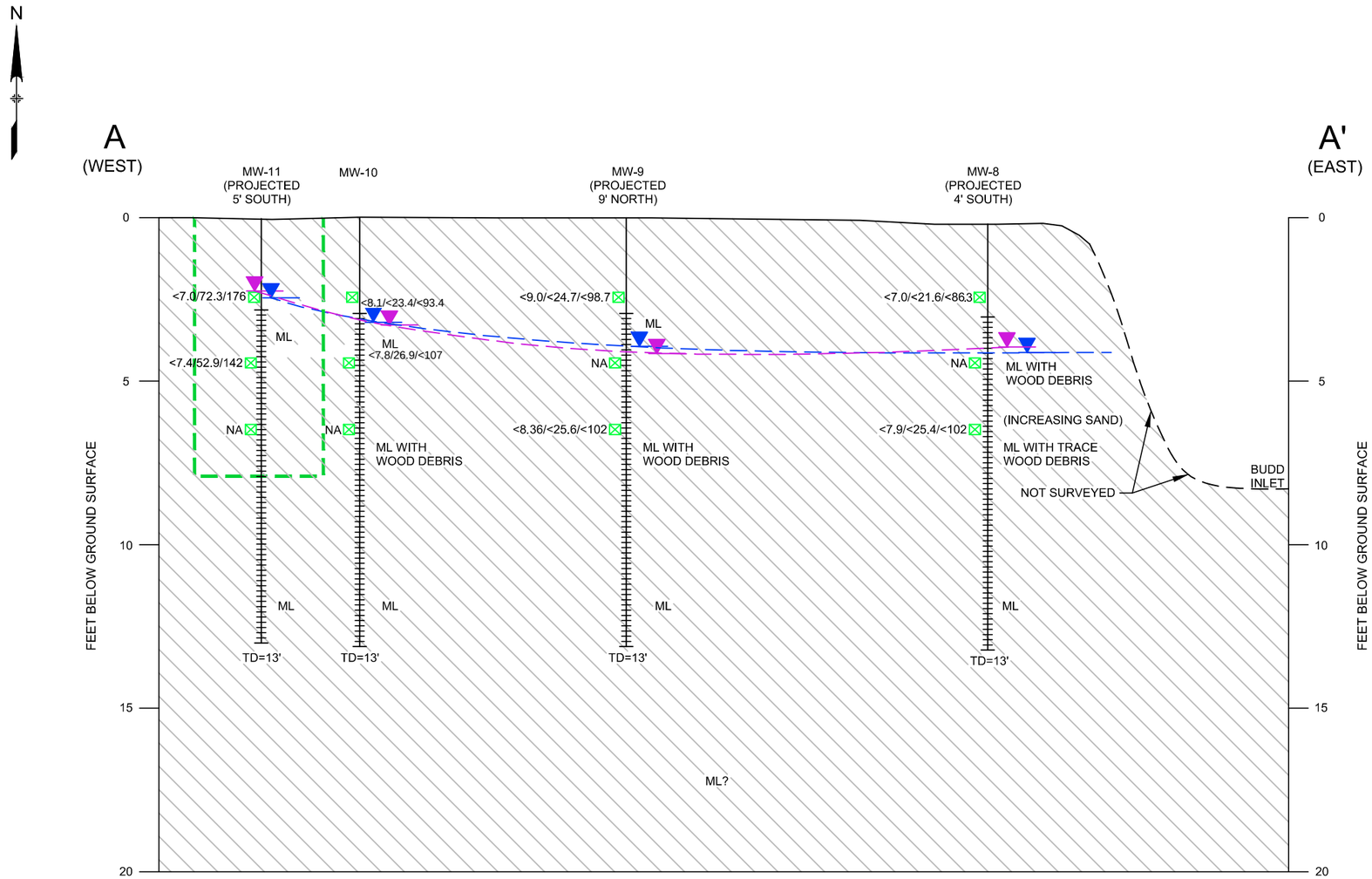
FORMER INDUSTRIAL PETROLEUM DISTRIBUTORS
BULK TERMINAL
1120 WEST BAY DRIVE, OLYMPIA, WASHINGTON
FEASIBILITY STUDY REPORT

SITE PLAN WITH GEOPROBE AND MONITORING WELL LOCATIONS

ARCADIS

FIGURE 2

CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
G:\ENVCAD\Emeryville\ACT\GP09BPNA\WA60\C0000\R Rpt\GP09BPNAWA60-B02.dwg LAYOUT: 2 SAVED: 10/19/2011 10:33 AM ACADVER: 18.1S (LMS TECH) PAGESETUP: --- PLOTSTYLETABLE: ARCADIS.CTB PLOTTED: 10/19/2011 10:34 AM BY: REYES, ALEC
XREFS: IMAGES: PROJECTNAME: ---



LEGEND:

MW-11 — MONITORING WELL ID

WATER LEVEL AT HIGH TIDE (MEASURED JUNE 2, 2011)

WATER LEVEL AT LOW TIDE (MEASURED JUNE 2, 2011)

<7.0/72.3/176 — SOIL SAMPLE TPH-G/TPH-D/TPH-O IN mg/kg

WELL SCREEN

TD=13' — TD = TOTAL DEPTH OF BOREHOLE IN FEET BELOW GROUND SURFACE

ML — INORGANIC SILTS AND VERY FINE SANDS SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS

TPH-G TOTAL PETROLEUM HYDROCARBONS AS GASOLINE

TPH-D TOTAL PETROLEUM HYDROCARBONS AS DIESEL

TPH-O TOTAL PETROLEUM HYDROCARBONS AS HEAVY OIL

mg/kg MILLIGRAMS PER KILOGRAM

NA NOT ANALYZED

< LESS THAN THE SPECIFIED LABORATORY REPORTING LIMIT

HIGH TIDE GROUNDWATER SURFACE

LOW TIDE GROUNDWATER SURFACE

ESTIMATED EXTENT OF SOIL IMPACTED ABOVE MTCA-A

MTCA-A MTCA METHOD A CLEANUP LEVELS

ALL LOCATIONS ARE APPROXIMATE

0 20 40
HORIZONTAL SCALE IN FEET

0 4 8
VERTICAL SCALE IN FEET

VERTICAL EXAGGERATION = 4X

FORMER INDUSTRIAL PETROLEUM DISTRIBUTORS
BULK TERMINAL
1120 WEST BAY DRIVE, OLYMPIA, WASHINGTON
FEASIBILITY STUDY REPORT

CROSS SECTION A-A'

ARCADIS

FIGURE
3

CITY:(Read) DIV/GROUP:(Read) DB:(Read) LD:(Opt) PIC:(Opt) PM:(Read) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
G:\ENVCAD\Emeryville\ACT\GP09BPNA\WA60\C0000\R Rpt\GP09BPNAWA60-V08.dwg LAYOUT: MODEL SAVED: 10/28/2011 2:50 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ARCADIS-DEN.CTB PLOTTED: 10/28/2011 3:26 PM BY: REYES, ALEC

CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
G:\ENVCAD\Emeryville\ACT\GP09BPNA\WA60\C00000IRI Rpt\GP09BPNAWA60-B07.dwg LAYOUT: 7 SAVED: 10/28/2011 2:48 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: --- PLOTSTYLETABLE: ARCADIS.CTB PLOTTED: 10/28/2011 2:48 PM BY: REYES, ALEC

LEGEND

- SUBJECT PROPERTY LINE BOUNDARY
- MW-7 GROUNDWATER MONITORING WELL LOCATION
- GP-5 SOIL BORING LOCATION
- A — A' CROSS SECTION LOCATION

PIPING ELBOWS EMERGING FROM UNDERGROUND

GATE

GP-1

B

B'

MW-12

MW-6R

GP-9

GP-5

MW-6

GP-4

GP-2

GP-3

MW-7

GP-6

GP-7

MW-11

MW-8

A

MW-10

MW-9

A'

TOP OF BANK

GP-8

ABANDONED PIER

WEST BAY DRIVE

RAIL ROAD

0 40' 80'

Approximate Scale: 1 in. = 40 ft.

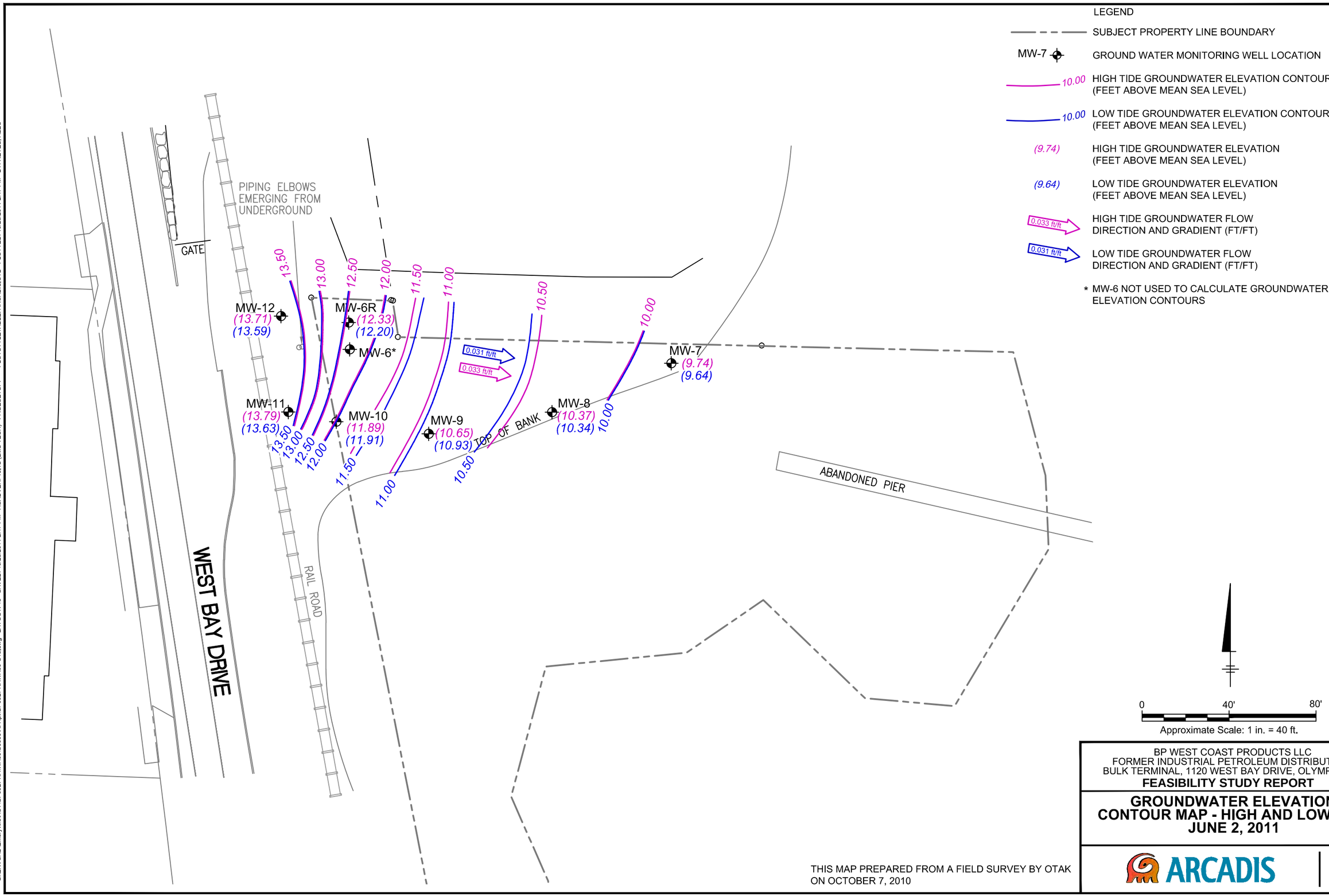
THIS MAP PREPARED FROM A FIELD SURVEYS BY OTAK IN MAY 2010 AND OCTOBER 2010.

BP WEST COAST PRODUCTS LLC
FORMER INDUSTRIAL PETROLEUM DISTRIBUTORS
BULK TERMINAL, 1120 WEST BAY DRIVE, OLYMPIA, WA
FEASIBILITY STUDY REPORT

CROSS-SECTION LOCATION MAP

ARCADIS

FIGURE 4



THIS MAP PREPARED FROM A FIELD SURVEY BY OTAK ON OCTOBER 7, 2010

BP WEST COAST PRODUCTS LLC
FORMER INDUSTRIAL PETROLEUM DISTRIBUTORS
BULK TERMINAL, 1120 WEST BAY DRIVE, OLYMPIA, WA

FEASIBILITY STUDY REPORT

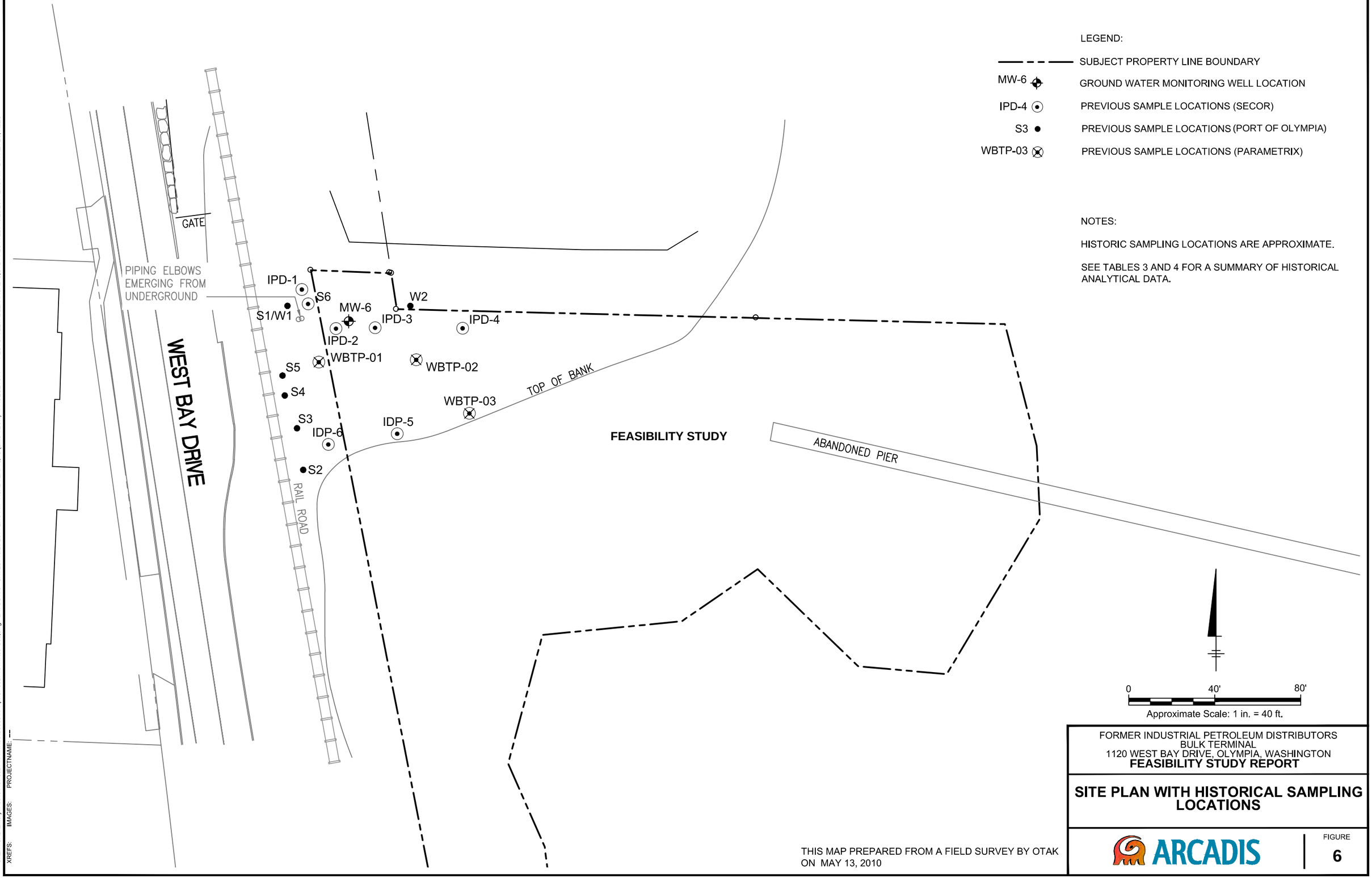
GROUNDWATER ELEVATION CONTOUR MAP - HIGH AND LOW TIDE JUNE 2, 2011

ARCADIS

FIGURE 5

CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
G:\ENVCAD\Emeryville\ACT\GP09BPNAWA60\C0000\R Rpt\GP09BPNAWA60-C15.dwg LAYOUT: 15 SAVED: 10/28/2011 2:47 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ARCADIS.CTB PLOTTED: 10/28/2011 2:47 PM BY: REYES, ALEC

CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
G:\ENVCAD\Emeryville\ACT\GP09BPNA\WA60\C0000\Rl Rpt\GP09BPNAWA60-C03.dwg LAYOUT: 3 SAVED: 10/28/2011 2:46 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: --- PLOTSTYLETABLE: ARCADIS.CTB PLOTTED: 10/28/2011 2:46 PM BY: REYES, ALEC
XREFS: IMAGES: PROJECTNAME: ---



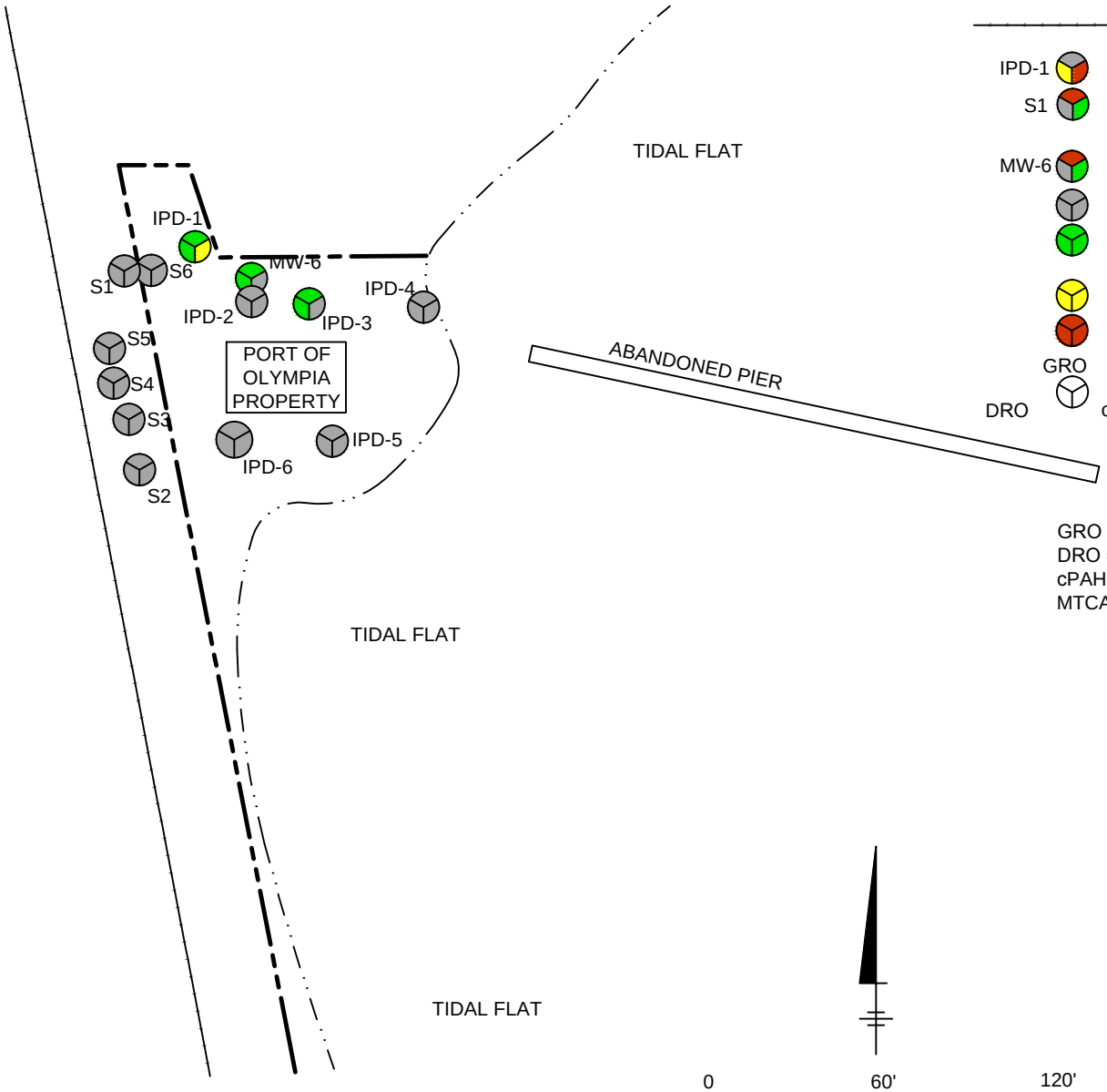
THIS MAP PREPARED FROM A FIELD SURVEY BY OTAK ON MAY 13, 2010

FORMER INDUSTRIAL PETROLEUM DISTRIBUTORS
BULK TERMINAL
1120 WEST BAY DRIVE, OLYMPIA, WASHINGTON
FEASIBILITY STUDY REPORT

SITE PLAN WITH HISTORICAL SAMPLING LOCATIONS

ARCADIS

FIGURE
6



LEGEND:

- APPROXIMATE PROPERTY BOUNDARY
- APPROXIMATE SHORE LINE
- RAILROAD TRACKS
- IPD-1 — TEST PIT SAMPLING LOCATION (JANUARY 2000)
- S1 — PREVIOUS SAMPLED LOCATION (NORTH WEST TEST) (FEBRUARY 2000)
- MW-6 — MONITORING WELL (SOIL SAMPLES COLLECTED IN 2004)
- NOT ANALYZED
- NOT DETECTED ABOVE LABORATORY AND/OR METHOD REPORTING LIMIT
- DETECTED < MTCA-A
- DETECTED > MTCA-A

GRO
DRO cPAH

GRO = TOTAL PETROLEUM HYDROCARBONS AS GASOLINE
DRO = TOTAL PETROLEUM HYDROCARBONS AS DIESEL
cPAH = CARCINOGENIC POLYCYCLIC AROMATIC HYDROCARBONS
MTCA-A = MTCA METHOD A CLEANUP LEVEL

NOTES:

1. ALL LOCATIONS ARE APPROXIMATE DUE TO INACCURACIES IN THE PREVIOUSLY SUBMITTED BASEMAPS.
2. MAP FEATURES AND SAMPLE LOCATIONS BASED ON FIGURE 2B OF SECOR'S FINAL REMEDIAL INVESTIGATION AND FEASIBILITY STUDY BY SECOR IN OCTOBER 2001.

0 60' 120'

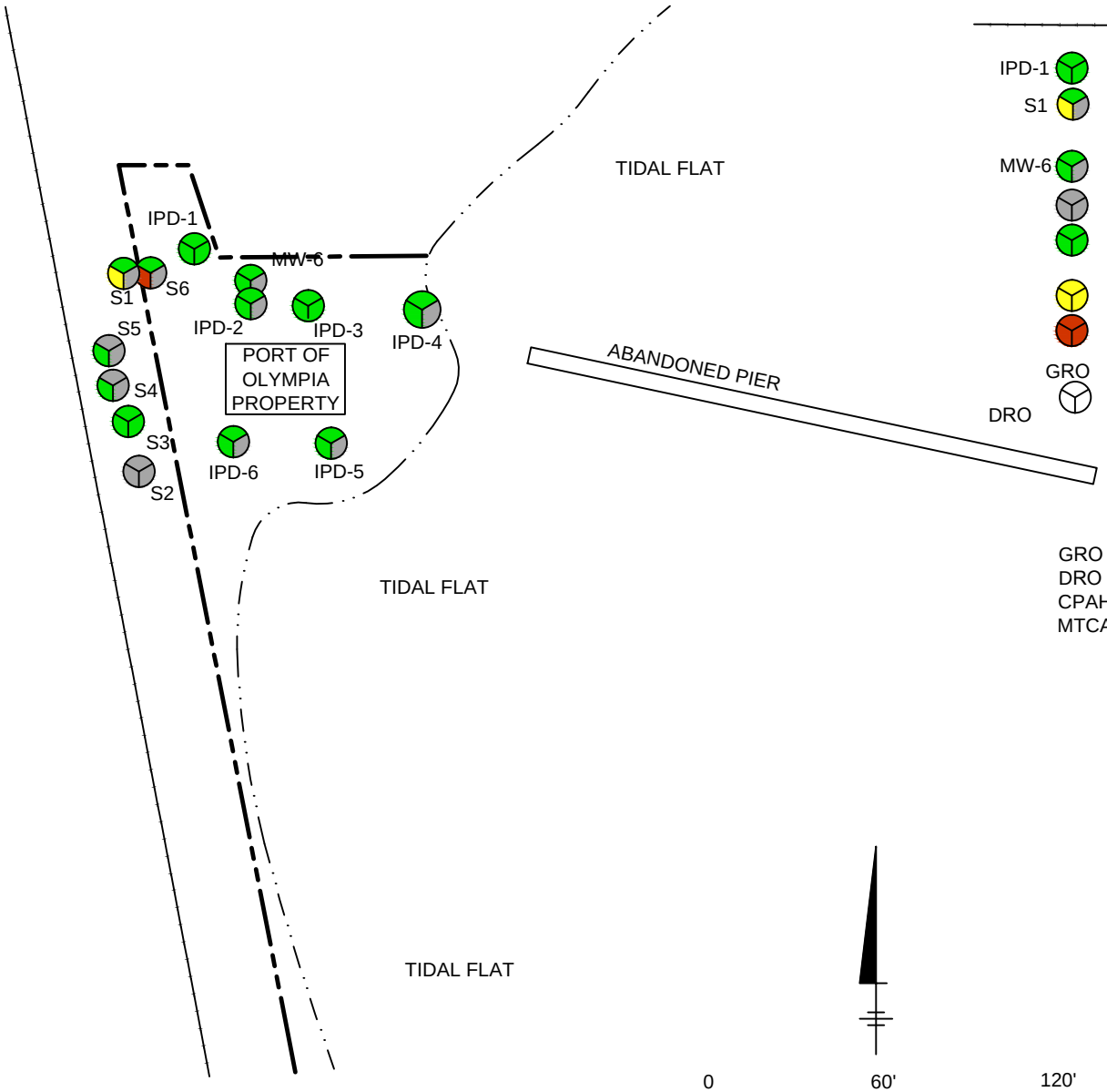
Approximate Scale: 1 in. = 60 ft.

BP WEST COAST PRODUCTS LLC
FORMER INDUSTRIAL PETROLEUM DISTRIBUTORS
BULK TERMINAL, 1120 WEST BAY DRIVE, OLYMPIA, WA
FEASIBILITY STUDY REPORT

HISTORICAL GRO, DRO, AND cPAH CONCENTRATIONS IN SOIL (1 - 3 FEET BGS)

ARCADIS

FIGURE
7



LEGEND:

- APPROXIMATE PROPERTY BOUNDARY
- APPROXIMATE SHORE LINE
- RAILROAD TRACKS
- IPD-1 — TEST PIT SAMPLING LOCATION (JANUARY 2000)
- S1 — PREVIOUS SAMPLED LOCATION (NORTH WEST TEST) (FEBRUARY 2000)
- MW-6 — MONITORING WELL (SOIL SAMPLES COLLECTED IN 2004)
- NOT ANALYZED
- NOT DETECTED ABOVE LABORATORY AND/OR METHOD REPORTING LIMIT
- DETECTED < MTCA-A
- DETECTED > MTCA-A

GRO
DRO cPAH

GRO = TOTAL PETROLEUM HYDROCARBONS AS GASOLINE
DRO = TOTAL PETROLEUM HYDROCARBONS AS DIESEL
CPAH = CARCINOGENIC POLYCYCLIC AROMATIC HYDROCARBONS
MTCA-A = MTCA METHOD A CLEANUP LEVEL

NOTES:

1. ALL LOCATIONS ARE APPROXIMATE DUE TO INACCURACIES IN THE PREVIOUSLY SUBMITTED BASEMAPS
2. MAP FEATURES AND SAMPLE LOCATIONS BASED ON FIGURE 2B OF THE FINAL REMEDIAL INVESTIGATION AND FEASIBILITY STUDY BY SECOR IN OCTOBER 2001.

0 60' 120'

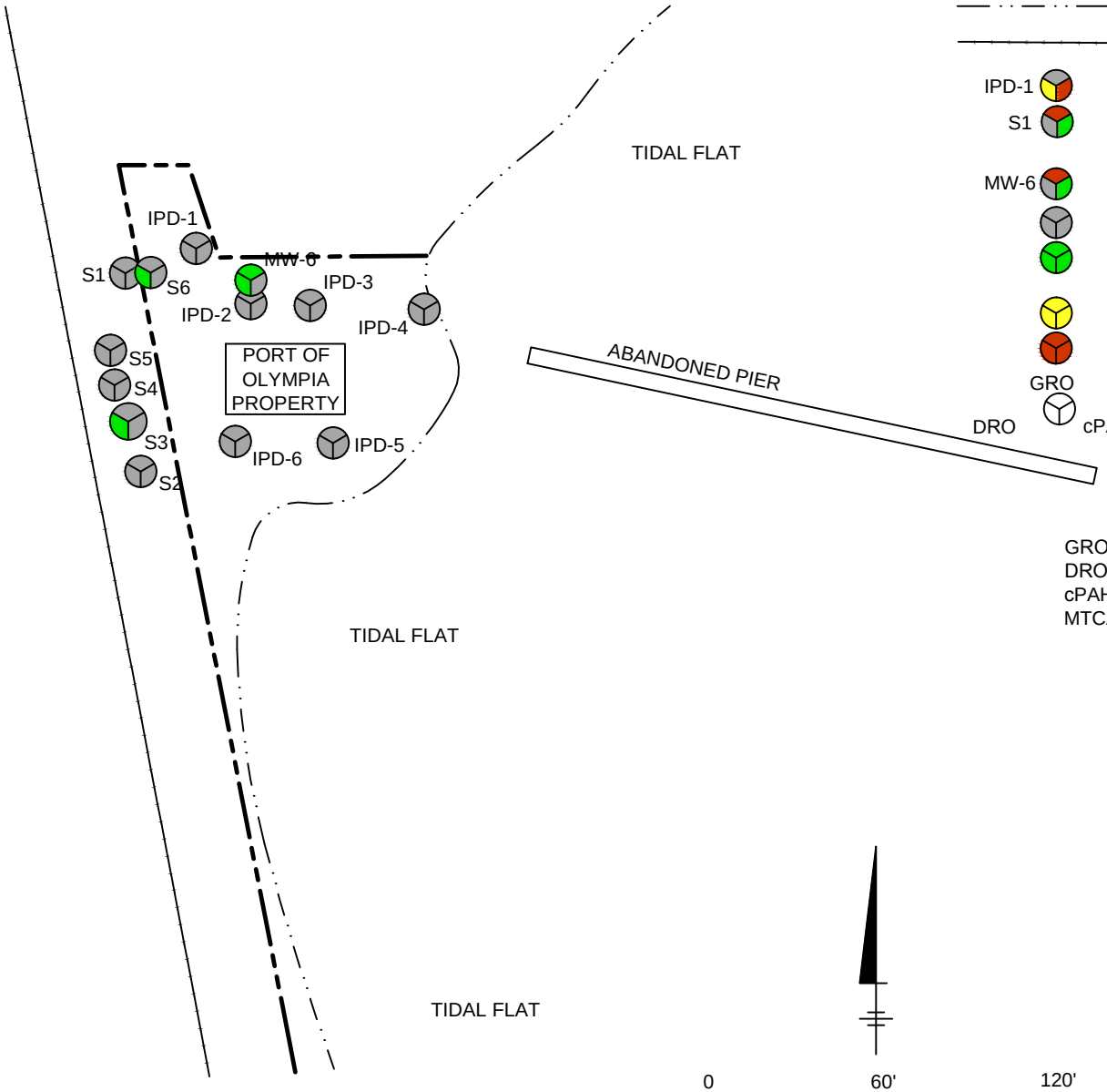
Approximate Scale: 1 in. = 60 ft.

BP WEST COAST PRODUCTS LLC
FORMER INDUSTRIAL PETROLEUM DISTRIBUTORS
BULK TERMINAL, 1120 WEST BAY DRIVE, OLYMPIA, WA
FEASIBILITY STUDY REPORT

HISTORICAL GRO, DRO, AND cPAH CONCENTRATIONS IN SOIL (3 - 6 FEET BGS)

ARCADIS

FIGURE
8



LEGEND:

- APPROXIMATE PROPERTY BOUNDARY
- APPROXIMATE SHORE LINE
- RAILROAD TRACKS
- IPD-1 — TEST PIT SAMPLING LOCATION (JANUARY 2000)
- S1 — PREVIOUS SAMPLED LOCATION (NORTH WEST TEST) (FEBRUARY 2000)
- MW-6 — MONITORING WELL (SOIL SAMPLES COLLECTED IN 2004)
- NOT ANALYZED
- NOT DETECTED ABOVE LABORATORY AND/OR METHOD REPORTING LIMIT
- DETECTED < MTCA-A
- DETECTED > MTCA-A
- GRO / DRO / cPAH

0 60' 120'

Approximate Scale: 1 in. = 60 ft.

GRO = TOTAL PETROLEUM HYDROCARBONS AS GASOLINE
DRO = TOTAL PETROLEUM HYDROCARBONS AS DIESEL
cPAH = CARCINOGENIC POLYCYCLIC AROMATIC HYDROCARBONS
MTCA-A = MTCA METHOD A CLEANUP LEVEL

NOTES:

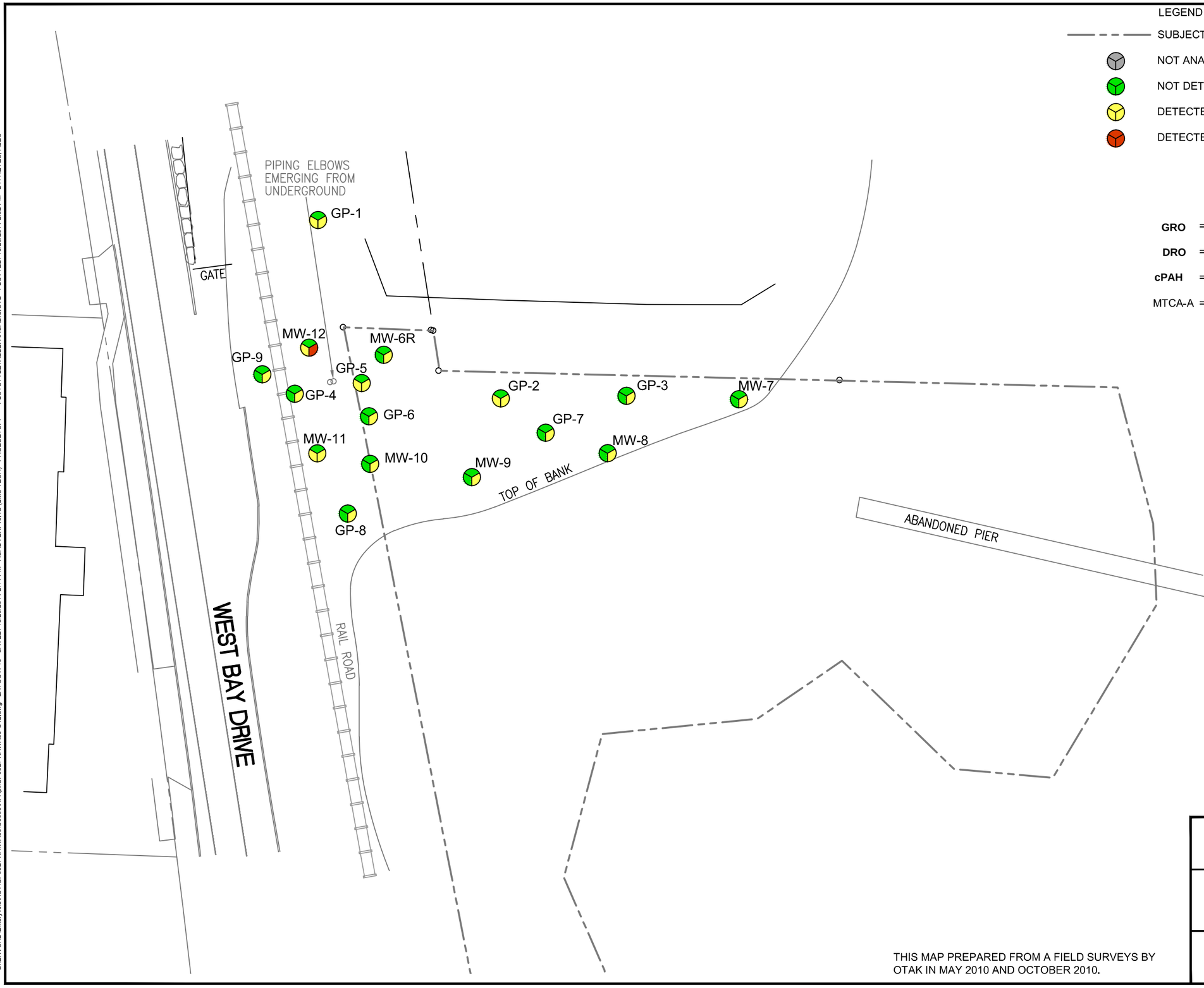
1. ALL LOCATIONS ARE APPROXIMATE DUE TO INACCURACIES IN THE PREVIOUSLY SUBMITTED BASEMAPS.
2. MAP FEATURES AND SAMPLE LOCATIONS BASED ON FIGURE 2B OF SECOR'S FINAL REMEDIAL INVESTIGATION AND FEASIBILITY STUDY BY SECOR IN OCTOBER 2001.

BP WEST COAST PRODUCTS LLC
FORMER INDUSTRIAL PETROLEUM DISTRIBUTORS
BULK TERMINAL, 1120 WEST BAY DRIVE, OLYMPIA, WA
FEASIBILITY STUDY REPORT

HISTORICAL GRO, DRO, AND cPAH CONCENTRATIONS IN SOIL (6 - 9 FEET BGS)

ARCADIS

FIGURE
9



LEGEND

- SUBJECT PROPERTY LINE BOUNDARY
- NOT ANALYZED
- NOT DETECTED ABOVE LABORATORY REPORTING LIMIT
- DETECTED ≤ MTCA-A
- DETECTED ≥ MTCA-A

GRO
DRO cPAH

GRO = TOTAL PETROLEUM HYDROCARBONS AS GASOLINE

DRO = TOTAL PETROLEUM HYDROCARBONS AS DIESEL

cPAH = CARCINOGENIC POLYCYCLIC AROMATIC HYDROCARBONS

MTCA-A = MTCA METHOD A CLEANUP LEVEL

0 40' 80'

Approximate Scale: 1 in. = 40 ft.

THIS MAP PREPARED FROM A FIELD SURVEYS BY OTAK IN MAY 2010 AND OCTOBER 2010.

BP WEST COAST PRODUCTS LLC
FORMER INDUSTRIAL PETROLEUM DISTRIBUTORS
BULK TERMINAL, 1120 WEST BAY DRIVE, OLYMPIA, WA

FEASIBILITY STUDY REPORT

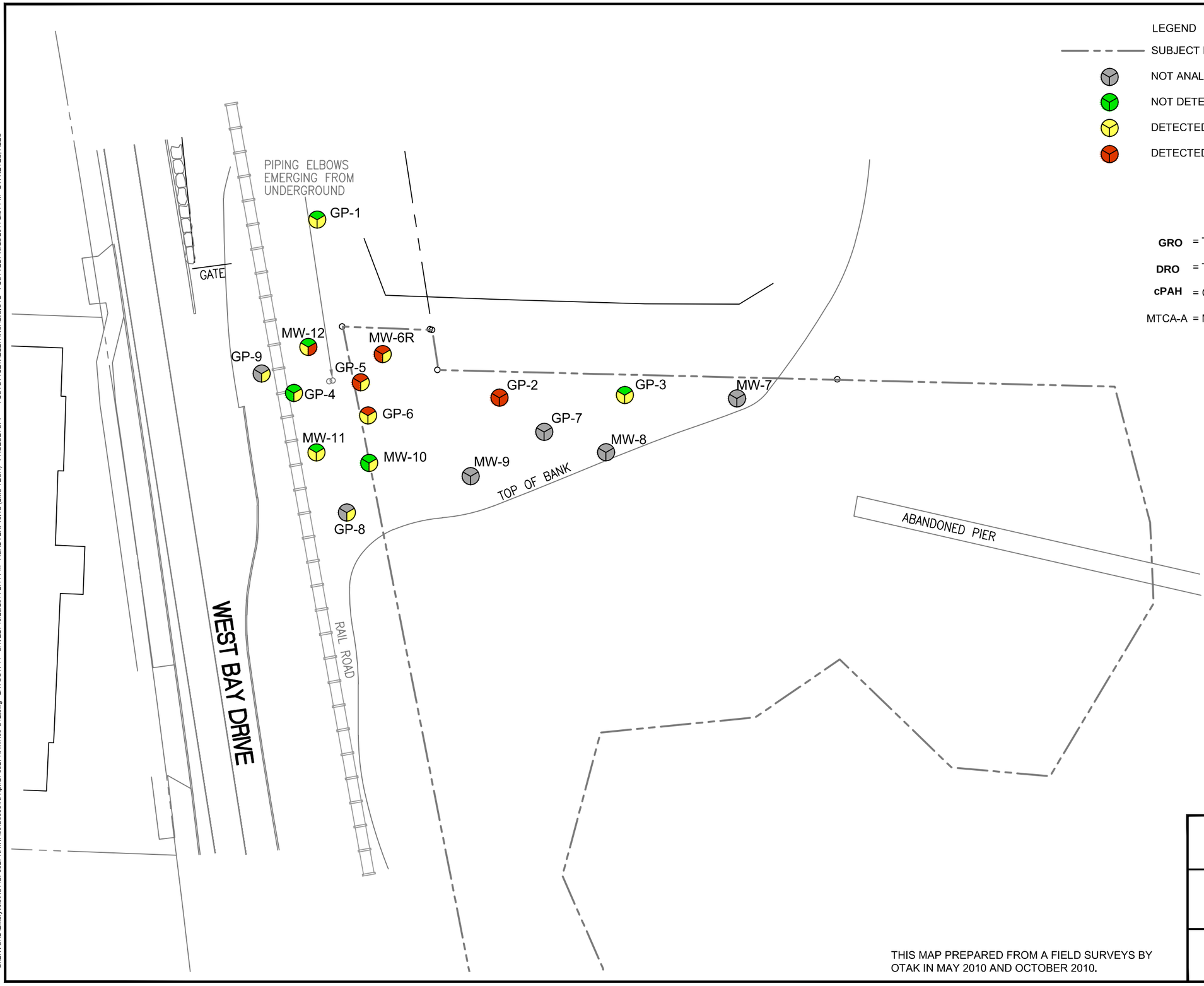
GRO, DRO, AND cPAH CONCENTRATIONS IN SOIL (2 - 2.5 FT BGS) - AUGUST 2010

ARCADIS

FIGURE **10**

CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
G:\ENVCAD\Emeryville\ACT\GP09BPNAWA60\C0000\RI Rpt\GP09BPNAWA60-C12.dwg LAYOUT: 10 SAVED: 10/28/2011 2:44 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ARCADIS.CTB PLOTTED: 10/28/2011 2:52 PM BY: REYES, ALEC

CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
G:\ENVCAD\Emeryville\ACT\GP09BPNAWA60\C0000\RI Rpt\GP09BPNAWA60-C12.dwg LAYOUT: 11 SAVED: 10/28/2011 2:44 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ARCADIS.CTB PLOTTED: 10/28/2011 2:51 PM BY: REYES, ALEC



LEGEND

- SUBJECT PROPERTY LINE BOUNDARY
- NOT ANALYZED
- NOT DETECTED ABOVE LABORATORY REPORTING LIMIT
- DETECTED ≤ MTCA-A
- DETECTED ≥ MTCA-A

GRO / DRO / cPAH

GRO = TOTAL PETROLEUM HYDROCARBONS AS GASOLINE

DRO = TOTAL PETROLEUM HYDROCARBONS AS DIESEL

cPAH = CARCINOGENIC POLYCYCLIC AROMATIC HYDROCARBONS

MTCA-A = MTCA METHOD A CLEANUP LEVEL

0 40' 80'

Approximate Scale: 1 in. = 40 ft.

THIS MAP PREPARED FROM A FIELD SURVEYS BY OTAK IN MAY 2010 AND OCTOBER 2010.

BP WEST COAST PRODUCTS LLC
FORMER INDUSTRIAL PETROLEUM DISTRIBUTORS
BULK TERMINAL, 1120 WEST BAY DRIVE, OLYMPIA, WA

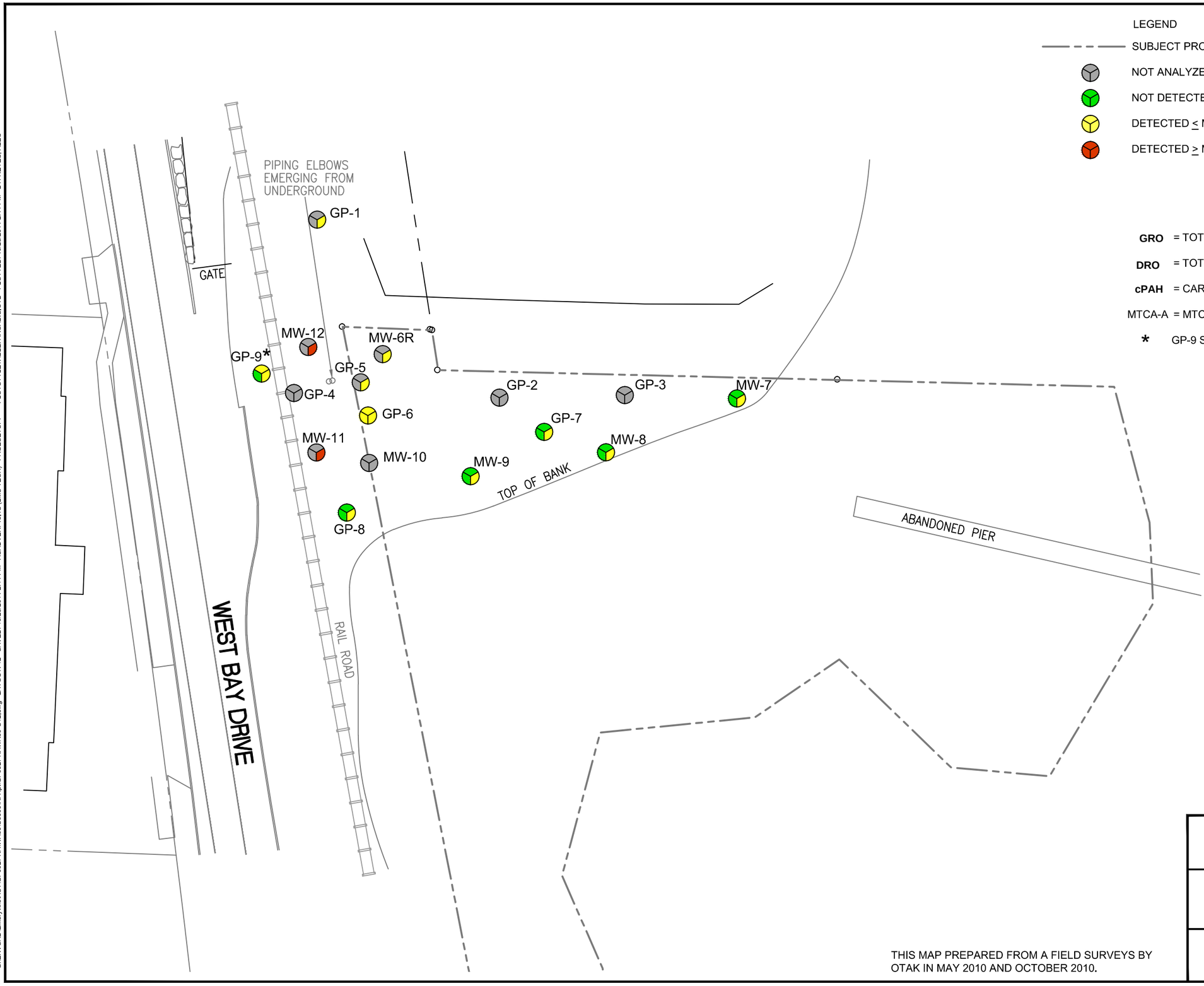
FEASIBILITY STUDY REPORT

GRO, DRO, AND cPAH CONCENTRATIONS IN SOIL (4 - 4.5 FT BGS) - AUGUST 2010

ARCADIS

FIGURE 11

CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
G:\ENVCAD\Emeryville\ACT\GP09BPNAWA60\C0000\RI Rpt\GP09BPNAWA60-C12.dwg LAYOUT: 12 SAVED: 10/28/2011 2:44 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ARCADIS.CTB PLOTTED: 10/28/2011 2:44 PM BY: REYES, ALEC



LEGEND

- SUBJECT PROPERTY LINE BOUNDARY
- NOT ANALYZED
- NOT DETECTED ABOVE LABORATORY REPORTING LIMIT
- DETECTED ≤ MTCA-A
- DETECTED ≥ MTCA-A

GRO / DRO / cPAH

GRO = TOTAL PETROLEUM HYDROCARBONS AS GASOLINE

DRO = TOTAL PETROLEUM HYDROCARBONS AS DIESEL

cPAH = CARCINOGENIC POLYCYCLIC AROMATICHYDROCARBONS

MTCA-A = MTCA METHOD A CLEANUP LEVEL

* GP-9 SAMPLE WAS COLLECTED FROM 5.5 - 6 FT BGS INTERVAL

0 40' 80'

Approximate Scale: 1 in. = 40 ft.

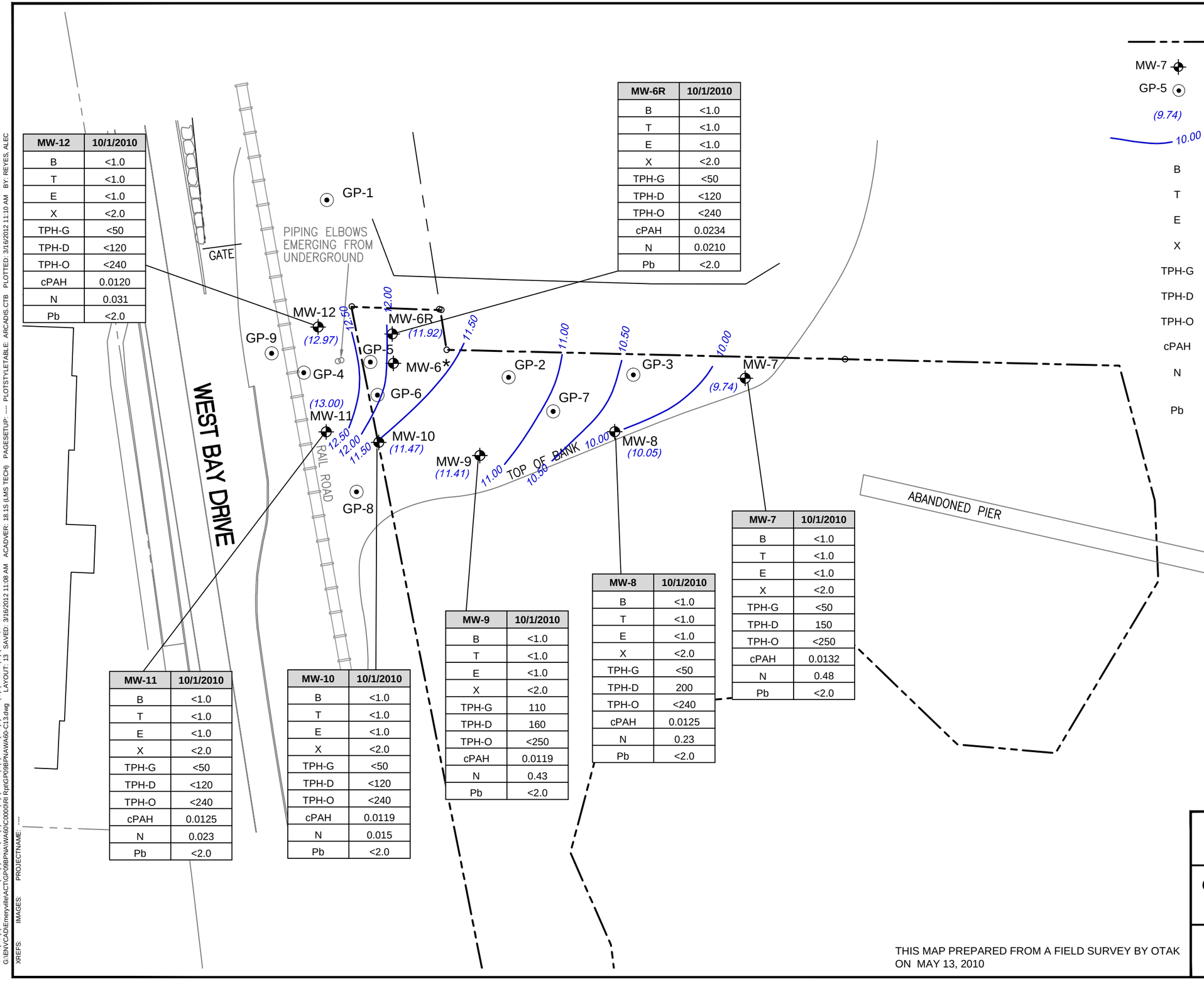
THIS MAP PREPARED FROM A FIELD SURVEYS BY OTAK IN MAY 2010 AND OCTOBER 2010.

BP WEST COAST PRODUCTS LLC
FORMER INDUSTRIAL PETROLEUM DISTRIBUTORS
BULK TERMINAL, 1120 WEST BAY DRIVE, OLYMPIA, WA
FEASIBILITY STUDY REPORT

GRO, DRO, AND cPAH CONCENTRATIONS IN SOIL (6 - 6.5 FT BGS) - AUGUST 2010

ARCADIS

FIGURE 12



MW-12	10/1/2010
B	<1.0
T	<1.0
E	<1.0
X	<2.0
TPH-G	<50
TPH-D	<120
TPH-O	<240
cPAH	0.0120
N	0.031
Pb	<2.0

MW-6R	10/1/2010
B	<1.0
T	<1.0
E	<1.0
X	<2.0
TPH-G	<50
TPH-D	<120
TPH-O	<240
cPAH	0.0234
N	0.0210
Pb	<2.0

MW-11	10/1/2010
B	<1.0
T	<1.0
E	<1.0
X	<2.0
TPH-G	<50
TPH-D	<120
TPH-O	<240
cPAH	0.0125
N	0.023
Pb	<2.0

MW-10	10/1/2010
B	<1.0
T	<1.0
E	<1.0
X	<2.0
TPH-G	<50
TPH-D	<120
TPH-O	<240
cPAH	0.0119
N	0.015
Pb	<2.0

MW-9	10/1/2010
B	<1.0
T	<1.0
E	<1.0
X	<2.0
TPH-G	110
TPH-D	160
TPH-O	<250
cPAH	0.0119
N	0.43
Pb	<2.0

MW-8	10/1/2010
B	<1.0
T	<1.0
E	<1.0
X	<2.0
TPH-G	<50
TPH-D	200
TPH-O	<240
cPAH	0.0125
N	0.23
Pb	<2.0

MW-7	10/1/2010
B	<1.0
T	<1.0
E	<1.0
X	<2.0
TPH-G	<50
TPH-D	150
TPH-O	<250
cPAH	0.0132
N	0.48
Pb	<2.0

LEGEND

- SUBJECT PROPERTY LINE BOUNDARY
- MW-7 — GROUND WATER MONITORING WELL LOCATION
- GP-5 — GEOPROBE LOCATION
- (9.74) — GROUNDWATER ELEVATION, FEET
- 10.00 — GROUNDWATER ELEVATION CONTOUR, FEET

B	BENZENE
T	TOLUENE
E	ETHYLBENZENE
X	TOTAL XYLENES
TPH-G	GASOLINE RANGE TOTAL PETROLEUM HYDROCARBONS
TPH-D	DIESEL RANGE TOTAL PETROLEUM HYDROCARBONS
TPH-O	HEAVY OIL RANGE TOTAL PETROLEUM HYDROCARBONS
cPAH	CARCINOGENIC POLYCYCLIC AROMATIC HYDROCARBONS
N	NAPHTHALENE, 1-METHYLNAPHTHALENE AND 2-METHYLNAPHTHALENE, TOTAL
Pb	TOTAL LEAD

NOTES:

ALL CONCENTRATIONS IN MICROGRAMS PER LITER.

SEE TABLE 2 NOTES FOR cPAH AND N CALCULATION METHODOLOGY.

* MW-6 NOT USED TO CALCULATE GROUNDWATER ELEVATION CONTOUR.

Approximate Scale: 1 in. = 40 ft.

THIS MAP PREPARED FROM A FIELD SURVEY BY OTAK ON MAY 13, 2010

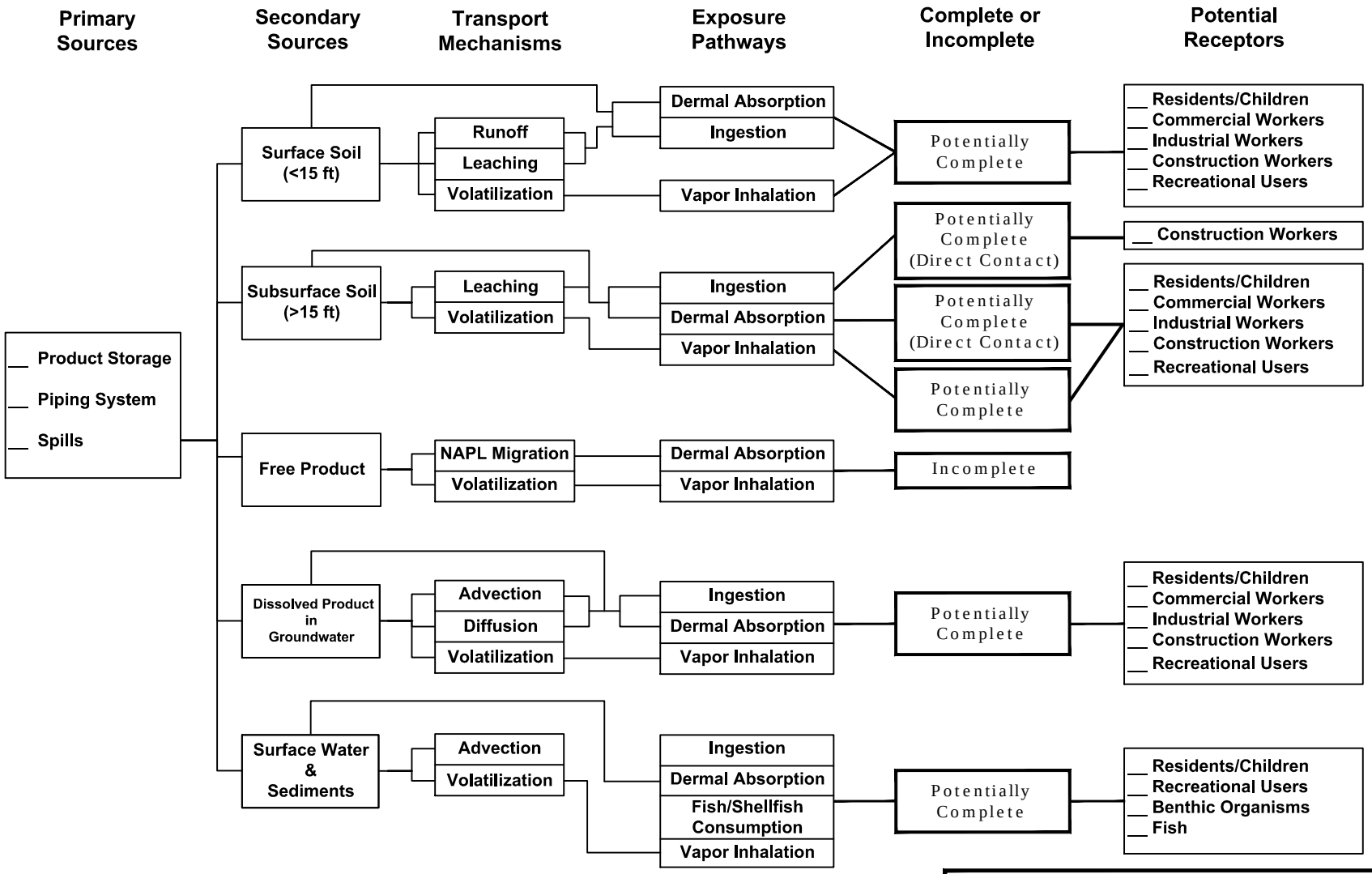
FORMER INDUSTRIAL PETROLEUM DISTRIBUTORS
BULK TERMINAL
1120 WEST BAY DRIVE, OLYMPIA, WASHINGTON
FEASIBILITY STUDY REPORT

GROUNDWATER ELEVATION CONTOUR AND ANALYTICAL SUMMARY MAP

ARCADIS

FIGURE
13

CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
G:\ENVCAD\Emeryville\ACTIVE\GP09BPNA\WA60\C0000\RI Rpt\GP09BPNAWA60-C13.dwg LAYOUT: 13 SAVED: 3/16/2012 11:08 AM ACADVER: 18.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ARCADIS.CTB PLOTTED: 3/16/2012 11:10 AM BY: REYES, ALEC
XREFS: IMAGES: PROJECTNAME: ----



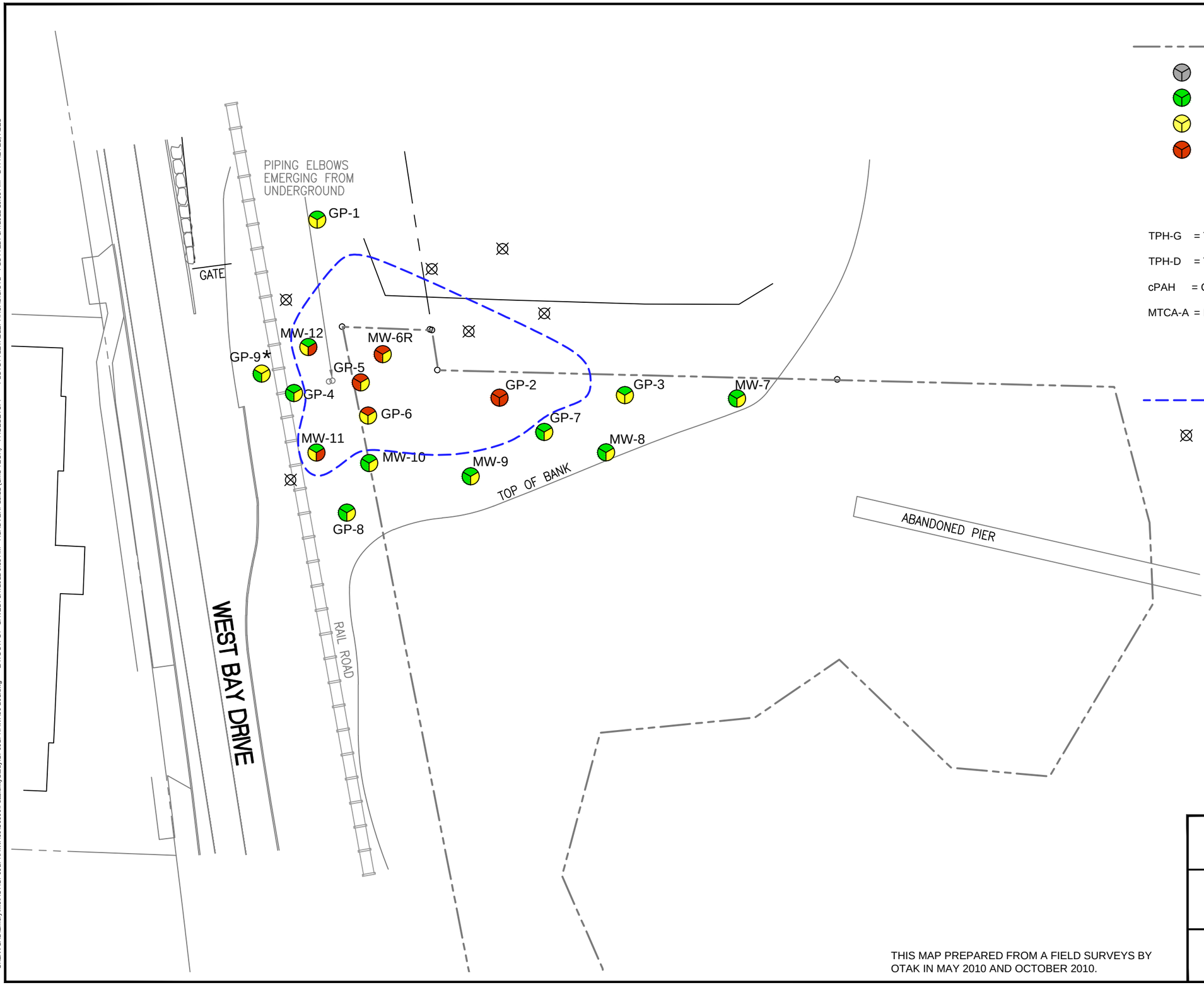
BP WEST COAST PRODUCTS LLC
FORMER INDUSTRIAL PETROLEUM DISTRIBUTORS
BULK TERMINAL, 1120 WEST BAY DRIVE, OLYMPIA, WA

FEASIBILITY STUDY REPORT

CONCEPTUAL SITE MODEL

ARCADIS

FIGURE
14



LEGEND

SUBJECT PROPERTY LINE BOUNDARY

NOT ANALYZED

NOT DETECTED ABOVE LABORATORY REPORTING LIMIT

DETECTED ≤ MTCA-A

DETECTED ≥ MTCA-A

TPH-G
TPH-D CPAH

TPH-G = TOTAL PETROLEUM HYDROCARBONS AS GASOLINE

TPH-D = TOTAL PETROLEUM HYDROCARBONS AS DIESEL

cPAH = CARCINOGENIC POLYCYCLIC AROMATIC HYDROCARBONS

MTCA-A = MTCA METHOD A CLEANUP LEVEL

CALCULATIONS WERE BASED ON THE HIGHEST CONCENTRATION OBSERVED AT EACH BORING LOCATION.

ESTIMATED EXTENT SOIL IMPACTED ≥ MTCA

APPROXIMATE PROPOSED CONFIRMATION SOIL SAMPLE LOCATION.

0 40' 80'

Approximate Scale: 1 in. = 40 ft.

THIS MAP PREPARED FROM A FIELD SURVEYS BY OTAK IN MAY 2010 AND OCTOBER 2010.

BP WEST COAST PRODUCTS LLC
FORMER INDUSTRIAL PETROLEUM DISTRIBUTORS
BULK TERMINAL, 1120 WEST BAY DRIVE, OLYMPIA, WA

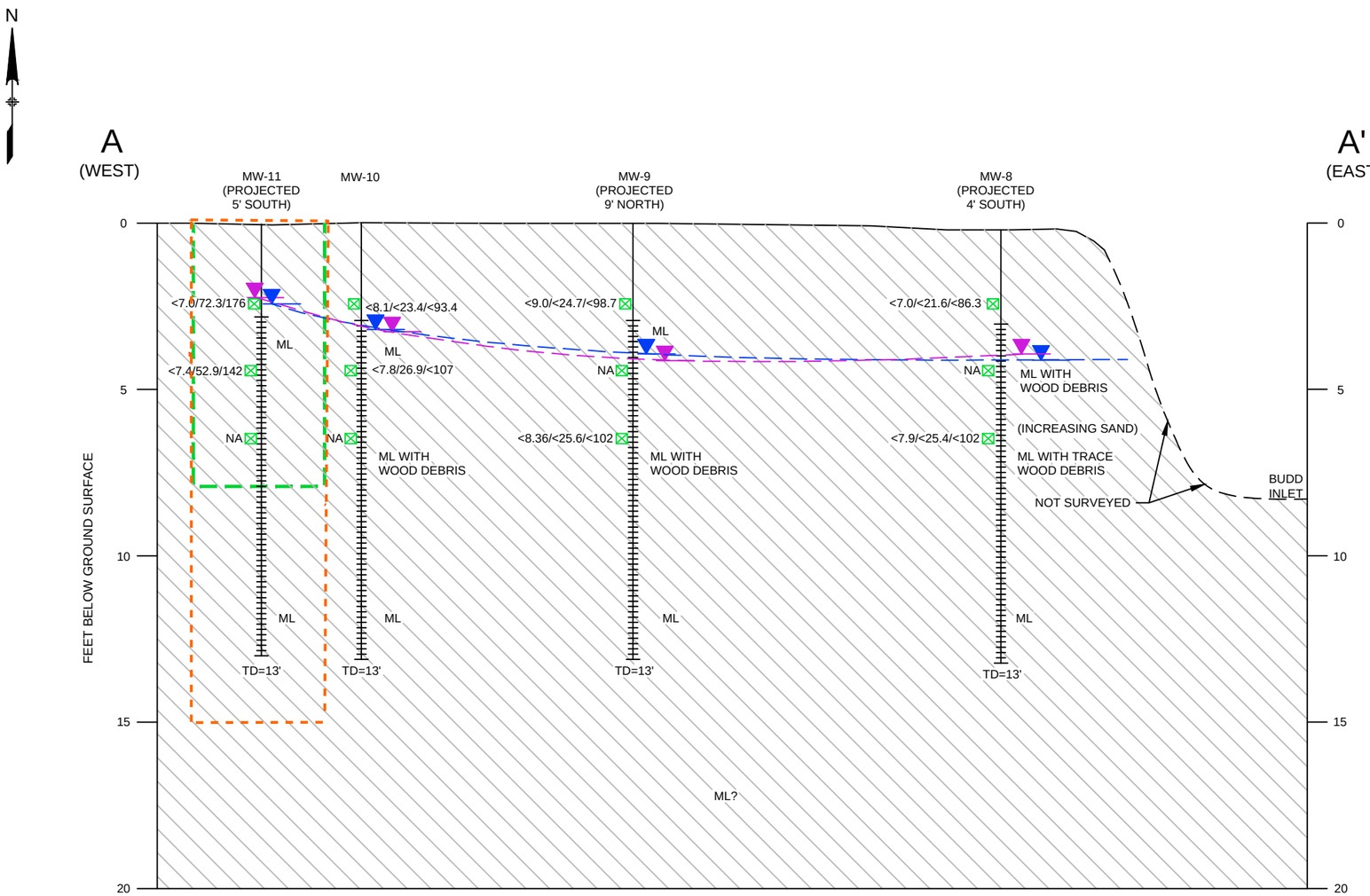
FEASIBILITY STUDY REPORT

ESTIMATED EXTENT OF SOIL EXCAVATION AND CONFIRMATION SAMPLING LOCATIONS

ARCADIS

FIGURE
15

CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
G:\ENVCAD\Emeryville\ACT\GP09BPNA\WA60\C0000\FeasibilityStudy\GP09BPNAWA60 B01.dwg LAYOUT: 14 SAVED: 3/7/2012 9:55 AM ACADVER: 18.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ARCADIS.CTB PLOTTED: 3/7/2012 10:05 AM BY: REYES, ALEC



LEGEND:

MW-11 ← MONITORING WELL ID

WATER LEVEL AT HIGH TIDE (MEASURED JUNE 2, 2011)

WATER LEVEL AT LOW TIDE (MEASURED JUNE 2, 2011)

<7.0/72.3/176 SOIL SAMPLE TPH-G/TPH-D/TPH-O IN mg/kg

WELL SCREEN

TD=13' TD = TOTAL DEPTH OF BOREHOLE IN FEET BELOW GROUND SURFACE

ML INORGANIC SILTS AND VERY FINE SANDS SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS

TPH-G TOTAL PETROLEUM HYDROCARBONS AS GASOLINE

TPH-D TOTAL PETROLEUM HYDROCARBONS AS DIESEL

TPH-O TOTAL PETROLEUM HYDROCARBONS AS HEAVY OIL

mg/kg MILLIGRAMS PER KILOGRAM

NA NOT ANALYZED

< LESS THAN THE SPECIFIED LABORATORY REPORTING LIMIT

HIGH TIDE GROUNDWATER SURFACE

LOW TIDE GROUNDWATER SURFACE

ESTIMATED EXTENT OF SOIL IMPACTED ABOVE MTCA-A

EXTENT OF SOIL POINT OF COMPLIANCE

MTCA-A MTCA METHOD A CLEANUP LEVELS

ALL LOCATIONS ARE APPROXIMATE

0 20 40
HORIZONTAL SCALE IN FEET

0 4 8
VERTICAL SCALE IN FEET

VERTICAL EXAGGERATION = 4X

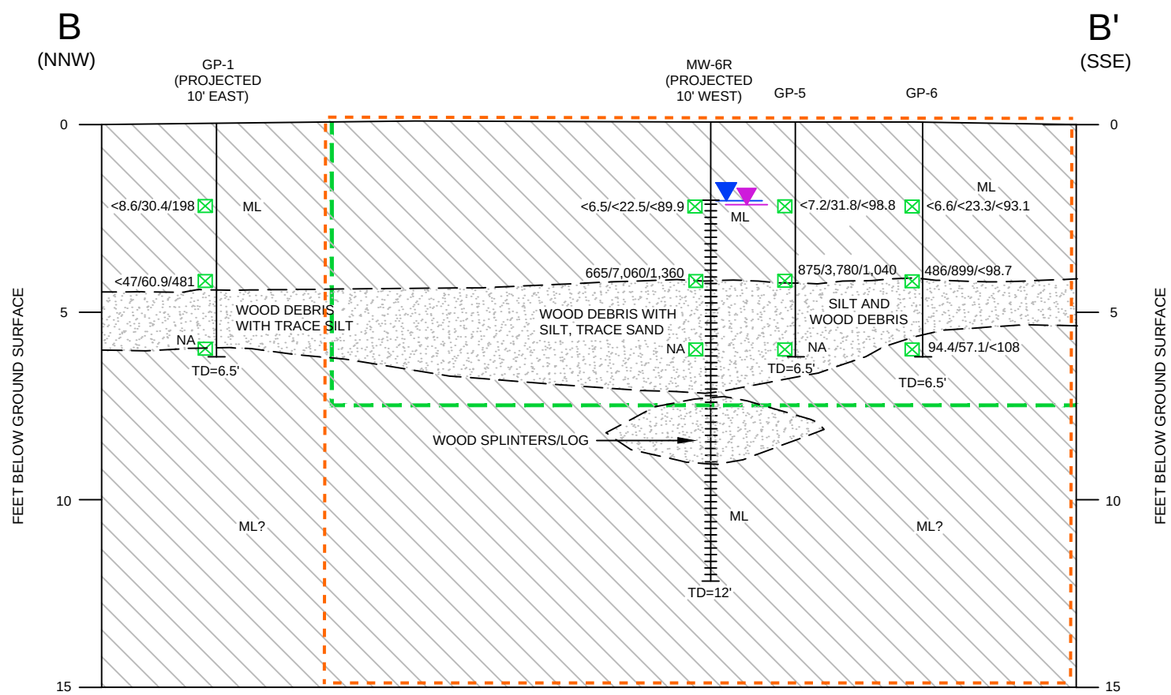
FORMER INDUSTRIAL PETROLEUM DISTRIBUTORS
BULK TERMINAL
1120 WEST BAY DRIVE, OLYMPIA, WASHINGTON
FEASIBILITY STUDY REPORT

CROSS SECTION A-A' WITH PROPOSED EXTENT OF SOIL EXCVATION

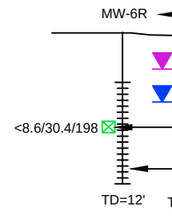
ARCADIS

FIGURE
16

CTRY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
G:\ENVCAD\Emeryville\ACT\GP09BPNAWA60\E0000GP09BPNAWA60-V16.dwg LAYOUT: 16 SAVED: 3/6/2012 11:04 AM ACADVER: 18.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ARCADIS.CTB PLOTTED: 3/16/2012 11:04 AM BY: REYES, ALEC
XREFS: IMAGES: PROJECTNAME: ----



LEGEND:



ML — INORGANIC SILTS AND VERY FINE SANDS SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS

TPH-G TOTAL PETROLEUM HYDROCARBONS AS GASOLINE

TPH-D TOTAL PETROLEUM HYDROCARBONS AS DIESEL

TPH-O TOTAL PETROLEUM HYDROCARBONS AS HEAVY OIL

mg/kg MILLIGRAMS PER KILOGRAM

NA NOT ANALYZED

< LESS THAN THE SPECIFIED LABORATORY REPORTING LIMIT

ESTIMAED EXTENT OF SOIL IMPACTED ABOVE MTCA-A

EXTENT OF SOIL POINT OF COMPLIANCE

MTCA-A MTCA METHOD A CLEANUP LEVELS

ALL LOCATIONS ARE APPROXIMATE

VERTICAL EXAGGERATION = 4X

FORMER INDUSTRIAL PETROLEUM DISTRIBUTORS
BULK TERMINAL
1120 WEST BAY DRIVE, OLYMPIA, WASHINGTON
FEASIBIITY STUDY REPORT

CROSS SECTION B-B' WITH PROPOSED EXTENT OF SOIL EXCAVATION

ARCADIS

FIGURE
17

CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
G:\ENVCAD\Emeryville\ACTIVE\GP09BPNAWA60\E0000\GP09BPNAWA60-V17.dwg LAYOUT: 17 SAVED: 3/5/2012 11:07 AM ACADVER: 18.1S (LMS TECH) PAGESETUP: ----
XREFS: IMAGES: PROJECTNAME: ----

ARCADIS

Appendix A

Supporting Documentation for Cost Estimates

APPENDIX A COST ESTIMATE SUPPORTING DOCUMENTATION FOR
TABLE 8
FEASIBILITY STUDY REPORT
Former ARCO Olympia Bulk Terminal
Industrial Petroleum Distributors Site
1120 West Bay Drive
Olympia, Washington

I. Labor

Professional Category	Personnel	Hourly Rate	Task 1 Development of Plan/HASP Update		Task 2 Confirmation Soil Sampling		Task 3 Evaluation of Soil Sampling Results		Task 4 Soil Excavation Event (3,000 CY Excavation)		Task 5 Technical Report		Total	
			Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost
Principal Hydrogeologist		$58	1	$ 58	1	$ 58	0	$ -	1	$ 58	2	$ 116	5	$ 290
Project Geologist		$36	2	$ 72	6	$ 217	3	$ 108	2	$ 72	4	$ 145	17	$ 615
Geologist 2		$26	8	$ 212	35	$ 926	5	$ 132	40	$ 1,058	20	$ 529	108	$ 2,857
Geologist/Engineer 1		$23	4	$ 93	6	$ 139	5	$ 116	8	$ 185	8	$ 185	31	$ 718
CADD/GIS 1		$24	0	$ -	0	$ -	2	$ 48		$ -	6	$ 144	8	$ 191
Clerical 1		$18	0	$ -	0	$ -	0	$ -	0	$ -	3	$ 53	3	$ 53
Labor Subtotal				**$ 435**		**$ 1,340**		**$ 404**		**$ 1,374**		**$ 1,171**		**$ 4,724**

II. Expenses

Technical Services by Others														
Stratus				$ -		$ -		$ -		$ 201,375		$ -		$ 201,375
Pace				$ -		$ 1,250		$ -		$ -		$ -		$ 1,250
Additional Servvices (Dewatering, Tanks, Treatment)				$ -		$ -		$ -		$ 75,000		$ -		$ 75,000
TSO Subtotal (with 5% markup)				**$ -**		**$ 1,313**		**$ -**		**$ 290,194**		**$ -**		**$ 291,506**
Other Direct Expenses														
Nitrile Gloves	13	box	0	$ -	2	$ 26	0	$ -	5	$ 65	0	$ -	7	$ 91
PID rental	130	day	0	$ -	1	$ 130	0	$ -	5	$ 650	0	$ -	6	$ 780
Fed Ex (reports)	31.25	shipment	0	$ -	0	$ -	0	$ -	0	$ -	5	$ 156	5	$ 156
Reproduction	50	each	0	$ -	0	$ -	0	$ -	0	$ -	5	$ 250	5	$ 250
Hotel	130	day	0	$ -	0	$ -	0	$ -	4	$ 520	0	$ -	4	$ 520
Rental Vehicle	70	day	0	$ -	1	$ 70	0	$ -	5	$ 350	0	$ -	6	$ 420
Board	30	day	0	$ -	0	$ -	0	$ -	5	$ 150	0	$ -	5	$ 150
Field Supplies (bags, tape, ice)	25	day	0	$ -	1	$ 25	0	$ -	5	$ 125	0	$ -	6	$ 150
ODE Subtotal				**$ -**		**$ 251**		**$ -**		**$ 1,860**		**$ 406**		**$ 2,517**
SUBTOTALS				**$ 435**		**$ 2,903**		**$ 404**		**$ 293,427**		**$ 1,578**		**$ 298,747**
TOTAL														**$ 298,747**

APPENDIX A COST ESTIMATE SUPPORTING DOCUMENTATION FOR
TABLE 8
FEASIBILITY STUDY
Former ARCO Olympia Bulk Terminal
Industrial Petroleum Distributors
1120 West Bay Drive
Olympia, Washington

Unit Costs for Non-Hazardous Petroleum Impacted Soil Disposal

	Quantity	Units	Unit Cost	Subtotal
Mobilization	1	each	$ 2,000.00	$ 2,000.00
Soil Handling (excavation, stockpiling, loading including dump truck and operator)	5	day	$ 1,250.00	$ 6,250.00
Transportation and Disposal of Waste	3000	ton	$ 20.00	$ 60,000.00
Disposal Permit	1	each	$ 125.00	$ 125.00
Backfill - 3/4" crushed rock	3000	tons	$ 45.00	$ 135,000.00
Total				**$ 201,375.00**

Assumptions
Approximately 2400 pounds soil/backfill per cubic yard
Cost based on unit costs quoted by Stratus Corporation March 2012

Pace Analytical Services, Inc.
940 S Harney St.
Seattle, WA 98108
Tel: 206-767-5060
Fax: 206-767-5063

Pace Analytical

Price Quotation
BP Grip Portfolio
7/20/2010
Confidential

Quote: Arcadis-OR_BP Grip_072010
Initiator: Lisa Domenighini
Phone : 206-473-0427

Company Information:

Company:	Arcadis US, Inc	Contact:	Alex Lopez
Address:	111 SW Columbia Street Suite 725	Email:	alex.lopez.III@arcadis-us.com
City, State Zip:	Portland, OR 97201	Phone:	503-220-8201

Pace Contact Information:

Project Manager: Regina Ste. Marie
Email: regina.stemarie@pacelabs.com
Phone: 206-767-5060
Fax: 206-767-5063

Project Details:

Start Date: Unknown
Project TAT: Standard
Project Location: Oregon/Washington
Data Package: Standard Level II

Reporting Information

Invoice To: Arcadis US, Inc
Report To: Alex Lopez

Pace Lab: Seattle, WA
EDD: Arcadis Equis and WA State EIM
Certification: WADOE/ORELAP
Prog. Req.: None Required

Additional Comments:

Pace Seattle laboratory standard reporting limits will be provided.

Accelerated Turnaround Time From Sample Receipt Date

Fuels Standard Turnaround (7 business days)
Non-Fuels Standard Turnaround (10 business days)
7 Day Turnaround (Business Days) = 20% surcharge for non-Fuels, no surcharge for Fuels
5 Day Turnaround (Business Days) = 40% surcharge for non-Fuels, no surcharge for Fuels
3 Day Turnaround (Business Days) = 60% surcharge
2 Day Turnaround (Business Days) = 80% surcharge
1 Day Turnaround (Business Days) = 100% surcharge

Standard turnaround time is 7-10 business days. Availability of Pace to perform analyses at expedited turn around time, or with short hold time, or subcontracted analyses must be verified with the Pace Project Manager prior to sample submission.

Pace Analytical Services, Inc.
940 S Harney St.
Seattle, WA 98108
Tel: 206-767-5060
Fax: 206-767-5063

Page 2 7/20/2010
Quote #: Arcadis-OR_BP Grip_072010
Project Name: **BP Grip Portfolio**

Qty	Matrix	Analysis/Method	Business DayTAT	Unit Price	Extended Cost
1	Water/Soil	BTEX/MTBE-EPA 8260B	10	$ 24.00	$ 24.00
1	Water/Soil	Full List Volatiles-EPA 8260B	10	$ 59.00	$ 59.00
1	Water/Soil	Gasoline-NWTPH Gx	5	$ 25.00	$ 25.00
1	Water/Soil	Diesel and Heavy Oil-NWTPH-Dx	5	$ 30.00	$ 30.00
1	Water/Soil	Diesel and Heavy Oil-NWTPH-Dx with silica gel	5	$ 40.00	$ 40.00
1	Water/Soil	Single Metal not including Hg	10	$ 9.00	$ 9.00
1	Water/Soil	8270SIMPAH	10	$ 60.00	$ 60.00
1	Water/Soil	NWTPHGx/BTEX	5	$ 45.00	$ 45.00
1	Water/Soil	RCRA 8 Metals	10	$ 60.00	$ 60.00
1	NA	Terracore Sampling Kit	NA	$ 8.00	$ 8.00
		Total Analytical Cost			**$ 360.00**

Project Considerations

1. Pace Analytical standard terms and conditions per Arcadis US, Inc. MSA
2. Pricing includes standard Level II deliverable in electronic PDF format on "requested" business day TAT.
3. Price includes containers, preservatives, COC documents and local courier service.
4. Samples are retained for 3 weeks and then disposed of at Pace Analytical's expense.
5. Any deviation from the scope of work including sample volume will result in appropriate price adjustment.
6. Pace Analytical will provide normal QC samples (LC/LCSD) as specified in the method. Client specified QC in addition to this, if required, will be handled as billable samples.
7. Pace Analytical will report the analytical run containing the highest concentration component/analyte in the sample within the calibrated (quantifiable) range of the method.
8. Re-extractions or dilutions due to high analyte levels or sample matrix problems can significantly impact the analytical process and may increase the final billed amount. Rework of this nature will not be initiated without your prior approval.

As a Pace Analytical client, you may take advantage of our PacePort feature which allows you secure 24/7 access to your data via the Internet! If you would like more information about this no cost, value-added service please contact your local laboratory representative.

If you have questions, or wish to initiate the project, please contact your sales representative as indicated below. Please allow Pace a minimum of 2-3 business days to prepare your bottle order. Rush charges may apply if priority shipping is required to meet delivery deadlines.

7/20/2010
Date

Lisa Domenighini
Pace Analytical Services, Inc
940 S Harney St
Seattle, WA 98108
cell: 206-473-0427
lab: 206-767-5060
fax: 206-767-5063

Client Signature _____ **Date** _____

Please include a copy of this quotation with your initial sample shipment and Chain of Custody