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BP West Coast Products, LLC

Remedial Investigation Report

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

January 30, 2012

ARCADIS

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Appendices

1. Introduction

On behalf of BP West Coast Products, LLC (BP), ARCADIS U.S., Inc. (ARCADIS) has prepared this revised Remedial Investigation Report (Report) for the lowland portion of the former Industrial Petroleum Distributors (IPD) site located at 1120 West Bay Drive in Olympia, Washington (the “Site”). The objective of this remedial investigation was to complete site characterization and define the extent of impacted soil and groundwater exceeding the Model Toxics Control Act (MTCA) Method A cleanup levels. This remedial investigation and report are being performed in accordance with Agreed Order No. DE 00TCPSR-1628. Soil and groundwater analytical data collected during this remedial investigation, as well as four subsequent quarters of groundwater analytical data, were compared to the MTCA Method A cleanup levels pursuant to Washington Administrative Code (WAC) Chapter 173-340-704 (2007). This revised report was prepared in response to the *Transmittal of Ecology Comments on the Remedial Investigation Report* dated October 31, 2011.

1.1 Site Description

The former IPD 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 also affiliated with a lowland area, which is not explicitly listed in the Agreed Order. The Site appears to have been assigned parcel No. 0903-000-1000 by Thurston County, but a line adjustment performed in 2010 is in the process of being reviewed by ARCADIS to confirm the current parcel number. The Site is located east of West Bay Drive. The majority of the Site is currently owned by the Port of Olympia (the “Port”), but a 0.02-acre parcel located on the west side of the Site is owned by BNSF Railroad. This report addresses the lowland parcel, which is located at 1120 West Bay Drive in Olympia, Washington on the east side of West Bay Drive. A site location map is presented in **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 former IPD site. The upland portion of the former IPD site was owned by Industrial Petroleum Distributors. An underground pipeline on the north side of the Site was used to transfer petroleum products (gasoline and oil) from barges into above-ground storage tanks located at the bulk plant. An abandoned pier originating on the Site extends approximately 400 feet into West Bay. The Site is currently vacant. A site plan is presented in **Figure 2**. The upland portion of the former IPD site was issued a No Further Action letter on June 25, 2003 and reports pertaining to the remedial investigations conducted at the upland IPD site are available in public record through the Washington State Department of Ecology (Ecology).

1.2 Previous 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 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 site investigations focused on the north side of the Site near the underground pipeline formerly used to transfer petroleum products. A total of 15 soil samples (IPD-1 through IPD-6, S-1 through S-6, and WBTP-01 through WBTP-03) were collected at depths ranging from 2.5 feet to 7 feet below ground surface (bgs). Groundwater samples were collected from 10 of these locations (IPD-1 through IPD-5, W-1[S-1] and W-2 [S-2], and WBTP-01 through WBTP-03) (SECOR, 2007). The approximate locations of historic soil and groundwater sampling locations are presented in **Figure 3** and results are summarized in **Figures 4** through **6**. The results of soil samples collected at the Site historically are included in **Table 1** and of historical groundwater samples in **Table 2**. Soil and groundwater samples collected as a result of these site investigations were submitted for analysis of petroleum hydrocarbon constituents and metals. . The results of these analyses detected petroleum constituents including total petroleum hydrocarbons–diesel range organics (TPH-DRO) and total petroleum hydrocarbons-heavy oils (TPH-HO), metals, and volatile organic compounds (VOCs) in both soil and groundwater samples.

TPH in the gasoline range (TPH-GRO) was not detected above laboratory method reporting limits in any of the soil samples submitted for analysis. TPH-DRO and TPH-HO, as well as polycyclic aromatic hydrocarbons (PAHs) and metals were detected in several soil samples. However, only TPH-DRO and PAHs were detected at concentrations exceeding the applicable MTCA Method A cleanup levels.

TPH-GRO, TPH-DRO, TPH-HO, benzene, toluene, total xylenes, PAHs, and metals were detected in several groundwater samples. Of these, only TPH-GRO, TPH-DRO, TPH-HO, arsenic and lead were detected at concentrations exceeding MTCA Method A cleanup levels (SECOR, 2001 & 2007).

2. Sediment Screening and Sampling

An investigation of marine sediments bordering the Site was conducted in August 2009 by Integral Consulting, Inc (Integral). The objective of the sediment sampling was to screen intertidal sediments for petroleum hydrocarbon impacts. The investigation included the collection of sediment samples at four locations along the abandoned pier. The sampling locations, depths of sediment samples collected, and analytical screening requirements were specified by Ecology. The samples were analyzed for total petroleum hydrocarbon identification (TPH-HCID). A detailed summary of the sampling methodology is presented in the Integral Sediment Screening and Sampling Report, dated December 17, 2009. The full report, including figures indicating sampling locations, is included in **Appendix A**.

3. Terrestrial Ecological Evaluation

A terrestrial ecological evaluation was conducted for the Site in accordance with WAC 173-340-7491. The terrestrial ecological evaluation was performed to determine 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. The Terrestrial Ecological Evaluation Form is included in **Appendix B**.

4. Site Investigation

ARCADIS conducted a site investigation between August and October 2010. The objective of this investigation was to complete site characterization and define the extent of impacted soil and groundwater exceeding the MTCA Method A cleanup levels. ARCADIS installed 16 soil borings to characterize the extent of hydrocarbon impacted soil at the Site. Seven borings were completed as monitoring wells, and both soil and groundwater samples were collected. Subsequently, four additional quarters of groundwater samples were collected at the newly installed wells.

4.1 Underground Utility Clearance

Washington State One Call was contacted by ARCADIS on August 17, 2010 to provide mark-outs of public utilities in the vicinity of the proposed boring locations. In addition, a private utility locate was performed by ULS to locate potential on-site utilities not identified by the public utility locate. Potential utilities and subsurface structures were marked-out on the surface with paint. The proposed boring locations were not found to conflict with potential underground utilities or structures. Finally, ARCADIS staff conducted a visual inspection of the Site to identify potential utility lines. In this way ARCADIS established three lines of evidence of utility location prior to implementation of drilling activities.

4.2 Soil Boring and Monitoring Well Installation

From August 23 to 25, 2010, Cascade Drilling, Inc. (Cascade), of Woodinville, Washington installed 16 borings (GP-1 through GP-9, MW-6R, and MW-7 through MW-12) under the direct supervision of ARCADIS personnel. Borings MW-6R and MW-7 through MW-12 were completed as groundwater monitoring wells. Locations of the soil borings and monitoring wells are shown in **Figure 2**. The Soil Drilling and Sample Collection Standard Operating Procedure (SOP) and Monitoring Well Installation SOP are included in **Appendix C**.

Borings GP-1 through GP-9 were advanced with a hand auger to a completed depth of 6.5 feet bgs unless refusal was encountered. Upon completion, soil borings were abandoned by backfilling with hydrated bentonite chips. Monitoring wells were installed to depths of 12 feet bgs (MW-6R), or 13 feet bgs (MW-7 through MW-12) using a limited-access hollow stem auger drill rig, following initial borehole clearance to 5 feet by hand auger. A cross section location map and two cross sections depicting selected boring locations are presented as **Figures 7**, **8** and **9**, respectively. Soil boring and monitoring well installation logs are included as **Appendix D**.

4.3 Soil Screening and Lithology

During hand-augering, soil samples were collected for field screening and lithologic documentation at approximate 2-foot intervals. During drilling, soil samples were collected continuously for lithologic documentation with field screening using a photo-ionization detector (PID) conducted at approximate 2-foot intervals. Field screening was conducted by measuring approximately 30 grams of soil from a relatively undisturbed soil sample and placing the sample in a resealable plastic bag. The collected soil was broken up and allowed to rest for approximately 20 minutes. The head space within the bag was tested for total organic vapor, measured in parts per million (ppm), by inserting the polyvinyl tubing of the PID into the bag. The PID results were noted on the field boring logs. PID concentrations of 10 ppm or less were used as a proxy to indicate no hydrocarbon impacts. PID readings are recorded in the soil boring logs presented in **Appendix D**.

Subsurface material observed during site investigation activities generally consisted of silty clays and sandy silt to approximately 6 feet bgs, and fine to medium sand and fine gravel between 6 and 13 feet bgs. Wood debris and bark dust were observed in borings MW-6R, MW-8, MW-10, MW-12, GP-1, GP-2, GP-4, GP-5, GP-6 and GP-7, between 3 and 9 feet bgs. Based on observations made throughout the drilling activities, groundwater elevation is highly variable and appears to be tidally influenced. Groundwater was encountered at approximately 7 feet bgs at low tide and 3 feet bgs at high tide across the Site.

4.4 Soil Sample Collection

Between August 23 and 25, 2010, at least two soil samples were collected from each borehole for chemical analysis:

- One sample at 2 to 2.5 feet bgs

- One sample at 4 to 4.5 feet bgs
- One sample at 6 to 6.5 feet (with the exception of soil boring locations GP-2 through GP-4)

Soil samples were collected at these prescribed depth intervals unless soil screening methods indicated additional hydrocarbon-impacted intervals. In this case, soil samples were collected from the hydrocarbon impacted area. Soil samples were placed in ice-chilled coolers and submitted to Pace Analytical Services, Inc. (Pace), located in Seattle, Washington, under chain-of-custody procedure for the following analyses:

- TPH-GRO by Northwest Method NWTPH-Gx
- TPH-DRO and TPH-HO by Northwest Method NWTPH-Dx
- RCRA 8 metals via U. S. Environmental Protection Agency (USEPA) method 6010, and mercury via USEPA Method SW7471A
- Selected VOCs including benzene, toluene, ethylbenzene and total xylenes (BTEX) by USEPA Method 5035/SW-846 8260B
- Carcinogenic PAHs (cPAHs) by USEPA Method 625/SW-846 8270

Soil analytical data are summarized in **Table 3** and **Figures 10** through **12.** Laboratory analytical reports are included in **Appendix E.** The Chain-of-Custody, Handling, Packing, and Shipping SOP is included in **Appendix C**.

4.5 Monitoring Well Construction and Development

Monitoring wells were constructed of 2-inch diameter, schedule 40 PVC piping with 10 feet of 0.010-inch slotted screen. The boring annulus was filled with 2/12 sand to approximately 1 foot above the screen, followed by 1 foot of hydrated bentonite chips to form the annular seal. Monitoring wells were finished with a concrete monument pad and flush mounted steel surface casing. At well location MW-6R, which is screened near the ground surface, there was insufficient room to complete the boring with a hydrated bentonite annular seal. At this location, the 2/12 sand pack extends to 1 foot above the screen, followed immediately by a concrete monument pad. One bollard was constructed immediately adjacent to each monitoring well to protect the well head and provide a highly visible location marker.

A combination of pumping and surging was used to develop the monitoring wells. A minimum of 10 casing volumes were removed from each well, and pumping and surging continued until flow was free and clear of sediment as described in the attached SOP for Monitoring Well Development (**Appendix C**).

4.6 Groundwater Sample Collection

On October 1, 2010, Blaine Tech Services, Inc., collected one groundwater sample from each monitoring well for chemical analysis. Groundwater monitoring field data sheets are included in **Appendix F**. Monitoring wells MW-6R, MW-7, MW-8, MW-9, MW-10, MW-11, and MW-12 were gauged and low-flow purged and sampled using a peristaltic pump with dedicated disposable polyethylene tubing and a Yellow Spring Instruments (YSI) multi parameter meter. Field parameters including pH, temperature, conductivity, turbidity, dissolved oxygen, and oxidation-reduction potential, were collected during the purging process. Groundwater samples were collected, placed in ice-chilled coolers, and submitted to TestAmerica Laboratories, Inc. (TestAmerica), located in Tacoma, Washington following chain-of-custody procedures. Groundwater samples were submitted for the following analyses:

- TPH-GRO by Northwest Method NWTPH-Gx
- TPH-DRO and TPH-HO by Northwest Method NWTPH-Dx
- Total and dissolved lead via USEPA Method 6020
- Selected VOCs including benzene, toluene, ethylbenzene and total xylenes (BTEX) by USEPA Method 5035/SW-846 8260B
- Carcinogenic polyaromatic hydrocarbons (cPAHs) by USEPA Method 625/SW-846 8270

Groundwater analytical data are summarized in **Table 4** and presented in **Figure 13**. Laboratory analytical reports are included in **Appendix E**. The Low Flow Groundwater Purging and Sampling SOP and the Chain of Custody, Handling, Packing, and Shipping SOP are included in **Appendix C**.

Additionally, four quarters of groundwater monitoring have been conducted at the site subsequent to the installation of wells MW-6R through MW-12. The methodology and results of these events were compiled as groundwater monitoring reports submitted to DOE under separate cover (ARCADIS 2011a-d).

4.7 Decontamination Activities

Downhole drilling equipment was steamcleaned following the completion of each soil boring. Decontamination of sampling equipment and nondedicated or nondisposable field equipment was conducted using an Alconox® solution and deionized water rinse to prevent potential crosscontamination. The Field Equipment Decontamination SOP is included in **Appendix C**.

4.8 Investigation Derived Waste Management

Soil cuttings generated during drilling operations were containerized in appropriately labeled 55-gallon drums, which were temporarily stored on the Site pending characterization and transportation to an appropriate disposal facility.

Groundwater produced during well purging activities, as well as water used during decontamination procedures, was containerized in 55-gallon drums and temporarily stored on Site pending characterization and transportation to an appropriate disposal facility. The Investigation Derived Waste Handling and Storage SOP is included in **Appendix C**.

5. Data Validation

The following sections describe the data quality assessment, quality assurance (QA) and quality control (QC) procedures, and the data usability for the analytical results presented in this Report.

5.1 Data Quality Assessment

ARCADIS performed data validation on the 2010 site investigation analytical data upon receipt of the final laboratory reports. The data validation included a data completeness review of each data package, and a review of QA/QC parameters to ensure that all project analytical data were of reliable and comparable data quality. Data validation was also performed on historical analytical data to the extent feasible, based on the availability of laboratory reports for review. Laboratory analytical reports were not reviewed for soil samples collected in August 2004 (MW-IP-1, -3, -5, -7 and MW-IP-9, all collected during the installation of MW-6). All associated analytical data and information for the samples was requested in the file review but never provided by Ecology, therefore, it is assumed this information is not on file. This sampling location was replicated later by well MW-6R. Thus, no conclusions need to be drawn from these data and the validation of data quality for these historic results is not critical to this assessment.

5.2 Quality Assurance/Quality Control Procedures

QA/QC procedures established by the analytical laboratories were used for this Report. The data for these QC samples were reviewed as part of the data validation, along with laboratory QC results. The following performance parameters were evaluated for each data set:

- Data completeness
- Holding times
- Blind duplicate samples
- Trip blanks
- Laboratory control standards and matrix spike/matrix spike sample duplicates
- Field duplicates/confirmatory samples
- Compound identification and quantification

5.3 Data Usability

The following sections detail the results of the data evaluation in each of the aforementioned categories.

5.3.1 Data Completeness

Data were reviewed for completeness. The chain-of-custody forms for samples submitted to the laboratory were reviewed to ensure that analytical results were received for all samples submitted and analyses requested. Based on a review of the chain-of-custody forms and the analytical data received, all samples submitted were analyzed for the indicated analyses except in 2004, where analysis for pesticides and polychlorinated biphenyls (PCBs) were performed but not requested on the chain-of-custody forms for one soil and groundwater sample collected at the Site. The analysis of additional data is not considered a significant data quality concern.

5.3.2 Holding Times

Analytical data were reviewed to ensure that holding times were met for all samples analyzed. Based on a comparison of the sample extraction dates to the sample collection dates, all samples were analyzed within the specified holding times.

5.3.3 Blind Duplicates

Blind duplicate samples were collected as part of the 2010 site assessment to ensure the accuracy and repeatability of the laboratory analyses and to confirm that samples were not compromised by contact with contaminants during sample collection or transport. During the October 2010 groundwater sampling event, one blind duplicate (Dup-1) groundwater sample was collected at MW-12. The results of the duplicate sample analysis are included in the laboratory analytical reports in **Appendix E**. Results of the comparison between duplicate and primary sample analytical results indicate that laboratory analytical data are acceptable. Historical reports do not indicate that duplicate samples were collected.

5.3.4 Trip Blanks

During the 2010 site investigation, laboratory-prepared and sealed trip blank containers were sent by the laboratory to accompany the laboratory-supplied sample containers. The trip blank containers were stored with the samples and one set of trip blank containers was sent inside each shipped cooler. Three trip blanks were shipped with the soil samples and one trip blank was shipped with the groundwater samples collected during the site assessment. Soil sample trip blanks were submitted for analysis of BTEX and GRO by EPA Method 8260 and Method NWTPH-GX, respectively, and the groundwater sample trip blank was submitted for analysis of BTEX by EPA Method 8260B. These analyses were selected because volatile compounds are most likely to be compromised during handling and shipping. The trip blank sample analyses exhibited no detectable concentrations of BTEX and/or GRO, which indicates that sample quality was not compromised during handling and shipping. Thus, this quality control measure indicates that the quality of the data collected during the 2010 site investigation is acceptable.

Historical reports for 2004 data do not report the analysis of trip blanks. Sediment data collected in 2009 included the analysis of trip blanks, but small bubbles were noted in the volatile vials of the trip blank. . However, analytical results did not indicate any data quality issues despite the presence of headspace in the trip blank vials.

5.3.5 Laboratory Quality Control Standards

Laboratory quality control results were reviewed in each laboratory report to ensure that data met laboratory criteria. Specifically, the laboratory reports were reviewed to ensure that laboratory method blanks did not contain target analytes and laboratory control standards and matrix spike/matrix spike sample duplicates were within acceptable ranges (unless otherwise noted).

Quality control testing was conducted by Pace and TestAmerica for each batch of soil and groundwater samples analyzed during the 2010 site investigation. Pace reported that surrogate recoveries and percent recoveries/relative percent differences for matrix spike/matrix spike duplicate (MS/MSD) were within QC limits with a few exceptions during USEPA 8270 SIM, USEPA 8260, and USEPA 6010 analyses of soil samples. Pace noted that surrogate recoveries and MS/MSD were outside QC limits because of matrix interferences. Batches where QC limits were not met were accepted based on separate quality control measures, such as the laboratory control sample recovery or analysis of re-extracted sample, falling within required limits. TestAmerica noted that all groundwater samples were re-analyzed by USEPA 8260 because surrogate recovery was low for one compound. TestAmerica also explains that lead data analyzed by USEPA 6020 is qualified because the inductively coupled plasma mass spectrometry (ICP-MS) standard contains trace impurities derived from the manufacturing process, which may cause the standards to fail method QC criteria.

Historical data were analyzed by ESN Northwest Chemical Laboratory and Analytical Resources, Inc., and comparable QA/QC methods were utilized by these laboratories. Based on a review of the laboratory narrative for each batch report, reported data quality issues are not indicative of any significant data quality issues.

5.4 Results of Data Validation

ARCADIS reviewed laboratory data to ensure that the QA/QC procedures met prescribed standards and to ensure that the project analytical data are of reliable and comparable data quality. Based on a review of the above parameters, all of the data collected at the Site have been deemed valid and acceptable for use in the evaluation presented herein. Laboratory analytical reports were not reviewed for soil samples collected in August 2004 (MW-IP-1, -3, -5, -7 and MW-IP-9, all collected from the installation of MW-6). This sampling location was replicated later by well MW-6R. Thus, no conclusions need to be drawn from these data and the validation of data quality for these historic results is not critical to this assessment. Conclusions are drawn based only on data collected during the 2010 site investigation as indicated in the following sections.

6. Conceptual Site Model

The conceptual site model (CSM) presented in this Report was conducted in accordance with the methods and procedures described in the MTCA (WAC 173-340-708). This CSM was also performed pursuant to Section 6.3 of the Guidance for Remediation of Petroleum Contaminated Sites (Ecology 2011). The purpose of this section is to describe possible pathways of exposure to residual concentrations of petroleum hydrocarbon constituents detected in Site media and to identify screening criteria that define levels deemed by Ecology to be safe for human and ecological exposure in various scenarios. This CSM follows MTCA guidelines, which emphasize protection of human health and the environment by incorporating conservative assumptions when estimating potential health risks associated with constituents of potential concern at a site. In general, the toxicity, exposure, and transport assumptions made in a CSM are intentionally conservative in order to provide a health-protective approach.

6.1 Sources of Contamination

The Site was formerly used as a bulk petroleum distribution facility ARCO and IPD, which provided infrastructure for a bulk petroleum storage facility (bulk plant) operated west of the Site. Gasoline and oil are known to have been stored at the bulk plant west of the Site. Based on the observed impacts at the Site, diesel also may have been stored at the bulk plant, though available records do not reference diesel storage. An underground pipeline on the north side of the Site was used to transfer petroleum products from barges into above-ground storage tanks located at the bulk plant. Confirmed and/or suspected spills and/or leaks of gasoline, diesel and/or oil from onsite infrastructure constitute release mechanisms of petroleum-related constituents at the Site.

6.2 Constituents of Concern

The former use of the Site included infrastructure for a gasoline, diesel and oil bulk plant. The specific type of oil transferred through Site infrastructure is not known and is conservatively assumed to have potentially included naphtha, mineral spirits, middle distillates, heavy oils, and/or mineral oil. The storage of waste oil and/or crude oil on-Site is not known to have occurred. Thus, constituents of interest (COIs) include the following chemicals based on Ecology guidance (Ecology 2011):

- TPH-GRO
- TPH-DRO
- TPH-HO
- Benzene
- Toluene
- Ethylbenzene
- Total xylenes
- n-Hexane
- Methyl tertiary butyl ether
- 1,2-Dichloroethane (EDC)
- Ethylene dibromide or 1,2-Dibromoethane (EDB)
- cPAHs
- Naphthalenes (Naphthalene, 1-Methylnaphthalene, and 2-Methylnaphthalene)
- Lead
- Polychlorinated biphenyls

TPH-GRO, TPH-DRO, TPH-HO, benzene, toluene, ethylbenzene, total xylenes, cPAHs, naphthalenes, and lead were analyzed in soil and groundwater samples collected during the 2010 site investigation as well as during previous investigations. All of these constituents have been detected in soil and groundwater at the Site above laboratory reporting limits. Full suite USEPA Method 8260B analysis was performed on soil and 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 (SECOR 2001). PCBs were analyzed in soil and groundwater at the Site in 2004 and were not detected (Parametrix 2004). Thus, all constituents of concern have been analyzed in both soil and groundwater samples collected at the Site.

6.3 Potentially Impacted Media

The Site is an unpaved lot located on Budd Inlet within the city limits of Olympia, Washington. Soil, groundwater, sediment and surface water are present on Site and constitute potentially impacted media.

6.4 Current and Future Land and Resource Uses

The majority of the Site is zoned Industrial according to the Thurston County Geodata Center. The Site is located within a mixed commercial/industrial and residential district of the city 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 plan to redevelop the Site for use as a public park in the future. However, no definite plan for redevelopment of the Site has been created. In the interest of conservative estimation, future uses are assumed to potentially include residential development.

Water is the only known site resource. The Site is located within the city of Olympia water service area. The city of Olympia provides drinking water from eight wellhead zones (City of Olympia 2009). The Site is located 8 miles northwest of the McAllister Springs drinking water protection area (DWPA), 6 miles north of Indian Summer DWPA, 5 miles northwest of the Shana Park DWPA, 4 miles northwest of the Hoffman DWPA, 3 miles northwest of Briggs DWPA, 2 miles east of the Kaiser DWPA, and 1.5 miles northeast of the Allison DWPA. Drinking water protection area maps are included in **Appendix G**. 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, for the purpose of conservative estimation, it is assumed that groundwater use at the Site may include drinking water beneficial uses in the future provided that the groundwater at the Site is considered potable under WAC 173-340-720(2).

6.5 Potential Receptor and Exposure Pathway Evaluation

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 the Site may be redeveloped in the future to industrial, occupational, residential, or public park land use. Thus, potential receptors that may be directly exposed to constituents in surface and/or subsurface soil at the Site in the future 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.

6.6 Identification of Preliminary Cleanup Levels

Based on the evaluation of potential receptors and exposure pathways, the following cleanup levels are appropriate for use at the Site:

- MTCA Method A soil cleanup levels for unrestricted land use
- MTCA Method A cleanup levels for groundwater

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

7. Results and Discussion

This section summarizes results of soil and groundwater sampling activities.

7.1 Sediment Analytical Results

The results of the 2009 sediment investigation indicated no measureable levels of petroleum hydrocarbons at the four sampling locations (Integral, 2009). The results of the sediment laboratory results are summarized in Table 2 of the Integral Sediment Screening and Sampling Report, included as **Appendix A**. No further analysis of sediments was necessary because all sample results were less than the reporting limits (and thus less than the established screening level of 100 mg/kg) according to Ecology (Ecology 2006).

7.2 Soil Analytical Results

The soil analytical results are compared to the MTCA Method A soil cleanup levels for unrestricted land uses presented in Table 740-1 of Chapter 173-340 WAC. Naphthalenes, cPAHs, TPH-GRO and TPH-DRO were detected above the applicable MTCA Method A cleanup levels in soil samples collected from several locations. The results of the soil analysis are presented in **Table 3**, and results that exceed the applicable cleanup levels are emboldened and highlighted. **Figures 10** through **12** summarize the results of soil analytical data.

Laboratory practical quantitation limits (PQLs) for each sample are appropriate for comparison to MTCA Method A cleanup levels, with the exception of the PQLs for cadmium in all soil samples and for arsenic at one soil sample location. In all cases, the laboratory method detection limits (MDLs) are appropriate for comparison to the MTCA Method A cleanup levels. Laboratory analytical reports are included as **Appendix E**.

Per Ecology's request, ARCADIS has calculated the volume of soil impacted above CULs at the Site. Thus, ARCADIS determined the approximate horizontal and vertical extent of soil impacts above CULs. The horizontal extent of impacts above CULs was determined using GRO, DRO and cPAH concentrations, because the combination of these three COIs rendered the most conservative estimate of the extent of soil impacts. The maximum concentration of GRO, DRO and cPAHs detected in soil samples collected from each boring was used in the calculation. ARCADIS assumed logarithmic concentration gradients between impacted and unimpacted areas. Where no COIs were detected, the reporting limit was conservatively used as a proxy concentration. Soil impacts above CULs at the Site affect approximately 7,573 square feet of the Site, the extent of which is depicted in **Figure 14**.

To determine the vertical extent of soil impacts, ARCADIS evaluated the soil analytical data, PID readings provided on boring logs, and depth to water at the Site. An evaluation of soil analytical data indicated that while some impacts above CULs were delineated to 4 feet bgs, impacts above CULs were observed at the maximum depth of several borings (6.5-feet bgs). Thus, soil analytical data does not vertically delineate soil impacts at every boring location. To supplement this data, ARCADIS considered PID readings collected during boring installation. A reading of 10 ppm was used as a proxy for no hydrocarbon impacts in the field. Given that PID readings collected below 5 feet bgs were less than 10 ppm, petroleum-hydrocarbon impacts are not considered to extend below the depth of the deepest impacted soil sample (e.g., 6.5 feet bgs).

ARCADIS also examined tidal and seasonal variations in depth to groundwater across the Site. A hydrograph showing depth to groundwater below top of casing over time is included in **Appendix H**. A discussion of tidal influences at the Site is provided in Section 7.3 of this Report. There was no apparent correlation between groundwater elevation fluctuations and proximity to Budd Inlet. The results of this evaluation indicate that depth to groundwater varies seasonally, with high groundwater (approximately 2 feet below top of casing [bTOC]) during the wet season and low groundwater (up to 7 feet bTOC) in the dry season. Petroleum hydrocarbon impacts generally remain in or above the smear zone because of the relative density of petroleum compared to water. The greatest vertical width of the vadose and smear zone would occur during the dry season when groundwater elevation is lowest. The vadose zone extends to a maximum of 7 feet bgs during the dry season. Based on these data, ARCADIS conservatively estimates that the maximum depth of impacted soil at the Site is approximately 8 feet bgs. **Figure 8** and **Figure 9** indicate the approximated vertical extent of soil impacts at the Site.

Thus, based on the horizontal extent depicted in **Figure 14** and a maximum vertical extent of 8 feet bgs, the estimated volume of soil impacted above CULs is approximately 2,243 cubic yards.

7.3 Tidal Influence Evaluation

Prior to June 2011, groundwater samples were collected between moderate and high tide events to ensure an adequate amount of water for sampling. However, due to possible inflow of bay water during high tide conditions, concentrations of constituents reported by the laboratory may reflect constituent levels found in groundwater as well as bay water. Historical groundwater elevations, tidal stages during sampling events, and groundwater electrical conductivity readings have been evaluated to determine if brackish bay water is intruding on-site groundwater.

On June 2, 2011, the on-site wells were gauged during subsequent high and low tide events. The groundwater elevations were used to create a contour map (**Figure 15**) depicting the high and low tide potentiometric groundwater surfaces. The groundwater elevations were plotted on cross-section A-A' (**Figure 8**) providing an apparent groundwater flow direction. The groundwater flow was generally toward the southeast at a hydraulic gradient of approximately 0.033 foot/foot (ft/ft) and 0.031 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 feet. There was no apparent correlation in groundwater level fluctuations and proximity to Budd Inlet. Groundwater elevation data is presented in **Table 5**.

An analysis was conducted comparing measurements of historical groundwater electrical conductivity with tidal times. Wells MW-6R, MW-10, MW-11, and MW-12, located upland from the bank, have consistently lower electrical conductivity measurements than wells MW-7, MW-8, and MW-9, located next to the bank and Budd Inlet. Brackish and saline water have significantly higher conductivity values than fresh to marginal water. Electrical conductivity measurements ranged from 0.145 to 0.313 mS/cm at high tide and 0.166 to 0.215 mS/cm at low tide in wells MW-6R, MW-10, MW-11, and MW-12. Electrical conductivity ranged from 0.358 to 3.051 mS/cm at high tide and 0.363 to 3.17 mS/cm at low tide in Wells MW-7, MW-8, and MW-9. Electrical conductivity increases in wells MW-6R, MW-10, MW-11, and MW-12 at high tide when comparing the high and low tide averages for each well. Electrical conductivity decreases in wells MW-7, MW-8, and MW-9 at high tide when comparing the high and low tide averages for each well. Groundwater conductivity data is presented in **Table 6**.

Groundwater in wells MW-7, MW-8, and MW-9 are likely experiencing influence from tidal fluctuation. The significance of this effect cannot be determined without additional collection of groundwater elevation and electrical conductivity data.

Groundwater samples collected during monitoring events conducted in second, third, and fourth quarter 2011 were timed as close to low tide as practicable. In the future, groundwater samples will continue to be collected during low tide events to ensure the best representation of groundwater quality is achieved.

7.4 Groundwater Analytical Results

Groundwater analytical results for the Site are compared to the MTCA Method A groundwater cleanup levels presented in Table 720-1 of Chapter 173-340 WAC. Concentrations of TPH-GRO, TPH-DRO, benzene, total lead, and several cPAHs have been detected in the groundwater samples above the laboratory reporting limits. However, groundwater samples did not exhibit concentrations of analyzed chemicals in exceedance of the MTCA Method A groundwater cleanup levels. TPH-HO, toluene, ethylbenzene, total xylenes, and dissolved lead have not been detected in the groundwater samples above reporting limits. In total, six quarters of groundwater analytical data indicating concentrations not exceeding MTCA Method A groundwater cleanup levels have been collected. A seventh monitoring event was conducted in December 2011,however, as of the date of this report results of this analysis have not yet been finalized. Results of groundwater sample analyses for October 2010 through September 2011 are summarized in **Table 4.** Groundwater analytical results from the initial site investigation in October 2010 are presented in **Figure 13**. Laboratory analytical reports are included as **Appendix E**.

8. Conclusions

ARCADIS has completed remedial investigation activities for the former IPD site at 1120 West Bay Drive, Olympia, Washington.

Sediment screening and sampling was conducted at the site to assess possible hydrocarbon impacts to intertidal sediments. The results of the sediment screening indicate no measureable hydrocarbon impact to intertidal sediments at the four sampling locations.

ARCADIS installed 16 soil borings to characterize the extent of hydrocarbon impacted soil at the Site. Seven borings were completed as monitoring wells, and both soil and groundwater samples were collected. Laboratory analytical results for soil indicate concentrations of cPAHs, naphthalenes, TPH-GRO and TPH-DRO in exceedance of the applicable MTCA Method A cleanup levels in soil samples collected from several locations at the Site.

No contaminants of concern have been identified in groundwater samples collected at the Site at concentrations in exceedance of the MTCA Method A cleanup levels. In total, six quarters of groundwater analytical data indicating concentrations not exceeding MTCA Method A groundwater cleanup levels have been collected. In order to collect the most conservative groundwater data, ARCADIS will collect future groundwater samples at low tide, when groundwater is less likely to be experiencing influence from tidal fluctuation.

Surface water has not been evaluated at the Site. However, based on the results of sediment sampling, which indicated no detectable impacts, and groundwater, which indicated no impacts greater than MTCA Method A cleanup levels for groundwater, no analysis of surface water is warranted.

References

ARCADIS 2011a. Fourth Quarter 2010 Groundwater Monitoring Report, Industrial Petroleum Distributors Site (Ecology ID No. 1436; Agreed Order No. DE00TCPSR-1628), 1117 West Bay Drive, Olympia, Washington. February 10.

ARCADIS 2011b. First Quarter 2011 Groundwater Monitoring Report, Industrial Petroleum Distributors Site (Ecology ID No. 1436; Agreed Order No. DE00TCPSR-1628), 1117 West Bay Drive, Olympia, Washington. August 24.

ARCADIS 2011c. Second Quarter 2011 Groundwater Monitoring Report, Industrial Petroleum Distributors Site (Ecology ID No. 1436; Agreed Order No. DE00TCPSR-1628), 1117 West Bay Drive, Olympia, Washington. September 20.

ARCADIS 2011d. Draft Third Quarter 2011 Groundwater Monitoring Report, Industrial Petroleum Distributors Site (Ecology ID No. 1436; Agreed Order No. DE00TCPSR-1628), 1117 West Bay Drive, Olympia, Washington. Not yet submitted.

City of Olympia 2009. City of Olympia Water System Plan for 2009-2014. July.

Integral Consulting, Inc. 2009. Final Former IPD West Olympia Site Budd Inlet Sediment Screening Sampling Report. December 17.

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

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.

SECOR 2007. Draft Remedial Investigation Work Plan, Former Industrial Petroleum Distributors, 1117 West Bay Drive, Olympia, Washington. February 14.

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 2007. Chapter 173-340 Washington Administrative Code, *Model Toxics Control Act*. Updated October 12, 2007.

Washington State Department of Ecology 2011. Guidance for Remediation of Petroleum Contaminated Sites. September.

ARCADIS

Tables

TABLE 1
HISTORICAL SOIL ANALYTICAL RESULTS
REMEDIAL INVESTIGATION REPORT
Former ARCO Olympia Bulk Terminal
Industrial Petroleum Distributors
1117 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
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
Gasoline Range Organics	30	<10	--	--	--	--	<10	--	--	--	--	--	--	--	--	--	<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
Heavy Oil Range Organics	2,000	<40	<40	<40	<40	<40	<40	**296**	--	--	--	--	--	--	--	--	<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
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
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
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***	--	--	--	--	--	--	--	--	--	--	--	--	--

TABLE 1
HISTORICAL SOIL ANALYTICAL RESULTS
REMEDIAL INVESTIGATION REPORT
Former ARCO Olympia Bulk Terminal
Industrial Petroleum Distributors
1117 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
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 = Hydrocarbon Identification
NWTPH = 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 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 2
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
REMEDIAL INVESTIGATION REPORT
Former ARCO Olympia Bulk Terminal
Industrial Petroleum Distributors
1117 West Bay Drive
Olympia, Washington

Analysis	MTCA Method A Cleanup Levels	Sample ID Sample Location Type Date Collected											
		W-1	**W-2**	**IPD-1**	**IPD-2**	**IPD-3**	**IPD-4**	**IPD-5**	**WBTP-01**	**WBTP-02**	**MW-6**	**MW-6**	**MW-6**
				TP	**TP**	**TP**	**TP**	**TP**	**TP**	**TP**	**MW**	**MW**	**MW**
		9/20/2000	**9/20/2000**	**2001**	**2001**	**2001**	**2001**	**2001**	**3/9/2004**	**3/9/2004**	**8/26/2004**	**11/12/2004**	**1/10/2005**
Volatile Organic Compounds	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/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	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**			**µg/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	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**			**µg/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	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**			**µg/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 2
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
REMEDIAL INVESTIGATION REPORT
Former ARCO Olympia Bulk Terminal
Industrial Petroleum Distributors
1117 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

µg/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 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)

TABLE 3
SOIL ANALYTICAL RESULTS - AUGUST 23-25, 2010
REMEDIAL INVESTIGATION REPORT
Former ARCO Olympia Bulk Terminal
Industrial Petroleum Distributors
1117 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 3
SOIL ANALYTICAL RESULTS - AUGUST 23-25, 2010
REMEDIAL INVESTIGATION REPORT
Former ARCO Olympia Bulk Terminal
Industrial Petroleum Distributors
1117 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 3
SOIL ANALYTICAL RESULTS - AUGUST 23-25, 2010
REMEDIAL INVESTIGATION REPORT
Former ARCO Olympia Bulk Terminal
Industrial Petroleum Distributors
1117 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 3
SOIL ANALYTICAL RESULTS - AUGUST 23-25, 2010
REMEDIAL INVESTIGATION REPORT
Former ARCO Olympia Bulk Terminal
Industrial Petroleum Distributors
1117 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 3
SOIL ANALYTICAL RESULTS - AUGUST 23-25, 2010
REMEDIAL INVESTIGATION REPORT

Former ARCO Olympia Bulk Terminal
Industrial Petroleum Distributors
1117 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 3
SOIL ANALYTICAL RESULTS - AUGUST 23-25, 2010
REMEDIAL INVESTIGATION REPORT

Former ARCO Olympia Bulk Terminal
Industrial Petroleum Distributors
1117 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 3
SOIL ANALYTICAL RESULTS - AUGUST 23-25, 2010
REMEDIAL INVESTIGATION REPORT
Former ARCO Olympia Bulk Terminal
Industrial Petroleum Distributors
1117 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 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 4
SELECT GROUNDWATER ANALYTICAL RESULTS
REMEDIAL INVESTIGATION REPORT
Former ARCO Olympia Bulk Terminal
Industrial Petroleum Distributors
1117 West Bay Drive
Olympia, Washington

Analysis	MTCA Method A Groundwater Cleanup Levels	MW-6R					
		Date Collected					
		10/1/2010	12/30/2010	12/30/2010 (dup)	3/17/2011	6/11/2011	9/22/2011
Volatile Organic Compounds	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Benzene	5	<1.0	<0.20	<0.20	<1.0	<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	<3.0	<2.0	<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	<50.0	<50	<50.0	<50.0
Diesel Range Organics	500	<120	<76	<76	<120	<85	<75
Residual Range/Heavy Oil Organics	500	<240	<380	<380	<240^	<430	<380
Metals	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Lead (Total)	15	<2.0^	<10.0	<10.0	**5.4**	<10.0	<10.0
Lead (Dissolved)	NE	<2.0^	<10.0	<10.0	<2.0	<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	<0.095	<0.47	<0.11	<0.094
1-Methylnaphthalene	(a)	<0.0097	<0.095	<0.095	<0.14	<0.11	<0.094
2-Methylnaphthalene	(a)	<0.013	<0.095	<0.095	<0.094	<0.11	<0.094
Naphthalenes	160	*0.0210*	*0.143*	*0.143*	*0.352*	*0.165*	*0.141*
Acenaphthene	NE	<0.0097	<0.095	<0.095	<0.094	<0.11	<0.094
Acenaphthylene	NE	<0.0097	<0.095	<0.095	<0.094	<0.11	<0.094
Anthracene	NE	<0.0097	<0.095	<0.095	<0.047	<0.11	<0.094
Benzo (a) anthracene	(b)	<0.0097	<0.095	<0.095	<0.094	<0.11	<0.094
Benzo (a) pyrene	0.1	**0.019**	<0.095	<0.095	<0.094	<0.11	<0.094
Benzo (b) fluoranthene	(b)	**0.017**	<0.095	<0.095	<0.094	<0.11	<0.094
Benzo (g,h,i) perylene	NE	**0.013**	<0.095	<0.095	<0.094	<0.11	<0.094
Benzo (k) fluoranthene	(b)	<0.0097	<0.095	<0.095	<0.094	<0.11	<0.094
Chrysene	(b)	**0.011**	<0.095	<0.095	<0.061	<0.11	<0.094
Dibenzo (a,h) anthracene	(b)	<0.0097	<0.095	<0.095	<0.094	<0.11	<0.094
Fluoranthene	NE	**0.013**	<0.095	<0.095	<0.061	<0.11	<0.094
Fluorene	NE	<0.0097	<0.095	<0.095	<0.094	<0.11	<0.094
Indeno (1,2,3-cd) pyrene	(b)	**0.011**	<0.095	<0.095	<0.094	<0.11	<0.094
Phenanthrene	NE	<0.0097	<0.095	<0.095	<0.094	<0.11	<0.094
Pyrene	NE	**0.017**	<0.095	<0.095	<0.061	<0.11	<0.094
cPAH B(a)P Equivalents	0.1	*0.0234*	*0.0717*	*0.0717*	*0.0708*	*0.0831*	*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
dup = Duplicate sample
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 4
SELECT GROUNDWATER ANALYTICAL RESULTS
REMEDIAL INVESTIGATION REPORT
Former ARCO Olympia Bulk Terminal
Industrial Petroleum Distributors
1117 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	6/11/2011 (dup)	9/22/2011
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	<86	<75
Residual Range/Heavy Oil Organics	500	<250	<380	<240^	<430	<430	<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	<0.11	<0.094
1-Methylnaphthalene	(a)	**0.23**	<0.096	<0.14	<0.11	**0.15**	**0.16**
2-Methylnaphthalene	(a)	**0.16**	<0.096	<0.094	<0.11	**0.11**	**0.13**
Naphthalenes	160	*0.48*	*0.144*	*0.352*	*0.165*	*0.308*	*0.337*
Acenaphthene	NE	**0.051**	<0.096	<0.094	<0.11	<0.095	<0.094
Acenaphthylene	NE	<0.0097	<0.096	<0.094	<0.11	<0.095	<0.094
Anthracene	NE	**0.011**	<0.096	<0.047	<0.11	<0.095	<0.094
Benzo (a) anthracene	(b)	**0.017**	<0.096	<0.094	<0.11	<0.095	<0.094
Benzo (a) pyrene	0.1	0.019	<0.096	<0.094	<0.11	<0.095	<0.094
Benzo (b) fluoranthene	(b)	<0.0097	<0.096	<0.094	<0.11	<0.095	<0.094
Benzo (g,h,i) perylene	NE	<0.0097	<0.096	<0.094	<0.11	<0.095	<0.094
Benzo (k) fluoranthene	(b)	<0.0097	<0.096	<0.094	<0.11	<0.095	<0.094
Chrysene	(b)	<0.0097	<0.096	<0.061	<0.11	<0.095	<0.094
Dibenzo (a,h) anthracene	(b)	<0.0097	<0.096	<0.094	<0.11	<0.095	<0.094
Fluoranthene	NE	**0.010**	<0.096	<0.061	<0.11	<0.095	<0.094
Fluorene	NE	**0.063**	<0.096	<0.094	<0.11	<0.095	<0.094
Indeno (1,2,3-cd) pyrene	(b)	<0.0097	<0.096	<0.094	<0.11	<0.095	<0.094
Phenanthrene	NE	**0.048**	<0.096	<0.094	<0.11	<0.095	<0.094
Pyrene	NE	<0.0097	<0.096	<0.061	<0.11	<0.095	<0.094
cPAH B(a)P Equivalents	0.1	*0.0132*	*0.0725*	*0.0708*	*0.0831*	*0.0717*	*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.
dup = Duplicate sample
Dup = Duplicate sample
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
Y = The chromatographic response resembles a typical fuel pattern

TABLE 4
SELECT GROUNDWATER ANALYTICAL RESULTS
REMEDIAL INVESTIGATION REPORT
Former ARCO Olympia Bulk Terminal
Industrial Petroleum Distributors
1117 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	3/17/2011 (dup)	6/11/2011	9/22/2011
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	<1.0	**0.26**	**0.35**
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	<2.0	<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	<50.0	<50.0
Diesel Range Organics	500	**200**Y	<77	<120	<120	<83	<75
Residual Range/Heavy Oil Organics	500	<240	<380	<240^	<240^	<420	<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	<2.0	<10.0	<10.0
Lead (Dissolved)	NE	<2.0^	<10.0	<2.0	<2.0	<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	<0.47	<0.096	**0.12**
1-Methylnaphthalene	(a)	**0.11**	<0.096	<0.14	<0.14	<0.096	**0.13**
2-Methylnaphthalene	(a)	**0.038**	<0.096	<0.094	<0.094	<0.096	<0.094
Naphthalenes	160	*0.23*	*0.144*	*0.352*	*0.352*	*0.144*	*0.297*
Acenaphthene	NE	**0.033**	<0.096	<0.094	<0.094	<0.096	<0.094
Acenaphthylene	NE	<0.0097	<0.096	<0.094	<0.094	<0.096	<0.094
Anthracene	NE	**0.018**	<0.096	<0.047	<0.047	<0.096	<0.094
Benzo (a) anthracene	(b)	<0.0097	<0.096	<0.094	<0.094	<0.096	<0.094
Benzo (a) pyrene	0.1	<0.019	<0.096	<0.094	<0.094	<0.096	<0.094
Benzo (b) fluoranthene	(b)	<0.0097	<0.096	<0.094	<0.094	<0.096	<0.094
Benzo (g,h,i) perylene	NE	<0.0097	<0.096	<0.094	<0.094	<0.096	<0.094
Benzo (k) fluoranthene	(b)	<0.0097	<0.096	<0.094	<0.094	<0.096	<0.094
Chrysene	(b)	**0.053**	<0.096	<0.061	<0.061	<0.096	<0.094
Dibenzo (a,h) anthracene	(b)	<0.0097	<0.096	<0.094	<0.094	<0.096	<0.094
Fluoranthene	NE	**0.011**	<0.096	<0.061	<0.061	<0.096	<0.094
Fluorene	NE	**0.029**	<0.096	<0.094	<0.094	<0.096	<0.094
Indeno (1,2,3-cd) pyrene	(b)	<0.0097	<0.096	<0.094	<0.094	<0.096	<0.094
Phenanthrene	NE	**0.028**	<0.096	<0.094	<0.094	<0.096	<0.094
Pyrene	NE	**0.010**	<0.096	<0.061	<0.061	<0.096	<0.094
cPAH B(a)P Equivalents	0.1	*0.0125*	*0.0725*	*0.0708*	*0.0708*	*0.0725*	*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.
dup = Duplicate sample
Dup = Duplicate sample
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
Y = The chromatographic response resembles a typical fuel pattern

TABLE 4
SELECT GROUNDWATER ANALYTICAL RESULTS
REMEDIAL INVESTIGATION REPORT
Former ARCO Olympia Bulk Terminal
Industrial Petroleum Distributors
1117 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
Volatile Organic Compounds	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**
Benzene	5	<1.0	**0.21**	<1.0	<0.20	**0.37**
Toluene	1,000	<1.0	<1.0	<1.0	<1.0	<1.0
Ethylbenzene	700	<1.0	<1.0	<1.0	<1.0	<1.0
Total Xylenes	1,000	<2.0	<3.0	<2.0	<3.0	<3.0
Total Petroleum Hydrocarbons	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**
Gasoline Range Hydrocarbons	800	**110**	**56.5**	<50	**84.4**	**241**
Diesel Range Organics	500	**160**Y	<76	<120	<88	<75
Residual Range/Heavy Oil Organics	500	<250	<380	<240^	<440	<380
Metals	**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
Lead (Dissolved)	NE	<2.0^	<10.0	<2.0	<10.0	<10.0
c-Polyaromatic Hydrocarbons	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**
Naphthalene	(a)	**0.400**	0.59	<1.9	**0.36**	<0.094
1-Methylnaphthalene	(a)	**0.019**	<0.095	<0.38	<0.11	<0.094
2-Methylnaphthalene	(a)	**0.013**	<0.095	<0.94	<0.11	<0.094
Naphthalenes	160	*0.43*	*0.390*	*0.352*	*0.470*	*0.141*
Acenaphthene	NE	<0.0094	<0.095	<0.094	<0.11	<0.094
Acenaphthylene	NE	<0.0094	<0.095	<0.094	<0.11	<0.094
Anthracene	NE	<0.0094	<0.095	<0.047	<0.11	<0.094
Benzo (a) anthracene	(b)	<0.0094	<0.095	<0.094	<0.11	<0.094
Benzo (a) pyrene	0.1	<0.019	<0.095	<0.094	<0.11	<0.094
Benzo (b) fluoranthene	(b)	<0.0094	<0.095	<0.094	<0.11	<0.094
Benzo (g,h,i) perylene	NE	<0.0094	<0.095	<0.094	<0.11	<0.094
Benzo (k) fluoranthene	(b)	<0.0094	<0.095	<0.094	<0.11	<0.094
Chrysene	(b)	<0.0094	<0.095	<0.061	<0.11	<0.094
Dibenzo (a,h) anthracene	(b)	<0.0094	<0.095	<0.094	<0.11	<0.094
Fluoranthene	NE	<0.0094	<0.095	<0.061	<0.11	<0.094
Fluorene	NE	<0.0094	<0.095	<0.094	<0.11	<0.094
Indeno (1,2,3-cd) pyrene	(b)	<0.0094	<0.095	<0.094	<0.11	<0.094
Phenanthrene	NE	**0.011**	<0.095	<0.094	<0.11	<0.094
Pyrene	NE	<0.0094	<0.095	<0.061	<0.11	<0.094
cPAH B(a)P Equivalents	0.1	*0.0119*	*0.0717*	*0.0708*	*0.0831*	*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
dup = Duplicate sample
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
Y = The chromatographic response resembles a typical fuel pattern

TABLE 4
SELECT GROUNDWATER ANALYTICAL RESULTS
REMEDIAL INVESTIGATION REPORT
Former ARCO Olympia Bulk Terminal
Industrial Petroleum Distributors
1117 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
Volatile Organic Compounds	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**
Benzene	5	<1.0	<0.20	<1.0	<0.20	<0.20
Toluene	1,000	<1.0	<1.0	<1.0	<1.0	<1.0
Ethylbenzene	700	<1.0	<1.0	<1.0	<1.0	<1.0
Total Xylenes	1,000	<2.0	<3.0	<2.0	<3.0	<3.0
Total Petroleum Hydrocarbons	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**
Gasoline Range Hydrocarbons	800	<50	<50.0	<50	<50.0	<50.0
Diesel Range Organics	500	<120	<77	<120	<86	<75
Residual Range/Heavy Oil Organics	500	<240	<380	<240^	<430	<380
Metals	**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
Lead (Dissolved)	NE	<2.0^	<10.0	<2.0	<10.0	<10.0
c-Polyaromatic Hydrocarbons	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**
Naphthalene	(a)	<0.0094	<0.096	<0.47	<0.11	<0.094
1-Methylnaphthalene	(a)	<0.0094	<0.096	<0.14	<0.11	<0.094
2-Methylnaphthalene	(a)	<0.012	<0.096	<0.094	<0.11	<0.094
Naphthalenes	160	*0.015*	*0.144*	*0.352*	*0.165*	*0.141*
Acenaphthene	NE	<0.0094	<0.096	<0.47	<0.11	<0.094
Acenaphthylene	NE	<0.0094	<0.096	<0.38	<0.11	<0.094
Anthracene	NE	<0.0094	<0.096	<0.19	<0.11	<0.094
Benzo (a) anthracene	(b)	<0.0094	<0.096	<0.28	<0.11	<0.094
Benzo (a) pyrene	0.1	<0.019	<0.096	<0.19	<0.11	<0.094
Benzo (b) fluoranthene	(b)	<0.0094	<0.096	<0.38	<0.11	<0.094
Benzo (g,h,i) perylene	NE	<0.0094	<0.096	<0.28	<0.11	<0.094
Benzo (k) fluoranthene	(b)	<0.0094	<0.096	<0.28	<0.11	<0.094
Chrysene	(b)	<0.0094	<0.096	<0.19	<0.11	<0.094
Dibenzo (a,h) anthracene	(b)	<0.0094	<0.096	<0.28	<0.11	<0.094
Fluoranthene	NE	<0.0094	<0.096	<0.24	<0.11	<0.094
Fluorene	NE	<0.0094	<0.096	<0.28	<0.11	<0.094
Indeno (1,2,3-cd) pyrene	(b)	<0.0094	<0.096	<0.28	<0.11	<0.094
Phenanthrene	NE	<0.0094	<0.096	<0.38	<0.11	<0.094
Pyrene	NE	<0.0094	<0.096	<0.28	<0.11	<0.094
cPAH B(a)P Equivalents	0.1	*0.0119*	*0.0725*	*0.0708*	*0.0831*	*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
dup = Duplicate sample
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 4
SELECT GROUNDWATER ANALYTICAL RESULTS
REMEDIAL INVESTIGATION REPORT
Former ARCO Olympia Bulk Terminal
Industrial Petroleum Distributors
1117 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
Volatile Organic Compounds	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**
Benzene	5	<1.0	<0.20	<1.0	<0.20	<0.20
Toluene	1,000	<1.0	<1.0	<1.0	<1.0	<1.0
Ethylbenzene	700	<1.0	<1.0	<1.0	<1.0	<1.0
Total Xylenes	1,000	<2.0	<3.0	<2.0	<3.0	<3.0
Total Petroleum Hydrocarbons	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**
Gasoline Range Hydrocarbons	800	<50	<50.0	<50	<50.0	<50.0
Diesel Range Organics	500	<120	**110**	<120	<84	<75
Residual Range/Heavy Oil Organics	500	<240	<380	<240^	<420	<380
Metals	**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
Lead (Dissolved)	NE	<2.0^	<10.0	<2.0	<10.0	<10.0
c-Polyaromatic Hydrocarbons	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**
Naphthalene	(a)	**0.012**	<0.095	<0.47	<0.11	<0.094
1-Methylnaphthalene	(a)	<0.0098	<0.095	<0.14	<0.11	<0.094
2-Methylnaphthalene	(a)	<0.013	<0.095	<0.094	<0.11	<0.094
Naphthalenes	160	*0.023*	*0.143*	*0.352*	*0.165*	*0.141*
Acenaphthene	NE	<0.0098	<0.095	<0.094	<0.11	<0.094
Acenaphthylene	NE	<0.0098	<0.095	<0.094	<0.11	<0.094
Anthracene	NE	<0.0098	<0.095	<0.047	<0.11	<0.094
Benzo (a) anthracene	(b)	<0.0098	<0.095	<0.094	<0.11	<0.094
Benzo (a) pyrene	0.1	<0.020	<0.095	<0.094	<0.11	<0.094
Benzo (b) fluoranthene	(b)	<0.0098	<0.095	<0.094	<0.11	<0.094
Benzo (g,h,i) perylene	NE	<0.0098	<0.095	<0.094	<0.11	<0.094
Benzo (k) fluoranthene	(b)	<0.0098	<0.095	<0.094	<0.11	<0.094
Chrysene	(b)	<0.0098	<0.095	<0.061	<0.11	<0.094
Dibenzo (a,h) anthracene	(b)	<0.0098	<0.095	<0.094	<0.11	<0.094
Fluoranthene	NE	<0.0098	<0.095	<0.061	<0.11	<0.094
Fluorene	NE	<0.0098	<0.095	<0.094	<0.11	<0.094
Indeno (1,2,3-cd) pyrene	(b)	<0.0098	<0.095	<0.094	<0.11	<0.094
Phenanthrene	NE	<0.0098	<0.095	<0.094	<0.11	<0.094
Pyrene	NE	<0.0098	<0.095	<0.061	<0.11	<0.094
cPAH B(a)P Equivalents	0.1	*0.0125*	*0.0717*	*0.0708*	*0.0831*	*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
dup = Duplicate sample
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 4
SELECT GROUNDWATER ANALYTICAL RESULTS
REMEDIAL INVESTIGATION REPORT
Former ARCO Olympia Bulk Terminal
Industrial Petroleum Distributors
1117 West Bay Drive
Olympia, Washington

Analysis	MTCA Method A Groundwater Cleanup Levels	MW-12					
		Date Collected					
		10/1/2010	10/1/2010 (dup)	12/30/2011	3/17/2011	6/11/2011	9/22/2011
Volatile Organic Compounds	**μg/L**	**μg/L**	**μg/L**	**μg/L**	**μg/L**	**μg/L**	**μg/L**
Benzene	5	<1.0	<1.0	<0.20	<1.0	<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	<2.0	<3.0	<2.0	<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	<50.0	<50	<50.0	<50.0
Diesel Range Organics	500	<120	<120	**89**	<120	<82	<75
Residual Range/Heavy Oil Organics	500	<240	<240	<380	<240^	<410	<380
Metals	**μg/L**	**μg/L**	**μg/L**	**μg/L**	**μg/L**	**μg/L**	**μg/L**
Lead (Total)	15	<2.0^	<2.0^	<10.0	<2.0	<10.0	<10.0
Lead (Dissolved)	NE	<2.0^	<2.0^	<10.0	<2.0	<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**	**0.020**	<0.096	<0.47	<0.11	<0.094
1-Methylnaphthalene	(a)	<0.0097	<0.0096	<0.096	<0.14	<0.11	<0.094
2-Methylnaphthalene	(a)	<0.013	<0.012	<0.096	<0.094	<0.11	<0.094
Naphthalenes	160	*0.031*	*0.031*	*0.144*	*0.352*	*0.165*	*0.141*
Acenaphthene	NE	<0.0097	<0.0096	<0.096	<0.094	<0.11	<0.094
Acenaphthylene	NE	<0.0097	<0.0096	<0.096	<0.094	<0.11	<0.094
Anthracene	NE	<0.0097	<0.0096	<0.096	<0.047	<0.11	<0.094
Benzo (a) anthracene	(b)	<0.0097	<0.0096	<0.096	<0.094	<0.11	<0.094
Benzo (a) pyrene	0.1	<0.019	<0.019	<0.096	<0.094	<0.11	<0.094
Benzo (b) fluoranthene	(b)	<0.0097	<0.0096	<0.096	<0.094	<0.11	<0.094
Benzo (g,h,i) perylene	NE	<0.0097	<0.0096	<0.096	<0.094	<0.11	<0.094
Benzo (k) fluoranthene	(b)	<0.0097	<0.0096	<0.096	<0.094	<0.11	<0.094
Chrysene	(b)	<0.0097	<0.0096	<0.096	<0.061	<0.11	<0.094
Dibenzo (a,h) anthracene	(b)	<0.0097	<0.0096	<0.096	<0.094	<0.11	<0.094
Fluoranthene	NE	<0.0097	<0.0096	<0.096	<0.061	<0.11	<0.094
Fluorene	NE	<0.0097	<0.0096	<0.096	<0.094	<0.11	<0.094
Indeno (1,2,3-cd) pyrene	(b)	<0.0097	<0.0096	<0.096	<0.094	<0.11	<0.094
Phenanthrene	NE	<0.0097	<0.0096	<0.096	<0.094	<0.11	<0.094
Pyrene	NE	<0.0097	<0.0096	<0.096	<0.061	<0.11	<0.094
cPAH B(a)P Equivalents	0.1	*0.0120*	*0.0119*	0.0725	*0.0708*	*0.0831*	*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
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µg/L = micrograms per liter
dup = Duplicate sample
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 5
GROUNDWATER ELEVATION DATA
REMEDIAL INVESTIGATION REPORT
Former ARCO Olympia Bulk Terminal
Industrial Petroleum Distributors
1117 West Bay Drive
Olympia, Washington

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

Notes
* High Tide
^ Low Tide
The groundwater elevation data approximately measured at high or low tides.

TABLE 6
ELECTRICAL CONDUCTIVITY VERSUS HIGH AND LOW TIDE
REMEDIAL INVESTIGATION REPORT

Former ARCO Olympia Bulk Terminal
Industrial Petroleum Distributors
1117 West Bay Drive
Olympia, Washington

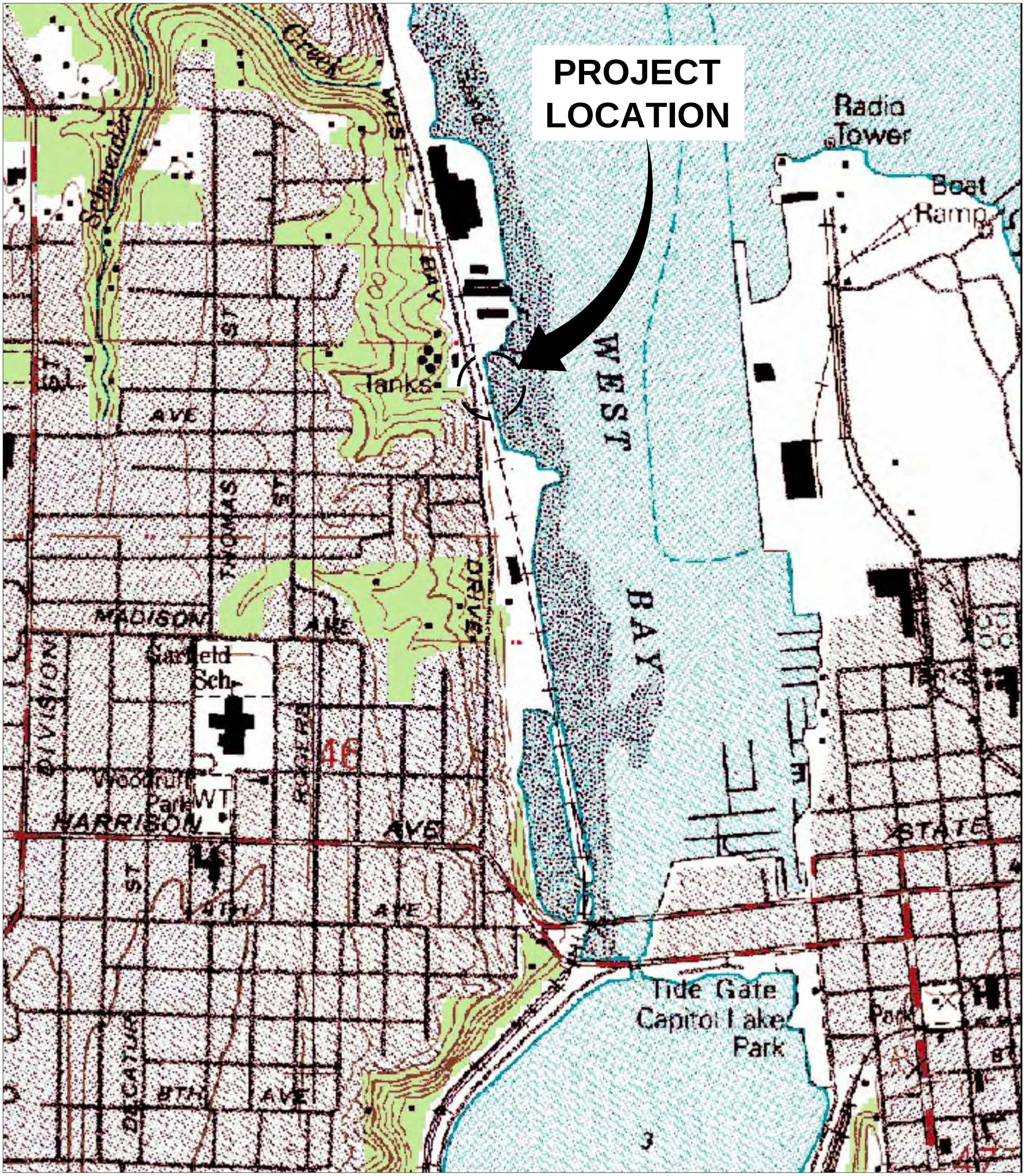
Electrical Conductivity	High or Low Tide	Well ID						
		MW-6R	MW-7	MW-8	MW-9	MW-10	MW-11	MW-12
Date Measured		mS/cm	mS/cm	mS/cm	mS/cm	mS/cm	mS/cm	mS/cm
10/1/2010	High	0.145	1.795	2.71	0.220	0.185	0.175	0.174
10/1/2010	Low	--	--	--	--	--	--	--
12/30/2010	High	0.175	0.774	2.51	0.358	0.241	--	0.240
12/30/2010	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

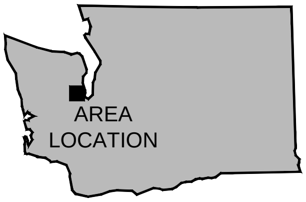
Figures



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

0 1000' 2000'

Approximate Scale: 1 in. = 1000 ft.

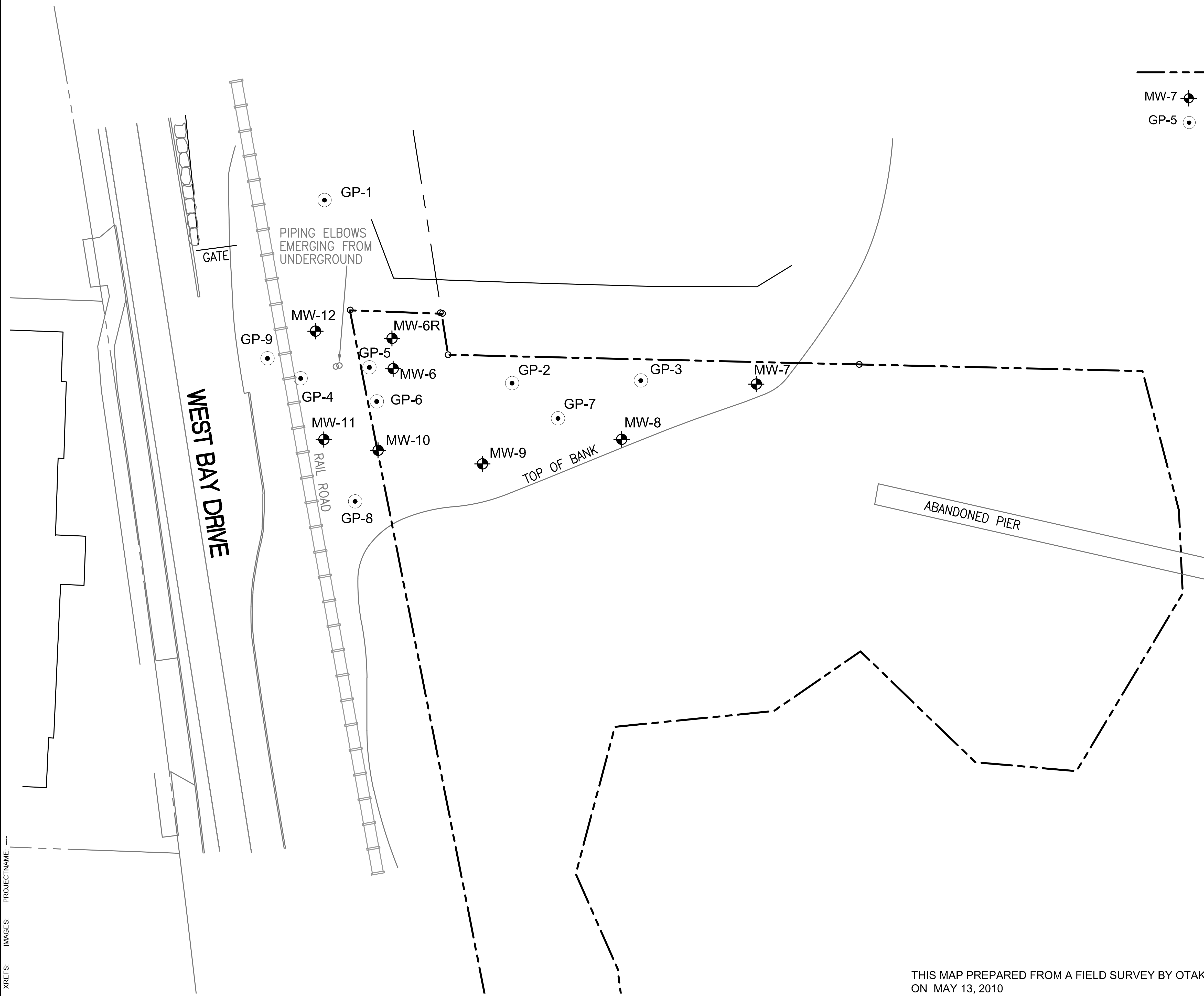


FORMER INDUSTRIAL PETROLEUM DISTRIBUTORS
BULK TERMINAL
1120 WEST BAY DRIVE, OLYMPIA, WASHINGTON
REMEDIAL INVESTIGATION REPORT

SITE LOCATION MAP

ARCADIS

FIGURE
1



LEGEND

SUBJECT PROPERTY LINE BOUNDARY

MW-7 GROUND WATER MONITORING WELL LOCATION

GP-5 GEOPROBE LOCATION

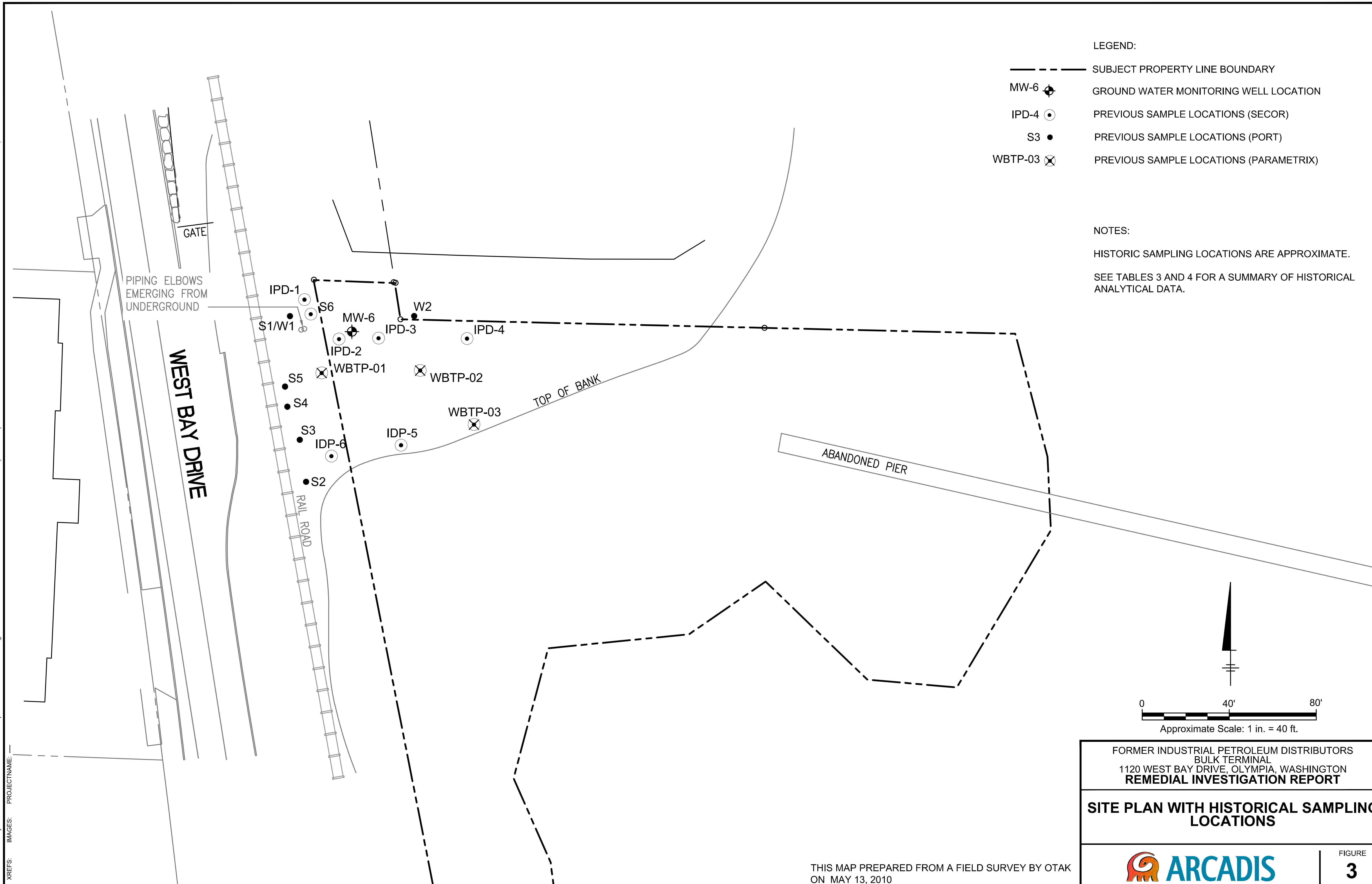
FORMER INDUSTRIAL PETROLEUM DISTRIBUTORS
BULK TERMINAL
1120 WEST BAY DRIVE, OLYMPIA, WASHINGTON

REMEDIAL INVESTIGATION REPORT

SITE PLAN WITH GEOPROBE AND MONITORING WELL LOCATIONS

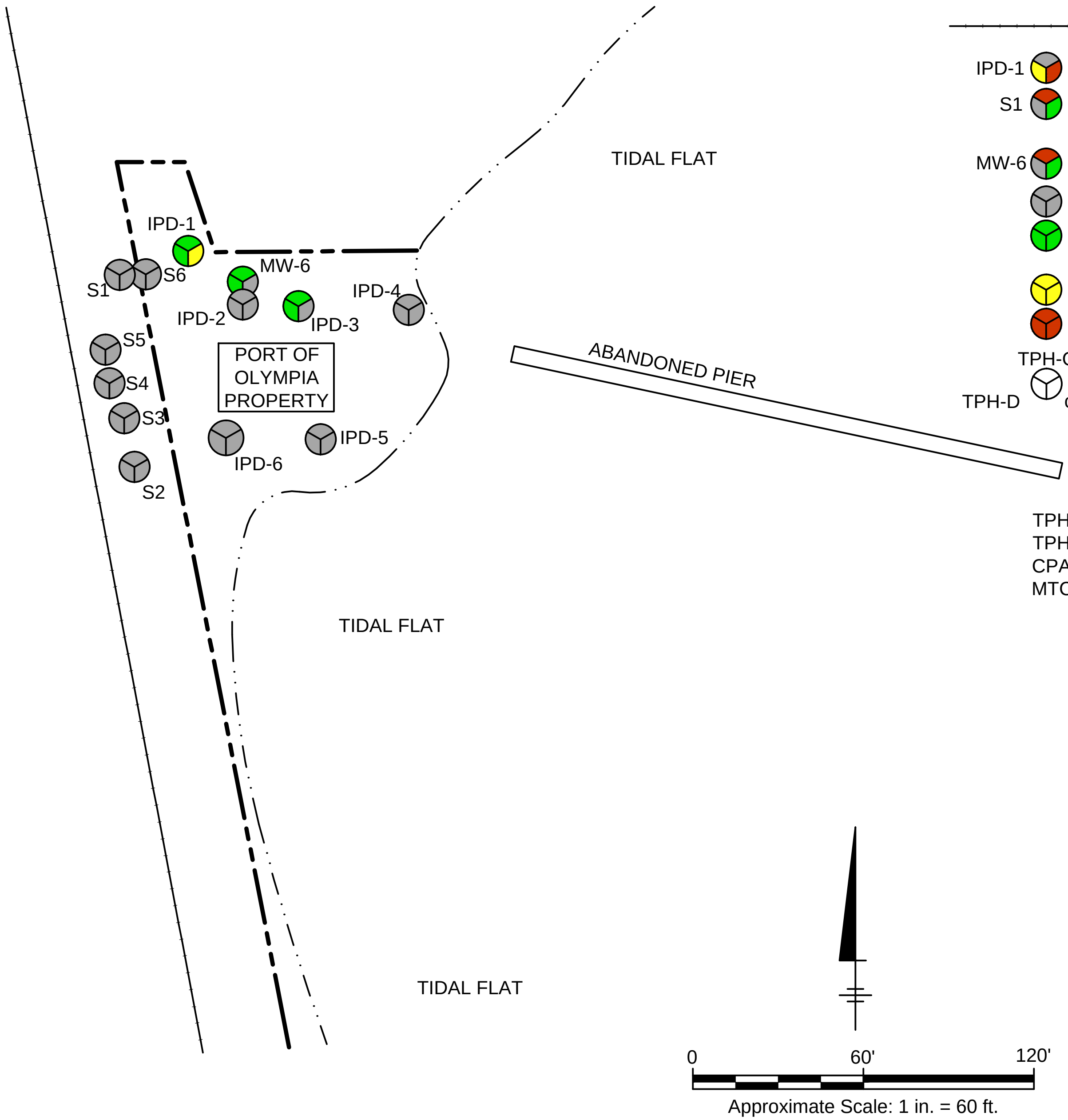
ARCADIS

FIGURE
2



LEGEND:
SUBJECT PROPERTY LINE BOUNDARY
MW-6
GROUND WATER MONITORING WELL LOCATION
IPD-4
PREVIOUS SAMPLE LOCATIONS (SECOR)
S3
PREVIOUS SAMPLE LOCATIONS (PORT)
WBTP-03
PREVIOUS SAMPLE LOCATIONS (PARAMETRIX)
NOTES:
HISTORIC SAMPLING LOCATIONS ARE APPROXIMATE.
SEE TABLES 3 AND 4 FOR A SUMMARY OF HISTORICAL ANALYTICAL DATA.
GATE
PIPING ELBOWS EMERGING FROM UNDERGROUND
WEST BAY DRIVE
RAIL ROAD
IPD-1
S6
S1/W1
MW-6
IPD-3
W2
IPD-4
IPD-2
WBTP-01
WBTP-02
S5
S4
S3
IDP-6
IDP-5
WBTP-03
S2
TOP OF BANK
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
REMEDIAL INVESTIGATION REPORT
SITE PLAN WITH HISTORICAL SAMPLING LOCATIONS
ARCADIS
FIGURE
3

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\RI Rpt\GP09BPNAWA60-B04.dwg LAYOUT: 4 SAVED: 10/28/2011 2:57 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ARCADIS.CTB PLOTTED: 10/28/2011 2:57 PM BY: REYES, ALEC
XREFS: IMAGES: PROJECTNAME: ----
SITE PLAN.jpg



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

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

NOTES:

1. ALL LOCATIONS ARE APPROXIMATE DUE TO APPARENT INACCURACIES IN THE PREVIOUS CONSULTANT'S BASEMAP.

2. MAP FEATURES AND SAMPLE LOCATIONS BASED ON FIGURE 2B OF SECOR'S FINAL REMEDIAL INVESTIGATION AND FEASIBILITY STUDY (OCTOBER 2001).

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

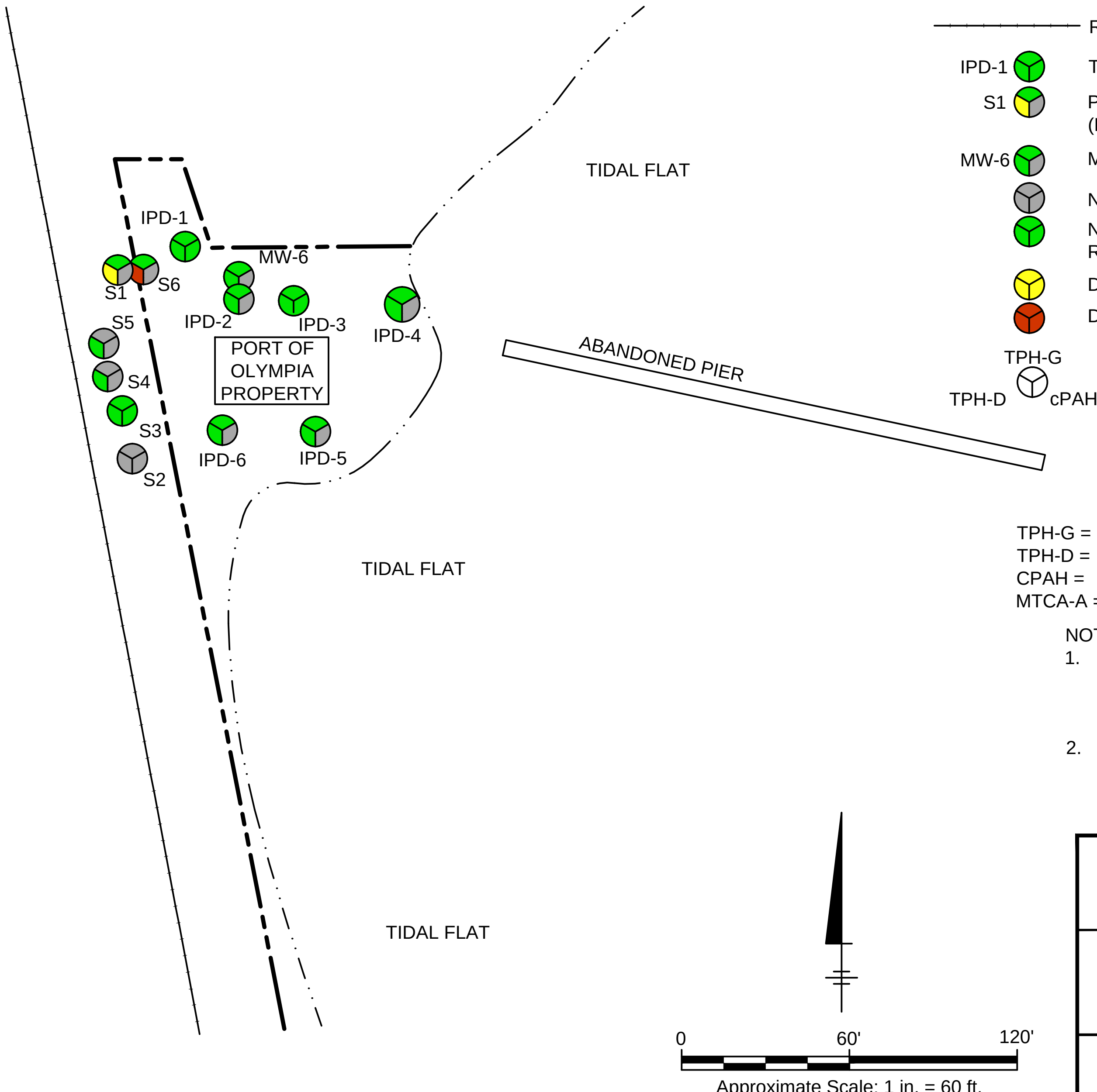
HISTORICAL TPH-G, TPH-D, AND cPAH CONCENTRATIONS IN SOIL (1 - 3 FEET BGS)

ARCADIS

FIGURE
4

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\RI Rpt\GP09BPNAWA60-B05.dwg LAYOUT: 5 SAVED: 10/28/2011 2:54 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ARCADIS.CTB PLOTTED: 10/28/2011 2:55 PM BY: REYES, ALEC

XREFS: IMAGES: PROJECTNAME: ----
SITE PLAN.jpg



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

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

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.

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

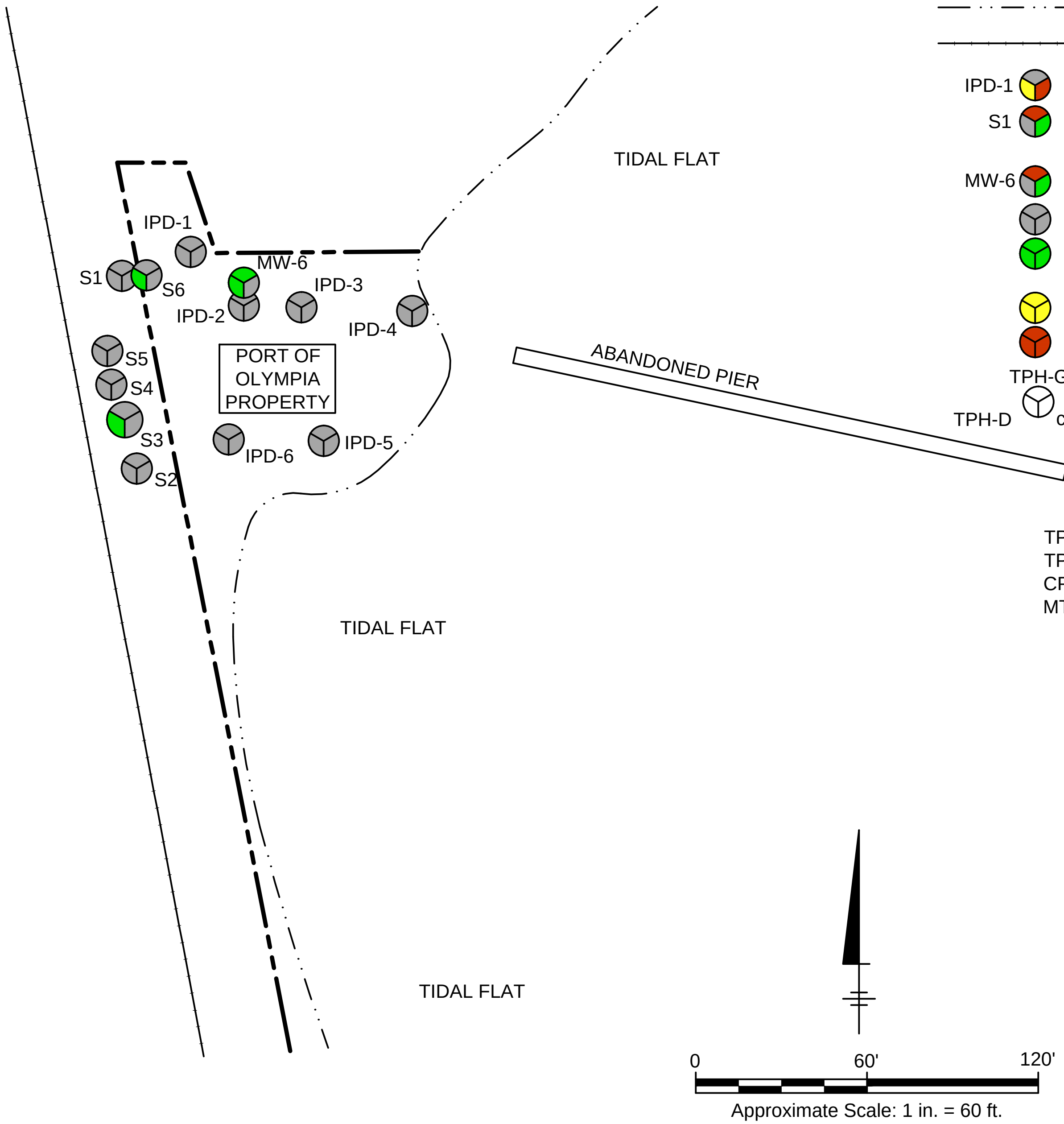
HISTORICAL TPH-G, TPH-D, AND cPAH CONCENTRATIONS IN SOIL (3 - 6 FEET BGS)

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\GP09BPNA\WA60\C0000\RI Rpt\GP09BPNAWA60-B06.dwg LAYOUT: 6 SAVED: 10/28/2011 2:53 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ARCADIS.CTB PLOTTED: 10/28/2011 2:54 PM BY: REYES, ALEC

XREFS: IMAGES: PROJECTNAME: ----
SITE PLAN.jpg



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

TPH-G
TPH-D cPAH

TPH-G = TOTAL PETROLEUM HYDROCARBONS AS GASOLINE
TPH-D = TOTAL PETROLEUM HYDROCARBONS AS DIESEL
CPAH = CARCINOGENIC POLYCYCLIC AROMATICHYDROCARBONS
MTCA-A = MTCA METHOD A CLEANUP LEVEL

NOTES:

1. ALL LOCATIONS ARE APPROXIMATE DUE TO APPARENT INACCURACIES IN THE PREVIOUS CONSULTANT'S BASEMAP.

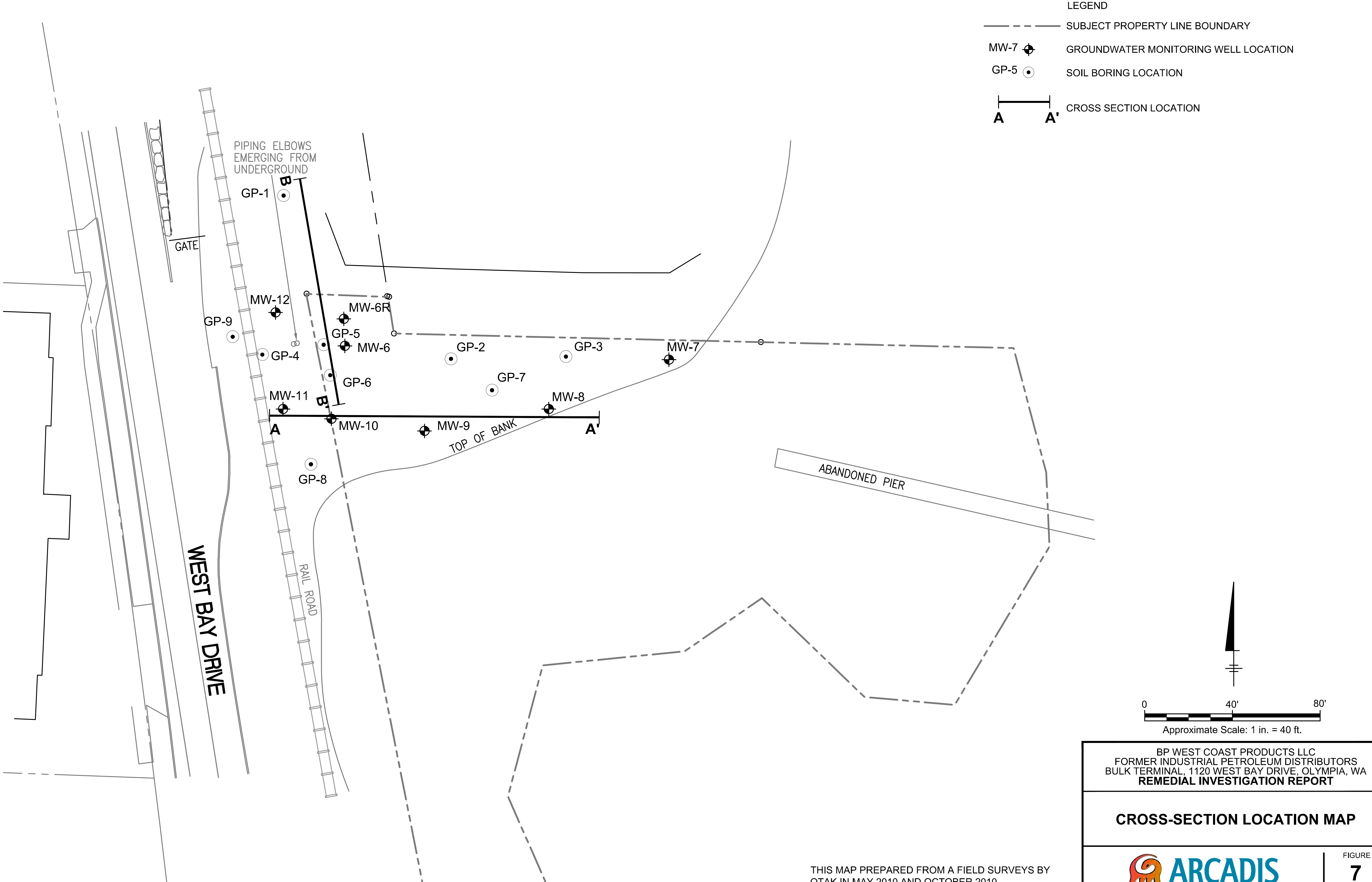
2. MAP FEATURES AND SAMPLE LOCATIONS BASED ON FIGURE 2B OF SECOR'S FINAL REMEDIAL INVESTIGATION AND FEASIBILITY STUDY (OCTOBER 2001).

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

HISTORICAL TPH-G, TPH-D, AND cPAH CONCENTRATIONS IN SOIL (6 - 9 FEET BGS)

ARCADIS

FIGURE
6



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

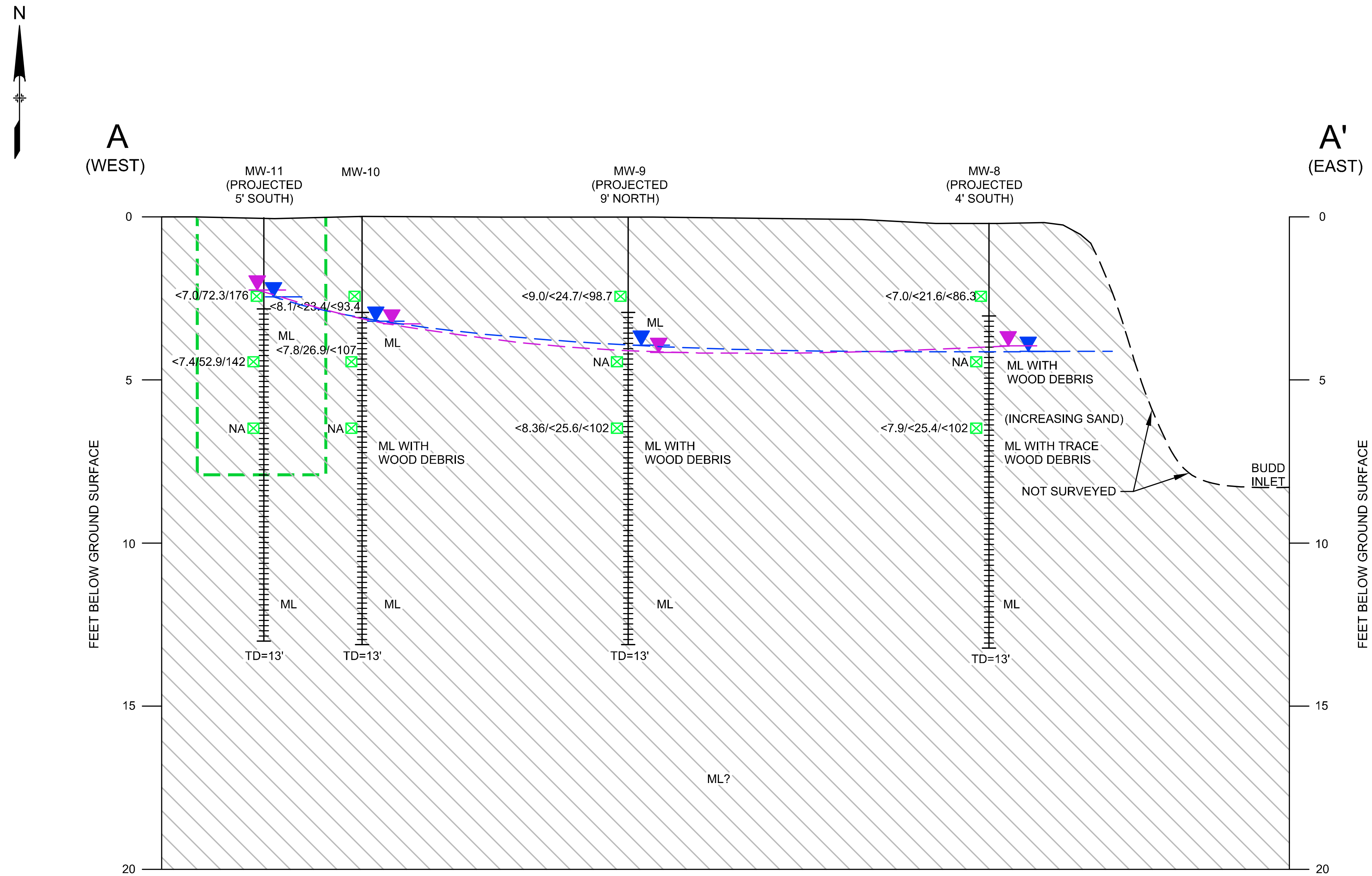
BP WEST COAST PRODUCTS LLC
FORMER INDUSTRIAL PETROLEUM DISTRIBUTORS
BULK TERMINAL, 1120 WEST BAY DRIVE, OLYMPIA, WA
REMEDIAL INVESTIGATION REPORT

CROSS-SECTION LOCATION MAP

ARCADIS

FIGURE
7

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\RI 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:

- 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-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

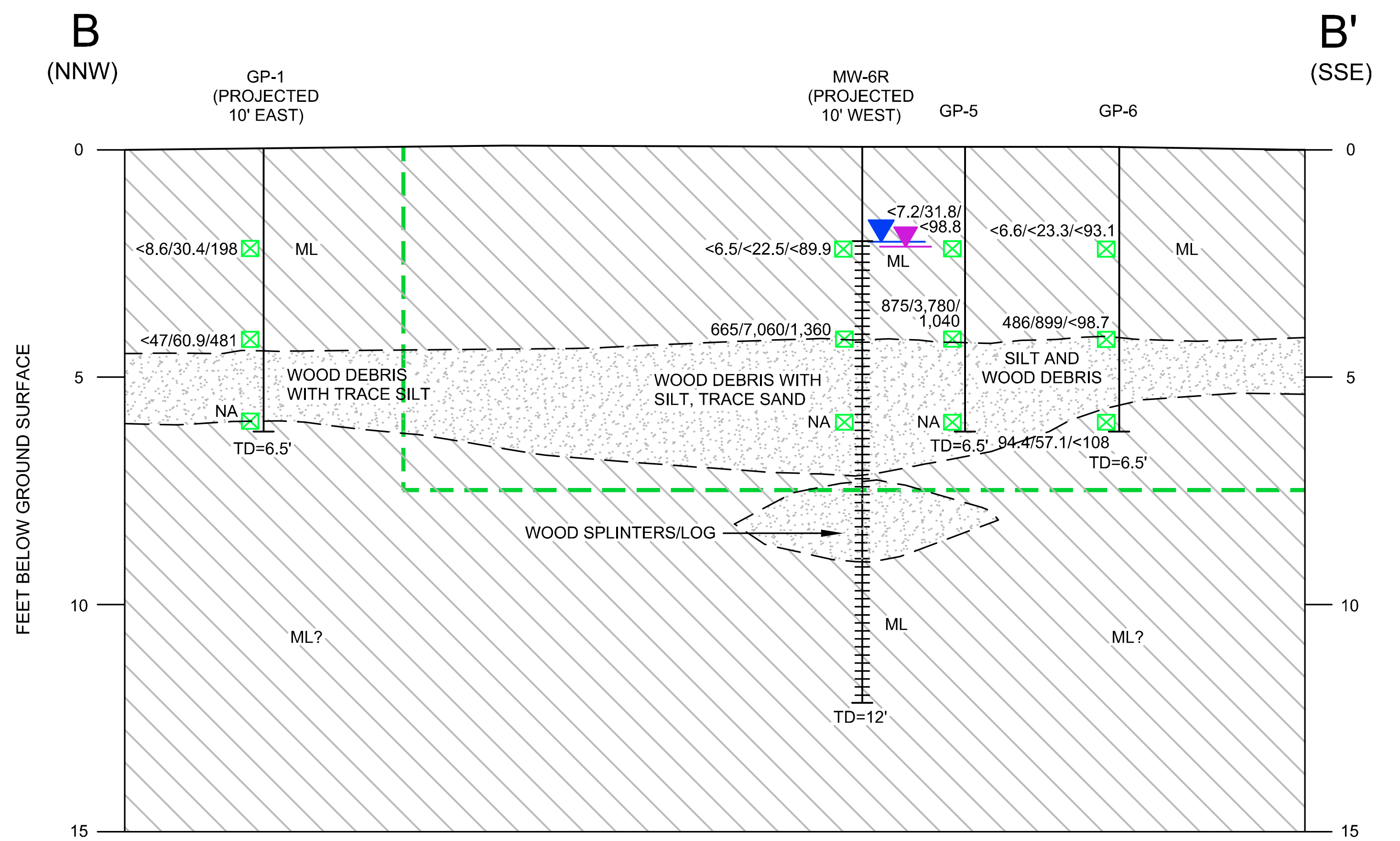
FORMER INDUSTRIAL PETROLEUM DISTRIBUTORS
BULK TERMINAL
1120 WEST BAY DRIVE, OLYMPIA, WASHINGTON
REMEDIAL INVESTIGATION REPORT

CROSS SECTION A-A'

ARCADIS

FIGURE
8

N



LEGEND:

MW-6R — MONITORING WELL/SOIL BORING ID

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

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

<8.6/30.4/198 — SOIL SAMPLE TPH-G/TPH-D/TPH-O IN mg/kg

WELL SCREEN

TD=12' — 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

ESTIMAED EXTENT OF SOIL IMPACTED ABOVE MTCA-A

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

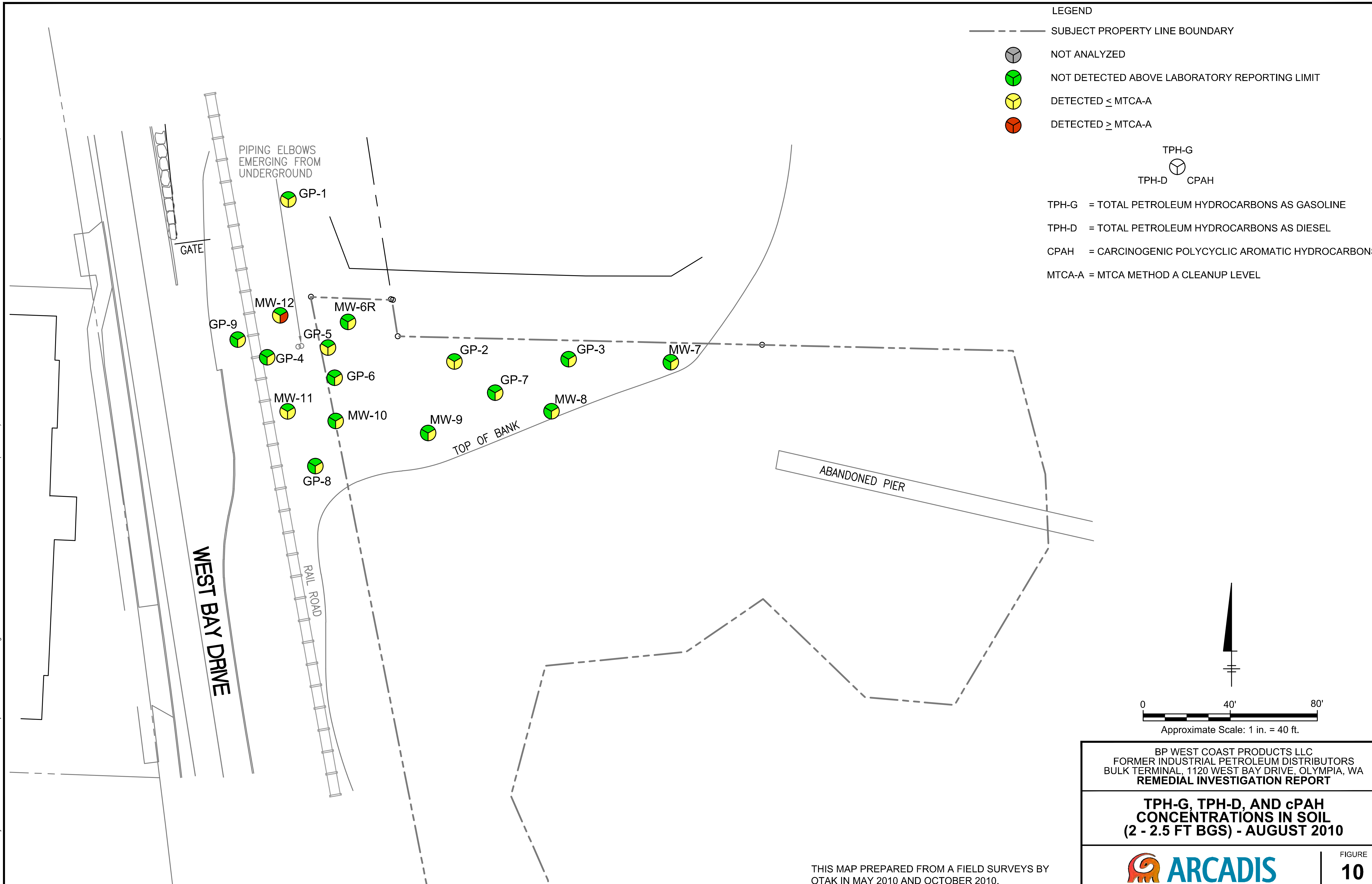
VERTICAL EXAGGERATION = 4X

FORMER INDUSTRIAL PETROLEUM DISTRIBUTORS
BULK TERMINAL
1120 WEST BAY DRIVE, OLYMPIA, WASHINGTON
REMEDIAL INVESTIGATION REPORT

CROSS SECTION B-B'

ARCADIS

FIGURE
9

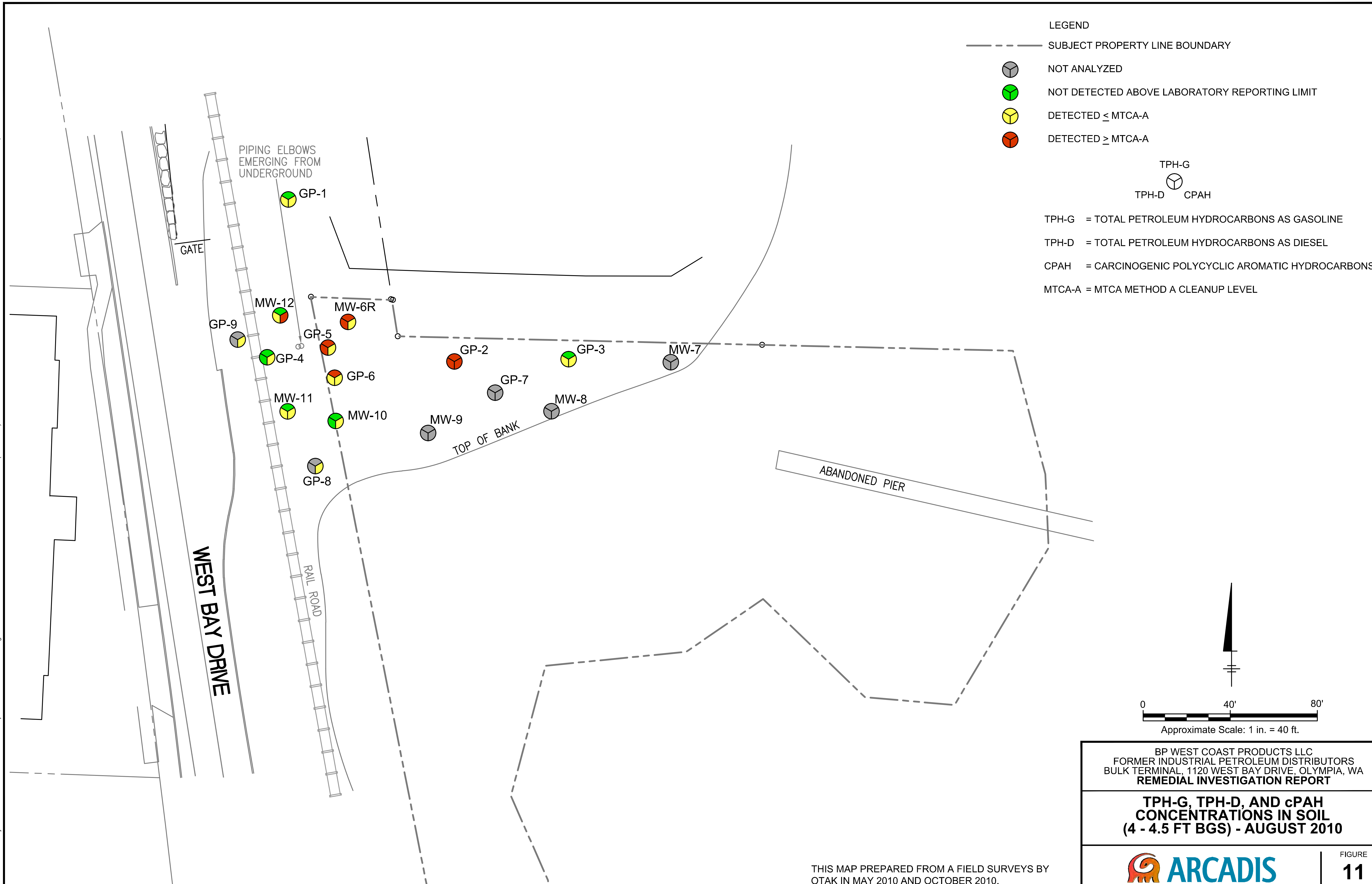


BP WEST COAST PRODUCTS LLC
FORMER INDUSTRIAL PETROLEUM DISTRIBUTORS
BULK TERMINAL, 1120 WEST BAY DRIVE, OLYMPIA, WA
REMEDIAL INVESTIGATION REPORT

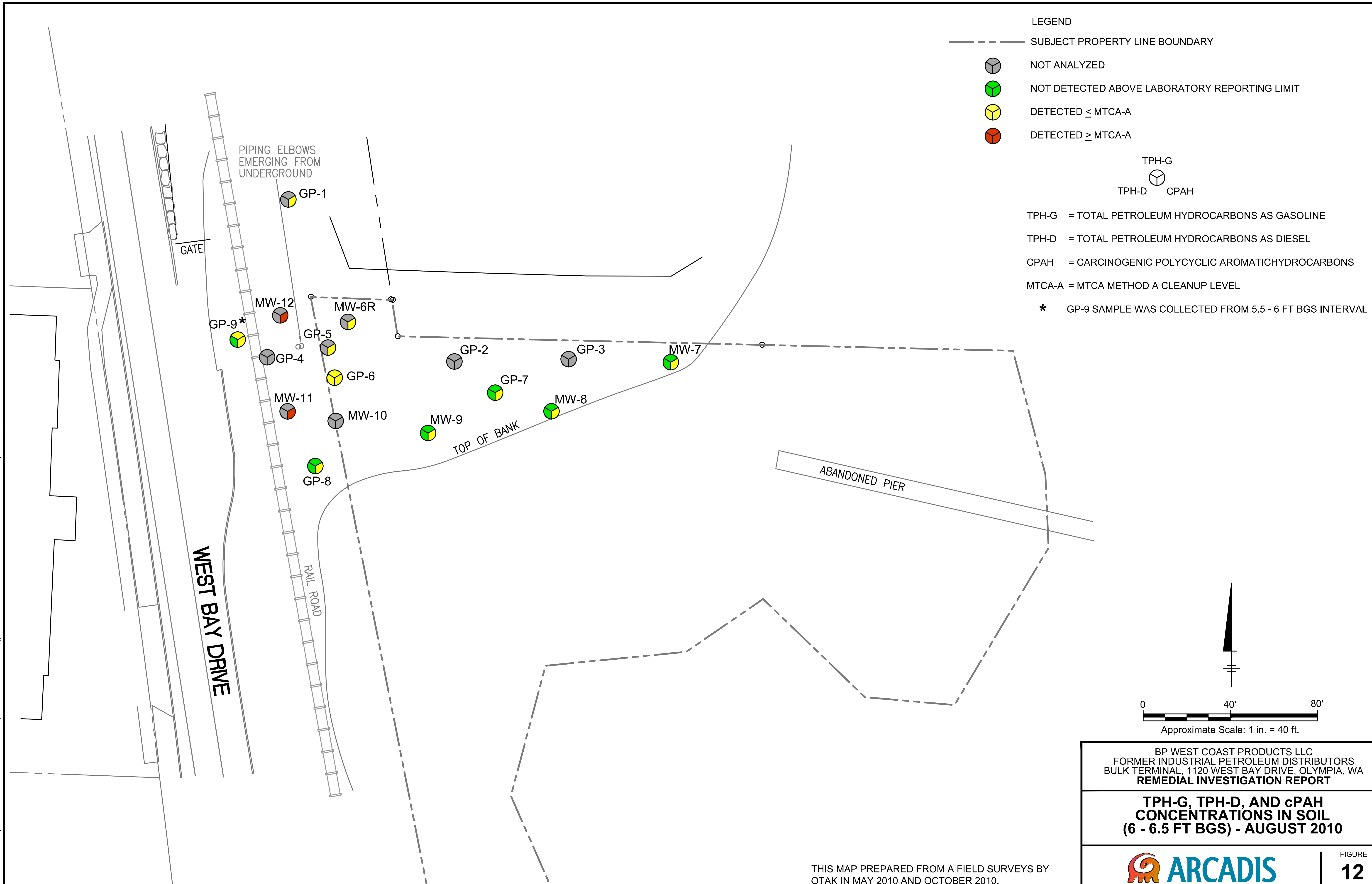
TPH-G, TPH-D, AND cPAH CONCENTRATIONS IN SOIL (2 - 2.5 FT BGS) - AUGUST 2010

ARCADIS

FIGURE **10**



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
PIPING ELBOWS EMERGING FROM UNDERGROUND
GATE
GP-1
GP-2
GP-3
GP-4
GP-5
GP-6
GP-7
GP-8
GP-9
MW-6R
MW-7
MW-8
MW-9
MW-10
MW-11
MW-12
TOP OF BANK
ABANDONED PIER
RAIL ROAD
WEST BAY DRIVE
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
REMEDIAL INVESTIGATION REPORT
TPH-G, TPH-D, AND cPAH CONCENTRATIONS IN SOIL (4 - 4.5 FT BGS) - AUGUST 2010
ARCADIS
FIGURE
11

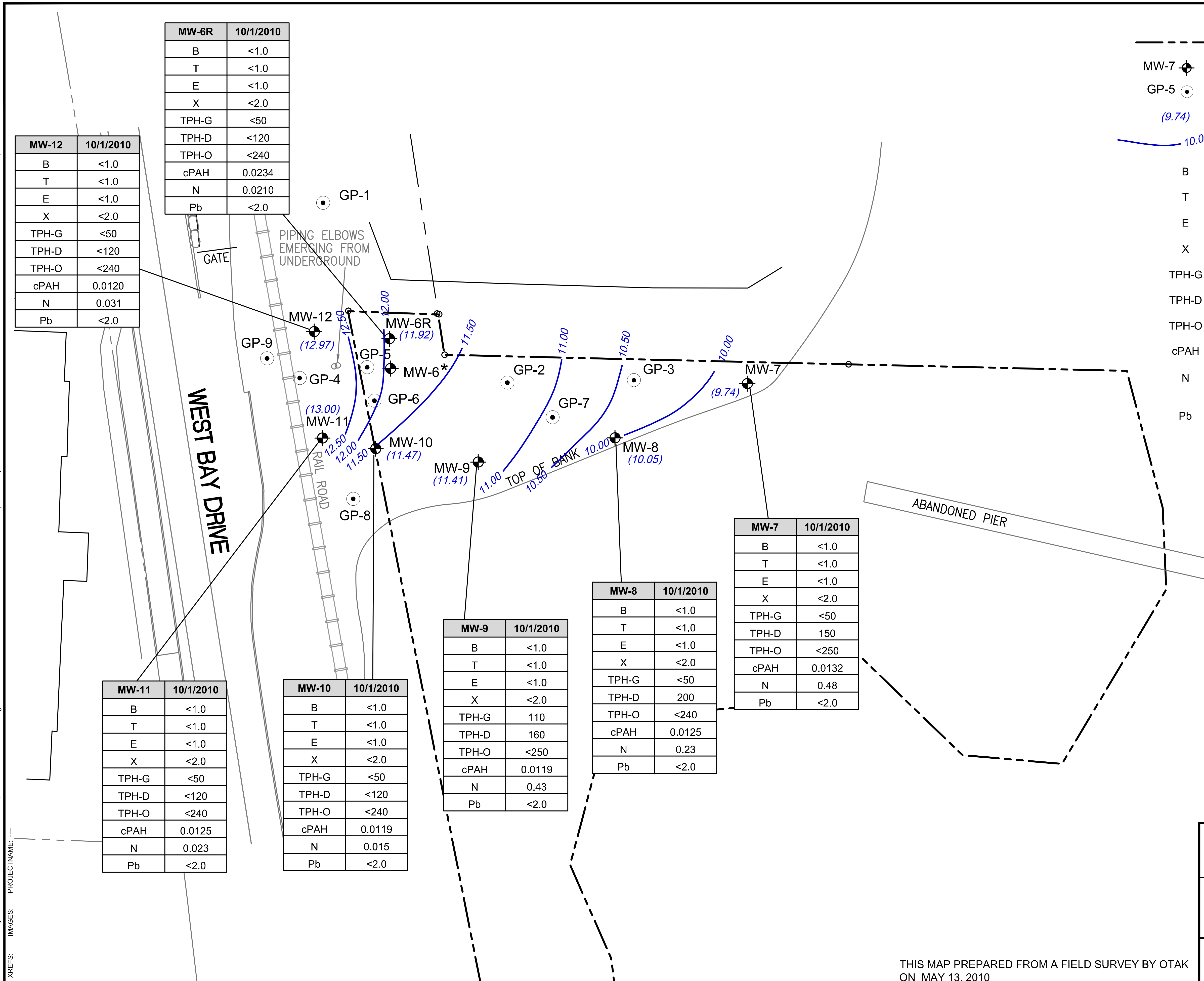


BP WEST COAST PRODUCTS LLC
FORMER INDUSTRIAL PETROLEUM DISTRIBUTORS
BULK TERMINAL, 1120 WEST BAY DRIVE, OLYMPIA, WA
REMEDIAL INVESTIGATION REPORT

TPH-G, TPH-D, 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-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

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-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-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

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.

0 40' 80'

Approximate Scale: 1 in. = 40 ft.

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

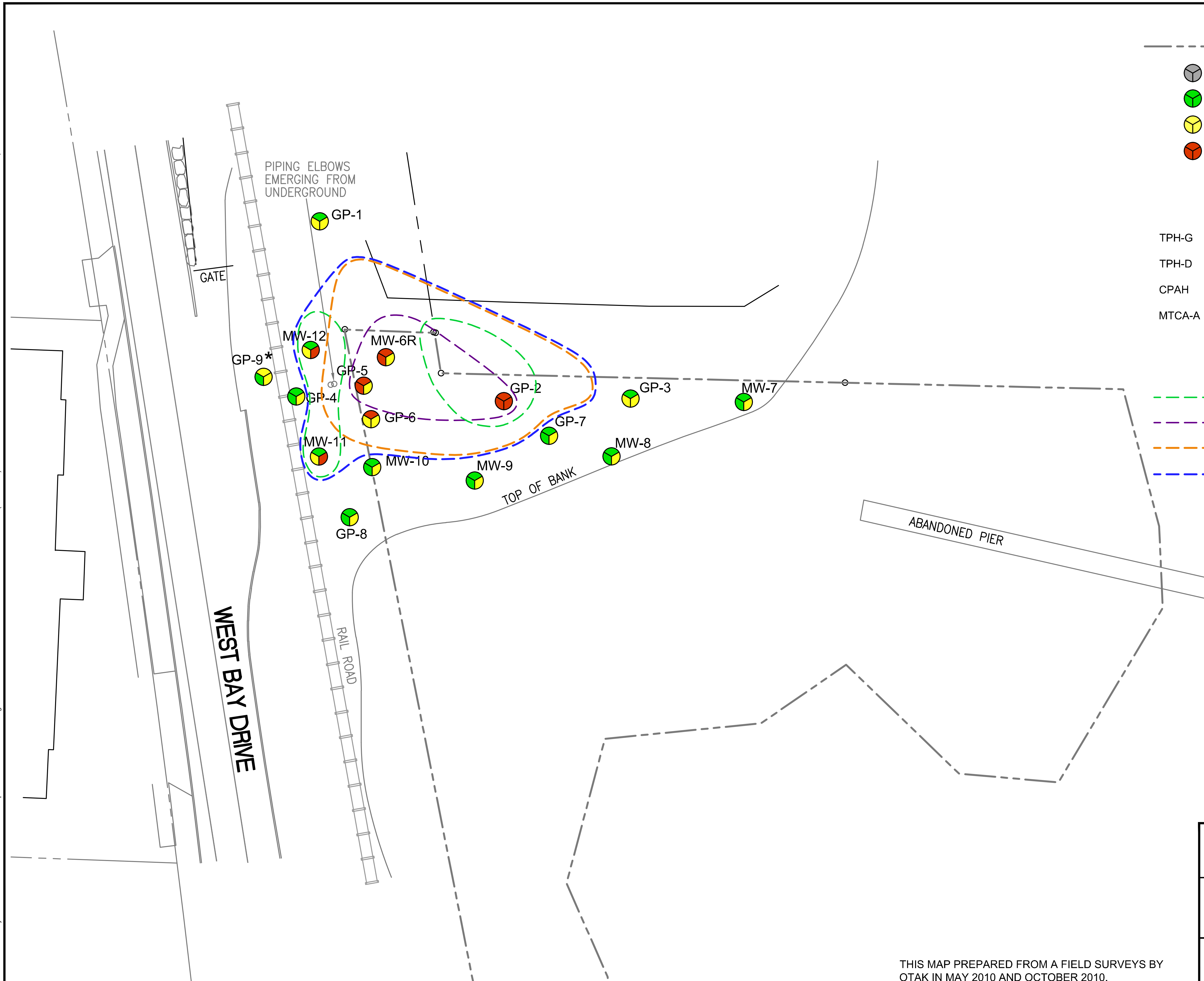
FORMER INDUSTRIAL PETROLEUM DISTRIBUTORS BULK TERMINAL
1120 WEST BAY DRIVE, OLYMPIA, WASHINGTON
REMEDIAL INVESTIGATION REPORT

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\ACT\GP09BPNA\WA60\C0000\RI Rpt\GP09BPNAWA60-C13.dwg LAYOUT: 13 SAVED: 10/28/2011 2:42 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ARCADIS.CTB PLOTTED: 10/28/2011 2:42 PM BY: REYES, ALEC
XREFS: IMAGES: PROJECTNAME: ----



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 OF cPAH ≥ MTCA-A

ESTIMATED EXTENT OF TPH-D ≥ MTCA-A

ESTIMATED EXTENT OF TPH-G ≥ MTCA-A

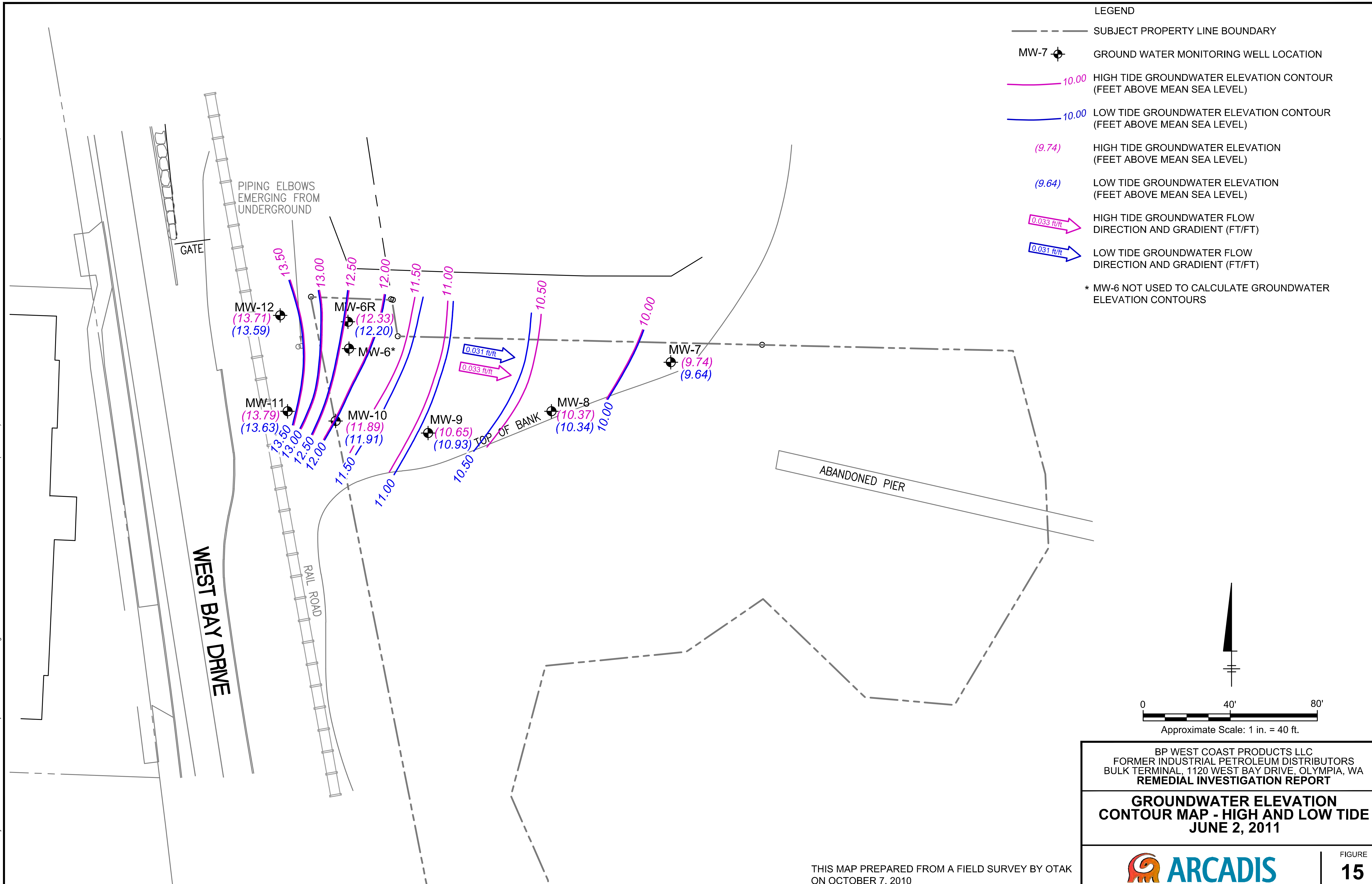
ESTIMATED EXTENT SOIL IMPACTED ≥ MTCA

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

ESTIMATED HORIZONTAL EXTENT OF SOIL IMPACTED ABOVE MTCA-A

ARCADIS

FIGURE
14



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

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

ARCADIS

FIGURE
15

ARCADIS

Appendices

ARCADIS

Appendix **A**

Integral Consulting, Inc., Sediment Screening Sampling Report

FINAL

Former IPD West Olympia Site
Budd Inlet Sediment Screening

Sampling Report

December 17, 2009

Prepared for
Delta Consultants
4006 148th Avenue NE
Redmond, WA 98052

Prepared by:

David Serdar
Scientist

Reviewed by:

Sandy Browning
Managing Scientist

4/22/10

Eron J. Dodak, L.H.G.
Senior Hydrogeologist
License No. 2643

State of Washington
Licensed Geologist
Hydrogeologist
2643
Eron J. Dodak

integral
consulting inc.

1205 West Bay Drive NW
Olympia, WA 98502

CONTENTS

LIST OF FIGURES

LIST OF TABLES

ACRONYMS AND ABBREVIATIONS

ARI	Analytical Resources, Inc.
GC/FID	gas chromatography/flame ionization detection
GPS	global positioning system
HCID	hydrocarbon identification
IPD	Industrial Petroleum Distributors
MLLW	mean lower low water
TPH	total petroleum hydrocarbons
VOC	volatile organic compound

1 INTRODUCTION

Integral Consulting Inc. (Integral) conducted a screening survey of intertidal sediments located adjacent to the former Industrial Petroleum Distributors (IPD) Site in Olympia, Washington, during August 2009. The survey was requested by the Washington State Department of Ecology (Ecology) to assess whether marine sediments have been impacted by upland contamination or historical activities at the site. Ecology specified the approximate sampling locations, depth of sediments to be collected, and analytical screening requirements to be used for the survey (Teel 2006). These specifications were used as the basis for the sediment sampling section of the remedial investigation work plan for the site (Delta 2008).

This report describes the sediment sampling conducted at the site and results of the laboratory analysis. Copies of Ecology's letter requesting the survey, field notes, chain of custody documentation, and the laboratory data report are included in the appendices.

The objective of the survey was to screen intertidal sediments for petroleum hydrocarbons at the former IPD Site on the western side of Budd Inlet in Olympia, Washington, and to determine if subsequent sampling and analysis is warranted based on the screening results.

2 SAMPLING METHODS AND LABORATORY ANALYSIS

The sample design was based on the sampling scheme requested by Ecology (Teel 2006, Appendix A) and was incorporated in the remedial investigation work plan (Delta 2008). Samples were collected by Integral staff on August 20, 2009, with the assistance of Delta Environmental (Delta). Steve Teel from Ecology was onsite to discuss the sampling plan and to oversee sampling activities.

The sampling date and time was selected to coincide with a mid-day minus tide (–2.1 feet MLLW at 12:15 p.m.) so that all locations were accessible by foot. Four sampling locations were established along the entire length of the former pier at equidistant intervals of approximately 140 feet. Figure 1 shows a schematic of the planned sampling locations. Figure 2 shows actual sampling locations superimposed on an aerial photograph.

Sampling location coordinates were recorded at each location using a Garmin GPS V Personal Navigator with differential correction and subsequently resolved to within 1 meter of accuracy using offsets from known landmark positions. Sample coordinates are shown in Table 1.

Table 1. Sample Location Coordinates for Sediment Screening at Former IPD Site

Station Id	Latitude North	Longitude West
ST01	47^0 03' 17.4"	122^0 54' 40.4"
ST02	47^0 03' 17.6"	122^0 54' 43.0"
ST03	47^0 03' 18.1"	122^0 54' 44.6"
ST04	47^0 03' 18.2"	122^0 54' 46.8"

Samples were collected using a 10-cm internal diameter stainless steel hand coring device designed to collect a core from the sediment surface to a depth of 10 cm below surface. Several cores were required to provide sufficient sample volume at each location. Upon extraction of the initial core at each location, samples for volatile organic compound (VOC) analysis were collected from the side wall of the hole using a specially designed open-barrel syringe and placed in vials for VOC analysis. Observations on sediment consistency, content, odor, etc., were recorded in a field logbook. A copy of the field notes is included as Appendix B.

Extracted material was placed in a stainless steel bowl, homogenized, and placed in appropriate jars specially cleaned for priority pollutant analysis. Prior to sampling, all equipment coming into contact with samples was decontaminated by scrubbing with 1 percent Alconox solution, triple-rinsed with tap water, rinsed with distilled water, and then allowed to air-dry. Once dry, equipment was wrapped in aluminum foil (dull side in).

Samples were submitted to Analytical Resources, Incorporated (ARI; Tukwila, WA) for analysis of petroleum hydrocarbon identification (NWTPH-HCID Method) using Prep Method SW3550B and gas chromatography/flame ionization detection (GC/FID). Chain of custody documentation is in Appendix C. Samples were analyzed at maximum screening level of 100 mg/kg. Samples collected for analysis of VOCs using Method 5035 were available for analysis pending results of the HCID screen.

3 RESULTS

A summary of the laboratory results are shown in Table 2. The complete laboratory report is shown in Appendix D. Overall quality of the data was good. The method blank and o-terphenyl surrogate was within acceptable limits for all samples. No petroleum hydrocarbons were detected at 20 mg/kg in the gas range, 50 mg/kg in the diesel range, and 100 mg/kg in the oil range. Analysis of VOCs was not necessary based on these results.

Table 2. Summary of Laboratory Results for Sediments Collected August 20, 2009 at the Former IPD Site (concentrations in mg/kg [ppm], dry weight basis)

Station ID	Sample ID	Analysis Date	Gas	Diesel	Oil
ST01	Sediment-1	8/22/09	20 *U*	50 *U*	100 *U*
ST02	Sediment-2	8/22/09	20 *U*	50 *U*	100 *U*
ST03	Sediment-3	8/22/09	20 *U*	50 *U*	100 *U*
ST04	Sediment-4	8/22/09	20 *U*	50 *U*	100 *U*

U = Not detected at value shown.

4 CONCLUSIONS

Intertidal surface sediments located in Budd Inlet off of the former IPD Site have no measurable levels of petroleum hydrocarbons when analyzed at a maximum screening level of 100 mg/kg. Gas, diesel, and oil range hydrocarbons are not detectable at concentrations of 20, 50, and 100 mg/kg, respectively.

5 REFERENCES

Delta. 2008. Remedial Investigation Work Plan, Former Industrial Distributors Site, 1117 West Bay Drive Olympia, Washington. Delta Project G0CLG. Prepared for Atlantic Richfield Company, La Palma, CA. Delta Consultants, Redmond, WA.

Teel. 2006. Sediment Screening Requirement and Potential Interim Action, Former Industrial Petroleum Distributors (IPD) Site, Olympia, WA. Letter from Steve Teel, Department of Ecology, to Bob May, Disclaimer Trust of John J. O'Connell and Scott Hooten, Atlantic Richfield Company. July 31, 2006.

FIGURES

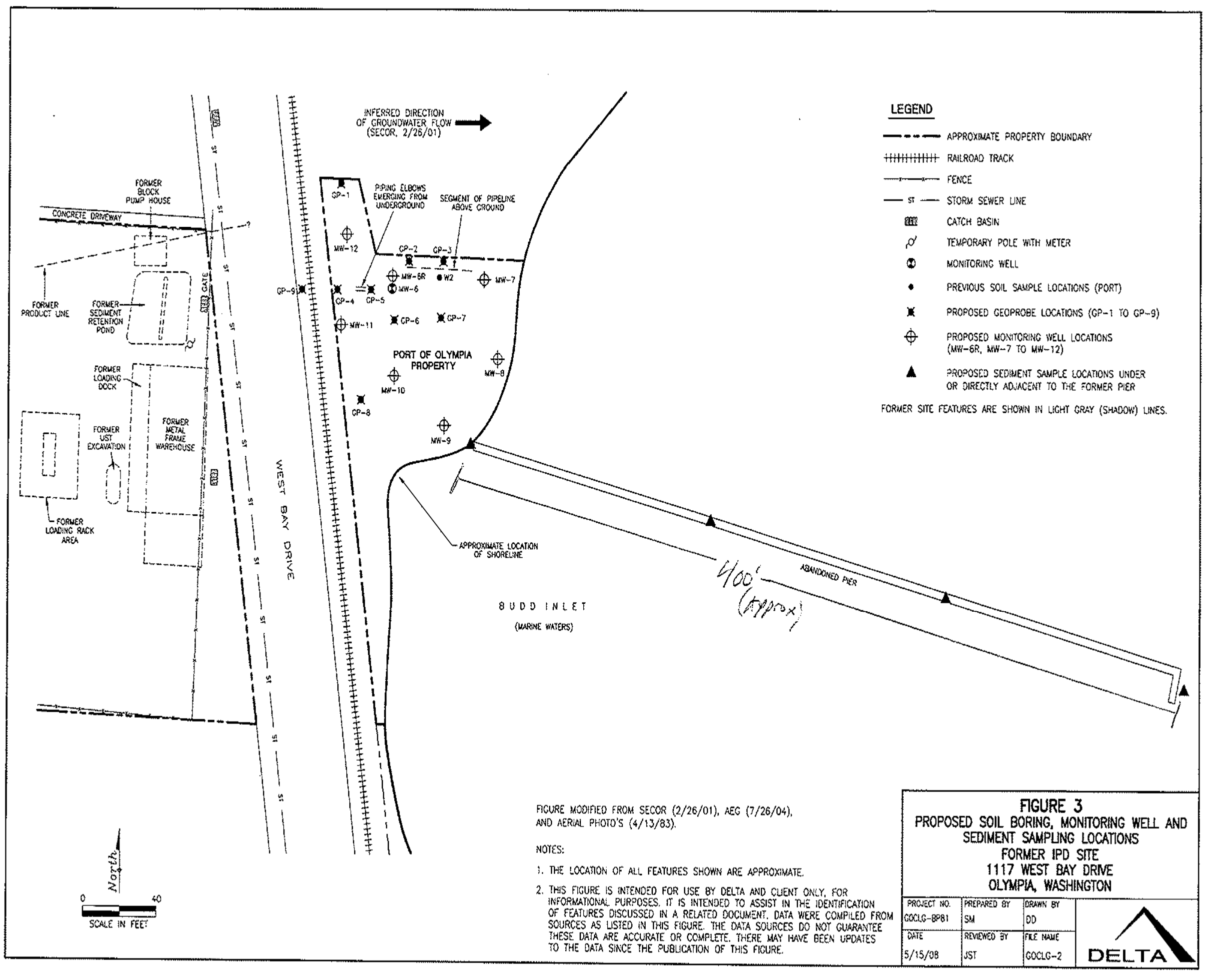


Figure 1. Schematic of Planned Sediment Sample Locations at the Former IPD Site.

Figure 2. Actual Sediment Sample Locations at the Former IPD Site (HHWHUB is a benchmark established by survey on August 20, 2009)

APPENDIX A

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300

CERTIFIED MAIL

July 31, 2006

Disclaimer Trust of John J. O'Connell
c/o Mr. Bob May, Trust Representative
18047 NE 88th Ct.
Redmond, WA 98052

Mr. Scott T. Hooton
Atlantic Richfield Company
295 SW 41st Street, Bldg. 13, STE N
Renton, WA 98055

Dear Mr. May and Mr. Hooton:

Re: Sediment Screening Requirement and Potential Interim Action
Former Industrial Petroleum Distributors (IPD) Site, Olympia, WA

As you know, further investigation is needed for the Port of Olympia portion of the site. Our letter of October 25, 2005 requested that a Remedial Investigation (RI) Work Plan be prepared and submitted to Ecology for review and comment. We understand that prior to beginning the RI, property access agreements would need to be negotiated by the Trust and ARCO from all affected property owners. The above letter also stated that the additional RI work shall include the further definition of the extent and type of residual soil contamination and groundwater characterization.

However, the potential for impact to sediments also needs to be assessed. To accomplish this, it will be necessary to collect four sediment screening samples (three locations beneath the former pier and one from the end of the pier). Sample locations beneath the pier should be spaced a consistent distance apart such that the entire length of the pier is characterized, beginning at the approximate mean higher high water level and ending at the sample location at the end of the pier. Samples should be collected from the top 10-centimeters only. Analyses shall initially consist of the hydrocarbon identification method (HCID) for all petroleum ranges. A screening level of **100 mg/kg** shall be used. If all sample results are less than this value, then no additional sediment characterization will be necessary. However, if any sample results exceed this value, then additional analyses and/or sediment characterization will be necessary. Prior to conducting this work, a sediment sampling plan should be prepared and submitted to Ecology for review and approval. Sample methods should be consistent with the Ecology guidance document *Sediment Sampling and Analysis Plan Appendix (03-09-043, revised April 2003).*

On July 20, Mr. Hooton and I visited the site. During this visit, Mr. Hooton expressed the willingness to conduct an interim remedial action consisting of excavation and off-site disposal for soil contamination associated with the former product pipeline. Grab groundwater samples would also be collected during this work. Ecology supports the option of conducting such an interim action at the site. However, in order to do this, the Agreed Order (AO) will need to be amended, the Interim Action Work Plan would need to be reviewed and approved by Ecology. Following this, both the Interim Action Work Plan and the AO Amendment would need to undergo a 30-day public review and comment period. After considering public comments, the Interim Action Work Plan and AO Amendment can be finalized and implemented.

Please let me know as soon as possible if you would still like to conduct an interim remedial action so I can begin preparing the AO Amendment. You can contact me at (360) 407-6247 or via e-mail at stee461@ecy.wa.gov if you have questions about this letter or if you would like to schedule a meeting to further discuss these issues.

Sincerely,

SS Teel

Steve Teel, LHG
Hydrogeologist
Toxics Cleanup Program
Southwest Regional Office

ST/ksc:07062006 Port of Olympia

Cc: Mr. Jeffrey S. Thompson, Delta Environmental Consultants
Mr. Heber Kennedy, Port of Olympia
Bojo Investments LLC
Mr. Steve Wise, Code Enforcement Officer, City of Olympia, Public Works Dept.
Bob Warren – Ecology

APPENDIX B

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...for outdoor writing people."

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Tacoma, WA 98424-1017 USA
www.RiteintheRain.com

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Integral Delta - Former IPD Olympia Site (BPOLY)

"Rite in the Rain"®
ALL-WEATHER
LEVEL
No. 311

August 2009

Intertidal Sediment Sampling

BPOLY (Former IPA site) 8/20/07

1/3

D. Serdar

BPoly Sediment Sampling

On Site:

D. Serdar, I. Stopakoff (Integral)
C. Crawford, S. Kennedy (Miliken), D. Turnow (Delta)

1030 - Met C Crawford on site - surveying high water station.

1100 - Met remainder of Delta crew. Went over safety plan and sampling plan. Discussions about determining sampling locations. Will use tape to measure from end to HW survey, then take equidistant measures.

1156 - Start of GPS readings at HWM surveyed by Delta.

1200 - Steve Teel on site - explained sampling method to him.

1230 - Walked out to end of pier to establish route.

1303 - Commenced sampling at $\boxed{\text{Station 1}}$ at end of pier (see opposite page)
Some heavy sheen - appeared like NAPL but then dissipated. Shells cleared from top surface. Many polychaetes, clams in hole. Sampled VOAs with 5035 syringe. Remaining

Samples collected with hand corer. 10 cm deep.

1334 - Station 2 sampled. Similar to Station 1 but more watery and more mussel shells. Less sheen.

1402 - Station 3 - Sample at higher elevation - Sediment was much more de-watered. Fewer shells. Slight anoxic/black layer on surface/below surface. Shells on surface w/ juvenile crabs. Clam shells below surface.

I.S. 50

1438 - Station 4 - sampled at high higher water. Sandy sediment with rocks under dense mat of salt grass (succulent). No shell debris and no marine worms.

Notes here by I.S.

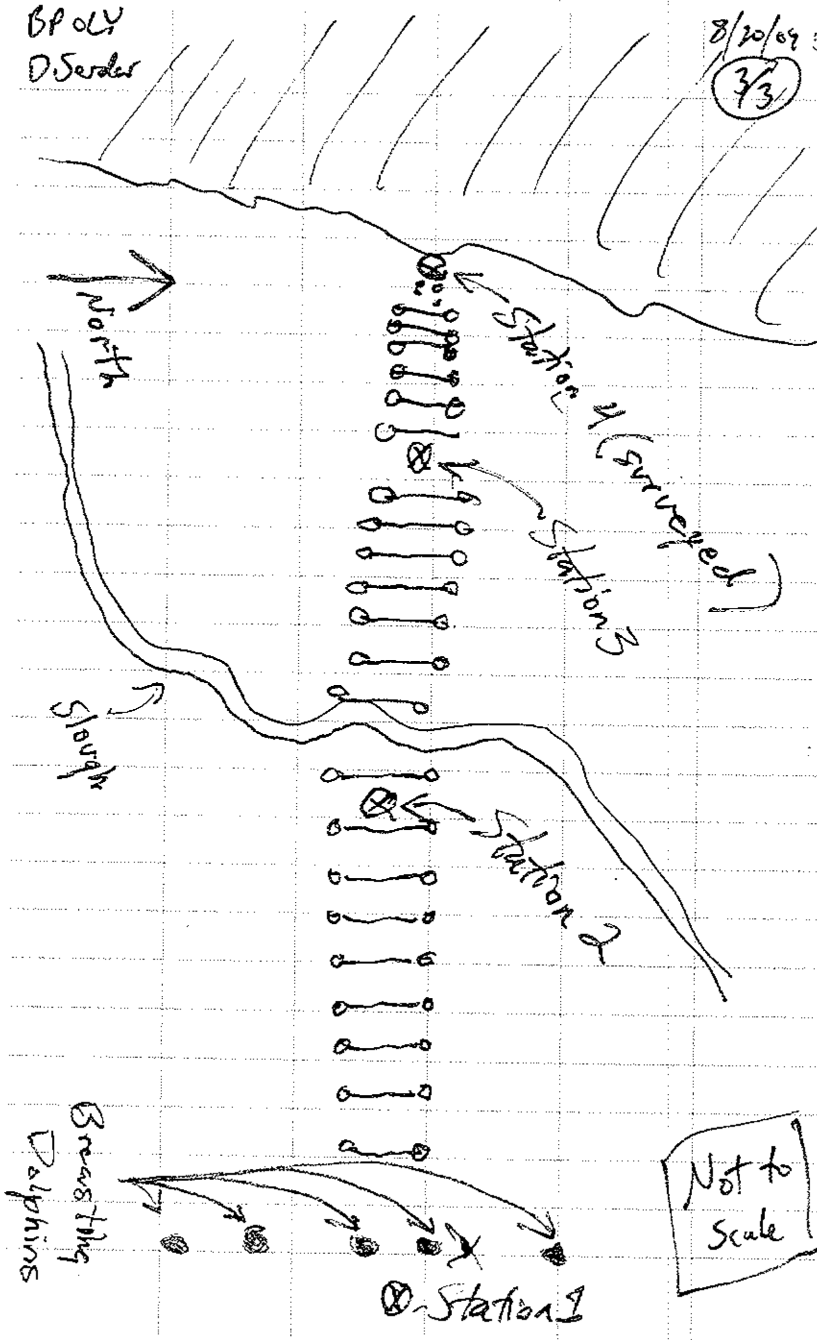
1500 - Sampling completed. COCs filled out and all jars labelled. Sarah M. assigned sample names:

Station 1 = Sediment 1
Station 2 = Sediment 2
Station 3 = Sediment 3
Station 4 = Sediment 4

1550 - Sarah M. will deliver samples to ARI. - Relinquished samples to her.

1620 - Decon and demobe back to office - (Oly)

Done for Day DMS



APPENDIX C

Chain of Custody Record & Laboratory Analysis Request

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

ARI Assigned Number: PL36	Turn-around Requested:
ARI Client Company: Integral Consulting	Phone: 360-705-3534
Client Contact: Dave Serdar	
Client Project Name: BPOLY-I	
Client Project #: C578-001	Samplers: Integral

Page: 1	of 1
Date: 8/20/09	Ice Present? Yes
No. of Coolers: 1	Cooler Temps: 1.6, 1.8

Sample ID	Date	Time	Matrix	No. Containers	HOLD/TPHD	TPHG	TOTAL SOLIDS						Notes/Comments
Sediment-1	8/20/09	1250	SEDIMENT	8	X	X*	X						
Sediment-2		1320			X	X*	X						
Sediment-3		1400			X	X*	X						
Sediment-4		1450			X	X*	X						

Comments/Special Instructions	Relinquished by:	Received by:	Relinquished by:	Received by:
*Hold - based on results of HCID screen.	(Signature) [signature]	(Signature) [signature]	(Signature) [signature]	(Signature) [signature]
	Printed Name: Dave Serdar	Printed Name: Sarah Milliken	Printed Name: Sarah Milliken	Printed Name: D. Peterson
	Company: Integral	Company: Delta Consultants	Company: Delta Consultants	Company: ARI
	Date & Time: 8/20/09 1530	Date & Time: 8/20/09 1530	Date & Time: 8/20/09 18:08	Date & Time: 8/20/09 1808

Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Integral Cons.

COC No(s): NA

Assigned ARI Job No: PL36

Project Name: ~~BPoly-2~~ JW BPOLY-1

Delivered by: Fed-Ex UPS Courier Hand Delivered Other:

Tracking No: NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler?	YES	NO
Were custody papers included with the cooler?	YES	NO
Were custody papers properly filled out (ink, signed, etc.)	YES	NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry) 1.6 1.8

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: 101866

Cooler Accepted by: JP Date: 8/20/09 Time: 1805

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler?		YES	NO
What kind of packing material was used? JW ~~Bubble Wrap~~ Wet Ice Gel Packs Baggies Foam Block Paper Other:			
Was sufficient ice used (if appropriate)?	NA	YES	NO
Were all bottles sealed in individual plastic bags?		YES	NO
Did all bottles arrive in good condition (unbroken)?		YES	NO
Were all bottle labels complete and legible?		YES	NO
Did the number of containers listed on COC match with the number of containers received?		YES	NO
Did all bottle labels and tags agree with custody papers?		YES	NO
Were all bottles used correct for the requested analyses?		YES	NO
Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)	NA	YES	NO
Were all VOC vials free of air bubbles?	NA	YES	NO
Was sufficient amount of sample sent in each bottle?		YES	NO

Samples Logged by: JW Date: 8/21/09 Time: 0840

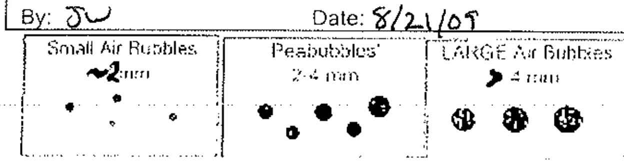
***** Notify Project Manager of discrepancies or concerns *****

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

Trip Blank 2 of 2 "pb" vials

By: JW Date: 8/21/09



Small → "sm"
Peabubbles → "pb"
Large → "lg"
Headspace → "hs"

APPENDIX D

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
NWTPH-HCID Method by GC/FID
Page 1 of 1
Matrix: Sediment

QC Report No: PL36-Integral Consulting
Project: BPOLY-1
C578-001

Data Release Authorized:
Reported: 08/24/09

ARI ID	Sample ID	Extraction Date	Analysis Date	DL	Range	Result
MB-082209 09-19572	Method Blank	08/22/09	08/22/09	1.0	Gas Diesel Oil o-Terphenyl	< 20 U < 50 U < 100 U 104%
PL36A 09-19572	Sediment-1 HC ID: ---	08/22/09	08/22/09	1.0	Gas Diesel Oil o-Terphenyl	< 20 U < 50 U < 100 U 101%
PL36B 09-19573	Sediment-2 HC ID: ---	08/22/09	08/22/09	1.0	Gas Diesel Oil o-Terphenyl	< 20 U < 50 U < 100 U 86.4%
PL36C 09-19574	Sediment-3 HC ID: ---	08/22/09	08/22/09	1.0	Gas Diesel Oil o-Terphenyl	< 20 U < 50 U < 100 U 102%
PL36D 09-19575	Sediment-4 HC ID: ---	08/22/09	08/22/09	1.0	Gas Diesel Oil o-Terphenyl	< 20 U < 50 U < 100 U 103%

Reported in mg/kg (ppm)

Gas value based on total peaks in the range from Toluene to C12.
Diesel value based on the total peaks in the range from C12 to C24.
Oil value based on the total peaks in the range from C24 to C38.

ANALYTICAL RESOURCES INCORPORATED

HCID SURROGATE RECOVERY SUMMARY

Matrix: Sediment

QC Report No: PL36-Integral Consulting
Project: BPOLY-1
C578-001

Client ID	O-TER	TOT OUT
082209MB	104%	0
Sediment-1	101%	0
Sediment-2	86.4%	0
Sediment-3	102%	0
Sediment-4	103%	0

	LCS/MB LIMITS	QC LIMITS
(O-TER) = o-Terphenyl	(68-122)	(50-150)

Prep Method: SW3550B
Log Number Range: 09-19572 to 09-19575

ANALYTICAL RESOURCES INCORPORATED

TOTAL HCID RANGE HYDROCARBONS-EXTRACTION REPORT

Matrix: Sediment
Date Received: 08/20/09

ARI Job: PL36
Project: BPOLY-1
C578-001

ARI ID	Client ID	Sample Amt	Final Vol	Basis	Prep Date
09-19572-082209MB	Method Blank	10.0 g	5.00 mL	-	08/22/09
09-19572-PL36A	Sediment-1	4.62 g	5.00 mL	D	08/22/09
09-19573-PL36B	Sediment-2	3.81 g	5.00 mL	D	08/22/09
09-19574-PL36C	Sediment-3	6.27 g	5.00 mL	D	08/22/09
09-19575-PL36D	Sediment-4	8.51 g	5.00 mL	D	08/22/09

Basis: D=Dry Weight W=As Received

ARCADIS

Appendix **B**

Terrestrial Ecological Evaluation Form

ARCADIS
Infrastructure · Water · Environment · Buildings

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

ENVIRONMENTAL

Mr. Steve Teel
State of Washington Department of Ecology
Southwest Regional Office
P.O. Box 47775
Olympia, WA 98504-7775

Re: Terrestrial Ecological Evaluation Form, Former ARCO Olympia Bulk Terminal, Industrial Petroleum Distributors Site (Facility Identification No. 1436), 1117 West Bay Drive, Olympia, Washington

Date:
June 10, 2011

Contact:
Alexander Lopez III

Phone:
503.220.8201 x 1122

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

Our ref:
GP09BPNA.WA60.C0000

Dear Mr. Teel,

On behalf of BP West Coast Products, LLC (BP), ARCADIS U.S. Inc. (ARCADIS) is pleased to present the enclosed *Terrestrial Ecological Evaluation Form* for former ARCO Olympia Bulk Terminal, Industrial Petroleum Distributors Site (site). Per subsection 7491(c)(i) of Chapter 173-340 WAC, the site qualifies for an exclusion from a terrestrial ecological evaluation because there are less than 1.5 acres of contiguous undeveloped land on or within 500 feet of the site.

If you have questions or comments regarding this form, 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

Melissa Blanchette, L.G.
Senior Geologist

State of Washington
2615
Licensed Geologist
Melissa Lee Blanchette

Imagine the result

Voluntary Cleanup Program

Washington State Department of Ecology
Toxics Cleanup Program

TERRESTRIAL ECOLOGICAL EVALUATION FORM

Under the Model Toxics Control Act (MTCA), a terrestrial ecological evaluation is necessary if hazardous substances are released into the soils at a Site. In the event of such a release, you must take one of the following three actions as part of your investigation and cleanup of the Site:

1. Document an exclusion from further evaluation using the criteria in WAC 173-340-7491.
2. Conduct a simplified evaluation as set forth in WAC 173-340-7492.
3. Conduct a site-specific evaluation as set forth in WAC 173-340-7493.

When requesting a written opinion under the Voluntary Cleanup Program (VCP), you must complete this form and submit it to the Department of Ecology (Ecology). The form documents the type and results of your evaluation. You still need to submit your evaluation as part of your cleanup plan or report.

If you have questions about how to conduct a terrestrial ecological evaluation, please contact the Ecology site manager assigned to your Site. For additional guidance, please refer to www.ecy.wa.gov/programs/tcp/policies/terrestrial/TEEHome.htm.

Step 1: IDENTIFY HAZARDOUS WASTE SITE	
Please identify below the hazardous waste site for which you are documenting an evaluation.	
Facility/Site Name: ARCO Facility Id. OLYMP	
Facility/Site Address: 1117 West Bay Drive, Olympia, WA	
Facility/Site No: 1436	VCP Project No.: NA

Step 2: IDENTIFY EVALUATOR		
Please identify below the person who conducted the evaluation and their contact information.		
Name: Lynne Stewart		Title: Environmental Scientist
Organization: ARCADIS-US		
Mailing address: 111 SW Columbia, Ste. 670		
City: Portland	State: Oregon	Zip code: 97201
Phone: 503-220-8201	Fax: 503-220-8209	E-mail: lynne.stewart@arcadis-us.com

Step 3: DOCUMENT EVALUATION TYPE AND RESULTS

A. Exclusion from further evaluation.

1. Does the Site qualify for an exclusion from further evaluation?

☒ Yes — *If you answered **"YES,"** then answer **Question 2**.*

☐ No or Unknown — *If you answered **"NO" or "UKNOWN,"** then skip to **Step 3B** of this form.*

2. What is the basis for the exclusion? *Check all that apply. Then skip to **Step 4** of this form.*

Point of Compliance: WAC 173-340-7491(1)(a)

☐ All soil contamination is, or will be,* at least 15 feet below the surface.

☐ All soil contamination is, or will be,* at least 6 feet below the surface (or alternative depth if approved by Ecology), and institutional controls are used to manage remaining contamination.

Barriers to Exposure: WAC 173-340-7491(1)(b)

☐ All contaminated soil, is or will be,* covered by physical barriers (such as buildings or paved roads) that prevent exposure to plants and wildlife, and institutional controls are used to manage remaining contamination.

Undeveloped Land: WAC 173-340-7491(1)(c)

☐ There is less than 0.25 acres of contiguous# undeveloped± land on or within 500 feet of any area of the Site and any of the following chemicals is present: chlorinated dioxins or furans, PCB mixtures, DDT, DDE, DDD, aldrin, chlordane, dieldrin, endosulfan, endrin, heptachlor, heptachlor epoxide, benzene hexachloride, toxaphene, hexachlorobenzene, pentachlorophenol, or pentachlorobenzene.

☒ For sites not containing any of the chemicals mentioned above, there is less than 1.5 acres of contiguous# undeveloped± land on or within 500 feet of any area of the Site.

Background Concentrations: WAC 173-340-7491(1)(d)

☐ Concentrations of hazardous substances in soil do not exceed natural background levels as described in WAC 173-340-200 and 173-340-709.

* An exclusion based on future land use must have a completion date for future development that is acceptable to Ecology.

± "Undeveloped land" is land that is not covered by building, roads, paved areas, or other barriers that would prevent wildlife from feeding on plants, earthworms, insects, or other food in or on the soil.

\# "Contiguous" undeveloped land is an area of undeveloped land that is not divided into smaller areas of highways, extensive paving, or similar structures that are likely to reduce the potential use of the overall area by wildlife.

B. Simplified evaluation.

1. Does the Site qualify for a simplified evaluation?

☐ Yes — *If you answered **"YES,"** then answer **Question 2** below.*

☐ No or Unknown — *If you answered **"NO"** or **"UNKNOWN,"** then skip to **Step 3C** of this form.*

2. Did you conduct a simplified evaluation?

☐ Yes — *If you answered **"YES,"** then answer **Question 3** below.*

☐ No — *If you answered **"NO,"** then skip to **Step 3C** of this form.*

3. Was further evaluation necessary?

☐ Yes — *If you answered **"YES,"** then answer **Question 4** below.*

☐ No — *If you answered **"NO,"** then answer **Question 5** below.*

4. If further evaluation was necessary, what did you do?

☐ Used the concentrations listed in Table 749-2 as cleanup levels. *If so, then skip to **Step 4** of this form.*

☐ Conducted a site-specific evaluation. *If so, then skip to **Step 3C** of this form.*

5. If no further evaluation was necessary, what was the reason? *Check all that apply. Then skip to **Step 4** of this form.*

Exposure Analysis: WAC 173-340-7492(2)(a)

☐ Area of soil contamination at the Site is not more than 350 square feet.

☐ Current or planned land use makes wildlife exposure unlikely. Used Table 749-1.

Pathway Analysis: WAC 173-340-7492(2)(b)

☐ No potential exposure pathways from soil contamination to ecological receptors.

Contaminant Analysis: WAC 173-340-7492(2)(c)

☐ No contaminant listed in Table 749-2 is, or will be, present in the upper 15 feet at concentrations that exceed the values listed in Table 749-2.

☐ No contaminant listed in Table 749-2 is, or will be, present in the upper 6 feet (or alternative depth if approved by Ecology) at concentrations that exceed the values listed in Table 749-2, and institutional controls are used to manage remaining contamination.

☐ No contaminant listed in Table 749-2 is, or will be, present in the upper 15 feet at concentrations likely to be toxic or have the potential to bioaccumulate as determined using Ecology-approved bioassays.

☐ No contaminant listed in Table 749-2 is, or will be, present in the upper 6 feet (or alternative depth if approved by Ecology) at concentrations likely to be toxic or have the potential to bioaccumulate as determined using Ecology-approved bioassays, and institutional controls are used to manage remaining contamination.

C. Site-specific evaluation. A site-specific evaluation process consists of two parts: (1) formulating the problem, and (2) selecting the methods for addressing the identified problem. Both steps require consultation with and approval by Ecology. *See* WAC 173-340-7493(1)(c).

1. Was there a problem? *See* WAC 173-340-7493(2).

☐ Yes — *If you answered **"YES,"** then answer **Question 2** below.*

☐ No — *If you answered **"NO,"** then identify the reason here and then skip to **Question 5** below:*

- ☐ No issues were identified during the problem formulation step.
- ☐ While issues were identified, those issues were addressed by the cleanup actions for protecting human health.

2. What did you do to resolve the problem? *See* WAC 173-340-7493(3).

☐ Used the concentrations listed in Table 749-3 as cleanup levels. *If so, then skip to **Question 5** below.*

☐ Used one or more of the methods listed in WAC 173-340-7493(3) to evaluate and address the identified problem. *If so, then answer **Questions 3 and 4** below.*

3. If you conducted further site-specific evaluations, what methods did you use?
Check all that apply. See WAC 173-340-7493(3).

☐ Literature surveys.

☐ Soil bioassays.

☐ Wildlife exposure model.

☐ Biomarkers.

☐ Site-specific field studies.

☐ Weight of evidence.

☐ Other methods approved by Ecology. If so, please specify:

4. What was the result of those evaluations?

☐ Confirmed there was no problem.

☐ Confirmed there was a problem and established site-specific cleanup levels.

5. Have you already obtained Ecology's approval of both your problem formulation and problem resolution steps?

☐ Yes — If so, please identify the Ecology staff who approved those steps:

☐ No

Step 4: SUBMITTAL

Please mail your completed form to the Ecology site manager assigned to your Site. If a site manager has not yet been assigned, please mail your completed form to the Ecology regional office for the County in which your Site is located.

Northwest Region:	**Central Region:**
Attn: Sara Nied 3190 160th Ave. SE Bellevue, WA 98008-5452	Attn: Mark Dunbar 15 W. Yakima Ave., Suite 200 Yakima, WA 98902
Southwest Region: Attn: Scott Rose P.O. Box 47775 Olympia, WA 98504-7775	**Eastern Region:** Attn: Patti Carter N. 4601 Monroe Spokane WA 99205-1295

If you need this publication in an alternate format, please call the Toxics Cleanup Program at 360-407-7170. Persons with hearing loss can call 711 for Washington Relay Service. Persons with a speech disability can call 877-833-6341.

ARCADIS

Appendix **C**

Standard Operating Procedures

ARCADIS
Infrastructure, environment, facilities

Imagine the result

Monitoring Well Installation

Rev. #: 3

Rev Date: February 2, 2011

Approval Signatures

Prepared by: ______________________ Date: 2/2/2011

Reviewed by: ______________________ Date: 2/2/2011
(Technical Expert)

I. Scope and Application

The procedures set out herein are designed to produce standard groundwater monitoring wells suitable for: (1) groundwater sampling, (2) water level measurement, (3) bulk hydraulic conductivity testing of formations adjacent to the open interval of the well.

Monitoring well boreholes in unconsolidated (overburden) materials are typically drilled using the hollow-stem auger drilling method. Other drilling methods that are also suitable for installing overburden monitoring wells, and are sometimes necessary due to site-specific geologic conditions, include: drive-and-wash, spun casing, Rotasonic, dual-rotary (Barber Rig), and fluid/mud rotary with core barrel or roller bit. Direct-push techniques (e.g., Geoprobe or cone penetrometer) and driven well points may also be used in some cases within the overburden. Monitoring wells within consolidated materials such as bedrock are commonly drilled using water-rotary (coring or tri-cone roller bit), air rotary or Rotasonic methods. The drilling method to be used at a given site will be selected based on site-specific consideration of anticipated drilling/well depths, site or regional geologic knowledge, type of monitoring to be conducted using the installed well, and cost.

No oils or grease will be used on equipment introduced into the boring (e.g., drill rod, casing, or sampling tools). No polyvinyl chloride (PVC) glue/cement will be used in constructing or retrofitting monitoring wells that will be used for water-quality monitoring. No coated bentonite pellets will be used in the well drilling or construction process. Specifications of materials to be installed in the well will be obtained prior to mobilizing onsite, including:

- well casing;
- bentonite;
- sand; and
- grout.

Well materials will be inspected and, if needed, cleaned prior to installation.

II. Personnel Qualifications

Monitoring well installation activities will be performed by persons who have been trained in proper well installation procedures under the guidance of an experienced field geologist, engineer, or technician. Where field sampling is performed for soil or bedrock characterization, field personnel will have undergone in-field training in soil or bedrock description methods, as described in the appropriate SOP(s) for those activities.

III. Equipment List

The following materials will be available during soil boring and monitoring well installation activities, as required:

- Site Plan with proposed soil boring/well locations;
- Work Plan or Field Sampling Plan (FSP), and site Health and Safety Plan (HASP);
- personal protective equipment (PPE), as required by the HASP;
- traffic cones, delineators, caution tape, and/or fencing as appropriate for securing the work area, if such are not provided by drillers;
- appropriate soil sampling equipment (e.g., stainless steel spatulas, knife);
- soil and/or bedrock logging equipment as specified in the appropriate SOPs;
- appropriate sample containers and labels;
- drum labels as required for investigation derived waste handling;
- chain-of-custody forms;
- insulated coolers with ice, when collecting samples requiring preservation by chilling;
- photoionization detector (PID) or flame ionization detector (FID);
- ziplock style bags;
- water level or oil/water interface meter;
- locks and keys for securing the well after installation;
- decontamination equipment (bucket, distilled or deionized water, cleansers appropriate for removing expected chemicals of concern, paper towels);

- field notebook.

Prior to mobilizing to the site, ARCADIS personnel will contact the drilling subcontractor or in-house driller (as appropriate) to confirm that appropriate sampling and well installation equipment will be provided. Specifications of the sampling and well installation equipment are expected to vary by project, and so communication with the driller will be necessary to ensure that the materials provided will meet the project objectives. Equipment typically provided by the driller could include:

- drilling equipment required by the American Society of Testing and Materials (ASTM) D 1586, when performing split-spoon sampling;
- disposable plastic liners, when drilling with direct-push equipment;
- drums for investigation derived waste;
- drilling and sampling equipment decontamination materials;
- decontamination pad materials, if required; and
- well construction materials.

IV. Cautions

Prior to beginning field work, underground utilities in the vicinity of the drilling areas will be delineated by the drilling contractor or an independent underground utility locator service. See separate SOP for utility clearance.

Some regulatory agencies require a minimum annular space between the well or permanent casing and the borehole wall. When specified, the minimum clearance is typically 2 inches on all sides (e.g., a 2-inch diameter well requires a 6-inch diameter borehole). In addition, some regulatory agencies have specific requirements regarding grout mixtures. Determine whether the oversight agency has any such requirements prior to finalizing the drilling and well installation plan.

If dense non-aqueous phase liquids (DNAPL) are known or expected to exist at the site, refer to the DNAPL Contingency Plan SOP for additional details regarding drilling and well installation to reduce the potential for inadvertent DNAPL remobilization.

Similarly, if light non-aqueous phase liquids (LNAPLs) are known or expected to be present as “perched” layers above the water table, refer to the DNAPL Contingency

Plan. Follow the general provisions and concepts in the DNAPL contingency plan during drilling above the water table at known or expected LNAPL sites.

Avoid using drilling fluids or materials that could impact groundwater or soil quality, or could be incompatible with the subsurface conditions.

Similarly, consider the material compatibility between the well materials and the surrounding environment. For example, PVC well materials are not preferred when DNAPL is present. In addition, some groundwater conditions leach metals from stainless steel.

Water used for drilling and sampling of soil or bedrock, decontamination of drilling/sampling equipment, or grouting boreholes upon completion will be of a quality acceptable for project objectives. Testing of water supply should be considered.

Specifications of materials used for backfilling bore hole will be obtained, reviewed and approved to meet project quality objectives. Bentonite is not recommended where DNAPLs are likely to be present. In these situations, neat cement grout is preferred.

No coated bentonite pellets will be used in monitoring well construction, as the coating could impact the water quality in the completed well.

Monitoring wells may be installed with Schedule 40 polyvinyl chloride (PVC) to a maximum depth of 200 feet below ground surface (bgs). PVC monitoring wells between 200 and 400 feet total depth will be constructed using Schedule 80 PVC. Monitoring wells deeper than 400 feet will be constructed using steel.

V. Health and Safety Considerations

Field activities associated with monitoring well installation will be performed in accordance with a site-specific HASP, a copy of which will be present on site during such activities.

VI. Procedures

The procedures for installing groundwater monitoring wells are presented below:

Hollow-Stem Auger, Drive-and-Wash, Spun Casing, Fluid/Mud Rotary, Rotasonic, and Dual-Rotary Drilling Methods

1. Locate boring/well location, establish work zone, and set up sampling equipment decontamination area.

2. Advance boring to desired depth. Collect soil and/or bedrock samples at appropriate interval as specified in the Work Plan and/or FSP. Collect, document, and store samples for laboratory analysis as specified in the Work Plan and/or FSP. Decontaminate equipment between samples in accordance with the Work Plan and/or FSP. A common sampling method that produces high-quality soil samples with relatively little soil disturbance is the ASTM D 1586 - Standard Test Method for Penetration Test and Split-Barrel Sampling of Soils. Split-spoon samples are obtained during drilling using hollow-stem auger, drive-and-wash, spun casing, and fluid/mud rotary. Rotasonic drilling produces large-diameter soil cores that tend to be more disturbed than split-spoon samples due to the vibratory action of the drill casing. Dual-rotary removes cuttings by compressed air and allows only a general assessment of geology. High-quality bedrock samples can be obtained by coring.

3. Describe each soil or bedrock sample as outlined in the appropriate SOP. Record descriptions in the field notebook and/or personal digital assistant (PDA). It should be noted that PDA logs must be electronically backed up and transferred to a location accessible to other project team members as soon as feasible to retain and protect the field data. During soil boring advancement, document all drilling events in field notebook, including blow counts (number of blows required to advance split-spoon sampler in 6-inch increments) and work stoppages. Blow counts will not be available if Rotasonic, dual-rotary, or direct-push methods are used. When drilling in bedrock, the rate of penetration (minutes per foot) is recorded.

4. If it is necessary to install a monitor well into a permeable zone below a confining layer, particularly if the deeper zone is believed to have water quality that differs significantly from the zone above the confining layer, then a telescopic well construction should be considered. In this case, the borehole is advanced approximately 3 to 5 feet into the top of the confining layer, and a permanent casing (typically PVC, black steel or stainless steel) is installed into the socket drilled into the top of the confining layer. The casing is then grouted in place. The preferred methods of grouting telescoping casings include: pressure-injection grouting using an inflatable packer installed temporarily into the base of the casing, such that grout is injected out the bottom of the casing until it is observed at ground surface outside the casing; displacement-method grouting (also known as the Halliburton method), which entails filling the casing with grout and displacing the grout out the bottom of the casing by pushing a drillable plug, typically made of wood to the bottom of the casing, following by tremie grouting the remainder of the annulus outside the casing; or tremie grouting the annulus surrounding the casing using a tremie pipe installed to the base of the borehole. In all three cases, the casing is grouted to the ground

surface, and the grout is allowed to set prior to drilling deeper through the casing. Site-specific criteria and work plans should be created for the completion of non-standard monitoring wells, including telescopic wells.

5. In consolidated formations such as competent bedrock, a monitoring well may be completed with an open borehole interval without a screen and sandpack. In these cases, the borehole is advanced to the targeted depth of the top of the open interval. A permanent casing is then grouted in place following the procedures described in Step 4 above. After the grout sets, the borehole is advanced by drilling through the permanent casing to the targeted bottom depth of the open interval, which then serves as the monitoring interval for the well. If open-borehole interval stability is found to be questionable or if a specific depth interval is later selected for monitoring, a screened monitoring well may later be installed within the open-borehole interval, depending on the annular space and well diameter requirements.

6. Before installing a screened well – or after drilling an open-bedrock well –, it is important to confirm that the borehole has been advanced into the saturated zone. This is particularly important for wells installed to monitor the water table and/or the shallow saturated zone, as the capillary fringe may cause soils above the water table to appear saturated. If one or more previously installed monitoring wells exist nearby, use the depth to water at such well(s) to estimate the water-table depth at the new borehole location.

   To verify that the borehole has been advanced into the saturated zone, it is necessary to measure the water level in the borehole. For boreholes drilled without using water (e.g., hollow-stem auger, cable-tool, air rotary, air hammer), verify the presence of groundwater (and /or LNAPL, if applicable) in the borehole using an electronic water level probe, oil-water interface probe, or a new or decontaminated bailer. For boreholes drilled using water (e.g., drive and wash, spun-casing with roller-bit wash, rotasonic, or water rotary with core or roller bit), monitor the water level in the borehole as it re-equilibrates to the static level. In low-permeability units like clay, fine-grained glacial tills, shale and other bedrock formations, it may be necessary to wait overnight to allow the water level to equilibrate. To the extent practicable, ensure that the depth of the well below the apparent water table is deep enough so that the installed well can monitor groundwater year-round, accounting for seasonal water-table fluctuations. In most cases, the well should be installed at least five feet below the water-table depth, determined as described above. When in doubt, err on the side of slightly deeper well installation.

If necessary, the borehole should be drilled deeper to ensure that the well may intersects the water table or a permeable water-bearing zone.

7. Upon completing the borehole to the desired depth, if a screened well construction is desired, install the monitoring well by lowering the screen and casing assembly with sump through the augers or casing. Monitoring wells typically will be constructed of 2-inch-diameter, flush-threaded PVC or stainless steel slotted well screen and blank riser casing. Smaller diameters may be used if wells are installed using direct-push methodology or if multiple wells are to be installed in a single borehole. The screen length will be specified in the Work Plan or FSP based on regulatory requirements and specific monitoring objectives. Monitoring well screens are usually 5 to 10 feet long, but may be up to 25 feet long in very low permeability, thick geologic formations. The screen length will depend on the purpose for the well and the objectives of the groundwater investigation. Typically, the slot size will be 0.010 inch and the sand pack will be 20-40, Morie No. 0, or equivalent. In very fine-grained formations where sample turbidity needs to be minimized, it may be preferred to use a 0.006-inch slot size and 30-65, Morie No. 00, or equivalent sand pack. Alternatively, where monitoring wells are installed in coarse-grained deposits and higher well yield is required, a 0.020-inch slot size and 10-20, Morie No. 1, or equivalent sand pack may be preferred. To the extent practicable, the slot size and sand pack gradation may be predetermined in the Work Plan or FSP based on site-specific grain-size analysis or other geologic considerations or monitoring objectives. A blank sump may be attached below the well screen if the well is being installed for DNAPL recovery/monitoring purposes. If so, the annular space around the sump will be backfilled with neat cement grout to the bottom of the well screen prior to placing the sand pack around the screen. A blank riser will extend from the top of the screen to approximately 2.5 feet above grade or, if necessary, just below grade where conditions warrant a flush-mounted monitoring well. For wells greater than 50 feet deep, centralizers may be desired to assist in centralizing the monitoring well in the borehole during construction.

8. When the monitoring well assembly has been set in place and the grout has been placed around the sump (if any), place a washed silica sand pack in the annular space from the bottom of the boring to a height of 1 to 2 feet above the top of the well screen. The sand pack is placed and drilling equipment extracted in increments until the top of the sand pack is at the appropriate depth. The sand pack will be consistent with the screen slot size and the soil particle size in the screened interval, as specified in the Work Plan or FSP. A hydrated bentonite seal (a minimum of 2 feet thick) will then be placed in the annular space above the sand pack. If non-hydrated bentonite is used, the bentonite

should be permitted to hydrate in place for a minimum of 30 minutes before proceeding. No coated bentonite pellets will be used in monitoring well drilling or construction. Potable water may be added to hydrate the bentonite if the seal is above the water table. Monitor the placement of the sand pack and bentonite with a weighted tape measure. During the extraction of the augers or casing, a cement/bentonite or neat cement grout will be placed in the annular space from the bentonite seal to a depth approximately 2 feet bgs.

9. Place a locking, steel protective casing (extended at least 1.5 feet below grade and 2 feet above grade) over the riser casing and secure with a neat cement seal. Alternatively, for flush-mount completions, place a steel curb box with a bolt-down lid over the riser casing and secure with a neat cement seal. In either case, the cement seal will extend approximately 1.5 to 2.0 feet below grade and laterally at least 1 foot in all directions from the protective casing, and should slope gently away to promote drainage away from the well. Monitoring wells will be labeled with the appropriate designation on both the inner and outer well casings or inside of the curb box lid.

   When an above-grade completion is used, the PVC riser will be sealed using an expandable locking plug and the top of the well will be vented by drilling a small-diameter (1/8 inch) hole near the top of the well casing or through the locking plug, or by cutting a vertical slot in the top of the well casing. When a flush-mount installation is used, the PVC riser will be sealed using an unvented, expandable locking plug.

10. During well installation, record construction details and actual measurements relayed by the drilling contractor and tabulate materials used (e.g., screen and riser footages; bags of bentonite, cement, and sand) in the field notebook.

11. After completing the well installation, lock the well, clean the area, and dispose of materials in accordance with the procedures outlined in Section VII below.

Direct-Push Method

The direct-push drilling method may also be used to complete soil borings and install monitoring wells. Examples of this technique include the Diedrich ESP vibratory probe system, GeoProbe®, or AMS Power Probe® dual-tube system. Environmental probe systems typically use a hydraulically operated percussion hammer. Depending on the equipment used, the hammer delivers 140- to 350-foot pounds of energy with each blow. The hammer provides the force needed to penetrate very stiff/medium dense soil formations. The hammer simultaneously advances an outer steel casing that contains a dual-tube liner for sampling soil. The outside diameter (OD) of the outer casing ranges from 1.75 to 2.4 inches and the OD of the inner sampling tube ranges from 1.1 to 1.8 inches. The outer casing isolates shallow layers and permits the unit to continue to probe at depth. The double-rod system provides a borehole that may be tremie-grouted from the bottom up. Alternatively, the inside diameter (ID) of the steel casing provides clearance for the installation of small-diameter (e.g., 0.75- to 1-inch ID) micro-wells. The procedures for installing monitoring wells in soil using the direct-push method are described below.

1. Locate boring/well location, establish work zone, and set up sample equipment decontamination area.

2. Advance soil boring to designated depth, collecting samples at intervals specified in the Work Plan. Samples will be collected using dedicated, disposable, plastic liners. Describe samples in accordance with the procedures outlined in Step 3 above. Collect samples for laboratory analysis as specified in the Work Plan and/or FSP.

3. Upon advancing the borehole to the desired depth, install the micro-well through the inner drill casing. The micro-well will consist of approximately 1-inch ID PVC or stainless steel slotted screen and blank riser. The sand pack, bentonite seal, and cement/bentonite grout will be installed as described, where applicable, in Step 7 and 8 above.

4. Install protective steel casing or flush-mount, as appropriate, as described in Step 9 above. During well installation, record construction details and tabulate materials used.

5. After completing the well installation, lock the well, clean the area, and dispose of materials in accordance with the procedures outlined in Section VII below.

Driven Well Point Installation

Well points will be installed by pushing or driving using a drilling rig or direct-push rig, or hand-driven where possible. The well point construction materials will consist of a 1- to 2-inch-diameter threaded steel casing with either 0.010- or 0.020-inch slotted stainless steel screen. The screen length will vary depending on the hydrogeologic conditions of the site. The casings will be joined together with threaded couplings and the terminal end will consist of a steel well point. Because they are driven or pushed to the desired depth, well points do not have annular backfill materials such as sand pack or grout.

VII. Waste Management

Investigation-derived wastes (IDW), including soil cuttings and excess drilling fluids (if used), decontamination liquids, and disposable materials (well material packages, PPE, etc.), will be placed in clearly labeled, appropriate containers, or managed as otherwise specified in the Work Plan, FSP, and/or IDW management SOP.

VIII. Data Recording and Management

Drilling activities will be documented in a field notebook. Pertinent information will include personnel present on site, times of arrival and departure, significant weather conditions, timing of well installation activities, soil descriptions, well construction specifications (screen and riser material and diameter, sump length, screen length and slot size, riser length, sand pack type), and quantities of materials used. In addition, the locations of newly-installed wells will be documented photographically or in a site sketch. If appropriate, a measuring wheel or engineer's tape will be used to determine approximate distances between important site features.

The well or piezometer location, ground surface elevation, and inner and outer casing elevations will be surveyed using the method specified in the site Work Plan. Generally, a local baseline control will be set up. This local baseline control can then be tied into the appropriate vertical and horizontal datum, such as the National Geodetic Vertical Datum of 1929 or 1988 and the State Plane Coordinate System. At a minimum, the elevation of the top of the inner casing used for water-level measurements should be measured to the nearest 0.01 foot. Elevations will be established in relation to the National Geodetic Vertical Datum of 1929. A permanent mark will be placed on top of the inner casing to mark the point for water-level measurements.

IX. Quality Assurance

All drilling equipment and associated tools (including augers, drill rods, sampling equipment, wrenches, and any other equipment or tools) that may have come in contact with soil will be cleaned in accordance with the procedures outlined in the appropriate SOP. Well materials will also be cleaned prior to well installation.

X. References

American Society of Testing and Materials (ASTM) D 1586 - *Standard Test Method for Penetration Test and Split-Barrel Sampling of Soils*.

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Soil Drilling and Sample Collection

Rev. #: 2

Rev Date: March 8, 2011

Approval Signatures

Prepared by: ____________________ Date: 03/08/2011

Reviewed by: ____________________ Date: 03/08/2011
(Technical Expert)

I. Scope and Application

Overburden drilling is commonly performed using the hollow-stem auger drilling method. Other drilling methods suitable for overburden drilling, which are sometimes necessary due to site-specific geologic conditions, include: drive-and-wash, spun casing, Rotasonic, dual-rotary (Barber Rig), and fluid/mud rotary. Direct-push techniques (e.g., Geoprobe or cone penetrometer) may also be used. The drilling method to be used at a given site will be selected based on site-specific consideration of anticipated drilling depths, site or regional geologic knowledge, types of sampling to be conducted, required sample quality and volume, and cost.

No oils or grease will be used on equipment introduced into the boring (e.g., drill rod, casing, or sampling tools).

II. Personnel Qualifications

The Project Manager (a qualified geologist, environmental scientist, or engineer) will identify the appropriate soil boring locations, depth and soil sample intervals in a written plan.

Personnel responsible for overseeing drilling operations must have at least 16 hours of prior training overseeing drilling activities with an experienced geologist, environmental scientist, or engineer with at least 2 years of prior experience.

III. Equipment List

The following materials will be available during soil boring and sampling activities, as required:

- Site Plan with proposed soil boring/well locations;
- Work Plan or Field Sampling Plan (FSP), and site Health and Safety Plan (HASP);
- personal protective equipment (PPE), as required by the HASP;
- drilling equipment required by the American Society for Testing and Materials (ASTM) D 1586, when performing split-spoon sampling;
- disposable plastic liners, when drilling with direct-push equipment;
- appropriate soil sampling equipment (e.g., stainless steel spatulas, knife);

- equipment cleaning materials;
- appropriate sample containers and labels;
- chain-of-custody forms;
- insulated coolers with ice, when collecting samples requiring preservation by chilling;
- photoionization detector (PID) or flame ionization detector (FID); and
- field notebook and/or personal digital assistant (PDA).

IV. Cautions

Prior to beginning field work, underground utilities in the vicinity of the drilling areas will be identified by one of the following three actions (lines of evidence):

- Contact the State One Call
- Obtain a detailed site utility plan drawn to scale, preferably an “as-built” plan
- Conduct a detailed visual site inspection

In the event that one or more of the above lines of evidence cannot be conducted, or if the accuracy of utility location is questionable, a minimum of one additional line of evidence will be utilized as appropriate or suitable to the conditions. Examples of additional lines of evidence include but are not limited to:

- Private utility locating service
- Research of state, county or municipal utility records and maps including computer drawn maps or geographical information systems (GIS)
- Contact with the utility provider to obtain their utility location records
- Hand augering or digging
- Hydro-knife
- Air-knife
- Radio Frequency Detector (RFD)

- Ground Penetrating Radar (GPR)

- Any other method that may give ample evidence of the presence or location of subgrade utilities.

Overhead power lines also present risks and the following safe clearance must be maintained from them.

Power Line Voltage Phase to Phase (kV)	Minimum Safe Clearance (feet)
50 or below	10
Above 50 to 200	15
Above 200 to 350	20
Above 350 to 500	25
Above 500 to 750	35
Above 750 to 1,000	35

ANSI Standard B30.5-1994, 5-3.4.5

Avoid using drilling fluids or materials that could impact groundwater or soil quality, or could be incompatible with the subsurface conditions.

Water used for drilling and sampling of soil or bedrock, decontamination of drilling/sampling equipment, or grouting boreholes upon completion will be of a quality acceptable for project objectives. Testing of water supply should be considered.

Specifications of materials used for backfilling borehole will be obtained, reviewed and approved to meet project quality objectives.

V. Health and Safety Considerations

Field activities associated with overburden drilling and soil sampling will be performed in accordance with a site-specific HASP, a copy of which will be present on site during such activities.

VI. Procedure

Drilling Procedures

The drilling contractor will be responsible for obtaining accurate and representative samples; informing the supervising geologist of changes in drilling pressure; and keeping a separate general log of soils encountered, including blow counts (i.e., the number of blows from a soil sampling drive weight [140 pounds] required to drive the split-barrel sampler in 6-inch increments). The term “samples” means soil materials from particular depth intervals, whether or not portions of these materials are submitted for laboratory analysis. Records will also be kept of occurrences of premature refusal due to boulders or construction materials that may have been used as fill. Where a boring cannot be advanced to the desired depth, the boring will be abandoned and an additional boring will be advanced at an adjacent location to obtain the required sample. Where it is desirable to avoid leaving vertical connections between depth intervals, the borehole will be sealed using cement and/or bentonite. Multiple refusals may lead to a decision by the supervising geologist to abandon that sampling location.

Soil Characterization Procedures

Soils encountered while drilling soil borings will be collected using one of the following methods:

- 2-inch split-barrel (split-spoon) sampler, if using the ASTM D 1586 - Standard Test Method for Penetration Test and Split-Barrel Sampling of Soils

- Plastic internal soil sample sleeves if using direct-push drilling.

Soils are typically field screened with an FID or PID at sites where volatile organic compounds are present in the subsurface. Field screening is performed using one of the following methods:

- Upon opening the sampler, the soil is split open and the PID or FID probe is placed in the opening and covered with a gloved hand. Such readings should be obtained at several locations along the length of the sample

- A portion of the collected soil is placed in a jar, which is covered with aluminum foil, sealed, and allowed to warm to room temperature. After warming, the cover is removed, the foil is pieced with the FID or PID probe, and a reading is obtained.

Samples selected for laboratory analysis will be handled, packed, and shipped in accordance with the procedures outlined in the Work Plan, FSP, or Chain-of-Custody, Handling, Packing, and Shipping SOP.

A geologist will be onsite during drilling and sampling operations to describe each soil interval on the soil boring log, including:

- percent recovery;
- structure and degree of sample disturbance;
- soil type;
- color;
- moisture condition;
- density;
- grain-size;
- consistency; and
- other observations, particularly relating to the presence of waste materials

Further details regarding geologic description of soils are presented in the Soil Description SOP.

Particular care will be taken to fully describe any sheens observed, oil saturation, staining, discoloration, evidence of chemical impacts, or unnatural materials.

VII. Waste Management

Water generated during cleaning procedures will be collected and contained onsite in appropriate containers for future analysis and appropriate disposal.

PPE (such as gloves, disposable clothing, and other disposable equipment) resulting from personnel cleaning procedures and soil sampling/handling activities will be placed in plastic bags. These bags will be transferred into appropriately labeled 55-gallon drums or a covered roll-off box for appropriate disposal.

Soil materials will be placed in sealed 55-gallon steel drums or covered roll-off boxes and stored in a secured area. Once full, the material will be analyzed to determine the appropriate disposal method.

VIII. Data Recording and Management

The supervising geologist or scientist will be responsible for documenting drilling events using a bound field notebook and/or PDA to record all relevant information in a clear and concise format. The record of drilling events will include:

- start and finish dates of drilling;
- name and location of project;
- project number, client, and site location;
- sample number and depths;
- blow counts and recovery;
- depth to water;
- type of drilling method;
- drilling equipment specifications, including the diameter of drilling tools;
- documentation of any elevated organic vapor readings;
- names of drillers, inspectors, or other people onsite; and
- weather conditions.

IX. Quality Assurance

Equipment will be cleaned prior to use onsite, between each drilling location, and prior to leaving the site. Drilling equipment and associated tools, including augers, drill rods, sampling equipment, wrenches, and other equipment or tools that may have come in contact with soils and/or waste materials will be cleaned with high-pressure steam-cleaning equipment using a potable water source. The drilling equipment will be cleaned in an area designated by the supervising engineer or geologist that is located outside of the work zone. More elaborate cleaning procedures may be required for reusable soil samplers (split-spoons) when soil samples are obtained for laboratory analysis of chemical constituents.

X. References

American Society of Testing and Materials (ASTM) D 1586 - *Standard Test Method for Penetration Test and Split-Barrel Sampling of Soils*.

ARCADIS

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Chain-of-Custody, Handling, Packing and Shipping

Rev. #: 2

Rev Date: March 6, 2009

Approval Signatures

Prepared by: ______________________ Date: 3/6/09
Caron Koll

Reviewed by: ______________________ Date: 3/6/09
Jane Kennedy(Technical Expert)

I. Scope and Application

This Standard Operating Procedure (SOP) describes the chain-of-custody, handling, packing, and shipping procedures for the management of samples to decrease the potential for cross-contamination, tampering, mis-identification, and breakage, and to insure that samples are maintained in a controlled environment from the time of collection until receipt by the analytical laboratory.

II. Personnel Qualifications

ARCADIS field sampling personnel will have current health and safety training, including 40-hour HAZWOPER training, Department of Transportation (DOT) training, site supervisor training, and site-specific training, as needed. In addition, ARCADIS field sampling personnel will be versed in the relevant SOPs and possess the skills and experience necessary to successfully complete the desired field work.

III. Equipment List

The following list provides materials that may be required for each project. Project documents and sample collection requirements should be reviewed prior to initiating field operations:

- indelible ink pens (black or blue);
- polyethylene bags (resealable-type);
- clear packing tape, strapping tape, duct tape;
- chain of custody
- DOT shipping forms, as applicable
- custody seals or tape;
- appropriate sample containers and labels,;
- insulated coolers of adequate size for samples and sufficient ice to maintain 4°C during collection and transfer of samples;
- wet ice;
- cushioning and absorbent material (i.e., bubble wrap or bags);

- temperature blank
- sample return shipping papers and addresses; and
- field notebook.

IV. Cautions

Review project requirements and select appropriate supplies prior to field mobilization.

Insure that appropriate sample containers with applicable preservatives, coolers, and packing material have been supplied by the laboratory.

Understand the offsite transfer requirements for the facility at which samples are collected.

If overnight courier service is required schedule pick-up or know where the drop-off service center is located and the hours of operation. Prior to using air transportation, confirm air shipment is acceptable under DOT and International Air Transport Association (IATA) regulation

Schedule pick-up time for laboratory courier or know location of laboratory/service center and hours of operation.

Understand DOT and IATA shipping requirements and evaluate dangerous goods shipping regulations relative to the samples being collected (i.e. complete an ARCADIS shipping determination). Review the ARCADIS SOPs for shipping, packaging and labeling of dangerous goods. Potential samples requiring compliance with this DOT regulation include:

- Methanol preservation for Volatile Organic Compounds in soil samples
- Non-aqueous phase liquids (NAPL)

V. Health and Safety Considerations

Follow health and safety procedures outlined in the project/site Health and Safety Plan (HASP).

Use caution and appropriate cut resistant gloves when tightening lids to 40 mL vials. These vials can break while tightening and can lacerate hand. Amber vials (thinner glass) are more prone to breakage.

Some sample containers contain preservatives.

- The preservatives must be retained in the sample container and should in no instance be rinsed out.
- Preservatives may be corrosive and standard care should be exercised to reduce potential contact to personnel skin or clothing. Follow project safety procedures if spillage is observed.
- If sample container caps are broken discard the bottle. Do not use for sample collection.

VI. Procedure

Chain-of-Custody Procedures

1. Prior to collecting samples, complete the chain-of-custody record header information by filling in the project number, project name, and the name(s) of the sampling technician(s) and other relevant project information. Attachment 1 provides an example chain-o- custody record

2. Chain-of-custody information MUST be printed legibly using indelible ink (black or blue).

3. After sample collection, enter the individual sample information on the chain-of-custody:

   a. Sample Identification indicates the well number or soil location that the sample was collected from. Appropriate values for this field include well locations, grid points, or soil boring identification numbers (e.g., MW-3, X-20, SB-30). When the depth interval is included, the complete sample ID would be “SB-30 (0.5-1.0) where the depth interval is in feet. Please note it is very important that the use of hyphens in sample names and depth units (i.e., feet or inches) remain consistent for all samples entered on the chain-of-custody form. DO NOT use the apostrophe or quotes in the sample ID. Sample names may also use the abbreviations “FB,” “TB,” and “DUP” as prefixes or suffixes to indicate that the sample is a field blank, trip blank, or field duplicate, respectively. NOTE: The sample nomenclature may be dictated by the project database and require unique identification for each sample collected for the project. Consult the project data management plan for additional information regarding sample identification.

b. List the date of sample collection. The date format to be followed should be mm/dd/yy (e.g., 03/07/09) or mm/dd/yyyy (e.g. 03/07/2009).

c. List the time that the sample was collected. The time value should be presented using military format. For example, 3:15 P.M. should be entered as 15:15.

d. The composite field should be checked if the sample is a composite over a period of time or from several different locations and mixed prior to placing in sample containers.

e. The "Grab". field should be marked with an "X" if the sample was collected as an individual grab sample. (e.g. monitoring well sample or soil interval).

f. Any sample preservation should be noted.

g. The analytical parameters that the samples are being analyzed for should be written legibly on the diagonal lines. As much detail as possible should be presented to allow the analytical laboratory to properly analyze the samples. For example, polychlorinated biphenyl (PCB) analyses may be represented by entering "PCBs" or "Method 8082." Multiple methods and/or analytical parameters may be combined for each column (e.g., PCBs/VOCs/SVOCs or 8082/8260/8270). These columns should also be used to present project-specific parameter lists (e.g., Appendix IX+3 target analyte list. Each sample that requires a particular parameter analysis will be identified by placing the number of containers in the appropriate analytical parameter column. For metals in particular, indicate which metals are required.

h. Number of containers for each method requested. This information may be included under the parameter or as a total for the sample based on the chain of custody form used.

i. Note which samples should be used for site specific matrix spikes.

j. Indicate any special project requirements.

k. Indicate turnaround time required.

l. Provide contact name and phone number in the event that problems are encountered when samples are received at the laboratory.

m. If available attach the Laboratory Task Order or Work Authorization forms

n. The remarks field should be used to communicate special analytical requirements to the laboratory. These requirements may be on a per sample basis such as "extract and hold sample until notified," or may be used to inform the laboratory of special reporting requirements for the entire sample delivery group (SDG). Reporting requirements that should be specified in the remarks column include: 1) turnaround time; 2) contact and address where data reports should be sent; 3) name of laboratory project manager; and 4) type of sample preservation used.

o. The "Relinquished By" field should contain the signature of the sampling technician who relinquished custody of the samples to the shipping courier or the analytical laboratory.

p. The "Date" field following the signature block indicates the date the samples were relinquished. The date format should be mm/dd/yyyy (e.g., 03/07/2005).

q. The "Time" field following the signature block indicates the time that the samples were relinquished. The time value should be presented using military format. For example, 3:15 P.M. should be entered as 15:15.

r. The "Received By" section is signed by sample courier or laboratory representative who received the samples from the sampling technician or it is signed upon laboratory receipt from the overnight courier service.

3. Complete as many chain-of-custody forms as necessary to properly document the collection and transfer of the samples to the analytical laboratory.

4. Upon completing the chain-of-custody forms, forward two copies to the analytical laboratory and retain one copy for the field records.

5. If electronic chain-of-custody forms are utilized, sign the form and make 1 copy for ARCADIS internal records and forward the original with the samples to the laboratory.

Handling Procedures

1. After completing the sample collection procedures, record the following information in the field notebook with indelible ink:

   - project number and site name;
   - sample identification code and other sample identification information, if appropriate;
   - sampling method;
   - date;
   - name of sampler(s);
   - time;
   - location (project reference);
   - location of field duplicates and both sample identifications;
   - locations that field QC samples were collected including equipment blanks, field blanks and additional sample volume for matrix spikes; and
   - any comments.

2. Complete the sample label with the following information in indelible ink:

   - sample type (e.g., surface water);
   - sample identification code and other sample identification information, if applicable;
   - analysis required;
   - date;
   - time sampled; and
   - initials of sampling personnel;

- sample matrix; and
- preservative added, if applicable.

3. Cover the label with clear packing tape to secure the label onto the container and to protect the label from liquid.

4. Confirm that all caps on the sample containers are secure and tightly closed.

5. In some instances it may be necessary to wrap the sample container cap with clear packing tape to prevent it from becoming loose.

6. For some projects individual custody seals may be required. Custody seal evidence tape may be placed on the shipping container or they may be placed on each sample container such that the cooler or cap cannot be opened without breaking the custody seal. The custody seal should be initialed and dated prior to relinquishing the samples.

Packing Procedures

Following collection, samples must be placed on wet ice to initiate cooling to 4°C immediately. Retain samples on ice until ready to pack for shipment to the laboratory.

1. Secure the outside and inside of the drain plug at the bottom of the cooler being used for sample transport with "Duct" tape.

2. Place a new large heavy duty plastic garbage bag inside each cooler

3. Place each sample bottle wrapped in bubble wrap inside the garbage bag. VOC vials may be grouped by sample in individual resealable plastic bags). If a cooler temperature blank is supplied by the laboratory, it should be packaged following the same procedures as the samples. If the laboratory did not include a temperature blank, do not add one. Place 1 to 2 inches of cushioning material (i.e., vermiculite) at the bottom of the cooler.

4. Place the sealed sample containers upright in the cooler.

5. Package ice in large resealable plastic bags and place inside the large garbage bag in the cooler. Samples placed on ice will be cooled to and maintained at a temperature of approximately 4°C.

6. Fill the remaining space in the cooler with cushioning material such as bubble wrap. The cooler must be securely packed and cushioned in an upright position and be surrounded (Note: to comply with 49 CFR 173.4, filled cooler must not exceed 64 pounds).

7. Place the completed chain-of-custody record(s) in a large resealable bag and tape the bag to the inside of the cooler lid.

8. Close the lid of the cooler and fasten with packing tape.

9. Wrap strapping tape around both ends of the cooler.

10. Mark the cooler on the outside with the following information: shipping address, return address, “Fragile, Handle with Care” labels on the top and on one side, and arrows indicating “This Side Up” on two adjacent sides.

11. Place custody seal evidence tape over front right and back left of the cooler lid, initial and date, then cover with clear plastic tape.

Note: Procedure numbers 2, 3, 5, and 6 may be modified in cases where laboratories provide customized shipping coolers. These cooler types are designed so the sample bottles and ice packs fit snugly within preformed styrofoam cushioning and insulating packing material.

Shipping Procedures

1. All samples will be delivered by an express carrier within 48 hours of sample collection. Alternatively, samples may be delivered directly to the laboratory or laboratory service center or a laboratory courier may be used for sample pickup.

2. If parameters with short holding times are required (e.g., VOCs [EnCore™ Sampler], nitrate, nitrite, ortho-phosphate and BOD), sampling personnel will take precautions to ship or deliver samples to the laboratory so that the holding times will not be exceeded.

3. Samples must be maintained at 4°C±2°C until shipment and through receipt at the laboratory

4. All shipments must be in accordance with DOT regulations and ARCADIS dangerous goods shipping SOPs.

5. When the samples are received by the laboratory, laboratory personnel will complete the chain-of-custody by recording the date and time of receipt of samples, measuring and recording the internal temperature of the shipping container, and checking the sample identification numbers on the containers to ensure they correspond with the chain-of-custody forms.

Any deviations between the chain-of-custody and the sample containers, broken containers, or temperature excursions will be communicated to ARCADIS immediately by the laboratory.

VII. Waste Management

Not applicable

VIII. Data Recording and Management

Chain-of-custody records will be transmitted to the ARCADIS PM or designee at the end of each day unless otherwise directed by the ARCADIS PM. The sampling team leader retains copies of the chain-of-custody forms for filing in . the project file. Record retention shall be in accordance with project requirements.

IX. Quality Assurance

Chain-of-custody forms will be legibly completed in accordance with the applicable project documents such as Sampling and Analysis Plan (SAP), Quality Assurance Project Plan (QAPP), Work Plan, or other project guidance documents. A copy of the completed chain-of-custody form will be sent to the ARCADIS Project Manager or designee for review.

X. References

Not Applicable

Attachment 1

ARCADIS
Infrastructure, environment, facilities

ID#:

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Page ___ of ___

Lab Work Order #

Send Results to:		
Contact & Company Name:	Telephone:	
Address:	Fax:	
City State Zip	E-mail Address:	
Project Name/Location (City, State):	Project #:	
Sampler's Printed Name:	Sampler's Signature:	

Preservative							
Filtered (✓)							
# of Containers							
Container Information							

PARAMETER ANALYSIS & METHOD

Keys

Preservation Key:
A. H_2SO_4
B. HCL
C. HNO_3
D. NaOH
E. None
F. Other: ________
G. Other: ________
H. Other: ________

Container Information Key:
1. 40 ml Vial
2. 1 L Amber
3. 250 ml Plastic
4. 500 ml Plastic
5. Encore
6. 2 oz. Glass
7. 4 oz. Glass
8. 8 oz. Glass
9. Other: ________
10. Other: ________

Matrix Key:
SO - Soil; SE - Sediment; NL - NAPL/Oil
W - Water; SL - Sludge; SW - Sample Wipe
T - Tissue; A - Air; Other: ________

Sample ID	Collection Date	Collection Time	Type (✓) Comp	Type (✓) Grab	Matrix									REMARKS

Special Instructions/Comments:

☐ **Special QA/QC Instructions(✓):**

Laboratory Information and Receipt		Relinquished By	Received By	Relinquished By	Laboratory Received By
Lab Name:	Cooler Custody Seal (✓)	Printed Name:	Printed Name:	Printed Name:	Printed Name:
☐ Cooler packed with ice (✓)	☐ Intact ☐ Not Intact	Signature:	Signature:	Signature:	Signature:
Specify Turnaround Requirements:	Sample Receipt:	Firm:	Firm/Courier:	Firm/Courier:	Firm:
Shipping Tracking #:	Condition/Cooler Temp: ________	Date/Time:	Date/Time:	Date/Time:	Date/Time:

20730826 CofC AR Form 01.12.2007 **Distribution:** **WHITE – Laboratory returns with results** **YELLOW – Lab copy** **PINK – Retained by BBL**

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Monitoring Well Development

Rev. #: 2.2

Rev. Date: March 22, 2010

Approval Signatures

Prepared by: ______________________ Date: 03/22/2010

Reviewed by: ______________________ Date: 03/22/2010
(Technical Expert)

I. Scope and Application

Monitoring wells (or piezometers, well points, or micro-wells) will be developed to clear them of fine-grained sediment to enhance the hydraulic connection between the well and the surrounding geologic formation. Development will be accomplished by evacuating well water by either pumping or bailing. Prior to pumping or bailing, the screened interval will be gently surged using a surge block, bailer, or inertia pump with optional surgeblock fitting as appropriate. Accumulated sediment in the bottom of the well (if present) will be removed by bailing with a bottom-loading bailer or via pumping using a submersible or inertia pump with optional surge-block fitting. Wells will also be gently brushed with a weighted brush to assist in removing loose debris, silt or flock attached to the inside of the well riser and/or screen prior to development. Pumping methods will be selected based on site-specific geologic conditions, anticipated well yield, water table depth, and groundwater monitoring objectives, and may include one or more of the following:

- submersible pump
- inertial pump (Waterra™ pump or equivalent)
- bladder pump
- peristaltic pump
- centrifugal pump

When developing a well using the pumping method, the pump (or, with inertial pumps, the tubing) is lowered to the screened portion of the well. During purging, the pump or tubing is moved up and down the screened interval until the well yields relatively clear water.

Submersible pumps have a motor-driven impeller that pushes the groundwater through discharge tubing to the ground surface. Inertial pumps have a check valve at the bottom of stiff tubing which, when operated up and down, lifts water to the ground surface. Bladder pumps have a bottom check valve and a flexible internal bladder that fills from below and is then compressed using pressurized air to force water out the top of the bladder through the discharge tubing to the ground surface. These three types of pumps have a wide range of applicability in terms of well depth and water depth.

Centrifugal and peristaltic pumps use atmospheric pressure to lift water from the well, and therefore can only be practically used where the depth to water is less than 25 feet.

II. Personnel Qualifications

Monitoring well development activities will be performed by persons who have been trained in proper well development procedures under the guidance of an experienced field geologist, engineer, or technician.

III. Equipment List

Materials for monitoring well development using a pump include the following:

- health and safety equipment, as required by the site Health and Safety Plan (HASP):
- cleaning equipment
- photoionization detector (PID) to measure headspace vapors
- pump
- polyethylene pump discharge tubing
- plastic sheeting
- power source (generator or battery)
- field notebook and/or personal digital assistant (PDA)
- graduated pails
- appropriate containers

- monitoring well keys
- water level indicator

Materials for monitoring well development using a bailer include the following:

- personal protective equipment (PPE) as required by the HASP
- cleaning equipment
- PID to measure headspace vapors
- bottom-loading bailer, sand bailer
- polypropylene or nylon rope
- plastic sheeting
- graduated pails
- appropriate containers
- keys to wells
- field notebook and/or PDA
- water level indicator
- weighted brush for well brushing

IV. Cautions

Where surging is performed to assist in removing fine-grained material from the sand pack, surging must be performed in a gentle manner. Excessive suction could promote fine-grained sediment entry into the outside of the sand pack from the formation.

Avoid using development fluids or materials that could impact groundwater or soil quality, or could be incompatible with the subsurface conditions.

In some cases it may be necessary to add potable water to a well to allow surging and development, especially for new monitoring wells installed in low permeability formations. Before adding potable water to a well, the Project Manager (PM) must be notified and the PM shall make the decision regarding the appropriateness and applicability of adding potable water to a well during well development procedures. If potable water is to be added to a well as part of development, the potable water source should be sampled and analyzed for constituents of concern, and the results evaluated by the PM prior to adding the potable water to the well. If potable water is added to a well for development purposes, at the end of development the well will be purged dry to remove the potable water, or if the well no longer goes dry then the well will be purged to remove at least three times the volume of potable water that was added.

V. Health and Safety Considerations

Field activities associated with monitoring well development will be performed in accordance with a site-specific HASP, a copy of which will be present on site during such activities.

VI. Procedure

The procedures for monitoring well development are described below. (Note: Steps 7, 8, and 10 can be performed at the same time using an inertial pump with a surge-block fitting.)

1. Don appropriate PPE (as required by the HASP).

2. Place plastic sheeting around the well.

3. Clean all equipment entering each monitoring well, except for new, disposable materials that have not been previously used.

4. Open the well cover while standing upwind of the well, remove well cap. Insert PID probe approximately 4 to 6 inches into the casing or the well headspace and cover with gloved hand. Record the PID reading in the field notebook. If the well headspace reading is less than 5 PID units, proceed; if the headspace reading is greater than 5 PID units, screen the air within the breathing zone. If the PID reading in the breathing zone is below 5 PID units, proceed. If the PID reading is above 5 PID units, move upwind from well for 5 minutes to allow the volatiles to dissipate. Repeat the breathing zone test. If the reading is still above 5 PID units, don the appropriate respiratory protection in accordance with the requirements of the HASP. Record all PID readings.

5. Obtain an initial measurement of the depth to water and the total well depth from the reference point at the top of the well casing. Record these measurements in the field log book.

6. Prior to redeveloping older wells that may contain solid particulate debris along the inside of the well casing and screen, gently lower and raise a weighted brush along the entire length of the well screen and riser to free and assist in removing loose debris, silt or flock. Perform a minimum of 4 “passes” along the screened and cased intervals of the well below the static water level in the well. Allow the resulting suspended material to settle for a minimum of one day prior to continuing with redevelopment activities.

7. Lower a surge block or bailer into the screened portion of the well. Gently raise and lower the surge block or bailer within the screened interval of the well to force water in and out of the screen slots and sand pack. Continue surging for 15 to 30 minutes.

8. Lower a bottom-loading bailer, submersible pump, or inertia pump tubing with check valve to the bottom of the well and gently bounce the bailer, pump, pump tubing on the bottom of the well to collect/remove accumulated sediment, if any. Remove and empty the bailer, if used. Repeat until the bailed/pumped water is free of excessive sediment and the bottom of the well feels solid. Alternatively, measurement of the well depth with a water level indicator can be used to verify that sediment and/or silt has been removed to the extent practicable, based on a comparison with the well installation log or previous measurement of total well depth.

9. After surging the well and removing excess accumulated sediment from the bottom of the well, re-measure the depth-to-water and the total well depth from the reference point at the top of the well casing. Record these measurements in the field log book.

10. Remove formation water by pumping or bailing. Where pumping is used, measure and record the pre-pumping water level. Operate the pump at a relatively constant rate. Measure the pumping rate using a calibrated container and stop watch, and record the pumping rate in the field log book. Measure and record the water level in the well at least

once every 5 minutes during pumping. Note any relevant observations in terms of water color, visual level of turbidity, sheen, odors, etc. Pump or bail until termination criteria specified in the Field Sampling Plan (FSP) are reached. Record the total volume of water purged from the well.

11. If the well goes dry, stop pumping or bailing. Note the time that the well went dry. After allowing the well to recover, note the time and depth to water. Resume pumping or bailing when sufficient water has recharged the well.

12. Contain all water in appropriate containers.

13. When complete, secure the lid back on the well.

14. Place disposable materials in plastic bags for appropriate disposal and decontaminate reusable, downhole pump components and/or bailer.

VII. Waste Management

Materials generated during monitoring well installation and development will be placed in appropriate labeled containers and disposed of as described in the Work Plan or Field Sampling Plan.

VIII. Data Recording and Management

Well development activities will be documented in a proper field notebook and/or PDA. Pertinent information will include personnel present on site; times of arrival and departure; significant weather conditions; timing of well development activities; development method(s); observations of purge water color, turbidity, odor, sheen, etc.; purge rate; and water levels before and during pumping.

IX. Quality Assurance

All reused, non-disposable, downhole well development equipment will be cleaned in accordance with the procedures outlined in the Field Equipment Cleaning-Decontamination SOP.

X. References

Not applicable.

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Standard Groundwater Sampling for Monitoring Wells

Rev. #: 1

Rev Date: July 16, 2008

Approval Signatures

Prepared by: Sonya A Cadle Date: 7/16/08

Reviewed by: ______________ Date: 7/16/08
(Technical Expert)

I. Scope and Application

This Standard Operating Procedure (SOP) describes the procedures to be used to collect groundwater samples using traditional purging and sampling techniques. For low-flow purging techniques, please refer to the Low Flow Purging SOP. Monitoring wells must be developed after installation at least 1 week prior to groundwater sample collection. Monitoring wells will not be sampled until the well has been developed. During precipitation events, groundwater sampling will be discontinued until precipitation ceases or a cover has been erected over the sampling area and monitoring well.

Both filtered and unfiltered groundwater samples may be collected using this SOP. Filtered samples may be obtained using a 1.0-, 0.45-, or 0.1-micron disposable filter.

II. Personnel Qualifications

ARCADIS personnel directing, supervising, or leading groundwater sample collection activities should have a minimum of 2 years of previous groundwater sampling experience. Field employees with less than 6 months of experience should be accompanied by a supervisor (as described above) to ensure that proper sample collection techniques are employed.

III. Equipment List

The following materials shall be available, as required, during groundwater sampling:

- site plan of monitoring well locations and site Field Sampling Plan (FSP);
- appropriate health and safety equipment, as specified in the site Health and Safety Plan (HASP);
- photoionization detector (PID) or flame ionization detector (FID), as needed, in accordance with the HASP;
- monitoring well construction logs or tables and historical water level information, if available;
- dedicated plastic sheeting or other clean surface to prevent sample contact with the ground;
- if bailers are to be used in sampling:

    - appropriate dedicated bottom-loading, bottom-emptying bailers (i.e., polyvinyl chloride [PVC], Teflon, or stainless steel);
    - polypropylene rope;

- if submersible pumps are to be used in sampling:
    - dedicated tubing and other equipment necessary for purging;
    - generator or battery for operation of pumps, if required;
    - a pump selected in accordance with the FSP or Work Plan (parameter-specific [e.g., submersible, bladder, peristaltic]);
- graduated buckets to measure purge water;
- water-level or oil/water interface probe, in accordance with the FSP or Work Plan;
- conductivity/temperature/pH meter;
- down-hole dissolved oxygen meter, oxidation reduction potential meter, and/or turbidity meter, if specified in the FSP;
- water sample containers appropriate for the analytical method(s) with preservative, as needed (parameter-specific);
- filter, as needed, in accordance with the analytical method and parameter;
- appropriate blanks (trip blank supplied by the laboratory), as specified in the FSP;
- Ziploc-type freezer bags for use as ice containers;
- appropriate transport containers (coolers) with ice and appropriate labeling, packing, and shipping materials;
- appropriate groundwater sampling log (example attached);
- chain-of-custody forms;
- site map with well locations and groundwater contour maps;

- keys to wells and contingent bolt cutters for rusted locks and replacement keyed-alike locks; and

- drums or other containers for purge water, as specified by the site investigation derived waste (IDW) management plan.

IV. Cautions

If heavy precipitation occurs and no cover over the sampling area and monitoring well can be erected, sampling must be discontinued until adequate cover is provided. Rain water could contaminate groundwater samples.

Remember that field logs and some forms are considered to be legal documents. All field logs and forms should therefore be filled out in indelible ink.

It may be necessary to field filter some parameters (e.g., metals) prior to collection, depending on preservation, analytical method, and project quality objectives.

Check monitoring well logs for use of bentonite pellets. Make note of potential use of bentonite pellets on the groundwater sampling log. Coated bentonite pellets have been found to contaminate monitoring wells with elevated levels of acetone.

Store and/or stage empty and full sample containers and coolers out of direct sunlight.

To mitigate potential cross-contamination, groundwater samples are to be collected in a pre-determined order from least impacted to more impacted based on previous analytical data. If no analytical data are available, samples are to be collected in the following order:

1. First sample the upgradient well(s).

2. Next, sample the well located furthest downgradient of the interpreted or known source.

3. The remaining wells should be progressively sampled in order from downgradient to upgradient, such that the wells closest to the interpreted or known source are sampled last.

Be careful not to over-tighten lids with Teflon liners or septa (e.g., 40 mL vials). Over-tightening can impair the integrity of the seal.

V. Health and Safety Considerations

If thunder or lighting is present, discontinue sampling until 30 minutes have passed after the last occurrence of thunder or lighting.

VI. Procedure

The procedures to sample monitoring wells will be as follows:

1. Don safety equipment, as required in the HASP. Depending on site-specific security and safety considerations, this often must be done prior to entering the work area.

2. Review equipment list (Section III above) to confirm that the appropriate equipment has been acquired.

3. Record site and monitoring well identification on the groundwater sampling log, along with date, arrival time, and weather conditions. Also identify the personnel present, equipment utilized, and other relevant data requested on the log.

4. Label all sample containers with indelible ink.

5. Place plastic sheeting adjacent to the well for use as a clean work area, if conditions allow. Otherwise, prevent sampling equipment from contacting the ground or other surface that could compromise sample integrity.

6. Remove lock from well and if rusted or broken, replace with a new brass keyed-alike lock.

7. Unlock and open the well cover while standing upwind of the well. Remove well cap and place on the plastic sheeting.

8. Set the sampling device,meters, and other sampling equipment on the plastic sheeting. If a dedicated sampling device stored in the well is to be used, this may also be set temporarily on the plastic sheeting, for convenience. However, if a dedicated sampling device is stored below the water table, removing it may compromise water-level data, so water level measurements should be taken prior to removing the device.

9. Obtain a water-level depth and bottom-of-well depth using an electric well probe and record on the groundwater sampling log using indelible ink. Clean the probe(s) after each use in accord with the FSP or the equipment

decontamination SOP.

Note: Water levels may be measured at all wells prior to initiating any sampling activities, depending on FSP requirements.

10. Calculate the number of gallons of water in the well using the length of water column (in feet). Record the well volume on the groundwater sampling log using indelible ink.

11. Remove the required purge volume of water from the well (measure purge water volume in measuring buckets). The required purge volume will be three to five well volumes (the water column in the well screen and casing) unless the well runs dry, in which case, the water that comes into the well will be sampled (USEPA, 1996). In any case, the pumping rate will be decreased during sampling to limit the potential for volatilization of organics potentially present in the groundwater.

12. Field parameter measurements will be periodically collected in accord with FSP specifications. The typical time intervals of field parameter measurement are (1) after each well volume removed, and (2) before sampling. If the field parameters are being measured above-ground (rather than with a downhole probe), then the final pre-sampling parameter measurement should be collected at the reduced flow rate to be used during sampling. The physical appearance of the purged water should be noted on the groundwater sampling log. In addition, water level measurements should be collected and recorded to verify that the well purging is in accord with the guidelines set forth in the previous step.

13. Unless otherwise specified by the applicable regulatory agencies, all purge water will be contained. Contained purge water will be managed in accordance with the FSP or Work Plan. If historical concentrations in the well are less than federal or state regulated concentrations appropriate for current land use, *and permission has been granted by the oversight regulatory agency* to dispose of clean purge water on the ground next to the well(s), then purge water will be allowed to infiltrate into the ground surface downgradient from the monitoring well after the well is sampled.

14. After the appropriate purge volume of groundwater in the well has been removed, or if the well has been bailed dry and allowed to recover, obtain the groundwater sample needed for analysis with the dedicated bailer or from the dedicated sampling tubing, pour the groundwater directly from the sampling device into the appropriate container in the order of volatilization sensitivity of

the parameters sampled, and tightly screw on the cap (snug, but not too tight). The suggested order for sample parameter collection, based on volatilization sensitivity, is presented below:

a. volatile organic compounds (VOCs);

b. semi-volatile organic compounds (SVOCs);

c. polychlorinated biphenyls (PCBs)/pesticides;

d. metals; and

e. wet chemistry.

15. When sampling for volatiles, water samples will be collected directly from the bailer or dedicated tubing into 40 mL vials with Teflon-lined septa.

16. For other analytical samples, sample containers for each analyte type should be filled in the order specified by the FSP. If a bailer is used, then the sample for dissolved metals and/or filtered PCBs should either be placed directly from the bailer into a pressure filter apparatus or pumped directly from the bailer with a peristaltic pump, through an in-line filter, into the pre-preserved sample bottle. If dedicated sample tubing is used, then the filter should be installed in-line just prior to filtered sample collection.

17. If sampling for total and filtered metals and/or PCBs, a filtered and unfiltered sample will be collected. Sample filtration for the filtered sample will be performed in the field utilizing a pump prior to preservation. Attach (clamp) a new 1.0-, 0.45-, or 0.1-micron filter to the discharge tubing of the pump (note the filter flow direction). Turn the pump on and allow 100 mL (or manufacturer recommended amount) of fluid through the filter before sample collection. Dispense the filtered liquid directly into the laboratory sample bottles. If bailers are used for purging and sampling, a proper volume of purge water will be placed in a disposable or decontaminated polyethylene container and pumped through the filter and into the sample container using a peristaltic pump.

18. Place the custody seal around the cap and the sampler container, if required. Note the time on the sample label. Secure with packing material and maintain at approximately 4°C on wet ice contained in double Ziploc-type freezer bags during storage in an insulated, durable transport container.

19. Replace the well cap and lock well, or install a new lock if needed.

20. Record the time sampling procedures were completed on the appropriate field logs (using indelible ink).

21. Complete the procedures for chain-of-custody, handling, packing, and shipping. Chain-of-custody forms should be filled out and checked against the labels on the sample containers progressively after each sample is collected.

22. Place all disposable sampling materials (such as plastic sheeting, disposable tubing or bailers, and health and safety equipment) in appropriate containers.

23. If new locks were installed, forward copies of the keys to the client Project Manager (PM) and ARCADIS PM at the end of the sampling activities.

VII. Waste Management

Purge water will be managed as specified in the FSP or Work Plan, and according to state and/or federal requirements. Personal protective equipment (PPE) and decontaminated fluids will be contained separately and staged at the sampling location. Containers must be labeled at the time of collection. Labels will include date, location(s), site name, city, state, and description of matrix contained (e.g., soil, groundwater, PPE). General guidelines for IDW management are set forth in a separate IDW management SOP.

VIII. Data Recording and Management

Initial field logs and chain-of-custody records will be transmitted to the ARCADIS PM at the end of each day unless otherwise directed by the PM. The groundwater team leader retains copies of the groundwater sampling logs. All field data should be recorded in indelible ink.

IX. Quality Assurance

Field-derived quality assurance blanks will be collected as specified in the FSP, depending on the project quality objectives. Typically, field rinse blanks will be collected when non-dedicated equipment is used during groundwater sampling. Field rinse blanks will be used to confirm that decontamination procedures are sufficient and samples are representative of site conditions. Trip blanks for VOCs, which aid in the detection of contaminates from other media, sources, or the container itself, will be kept with the coolers and the sample containers throughout the sampling activities.

X. References

USEPA. 1986. RCRA Groundwater Monitoring Technical Enforcement Guidance Document (September 1986).

USEPA. 1991. Handbook Groundwater, Volume ii Methodology, Office of Research and Development, Washington, DC. USEPN62S, /6-90/016b (July, 1991).

U.S. Geological Survey (USGS). 1977. National Handbook of Recommended Methods for Water-Data Acquisition: USGS Office of Water Data Coordination. Reston, Virginia.

Imagine the result

Field Equipment Decontamination

Rev. #: 3

Rev Date: April 26, 2010

Approval Signatures

Prepared by: ______________________ Date: 4/26/2010
Keith Shepherd

Reviewed by: ______________________ Date: 4/26/2010
Richard Murphy (Technical Expert)

I. Scope and Application

Equipment decontamination is performed to ensure that sampling equipment that contacts a sample, or monitoring equipment that is brought into contact with environmental media to be sampled, is free from analytes of interest and/or constituents that would interfere with laboratory analysis for analytes of interest. Equipment must be cleaned prior to use for sampling or contact with environmental media to be sampled, and prior to shipment or storage. The effectiveness of the decontamination procedure should be verified by collecting and analyzing equipment blank samples.

The equipment cleaning procedures described herein includes pre-field, in the field, and post-field cleaning of sampling tools which will be conducted at an established equipment decontamination area (EDA) on site (as appropriate). Equipment that may require decontamination at a given site includes: soil sampling tools; groundwater, sediment, and surface-water sampling devices; water testing instruments; down-hole instruments; and other activity-specific sampling equipment. Non-disposable equipment will be cleaned before collecting each sample, between sampling events, and prior to leaving the site. Cleaning procedures for sampling equipment will be monitored by collecting equipment blank samples as specified in the applicable work plan or field sampling plan. Dedicated and/or disposable (not to be re-used) sampling equipment will not require decontamination.

II. Personnel Qualifications

ARCADIS field sampling personnel will have current health and safety training, including 40-hour HAZWOPER training, site supervisor training, and site-specific training, as needed. In addition, ARCADIS field sampling personnel will be versed in the relevant SOPs and possess the skills and experience necessary to successfully complete the desired fieldwork. The project HASP and other documents will identify any other training requirements such as site specific safety training or access control requirements.

III. Equipment List

- health and safety equipment, as required in the site Health and Safety Plan (HASP)

- distilled water

- Non-phosphate detergent such as Alconox or, if sampling for phosphorus phosphorus-containing compounds, Luminox (or equivalent).
- tap water
- rinsate collection plastic containers
- DOT-approved waste shipping container(s), as specified in the work plan or field sampling plan (if decontamination waste is to be shipped for disposal)
- brushes
- large heavy-duty garbage bags
- spray bottles
- (Optional) – Isoprophyl alcohol (free of ketones) or methanol
- Ziploc-type bags
- plastic sheeting

IV. Cautions

Rinse equipment thoroughly and allow the equipment to dry before re-use or storage to prevent introducing solvent into sample medium. If manual drying of equipment is required, use clean lint-free material to wipe the equipment dry.

Store decontaminated equipment in a clean, dry environment. Do not store near combustion engine exhausts.

If equipment is damaged to the extent that decontamination is uncertain due to cracks or dents, the equipment should not be used and should be discarded or submitted for repair prior to use for sample collection.

A proper shipping determination will be performed by a DOT-trained individual for cleaning materials shipped by ARCADIS.

V. Health and Safety Considerations

Review the material safety data sheets (MSDS) for the cleaning materials used in decontamination. If solvent is used during decontamination, work in a well-ventilated area and stand upwind while applying solvent to equipment. Apply solvent in a manner that minimizes potential for exposure to workers. Follow health and safety procedures outlined in the HASP.

VI. Procedure

A designated area will be established to clean sampling equipment in the field prior to sample collection. Equipment cleaning areas will be set up within or adjacent to the specific work area, but not at a location exposed to combustion engine exhaust. Detergent solutions will be prepared in clean containers for use in equipment decontamination.

Cleaning Sampling Equipment

1. Wash the equipment/pump with potable water.

2. Wash with detergent solution (Alconox, Liquinox or equivalent) to remove all visible particulate matter and any residual oils or grease.

3. If equipment is very dirty, precleaning with a brush and tap water may be necessary.

4. (Optional) – Flush with isopropyl alcohol (free of ketones) or with methanol. This step is optional but should be considered when sampling in highly impacted media such as non-aqueous phase liquids or if equipment blanks from previous sampling events showed the potential for cross contamination of organics.

5. Rinse with distilled/deionized water.

Decontaminating Submersible Pumps

Submersible pumps may be used during well development, groundwater sampling, or other investigative activities. The pumps will be cleaned and flushed before and between uses. This cleaning process will consist of an external detergent solution wash and tap water rinse, a flush of detergent solution through the pump, followed by a flush of potable water through the pump. Flushing will be accomplished by using an appropriate container filled with detergent solution and another contained filled with potable water. The pump will run long enough to effectively flush the pump housing and hose (unless new, disposable hose is used). Caution should be exercised to avoid contact with the pump casing and water in the container while the pump is running (do not use metal drums or garbage cans) to avoid electric shock. Disconnect the pump from the power source before handling. The pump and hose should be placed on or in clean polyethylene sheeting to avoid contact with the ground surface.

VII. Waste Management

Equipment decontamination rinsate will be managed in conjunction with all other waste produced during the field sampling effort. Waste management procedures are outlined in the work plan or Waste Management Plan (WMP).

VIII. Data Recording and Management

Equipment cleaning and decontamination will be noted in the field notebook. Information will include the type of equipment cleaned, the decontamination location and any deviations from this SOP. Specific factors that should be noted include solvent used (if any), and source of water.

Any unusual field conditions should be noted if there is potential to impact the efficiency of the decontamination or subsequent sample collection.

An inventory of the solvents brought on site and used and removed from the site will be maintained in the files. Records will be maintained for any solvents used in decontamination, including lot number and expiration date.

Containers with decontamination fluids will be labeled.

IX. Quality Assurance

Equipment blanks should be collected to verify that the decontamination procedures are effective in minimizing potential for cross contamination. The equipment blank is prepared by pouring deionized water over the clean and dry tools and collecting the deionized water into appropriate sample containers. Equipment blanks should be analyzed for the same set of parameters that are performed on the field samples collected with the equipment that was cleaned. Equipment blanks are collected per equipment set, which represents all of the tools needed to collect a specific sample.

X. References

USEPA Region 9, Field Sampling Guidance #1230, Sampling Equipment Decontamination.

USEPA Region 1, Low Stress (low flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells.

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Investigation-Derived Waste Handling and Storage

Rev. #: 2

Rev Date: March 6, 2009

Approval Signatures

Prepared by: Andrew Karnik Date: 3/6/09

Reviewed by: Liz Marsh Date: 3/6/09
(Technical Expert)

I. Scope and Application

The objective of this Standard Operating Procedure (SOP) is to describe the procedures to manage investigation-derived wastes (IDW), both hazardous and non-hazardous, generated during site activities, which may include, but are not limited to - drilling, trenching/excavation, construction, demolition, monitoring well sampling, soil sampling, decontamination and remediation. Please note that this SOP is intended for materials that have been deemed a solid waste as defined by 40 CFR § 261.2 (which may includes liquids, solids, and sludges). In some cases, field determinations will be made based on field screening or previous data that materials are not considered a solid waste. IDW may include soil, groundwater, drilling fluids, decontamination liquids, personal protective equipment (PPE), sorbent materials, construction and demolition debris, and disposable sampling materials that may have come in contact with potentially impacted materials. IDW will be collected and staged at the point of generation. Quantities small enough to be containerized in 55-gallon drums will be taken to a designated temporary storage area (discussed in further detail under Drum Storage) onsite pending characterization and disposal. Waste materials will be analyzed for constituents of concern to evaluate proper disposal methods. PPE and disposable sampling equipment will be placed in DOT-approved drums prior to disposal and typically does not require laboratory analysis. This SOP describes the necessary equipment, field procedures, materials, regulatory references, and documentation procedures necessary for proper handling and storage of IDW up to the time it is properly disposed. The procedures for handling IDW are based on the United States Environmental Protection Agency's Guide to Management of Investigation Derived Wastes (USEPA, 1992). IDW is assumed to be contaminated with the site constituents of concern (COCs) until analytical evidence indicates otherwise. IDW will be managed to ensure the protection of human health and the environment and will comply with all applicable or relevant and appropriate requirements (ARAR). The following Laws and Regulations on Hazardous Waste Management are potential ARAR for this site.

State Laws and Regulations

- To Be Determined Based on Location of Site and Location of Treatment, Storage, and/or Disposal Facility (TSDF) to be utilized

Federal Laws and Regulations

- Resource Conservation and Recovery Act (RCRA) 42 USC § 6901-6987

- Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) 42 USC § 9601-9675

- Superfund Amendments and Reauthorization Act (SARA)
- Department of Transportation (DOT) Hazardous Materials Transportation

Pending characterization, IDW will be stored appropriately within each area of contamination (AOC). Under RCRA, "storage" is defined as the holding of hazardous waste for a temporary period, at the end of which the hazardous waste is treated, disposed of, or stored elsewhere" (40 CFR § 260.10). The onsite waste staging area will be in a secure and controlled area. Waste characterization can either be based on generator knowledge, such as using materials safety data sheets (MSDS'), or can be based upon analytical results. The laboratory used for waste characterization analysis must have the appropriate state and federal certifications and be approved by ARCADIS and Client. IDW will be classified as RCRA hazardous or non-regulated under RCRA based on the waste characterization.

If IDW is characterized as RCRA hazardous waste, RCRA and DOT requirements must be followed for packaging, labeling, transporting, storing, and record keeping as described in 40 CFR § 262 and 49 CFR § 171-178. Wastes judged to potentially meet the criteria for hazardous wastes shall be stored in DOT approved packaging. Waste material classified as RCRA non-hazardous may be handled and disposed of as an industrial waste.

Liquid wastes judged to potentially meet the criteria for hazardous wastes shall be stored in DOT approved 55 gallon drums or other approved containers that are compatible with the type of material stored therein. Solid materials deemed to potentially meet hazardous criteria will be drummed where practicable. Large quantities of potentially hazardous solid materials must be containerized (such as in a roll-off box) for up to a maximum of 90 or 180 days as described in the Excavated Solids Section. Waste material classified as non-hazardous may be handled and disposed of as an industrial waste and is not subject to the 90-day or 180-day on-site storage limitation.

This is a standard (i.e., typically applicable) operating procedure which may be varied or changed as required, dependent upon site conditions, equipment limitations, or limitations imposed by the procedure. The ultimate procedure employed will be documented in the project work plans or reports. If changes to the sampling procedures are required due to unanticipated field conditions, the changes will be discussed with the Project Manager and Client as soon as practicable and documented in the report.

II. Personnel Qualifications

ARCADIS field sampling personnel will have current health and safety training including 40-hour HAZWOPER training, site supervisor training, site-specific training, first aid, and CPR, as needed. ARCADIS personnel may sign manifests on a case-to-case basis for clients, provided the appropriate agreement is in place between ARCADIS and the client documenting that ARCADIS is not the generator, but is acting as authorized representative for the generator. ARCADIS personnel who sign hazardous waste manifests will have the current DOT hazardous materials transportation training according to 49 CFR § 172.704. ARCADIS field personnel will also comply with client-specific training such as LPS. In addition, ARCADIS field sampling personnel will be versed in the relevant SOPs and posses the required skills and experience necessary to successfully complete the desired field work.

III. Equipment List

The following materials, as required, shall be available for IDW handling and storage:

Appropriate personal protective equipment as specified in the Site Health and Safety Plan

- 55-gallon steel drums, DOT 1A2 or equivalent
- ¾ -inch socket wrench
- Hammer
- Leather gloves
- Drum dolly
- Appropriate drum labels (outdoor waterproof self adhesive)
- Polyethylene storage tank
- Appropriate labeling, packing, chain-of-custody forms, and shipping materials as specified in the *Chain-of-Custody* SOP and *Field Sampling Handling, Packing, and Shipping* SOP.
- Indelible ink and/or permanent marking pens
- Plastic sheeting

- Appropriate sample containers, labels, and forms
- Stainless-steel bucket auger
- Stainless steel spatula or knife
- Stainless steel hand spade
- Stainless steel scoop
- Digital camera
- Field logbook.

IV. Cautions

- Filled drums can be very heavy, always use appropriate moving techniques and equipment.
- Similar media will be stored in the same drums to aid in sample analysis and disposal.
- Drum lids must be secured to prevent rainwater from entering the drums.
- Drums containing solid material may not contain any free liquids.
- Waste containers stored for extended periods of time may be subject to deterioration. Drum over packs may be used as secondary containment.
- All drums must be in good condition to prevent potential leakage and facilitate subsequent disposal. Inspect the drums for dents and rust, and verify the drum has a secure lid prior to use.

V. Health and Safety Considerations

- Appropriate personal protective equipment must be worn by all field personnel within the designated work area.
- Air monitoring may be required during certain field activities as required in the Site Health and Safety Plan.

- If excavating in potentially hazardous areas is possible, contingency plans should be developed to address the potential for encountering gross contamination or non-aqueous phase liquids.

- ARCADIS field personnel will be familiar and compliant with Client-specific health and safety requirements such as Chevron's hand safety policy including the prohibition of fixed and/or folding blade knives.

VI. Procedure

Waste storage and handling procedures to be used depend upon the type of generated waste. For this reason, IDW should be stored in a secure location onsite in separate 55-gallon storage drums, solids can be stockpiled onsite (if non-hazardous), and purge water may be stored in polyethylene tanks. Waste materials such as broken sample bottles or equipment containers and wrappings will be stored in 55-gallon drums unless they were not in contact with sample media.

Management of IDW

Minimization of IDW should be considered by the Project Manager during all phases of the project. Site managers may want to consider techniques such as replacing solvent-based cleaners with aqueous-based cleaners for decontamination of equipment, reuse of equipment (where it can be decontaminated), limitation of traffic between exclusion and support zones, and drilling methods and sampling techniques that generate little waste. Alternative drilling and subsurface sampling methods may include the use of small diameter boreholes, as well as borehole testing methods such as a core penetrometer or direct push technique instead of coring (EPA, 1993).

Drum Storage

Drums containing hazardous waste shall be stored in accordance with the requirements of 40 CFR 265 Subpart I (for containers) and 265 Subpart DD (for containment buildings). All 55-gallon drums will be stored at a secure, centralized on-site location that is readily accessible for vehicular pick-up. Drums confirmed as, or believed to contain hazardous waste will be stored over an impervious surface provided with secondary containment. The storage location will, for drums containing liquid, have a containment system that can contain at least the larger of 10% of the aggregate volume of staged materials or 100% of the volume of the largest container. Drums will be closed during storage and be in good condition in accordance with the Guide to Management of Investigation-Derived Wastes (USEPA, 1992).

Hazardous Waste Determination

Waste material must be characterized to determine if it meets any of the federal definitions of hazardous waste as required by 40 CFR § 262.11. If the waste does not meet any of the federal definitions, it must then be established if any state-specific hazardous waste criteria exist/apply.

Generator Status

Once hazardous waste determination has been made, the generator status will be determined. Large quantity generators (LQG) are generators who generate more than 1,000 kilograms of hazardous waste in a calendar month. Small quantity generators (SQG) of hazardous waste are generators who generate greater than 100 kilograms but less than 1,000 kilograms of hazardous waste in a calendar month. Conditionally exempt small quantity generators (CESQG) are generators who generate less than 100 kilograms of hazardous waste per month. Please note that a generator status may change from month to month and that a notice of this change is usually required by the generator's state agency.

Accumulation Time for Hazardous Waste

A LQG may accumulate hazardous waste on site for 90 days or less without a permit and without having interim status provided that such accumulation is in compliance with specifications in 40 CFR § 262.34. A SQG may accumulate hazardous waste on site for 180 days or less without a permit or without having interim status subject to the requirements of 40 CFR § 262.34(d). CESQG requirements are found in 40 CFR § 261.5. **NOTE**: The CESQG and SQG provisions of 40 CFR § 261.5, 262.20(e), 262.42(b) and 262.44 may not be recognized by some states (e.g. Rhode Island). **State-specific regulations must be reviewed and understood prior to the generation of hazardous waste.**

<u>Satellite Accumulation of Hazardous Waste</u>

Satellite accumulation (SAA) shall mean the accumulation of as much as fifty-five (55) gallons of hazardous waste, or the accumulation of as much as one quart of acutely hazardous waste, in containers at or near any point of generation where the waste initially accumulates, which is under the control of the operator of the process generating the waste, without a permit or interim status and without complying with the requirements of 40 CFR § 262.34(a) and without any storage time limit, provided that the generator complies with 40 CFR § 262.34(c)(1)(i).

Once more than 55 gallons of hazardous waste accumulates in SAA, the generator has three days to move this waste into storage.

Storage recommendations for hazardous waste include:

- Ignitable Hazardous wastes must be >50 feet from the property line per 40 CFR § 265.176 (LQG generators only).
- Hazardous waste must be stored on a concrete slab (asphalt is acceptable if there are no free liquids in the waste) per 40 CFR § 265.176.
- Drainage must be directed away from the accumulation area.
- Area must be properly vented.
- Area must be secure.

Drum/Container Labeling

Drums will be labeled on both the side and lid of the drum using a permanent marking pen. Old drum labels must be removed to the extent possible, descriptions crossed out should any information remain, and new labels affixed on top of the old labels. Other containers used to store various types of waste (polyethylene tanks, roll-off boxes, end-dump trailers, etc.) will be labeled with an appropriate "Waste Container" or “Testing in Progress” label pending characterization. Drums and containers will be labeled as follows:

- Appropriate waste characterization label (Testing In Progress, Hazardous, or Non-Hazardous)
- Waste generator's name (e.g., client name)
- Project name
- Name and telephone number of ARCADIS project manager
- Composition of contents (e.g., used oil, acetone 40%, toluene 60%)
- Media (e.g., solid, liquid)
- Accumulation start date

- Drum number of total drums as reconciled with the Drum Inventory maintained in the field log book.

IDW containers will remain closed except when adding or removing waste. Immediately upon beginning to place waste into the drum/container, a “Waste Container” or “Testing in Progress” label will be filled out to include the information specified above, and affixed to the container. Once the contents of the container are identified as either non-hazardous or hazardous, the following additional labels will be applied. Containers with waste determined to be non-hazardous will be labeled with a green and white "Non-Hazardous Waste" label over the "Waste Container" label. Containers with waste determined to be hazardous will be stored in an onsite storage area and will be labeled with the "Hazardous Waste" label and affixed over the "Waste Container" label. The ACCUMULATION DATE for the hazardous waste is the date the waste is first placed in the container and is the same date as the date on the "Waste Container" label. DOT hazardous class labels must be applied to all hazardous waste containers for shipment offsite to an approved disposal or recycling facility. In addition a DOT proper shipping name shall be included on the hazardous waste label. The transporter should be equipped with the appropriate DOT placards. However, placarding or offering placards to the initial transporter is the responsibility of the generator per 40 CFR § 262.33.

Inspections and Documentation

All IDW will be documented as generated on a Drum Inventory Log maintained in the field log book. The Drum Inventory will record the generation date, type, quantity, matrix and origin (e.g. Boring-1, Test Pit 3, etc) of materials in every drum, as well as a unique identification number for each drum. The drum inventory will be used during drum pickup to assist with labeling of drums. The drum storage area and any other areas of temporarily staged waste, such as soil/debris piles, will be inspected weekly. The weekly inspections will be recorded in the field notebook or on a Weekly Inspection Log. Digital photographs will be taken upon the initial generation and drumming/staging of waste, and final labeling after characterization to document compliance with labeling and storage protocols, and condition of the container. Evidence of damage, tampering or other discrepancy should be documented photographically.

Emergency Response and Notifications

Specific procedures for responding to site emergencies will be detailed in the HASP. If the generator is designated as a LQG, a Contingency Plan will need to be prepared to include emergency response and notification procedures per 40 CFR § 265 Subpart D. In the event of a fire, explosion, or other release which could threaten human health outside of the site or when Client or ARCADIS has knowledge of a spill that has reached surface water, Client or ARCADIS must immediately notify the National Response Center (800-424-8802) in accordance with 40 CFR § 262.34. Other notifications to state agencies may also be necessary.

Drilling Soil Cuttings and Muds

Soil cuttings are solid to semi-solid soils generated during trenching activities, subsurface soil sampling, or installation of monitoring wells. Depending on the drilling method, drilling fluids known as "muds" may be used to remove soil cuttings. Drilling fluids flushed from the borehole must be directed into a settling section of a mud pit. This allows reuse of the decanted fluids after removal of the settled sediments. Soil cuttings will be labeled and stored in 55-gallon drums with bolt-sealed lids.

Excavated Solids

Excavated solids may include, but are not limited to soil, fill and construction and demolition debris. Excavated solids may be temporarily stockpiled onsite as long as the material is a RCRA non-hazardous waste and the solids will be treated onsite pursuant to a certified, authorized, or permitted treatment method, or properly disposed off-site. Stockpiled materials characterized as hazardous must be immediately containerized and removed from the site within 90 days of generation (except for soils using satellite accumulation). Excavated solids should be stockpiled and maintained in a secure area onsite. At a minimum, the floor of the stockpile area will be covered with a 20-mil high density polyethylene liner that is supported by a foundation or at least a 60-mil high density polyethylene liner that is not supported by a foundation. The excavated material will not contain free liquids. The owner/operator will provide controls for windblown dispersion, run-on control, and precipitation runoff. The run-on control system will prevent flow onto the active portion of the pile during peak discharge from at least a 25-year storm and the run-off management system will collect and control at least the water volume resulting from a 24-hour, 25-year storm (EPA, 1992). Additionally, the stockpile area will be inspected on a weekly basis and after storm events. Individual states may require that the stockpile be inspected/certified by a licensed professional engineer. Stockpiled material will be covered with a 6-mil polyvinyl chloride (PVC) liner. The stockpile cover will be secured in place with appropriate material (concrete blocks, weights, etc.) to prevent the movement of the cover. Excavated solids may also be placed in roll off containers and covered with a 6-mil PVC liner pending results for waste characterization.

Decontamination Solutions

Decontamination solutions are generated during the decontamination of personal protective equipment and sampling equipment. Decontamination solutions may range from detergents, organic solvents and acids used to decontaminate small field sampling equipment to steam cleaning rinsate used to wash heavy field equipment. These solutions are to be labeled and stored in 55-gallon drums with bolt-sealed lids.

Disposable Equipment

Disposable equipment includes personal protective equipment (tyvek coveralls, gloves, booties and APR cartridges) and disposable sampling equipment such as trowels or disposable bailers. If the media sampled exhibits hazardous characteristics per results of waste characterization sampling, disposable equipment will also be disposed of as a hazardous waste. These materials will be stored onsite in labeled 55-gallon drums pending analytical results for waste characterization.

Purge Water

Purge water includes groundwater generated during well development, groundwater sampling, or aquifer testing. The volume of groundwater generated will dictate the appropriate storage procedure. Monitoring well development and groundwater sampling may generate three well volumes of groundwater or more. This volume will be stored in labeled 55-gallon drums. Aquifer tests may generate significantly greater volumes of groundwater depending on the well yield and the duration of the test. Therefore, large-volume portable polyethylene tanks will be considered for temporary storage pending groundwater-waste characterization.

Purged Water Storage Tank Decontamination and Removal

The following procedures will be used for inspection, cleaning, and offsite removal of storage tanks used for temporary storage of purge water. These procedures are intended to be used for rented portable tanks such as Baker Tanks or Rain for Rent containers. Storage tanks will be made of inert polyethylene materials.

The major steps for preparing a rented tank for return to a vendor include characterizing the purge water, disposing of the purge water, decontaminating the tank, final tank inspection, and mobilization. Decontamination and inspection procedures are describe in further detail below.

- Tank Cleaning: Most vendors require that tanks be free of any sediment and water before returning, a professional cleaning service may be required. Each specific vendor should be consulted concerning specific requirements for returning tanks.

- Tank Inspection: After emptying the tank, purged water storage tanks should be inspected for debris, chemical staining, and physical damage. The vendors require that tanks be returned in the original condition (i.e., free of sediment, staining and no physical damage).

VII. Waste Characterization Sampling and Shipping

Soil/Solids Characterization

Waste characterization will be conducted in accordance with waste hauler, waste handling facility, and state/federal requirements. In general, RCRA hazardous wastes are those solid wastes determined by a Toxicity Characteristic Leaching Procedure (TCLP) test or to contain levels of certain toxic metals, pesticides, or other organic chemicals above specific federally regulated thresholds. If the one or more of 40 toxic compounds listed in Table I of 40 CFR § 261.24 are detected in the sample at levels above the maximum unregulated concentrations, the waste must be characterized as a toxic hazardous waste. Wastes can also be considered “listed” hazardous waste depending on site-specific processes.

Composite soil samples will be collected at a frequency of one sample per 10 cubic yard basis for stockpiled soil or one per 55-gallon drum for containerized. A four point composite sample will be collected per 10 cubic yards of stockpiled material and for each drum. Sample and composite frequencies may be adjusted in accordance with the waste handling facility’s requirements. Waste characterization samples may be analyzed for the TCLP volatile organic compounds (VOCs), TCLP semi-volatile organic compounds (SVOCs), TCLP RCRA metals, and polychlorinated biphenyls, as well as corrosivity (pH), reactivity and flammability (flashpoint). Additional samples may be collected and analyzed by the laboratory on a contingency basis.

Wastewater Characterization

Waste characterization will be conducted in accordance with the requirements of the waste hauler, waste handling facility, and state/federal governments. In general, purge water should be analyzed by methods appropriate for the known contaminants, if any, that have been historically detected in the monitoring wells. Samples will be collected and analyzed in accordance with the requirements of the waste disposal facility.

Wastewater characterization samples may be analyzed for TCLP volatile organic compounds (VOCs), TCLP semi-volatile organic compounds (SVOCs), TCLP RCRA metals, and polychlorinated biphenyls, as well as corrosivity (pH), reactivity and flammability (flashpoint). Additional samples may be collected and analyzed by the laboratory on a contingency basis.

Sample Handling and Shipping

All samples will be appropriately labeled, packed, and shipped, and the chain-of-custody will be filled out in accordance with the Chain-of-Custody SOP and Field Sampling Handling, Packing, and Shipping SOP and Hazardous Materials Packaging and Shipping SOP.

It should be noted that additional training is required for packaging and shipping of hazardous and/or dangerous materials. Please reference the following ARCADIS intranet team page for more information: http://team/sites/hazmat/default.aspx.

Preparing Waste Shipment Documentation (Hazardous and Non-Hazardous)

Waste profiles will be prepared by the ARCADIS PM and forwarded, along with laboratory analytical data to the Client PM for approval/signature. The Client PM will then return the profile to ARCADIS who will then forward to the waste removal contractor for preparation of a manifest. The manifest will be reviewed by ARCADIS prior to forwarding to the Client PM for approval. Upon approval of the manifest, the Client PM will return the original signed manifest directly to the waste contractor or to the ARCADIS PM for forwarding to the waste contractor.

Final drum labeling and pickup will be supervised by an ARCADIS representative who is experienced with waste labeling procedures. The ARCADIS representative will have a copy of the drum inventory maintained in the field book and will reconcile the drum inventory with the profile numbers on the labels and on the manifest. Different profile numbers will be generated for different matrices or materials in the drums. For example, the profile number for drill cuttings will be different than the profile number for purge water. **When there are multiple profiles it is critical that the proper label, with the profile number appropriate to a specific material be affixed to the proper drums.** A copy of the ARCADIS drum inventory will be provided to the waste transporter during drum pickup and to the facility receiving the waste.

VIII. Data Recording and Management

Waste characterization sample handling, packing, and shipping procedures will be documented in accordance with the *Quality Assurance Project Plan*, if one exists. Copies of the chains-of-custody forms will be maintained in the project file.

Following waste characterization, IDW containers will be re-labeled with the appropriate waste hazardous or non-hazardous waste labels and the client will initiate disposal at the appropriate waste disposal facility.

IX. Quality Assurance

The chain-of-custody and sample labels for waste characterization samples will be filled out in accordance with the *Quality Assurance Project Plan*.

X. References

United States Environmental Protection Agency (USEPA). 1992. Guide to Management of Investigation-Derived Wastes. Office of Remedial and Emergency Response. Hazardous Site Control Division. January 1992.

USEPA. 1991. *Guide to Discharging CERCLA Aqueous Wastes to Publicly Owned Treatment Works (POTWs)*. Office of Remedial and Emergency Response. Hazardous Site Control Division 0S-220W. March 1991.

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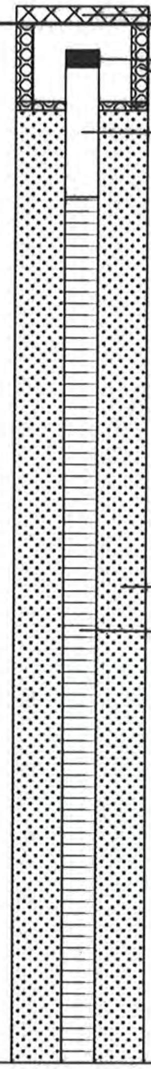
Appendix **D**

Soil Boring and Monitoring Well Installation Logs

Date Start/Finish: August 23, 2010 **Drilling Company:** Cascade **Driller's Name:** -- **Drilling Method:** HA/HSA **Sampling Method:** HA/HSA **Rig Type:** HA/HSA	**Northing:** -- **Easting:** -- **Casing Elevation:** -- **Borehole Depth:** 12' **Surface Elevation:** -- **Descriptions By:** Colleen Martin	**Well/Boring ID:** **MW-6R** **Client:** BP **Location:** BP Olympia Bulk Terminal 1117 West Bay Drive Olympia, Washington

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery %	PID Headspace (ppm)	USCS Code	Geologic Column	Stratigraphic Description
0	0					--		Gravel packed soil surface.
		--				ML		Brown SILT with clay and trace sand, no odor.
		MW-6R-2-2.5	2-2.5	100	1.5			
								Wet at 3' bgs.
								Brown SILT with wood debris, moderate hydrocarbon-like odor, wet.
		MW-6R-4-4.5	4-4.5	100	43.8			
5	-5							
		MW-6R-6-6.5	6-6.5	100	0.2			
								Wet WOOD.
						--		No recovery, wet silty brown liquid.
10	-10							
				0				
								Boring terminated at 12' bgs.

Well/Boring Construction



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Remarks: bgs: below ground surface
HSA: Hollow Stem Auger
HA: Hand Auger

Date Start/Finish: August 24, 2010
Drilling Company: Cascade
Driller's Name: --
Drilling Method: HA/HSA
Sampling Method: HA/HSA
Rig Type: HA/HSA

Northing: --
Easting: --
Casing Elevation: --

Borehole Depth: 13'
Surface Elevation: --

Descriptions By: Colleen Martin

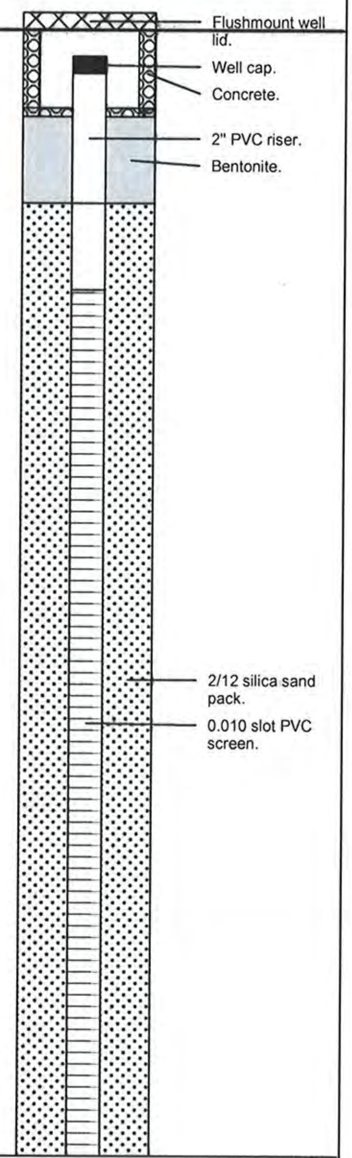
Well/Boring ID: **MW-7**

Client: BP

Location: BP Olympia Bulk Terminal
1117 West Bay Drive
Olympia, Washington

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery %	PID Headspace (ppm)	USCS Code	Geologic Column	Stratigraphic Description
0	0					--		Gravel packed soil surface.
								Brown sandy SILT, trace fine subrounded and subangular gravel, fine sand, dry, occasional organics, no odor or staining.
		MW-7-2-2.5	2-2.5	100	1.7			
						ML		Brown SILT with fine sand, low plasticity, slightly moist, no odor or staining.
		MW-7-4-4.5	4-4.5	100	0.4			
5	-5							
		MW-7-6-6.5	6-6.5	100	1.4			Brown silty SAND, trace gravel, fine to medium sand, subrounded fine gravel, increasing silts, moist, no odor or staining.
				100	0.3	SM		
10	-10							
				100	0.2			
								Brown sandy SILT, fine sand, no odor or staining, wet at 11.5' bgs.
				100	--	ML		Boring terminated at 13' bgs.

Well/Boring Construction



ARCADIS
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Remarks: bgs: below ground surface
HSA: Hollow Stem Auger
HA: Hand Auger

Date Start/Finish: August 24, 2010
Drilling Company: Cascade
Driller's Name: --
Drilling Method: HA/HSA
Sampling Method: HA/HSA
Rig Type: HA/HSA

Northing: --
Easting: --
Casing Elevation: --

Borehole Depth: 13'
Surface Elevation: --

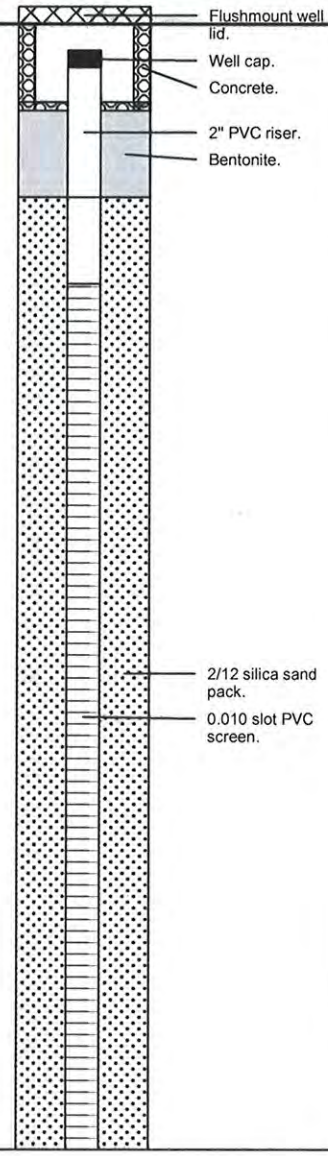
Descriptions By: Colleen Martin

Well/Boring ID: **MW-8**

Client: BP

Location: BP Olympia Bulk Terminal
1117 West Bay Drive
Olympia, Washington

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery %	PID Headspace (ppm)	USCS Code	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0					--		Gravel packed soil surface.	
								Light brown sandy SILT with clay, trace fine subrounded gravel, fine sand, moist, occasional organics, no odor or staining.	
		MW-8-2-2.5	2-2.5	100	2.9				
		MW-8-4-4.5	4-4.5	100	1.1			Brown clayey SILT, trace very fine sand, wood debris, moderate plasticity, moist, no odor or staining.	
5	-5								
		MW-8-6-6.5	6-6.5	100	2.4	ML		Brown SILT with clay, trace very fine sand, trace wood debris, increasing sand, low plasticity, moist, no odor or staining.	
				100	--				
10	-10			100	--				
								Brown sandy SILT with trace gravel, fine sand, fine rounded gravel, no odor or staining, wet at 12' bgs.	
				100	--			Boring terminated at 13' bgs.	



Remarks: bgs: below ground surface
HSA: Hollow Stem Auger
HA: Hand Auger

ARCADIS
Infrastructure, environment, buildings

Date Start/Finish: August 24, 2010
Drilling Company: Cascade
Driller's Name: --
Drilling Method: HA/HSA
Sampling Method: HA/Split Spoon
Rig Type: HA/HSA

Northing: --
Easting: --
Casing Elevation: --

Borehole Depth: 13'
Surface Elevation: --

Descriptions By: Colleen Martin

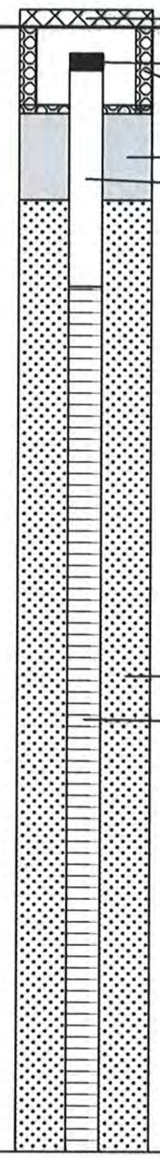
Well/Boring ID: MW-9

Client: BP

Location: BP Olympia Bulk Terminal
1117 West Bay Drive
Olympia, Washington

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery %	PID Headspace (ppm)	USCS Code	Geologic Column	Stratigraphic Description
0	0					--		Gravel packed soil surface.
								Light brown sandy SILT with clay, trace fine rounded gravel, fine sand, non-plastic, moist, no odor or staining.
		MW-9-2-2.5	2-2.5	100	1.3			
		MW-9-4-4.5	4-4.5	100	1.4			
5	-5							
		MW-9-6-6.5	6-6.5	100	1.9	ML		Brown SILT with sand, very fine sand, some wood debris, increasing sand, low plasticity, moist, no odor or staining.
				100	--			
10	-10							Wet at 10' bgs.
				100	--			
				100	--			Boring terminated at 13' bgs.

Well/Boring Construction



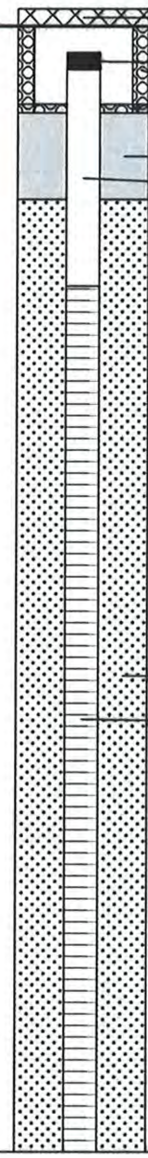
Remarks: bgs: below ground surface
HSA: Hollow Stem Auger
HA: Hand Auger

ARCADIS
Infrastructure, environment, buildings

Date Start/Finish: August 24, 2010 **Drilling Company:** Cascade **Driller's Name:** -- **Drilling Method:** HA/HSA **Sampling Method:** HA/Split Spoon **Rig Type:** HA/HSA	**Northing:** -- **Easting:** -- **Casing Elevation:** -- **Borehole Depth:** 13' **Surface Elevation:** -- **Descriptions By:** Colleen Martin	**Well/Boring ID: MW-10** **Client:** BP **Location:** BP Olympia Bulk Terminal 1117 West Bay Drive Olympia, Washington

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery %	PID Headspace (ppm)	USCS Code	Stratigraphic Description
0	0					--	Gravel packed soil surface.
							Light brown SILT with sand and trace gravel, non-plastic, fine sand, subangular fine gravel, no odor or staining.
		MW-10-2-2.5	2-2.5	100	2.7		
							Wet at 4' bgs.
		MW-10-4-4.5	4-4.5	100	1.6		Brown SILT with sand, trace clay, low plasticity, very fine sand, no odor or staining, wet.
5	-5					ML	
		MW-10-6-6.5	6-6.5	100	5.4		Brown sandy SILT with wood debris (30%), fine sand, wet, no odor or staining.
				100			
10	-10			100			
							No recovery.
				0		--	Boring terminated at 13' bgs.

Well/Boring Construction



ARCADIS
Infrastructure, environment, buildings

Remarks: bgs: below ground surface
HSA: Hollow Stem Auger
HA: Hand Auger

Date Start/Finish: August 25, 2010
Drilling Company: Cascade
Driller's Name: --
Drilling Method: HA/HSA
Sampling Method: HA/Split Spoon
Rig Type: HA/HSA

Northing: --
Easting: --
Casing Elevation: --

Borehole Depth: 13'
Surface Elevation: --

Descriptions By: Colleen Martin

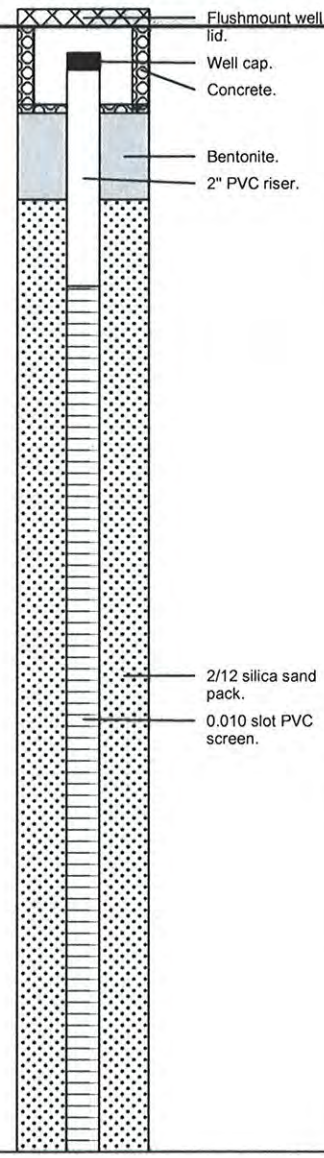
Well/Boring ID: **MW-11**

Client: BP

Location: BP Olympia Bulk Terminal
1117 West Bay Drive
Olympia, Washington

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery %	PID Headspace (ppm)	USCS Code	Geologic Column	Stratigraphic Description
0	0					--		Gravel packed soil surface.
								Light brown SILT with sand and gravel, non-plastic, fine sand, medium to coarse subrounded gravel, no odor or staining.
		MW-11-2-2.5	2-2.5	100	2.1			
		MW-11-4-4.5	4-4.5	100	2.0			
5	-5							
						ML		Wet at 6' bgs.
		MW-11-6-6.5	6-6.5	100	1.4			Brown sandy SILT with trace gravel, fine sand, medium rounded gravel, wet, no odor or staining.
				100				
10	-10			100				
								No recovery.
				0		--		Boring terminated at 13' bgs.

Well/Boring Construction



ARCADIS
Infrastructure, environment, buildings

Remarks: bgs: below ground surface
HSA: Hollow Stem Auger
HA: Hand Auger

Project: GP09BPNA.WA60.C0000 Template:G:\COMMON\LogPlot Shared Files\LogPlot 7
Data File:MW-11
Date: 11/3/2010 Barb Schnurr

Date Start/Finish: August 25, 2010
Drilling Company: Cascade
Driller's Name: --
Drilling Method: HA/HSA
Sampling Method: HA/Split Spoon
Rig Type: HA/HSA

Northing: --
Easting: --
Casing Elevation: --

Borehole Depth: 13'
Surface Elevation: --

Descriptions By: Colleen Martin

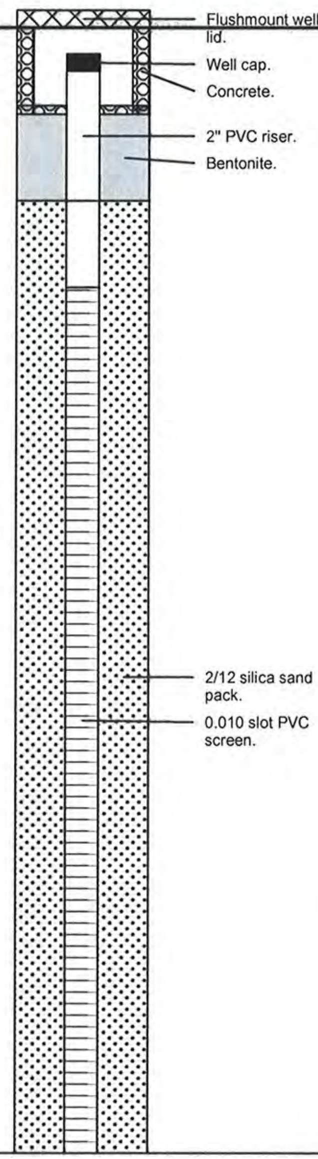
Well/Boring ID: **MW-12**

Client: BP

Location: BP Olympia Bulk Terminal
1117 West Bay Drive
Olympia, Washington

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery %	PID Headspace (ppm)	USCS Code	Stratigraphic Description
0	0					--	Gravel packed soil surface.
							Brown SILT with sand, trace fine subrounded gravel, fine sand, non-plastic, moist, no odor or staining.
		MW-12-2-2.5	2-2.5	100	0.4		
		MW-12-4-4.5	4-4.5	100	0.6		
5	-5						
		MW-12-6-6.5	6-6.5	100	0.1	ML	Brown sandy SILT with gravel and wood debris, fine sand, fine rounded gravel, no odor or staining, wet at 6' bgs.
				100	--		
10	-10			100	--		
				100	--		Boring terminated at 13' bgs.

Well/Boring Construction



ARCADIS
Infrastructure, environment, buildings

Remarks: bgs: below ground surface
HSA: Hollow Stem Auger
HA: Hand Auger

Date Start/Finish: August 25, 2010
Drilling Company: Cascade
Driller's Name: --
Drilling Method: HA
Sampling Method: HA
Rig Type: HA

Northing: --
Easting: --
Casing Elevation: --

Borehole Depth: 6.5'
Surface Elevation: --

Descriptions By: Colleen Martin

Well/Boring ID: **GP-1**

Client: BP

Location: BP Olympia Bulk Terminal
1117 West Bay Drive
Olympia, Washington

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery %	PID Headspace (ppm)	USCS Code	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0					--		Gravel packed soil surface.	
						ML		Grey sandy SILT mixed with bark dust and gravel, moist, fine sand, no odor or staining.	
		GP-1-2-2.5	2-2.5		4.1				
								Wet at 3.5' bgs.	Bentonite backfilled to surface.
		GP-1-4-4.5	4-4.5		0.2	--		Brown WOOD debris, trace silt, wet, no odor or staining.	
5	-5								
		GP-1-6-6.5	6-6.5		0.0			Boring terminated at 6.5' bgs.	
10	-10								

ARCADIS
Infrastructure, environment, buildings

Remarks: bgs: below ground surface
HA: Hand Auger

Date Start/Finish: August 25, 2010 **Drilling Company:** Cascade **Driller's Name:** -- **Drilling Method:** HA **Sampling Method:** HA **Rig Type:** HA	**Northing:** -- **Easting:** -- **Casing Elevation:** -- **Borehole Depth:** 6.5' **Surface Elevation:** -- **Descriptions By:** Colleen Martin	**Well/Boring ID: GP-2** **Client:** BP **Location:** BP Olympia Bulk Terminal 1117 West Bay Drive Olympia, Washington

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery %	PID Headspace (ppm)	USCS Code	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0					--		Gravel packed soil surface.	
						ML		Brown SILT with sand and wood debris (20%), no odor or staining.	
		GP-2-2-2.5	2-2.5		9.1				
								WOOD debris with some silt, faint odor, wet at 3.5' bgs.	Bentonite backfilled to surface.
		GP-2-4-4.5	4-4.5		17.5				
5	-5								
					4.6			WOOD debris and bark dust and water, trace silt in water. Boring terminated at 6.5' bgs.	
10	-10								

ARCADIS
Infrastructure, environment, buildings

Remarks: bgs: below ground surface
HA: Hand Auger

Date Start/Finish: August 24, 2010 **Drilling Company:** Cascade **Driller's Name:** -- **Drilling Method:** HA **Sampling Method:** HA **Rig Type:** HA	**Northing:** -- **Easting:** -- **Casing Elevation:** -- **Borehole Depth:** 5' **Surface Elevation:** -- **Descriptions By:** Colleen Martin	**Well/Boring ID: GP-3** **Client:** BP **Location:** BP Olympia Bulk Terminal 1117 West Bay Drive Olympia, Washington

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery %	PID Headspace (ppm)	USCS Code	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0					--		Gravel packed soil surface.	
								Orange brown sandy SILT, trace gravel, fine sand, subrounded fine gravel, occasional organics, dry, no odor or staining.	
		GP-3-2-2.5	2-2.5		1.1	ML			Bentonite backfilled to surface.
		GP-3-4-4.5	4-4.5		4.7			Brown sandy SILT, fine sand, wood debris, moist, no odor or staining. Boring terminated at 5' bgs (refusal).	
5	-5								
10	-10								

ARCADIS
Infrastructure, environment, buildings

Remarks: bgs: below ground surface
HA: Hand Auger

Date Start/Finish: August 23, 2010 **Drilling Company:** Cascade **Driller's Name:** -- **Drilling Method:** HA **Sampling Method:** HA **Rig Type:** HA	**Northing:** -- **Easting:** -- **Casing Elevation:** -- **Borehole Depth:** 5' **Surface Elevation:** -- **Descriptions By:** Colleen Martin	**Well/Boring ID:** **GP-4** **Client:** BP **Location:** BP Olympia Bulk Terminal 1117 West Bay Drive Olympia, Washington

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery %	PID Headspace (ppm)	USCS Code	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0					--		Gravel packed soil surface.	Bentonite backfilled to surface.
		GP-4-2-2.5	2-2.5		1.2	ML		Brown SILT with clay, trace sand, low plasticity, very fine sand, some wood debris, moist, no odor or staining.	
		GP-4-4-4.5	4-4.5		4.6	--		WOOD debris with some silt, trace sand, few cobbles, no odor or staining, wet at 3' bgs. Boring terminated at 5' bgs (refusal).	
5	5								
10	-10								

ARCADIS
Infrastructure, environment, buildings

Remarks: bgs: below ground surface
HA: Hand Auger

Date Start/Finish: August 23, 2010 **Drilling Company:** Cascade **Driller's Name:** -- **Drilling Method:** HA **Sampling Method:** HA **Rig Type:** HA	**Northing:** -- **Easting:** -- **Casing Elevation:** -- **Borehole Depth:** 6.5' **Surface Elevation:** -- **Descriptions By:** Colleen Martin	**Well/Boring ID: GP-5** **Client:** BP **Location:** BP Olympia Bulk Terminal 1117 West Bay Drive Olympia, Washington

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery %	PID Headspace (ppm)	USCS Code	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0					--		Gravel packed soil surface.	Bentonite backfilled to surface.
								Brown SILT with clay and trace sand, non-plastic, very fine sand, moist, no odor or staining.	
		GP-5-2-2.5	2-2.5		5.5	ML		Wet at 3' bgs.	
								Bark and WOOD debris with some silt, moderate odor, wet.	
		GP-5-4-4.5	4-4.5		97.5	--			
5	-5							Brown SILT with clay, trace sand, lots of wood debris and bark, faint odor, wet.	
		GP-5-6-6.5	6-6.5		3.7	ML		Boring terminated at 6.5' bgs.	
10	-10								

ARCADIS
Infrastructure, environment, buildings

Remarks: bgs: below ground surface
HA: Hand Auger

Date Start/Finish: August 25, 2010 **Drilling Company:** Cascade **Driller's Name:** -- **Drilling Method:** HA **Sampling Method:** HA **Rig Type:** HA	**Northing:** -- **Easting:** -- **Casing Elevation:** -- **Borehole Depth:** 6.5' **Surface Elevation:** -- **Descriptions By:** Colleen Martin	**Well/Boring ID:** **GP-6** **Client:** BP **Location:** BP Olympia Bulk Terminal 1117 West Bay Drive Olympia, Washington

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery %	PID Headspace (ppm)	USCS Code	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0					--		Gravel packed soil surface.	Bentonite backfilled to surface.
						ML		Brown SILT with sand and gravel, non-plastic, fine sand, subrounded gravel, moist, no odor or staining, increasing wood debris.	
		GP-6-2-2.5	2-2.5		1.0				
		GP-6-4-4.5	4-4.5		243				
5	-5							Brown SILT with trace fine sand, faint odor, wet at 5' bgs.	
		GP-6-6-6.5	6-6.5		9.8			Boring terminated at 6.5' bgs.	
10	-10								

ARCADIS
Infrastructure, environment, buildings

Remarks: bgs: below ground surface
HA: Hand Auger

Project: GP09BPNA.WA60.C0000 Template:G:\COMMON\LogPlot Shared Files\LogPlot 7
Data File:GP-6

Date: 11/3/2010 Barb Schnurr

Date Start/Finish: August 24, 2010 **Drilling Company:** Cascade **Driller's Name:** -- **Drilling Method:** HA **Sampling Method:** HA **Rig Type:** HA	**Northing:** -- **Easting:** -- **Casing Elevation:** -- **Borehole Depth:** 6.5' **Surface Elevation:** -- **Descriptions By:** Colleen Martin	**Well/Boring ID: GP-7** **Client:** BP **Location:** BP Olympia Bulk Terminal 1117 West Bay Drive Olympia, Washington

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery %	PID Headspace (ppm)	USCS Code	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0					--		Gravel packed soil surface.	Bentonite backfilled to surface.
						ML		Light brown sandy SILT, trace gravel, non-plastic, fine sand, subangular fine gravel, dry, no odor or staining, occasional organics.	
		GP-7-2-2.5	2-2.5		1.8				
		GP-7-4-4.5	4-4.5		4.2			Brown sandy SILT, non-plastic, little wood debris, moist, no odor or staining.	
5	-5								
		GP-7-6-6.5	6-6.5		4.2			Brown SILT with fine sand, trace clay, low plasticity, moist, no odor or staining. Boring terminated at 6.5' bgs.	
10	-10								

ARCADIS
Infrastructure, environment, buildings

Remarks: bgs: below ground surface
HA: Hand Auger

Date Start/Finish: August 25, 2010 **Drilling Company:** Cascade **Driller's Name:** -- **Drilling Method:** HA **Sampling Method:** HA **Rig Type:** HA	**Northing:** -- **Easting:** -- **Casing Elevation:** -- **Borehole Depth:** 6.5' **Surface Elevation:** -- **Descriptions By:** Colleen Martin	**Well/Boring ID: GP-8** **Client:** BP **Location:** BP Olympia Bulk Terminal 1117 West Bay Drive Olympia, Washington

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery %	PID Headspace (ppm)	USCS Code	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0					--		Gravel packed soil surface.	
								Light brown sandy SILT, trace gravel, non-plastic, fine sand, subrounded fine gravel, moist, no odor or staining.	
		GP-8-2-2.5	2-2.5		0.4	ML			Bentonite backfilled to surface.
		GP-8-4-4.5	4-4.5		0.2			Brown SAND with trace silt and gravel, fine to medium sand, fine rounded gravel, moist, no odor or staining.	
5	-5					SM			
		GP-8-6-6.5	6-6.5		0.6			Boring terminated at 6.5' bgs.	
10	-10								

ARCADIS
Infrastructure, environment, buildings

Remarks: bgs: below ground surface
HA: Hand Auger

Date Start/Finish: August 24, 2010 **Drilling Company:** Cascade **Driller's Name:** -- **Drilling Method:** HA **Sampling Method:** HA **Rig Type:** HA	**Northing:** -- **Easting:** -- **Casing Elevation:** -- **Borehole Depth:** 6.2' **Surface Elevation:** -- **Descriptions By:** Colleen Martin	**Well/Boring ID:** **GP-9** **Client:** BP **Location:** BP Olympia Bulk Terminal 1117 West Bay Drive Olympia, Washington

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery %	PID Headspace (ppm)	USCS Code	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0					--		Gravel packed soil surface.	
								Brown SILT with clay, trace sand, non-plastic, very fine sand, moist, no odor or staining, occasional organics.	
		GP-9-2-2.5	2-2.5		0.9	ML			
									Bentonite backfilled to surface.
		GP-9-4-4.5	4-4.5		0.6				
								Brown silty CLAY, trace sand, moderate plasticity, very fine sand, moist, no odor or staining.	
5	-5					CL			
		GP-9-5.5-6	5.5-6		0.8			Boring terminated at 6.2 bgs.	
10	-10								

ARCADIS
Infrastructure, environment, buildings

Remarks: bgs: below ground surface
HA: Hand Auger

ARCADIS

Appendix **E**

Laboratory Analytical Reports

Pace Analytical Services, Inc.
940 South Harney
Seattle, WA 98108
(206)767-5060

September 30, 2010

Alex Lopez
Arcadis
111 SW Columbia St.
Ste. 725
Portland, OR 97201

RE: Project: BPOLY
Pace Project No.: 254662

Dear Alex Lopez:

Enclosed are the analytical results for sample(s) received by the laboratory on August 24, 2010. The results relate only to the samples included in this report. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

Revised Report - PAHs added to samples GP-5 6-6.5, MW-6R 6-6.5, and GP-9 4-4.5 at client's request.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Regina Ste. Marie

Regina SteMarie

regina.stemarie@pacelabs.com
Project Manager

Enclosures

Pace Analytical Services, Inc.
940 South Harney
Seattle, WA 98108
(206)767-5060

CERTIFICATIONS

Project:	BPOLY
Pace Project No.:	254662

Washington Certification IDs

940 South Harney Street, Seattle, WA 98108
Alaska CS Certification #: UST-025
Alaska Drinking Water VOC Certification #: WA01230
Alaska Drinking Water Micro Certification #: WA01230
California Certification #: 01153CA
Florida/NELAP Certification #: E87617
Oregon Certification #: WA200007
Washington Certification #: C1229

Pace Analytical Services, Inc.
940 South Harney
Seattle, WA 98108
(206)767-5060

SAMPLE ANALYTE COUNT

Project: BPOLY
Pace Project No.: 254662

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
254662001	**GP4-2-2.5**	NWTPH-Dx	ERB	4	PASI-S
		NWTPH-Gx	ATH	3	PASI-S
		EPA 6010	BGA	7	PASI-S
		EPA 7471	BGA	1	PASI-S
		EPA 8270 by SIM	DMT	20	PASI-S
		EPA 8260	LPM	8	PASI-S
		ASTM D2974-87	KJ1	1	PASI-S
254662002	**GP4-4-4.5**	NWTPH-Dx	ERB	4	PASI-S
		NWTPH-Gx	ATH	3	PASI-S
		EPA 6010	BGA	7	PASI-S
		EPA 7471	BGA	1	PASI-S
		EPA 8270 by SIM	DMT	20	PASI-S
		EPA 8260	LPM	8	PASI-S
		ASTM D2974-87	KJ1	1	PASI-S
254662003	**GP5-2-2.5**	NWTPH-Dx	ERB	4	PASI-S
		NWTPH-Gx	AY1	3	PASI-S
		EPA 6010	BGA	7	PASI-S
		EPA 7471	BGA	1	PASI-S
		EPA 8270 by SIM	DMT	20	PASI-S
		EPA 8260	LPM	8	PASI-S
		ASTM D2974-87	KJ1	1	PASI-S
254662004	**GP5-4-4.5**	NWTPH-Dx	ERB	4	PASI-S
		NWTPH-Gx	AY1	3	PASI-S
		EPA 6010	BGA	7	PASI-S
		EPA 7471	BGA	1	PASI-S
		EPA 8270 by SIM	DMT	20	PASI-S
		EPA 8260	LPM	8	PASI-S
		ASTM D2974-87	KJ1	1	PASI-S
254662005	**GP5-6-6.5**	EPA 8270 by SIM	DMT	20	PASI-S
		ASTM D2974-87	KJ1	1	PASI-S
254662006	**MW6R-2-2.5**	NWTPH-Dx	ERB	4	PASI-S
		NWTPH-Gx	AY1	3	PASI-S
		EPA 6010	BGA	7	PASI-S
		EPA 7471	BGA	1	PASI-S
		EPA 8270 by SIM	DMT	20	PASI-S
		EPA 8260	LPM	8	PASI-S
		ASTM D2974-87	KJ1	1	PASI-S

Pace Analytical Services, Inc.
940 South Harney
Seattle, WA 98108
(206)767-5060

SAMPLE ANALYTE COUNT

Project: BPOLY
Pace Project No.: 254662

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
254662007	**MW6R-4-4.5**	NWTPH-Dx	ERB	4	PASI-S
		NWTPH-Gx	AY1	3	PASI-S
		EPA 6010	BGA	7	PASI-S
		EPA 7471	BGA	1	PASI-S
		EPA 8270 by SIM	DMT	20	PASI-S
		EPA 8260	LPM	7	PASI-S
		ASTM D2974-87	KJ1	1	PASI-S
254662008	**MW6R-6-6.5**	EPA 8270 by SIM	DMT	20	PASI-S
		ASTM D2974-87	KJ1	1	PASI-S
254662009	**GP9-2-2.5**	NWTPH-Dx	ERB	4	PASI-S
		NWTPH-Gx	AY1	3	PASI-S
		EPA 6010	BGA	7	PASI-S
		EPA 7471	BGA	1	PASI-S
		EPA 8270 by SIM	DMT	20	PASI-S
		EPA 8260	LPM	8	PASI-S
		ASTM D2974-87	KJ1	1	PASI-S
254662010	**GP9-4-4.5**	EPA 8270 by SIM	DMT	20	PASI-S
		ASTM D2974-87	KJ1	1	PASI-S
254662011	**GP9-5.5-6**	NWTPH-Dx	ERB	4	PASI-S
		NWTPH-Gx	AY1	3	PASI-S
		EPA 6010	BGA	7	PASI-S
		EPA 7471	BGA	1	PASI-S
		EPA 8270 by SIM	DMT	20	PASI-S
		EPA 8260	LPM	8	PASI-S
		ASTM D2974-87	KJ1	1	PASI-S
254662012	**MW7-2-2.5**	NWTPH-Dx	ERB	4	PASI-S
		NWTPH-Gx	AY1	3	PASI-S
		EPA 6010	BGA	7	PASI-S
		EPA 7471	BGA	1	PASI-S
		EPA 8270 by SIM	DMT	20	PASI-S
		EPA 8260	LPM	8	PASI-S
		ASTM D2974-87	KJ1	1	PASI-S
254662013	**MW7-4-4.5**	ASTM D2974-87	KJ1	1	PASI-S
254662014	**MW7-6-6.5**	NWTPH-Dx	ERB	4	PASI-S
		NWTPH-Gx	AY1	3	PASI-S
		EPA 6010	BGA	7	PASI-S
		EPA 7471	BGA	1	PASI-S

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SAMPLE ANALYTE COUNT

Project: BPOLY
Pace Project No.: 254662

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 8270 by SIM	DMT	20	PASI-S
		EPA 8260	ATH	8	PASI-S
		ASTM D2974-87	KJ1	1	PASI-S
254662015	**MW8-2-2.5**	NWTPH-Dx	ERB	4	PASI-S
		NWTPH-Gx	AY1	3	PASI-S
		EPA 6010	BGA	7	PASI-S
		EPA 7471	BGA	1	PASI-S
		EPA 8270 by SIM	DMT	20	PASI-S
		EPA 8260	ATH	8	PASI-S
		ASTM D2974-87	KJ1	1	PASI-S
254662016	**Trip Blank**	NWTPH-Gx	AY1	3	PASI-S
		EPA 8260	LPM	8	PASI-S

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PROJECT NARRATIVE

Project: BPOLY
Pace Project No.: 254662

Method: **NWTPH-Dx**
Description: NWTPH-Dx GCS SG
Client: Arcadis OR
Date: September 30, 2010

General Information:
11 samples were analyzed for NWTPH-Dx. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3546 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: BPOLY
Pace Project No.: 254662

Method: **NWTPH-Gx**
Description: NWTPH-Gx GCV
Client: Arcadis OR
Date: September 30, 2010

General Information:
12 samples were analyzed for NWTPH-Gx. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with NWTPH-Gx with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: BPOLY
Pace Project No.: 254662

Method: **EPA 6010**
Description: 6010 MET ICP
Client: Arcadis OR
Date: September 30, 2010

General Information:
11 samples were analyzed for EPA 6010. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3050 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: BPOLY
Pace Project No.: 254662

Method: **EPA 7471**
Description: 7471 Mercury
Client: Arcadis OR
Date: September 30, 2010

General Information:
11 samples were analyzed for EPA 7471. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 7471 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: BPOLY
Pace Project No.: 254662

Method: **EPA 8270 by SIM**
Description: 8270 MSSV PAH by SIM
Client: Arcadis OR
Date: September 30, 2010

General Information:
14 samples were analyzed for EPA 8270 by SIM. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3546 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

QC Batch: OEXT/2573

S0: Surrogate recovery outside laboratory control limits.

- GP5-6-6.5 (Lab ID: 254662005)
  - Terphenyl-d14 (S)
- MW6R-4-4.5 (Lab ID: 254662007)
  - 2-Fluorobiphenyl (S)
  - Terphenyl-d14 (S)
- MW6R-6-6.5 (Lab ID: 254662008)
  - Terphenyl-d14 (S)
- MW7-2-2.5 (Lab ID: 254662012)
  - Terphenyl-d14 (S)

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

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PROJECT NARRATIVE

Project: BPOLY
Pace Project No.: 254662

Method: **EPA 8270 by SIM**
Description: 8270 MSSV PAH by SIM
Client: Arcadis OR
Date: September 30, 2010

Additional Comments:

Analyte Comments:

QC Batch: OEXT/2573

1n: Analyte recovery is below control limits. Associated samples reporting the analyte may be biased low.

- LCS (Lab ID: 38058)
  - 1-Methylnaphthalene

2n: Results for all reported compounds were confirmed by the analysis of an out-of-hold re-extract sample. This sample was associated with an acceptable method blank and LCS, and had acceptable surrogate recoveries.

- GP4-2-2.5 (Lab ID: 254662001)
  - 2-Fluorobiphenyl (S)
- GP4-4-4.5 (Lab ID: 254662002)
  - 2-Fluorobiphenyl (S)
- GP5-2-2.5 (Lab ID: 254662003)
  - 2-Fluorobiphenyl (S)
- GP5-4-4.5 (Lab ID: 254662004)
  - 2-Fluorobiphenyl (S)
- GP5-6-6.5 (Lab ID: 254662005)
  - Terphenyl-d14 (S)
- GP9-2-2.5 (Lab ID: 254662009)
  - 2-Fluorobiphenyl (S)
- GP9-4-4.5 (Lab ID: 254662010)
  - 2-Fluorobiphenyl (S)
- GP9-5.5-6 (Lab ID: 254662011)
  - 2-Fluorobiphenyl (S)
- MW6R-2-2.5 (Lab ID: 254662006)
  - 2-Fluorobiphenyl (S)
- MW6R-4-4.5 (Lab ID: 254662007)
  - 2-Fluorobiphenyl (S)
- MW6R-6-6.5 (Lab ID: 254662008)
  - Terphenyl-d14 (S)
- MW7-2-2.5 (Lab ID: 254662012)
  - Terphenyl-d14 (S)
- MW7-6-6.5 (Lab ID: 254662014)
  - 2-Fluorobiphenyl (S)

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PROJECT NARRATIVE

Project: BPOLY
Pace Project No.: 254662

Method: **EPA 8260**
Description: 8260/5035A Volatile Organics
Client: Arcadis OR
Date: September 30, 2010

General Information:
12 samples were analyzed for EPA 8260. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

QC Batch: MSV/2918

S5: Surrogate recovery outside control limits due to matrix interferences (not confirmed by re-analysis).
- GP5-4-4.5 (Lab ID: 254662004)
  - 4-Bromofluorobenzene (S)

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: BPOLY
Pace Project No.: 254662

Sample: GP4-2-2.5 **Lab ID: 254662001** Collected: 08/23/10 16:20 Received: 08/24/10 15:15 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS SG	Analytical Method: NWTPH-Dx Preparation Method: EPA 3546							
Diesel Range SG	ND	mg/kg	24.7	1	08/31/10 22:45	09/01/10 18:17		
Motor Oil Range SG	ND	mg/kg	98.6	1	08/31/10 22:45	09/01/10 18:17	64742-65-0	
n-Octacosane (S) SG	96	%	50-150	1	08/31/10 22:45	09/01/10 18:17	630-02-4	
o-Terphenyl (S) SG	96	%	50-150	1	08/31/10 22:45	09/01/10 18:17	84-15-1	
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
Gasoline Range Organics	ND	mg/kg	7.6	1	08/28/10 07:15	08/28/10 16:47		
a,a,a-Trifluorotoluene (S)	109	%	50-150	1	08/28/10 07:15	08/28/10 16:47	98-08-8	
4-Bromofluorobenzene (S)	107	%	50-150	1	08/28/10 07:15	08/28/10 16:47	460-00-4	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Arsenic	ND	mg/kg	13.1	5	08/27/10 07:06	08/30/10 12:22	7440-38-2	
Barium	**120**	mg/kg	26.1	1	08/27/10 07:06	08/30/10 13:31	7440-39-3	
Cadmium	ND	mg/kg	6.5	5	08/27/10 07:06	08/30/10 12:22	7440-43-9	
Chromium	**48.1**	mg/kg	1.3	1	08/27/10 07:06	08/30/10 13:31	7440-47-3	
Lead	**4.6**	mg/kg	1.3	1	08/27/10 07:06	08/30/10 13:31	7439-92-1	
Selenium	ND	mg/kg	6.5	5	08/27/10 07:06	08/30/10 12:22	7782-49-2	
Silver	ND	mg/kg	6.5	5	08/27/10 07:06	08/30/10 12:22	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	ND	mg/kg	0.13	1	08/26/10 08:21	08/26/10 12:07	7439-97-6	
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546							
Acenaphthene	ND	ug/kg	8.6	1	08/27/10 14:45	08/31/10 21:22	83-32-9	
Acenaphthylene	ND	ug/kg	8.6	1	08/27/10 14:45	08/31/10 21:22	208-96-8	
Anthracene	ND	ug/kg	8.6	1	08/27/10 14:45	08/31/10 21:22	120-12-7	
Benzo(a)anthracene	ND	ug/kg	8.6	1	08/27/10 14:45	08/31/10 21:22	56-55-3	
Benzo(a)pyrene	ND	ug/kg	8.6	1	08/27/10 14:45	08/31/10 21:22	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	8.6	1	08/27/10 14:45	08/31/10 21:22	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	8.6	1	08/27/10 14:45	08/31/10 21:22	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	8.6	1	08/27/10 14:45	08/31/10 21:22	207-08-9	
Chrysene	ND	ug/kg	8.6	1	08/27/10 14:45	08/31/10 21:22	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	8.6	1	08/27/10 14:45	08/31/10 21:22	53-70-3	
Fluoranthene	ND	ug/kg	8.6	1	08/27/10 14:45	08/31/10 21:22	206-44-0	
Fluorene	ND	ug/kg	8.6	1	08/27/10 14:45	08/31/10 21:22	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	8.6	1	08/27/10 14:45	08/31/10 21:22	193-39-5	
1-Methylnaphthalene	ND	ug/kg	8.6	1	08/27/10 14:45	08/31/10 21:22	90-12-0	
2-Methylnaphthalene	ND	ug/kg	8.6	1	08/27/10 14:45	08/31/10 21:22	91-57-6	
Naphthalene	ND	ug/kg	8.6	1	08/27/10 14:45	08/31/10 21:22	91-20-3	
Phenanthrene	ND	ug/kg	8.6	1	08/27/10 14:45	08/31/10 21:22	85-01-8	
Pyrene	ND	ug/kg	8.6	1	08/27/10 14:45	08/31/10 21:22	129-00-0	
2-Fluorobiphenyl (S)	78	%	55-136	1	08/27/10 14:45	08/31/10 21:22	321-60-8	2n
Terphenyl-d14 (S)	73	%	60-144	1	08/27/10 14:45	08/31/10 21:22	1718-51-0	

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ANALYTICAL RESULTS

Project: BPOLY
Pace Project No.: 254662

Sample: GP4-2-2.5 **Lab ID: 254662001** Collected: 08/23/10 16:20 Received: 08/24/10 15:15 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260/5035A Volatile Organics	Analytical Method: EPA 8260							
Benzene	ND	ug/kg	3.3	1		08/25/10 15:47	71-43-2	
Ethylbenzene	ND	ug/kg	3.3	1		08/25/10 15:47	100-41-4	
Toluene	ND	ug/kg	3.3	1		08/25/10 15:47	108-88-3	
Xylene (Total)	ND	ug/kg	9.9	1		08/25/10 15:47	1330-20-7	
Dibromofluoromethane (S)	96	%	80-136	1		08/25/10 15:47	1868-53-7	
Toluene-d8 (S)	93	%	80-120	1		08/25/10 15:47	2037-26-5	
4-Bromofluorobenzene (S)	91	%	72-122	1		08/25/10 15:47	460-00-4	
1,2-Dichloroethane-d4 (S)	88	%	80-143	1		08/25/10 15:47	17060-07-0	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**24.2**	%	0.10	1		08/27/10 11:29		

Sample: GP4-4-4.5 **Lab ID: 254662002** Collected: 08/23/10 16:30 Received: 08/24/10 15:15 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS SG	Analytical Method: NWTPH-Dx Preparation Method: EPA 3546							
Diesel Range SG	ND	mg/kg	26.2	1	08/31/10 22:45	09/01/10 18:34		
Motor Oil Range SG	ND	mg/kg	105	1	08/31/10 22:45	09/01/10 18:34	64742-65-0	
n-Octacosane (S) SG	88	%	50-150	1	08/31/10 22:45	09/01/10 18:34	630-02-4	
o-Terphenyl (S) SG	89	%	50-150	1	08/31/10 22:45	09/01/10 18:34	84-15-1	
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
Gasoline Range Organics	ND	mg/kg	7.4	1	08/28/10 07:15	08/28/10 17:24		
a,a,a-Trifluorotoluene (S)	105	%	50-150	1	08/28/10 07:15	08/28/10 17:24	98-08-8	
4-Bromofluorobenzene (S)	106	%	50-150	1	08/28/10 07:15	08/28/10 17:24	460-00-4	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Arsenic	ND	mg/kg	12.6	5	08/27/10 07:06	08/30/10 12:25	7440-38-2	
Barium	**115**	mg/kg	25.1	1	08/27/10 07:06	08/30/10 13:34	7440-39-3	
Cadmium	ND	mg/kg	6.3	5	08/27/10 07:06	08/30/10 12:25	7440-43-9	
Chromium	**48.3**	mg/kg	1.3	1	08/27/10 07:06	08/30/10 13:34	7440-47-3	
Lead	**7.1**	mg/kg	6.3	5	08/27/10 07:06	08/30/10 12:25	7439-92-1	
Selenium	ND	mg/kg	6.3	5	08/27/10 07:06	08/30/10 12:25	7782-49-2	
Silver	ND	mg/kg	6.3	5	08/27/10 07:06	08/30/10 12:25	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	ND	mg/kg	0.13	1	08/26/10 08:21	08/26/10 12:10	7439-97-6	
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546							
Acenaphthene	ND	ug/kg	8.9	1	08/27/10 14:45	08/31/10 21:39	83-32-9	
Acenaphthylene	ND	ug/kg	8.9	1	08/27/10 14:45	08/31/10 21:39	208-96-8	
Anthracene	ND	ug/kg	8.9	1	08/27/10 14:45	08/31/10 21:39	120-12-7	

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ANALYTICAL RESULTS

Project: BPOLY
Pace Project No.: 254662

Sample: GP4-4-4.5 **Lab ID: 254662002** Collected: 08/23/10 16:30 Received: 08/24/10 15:15 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546							
Benzo(a)anthracene	ND	ug/kg	8.9	1	08/27/10 14:45	08/31/10 21:39	56-55-3	
Benzo(a)pyrene	ND	ug/kg	8.9	1	08/27/10 14:45	08/31/10 21:39	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	8.9	1	08/27/10 14:45	08/31/10 21:39	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	8.9	1	08/27/10 14:45	08/31/10 21:39	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	8.9	1	08/27/10 14:45	08/31/10 21:39	207-08-9	
Chrysene	ND	ug/kg	8.9	1	08/27/10 14:45	08/31/10 21:39	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	8.9	1	08/27/10 14:45	08/31/10 21:39	53-70-3	
Fluoranthene	ND	ug/kg	8.9	1	08/27/10 14:45	08/31/10 21:39	206-44-0	
Fluorene	ND	ug/kg	8.9	1	08/27/10 14:45	08/31/10 21:39	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	8.9	1	08/27/10 14:45	08/31/10 21:39	193-39-5	
1-Methylnaphthalene	ND	ug/kg	8.9	1	08/27/10 14:45	08/31/10 21:39	90-12-0	
2-Methylnaphthalene	ND	ug/kg	8.9	1	08/27/10 14:45	08/31/10 21:39	91-57-6	
Naphthalene	ND	ug/kg	8.9	1	08/27/10 14:45	08/31/10 21:39	91-20-3	
Phenanthrene	ND	ug/kg	8.9	1	08/27/10 14:45	08/31/10 21:39	85-01-8	
Pyrene	ND	ug/kg	8.9	1	08/27/10 14:45	08/31/10 21:39	129-00-0	
2-Fluorobiphenyl (S)	77	%	55-136	1	08/27/10 14:45	08/31/10 21:39	321-60-8	2n
Terphenyl-d14 (S)	70	%	60-144	1	08/27/10 14:45	08/31/10 21:39	1718-51-0	
8260/5035A Volatile Organics	Analytical Method: EPA 8260							
Benzene	ND	ug/kg	3.3	1		08/25/10 16:06	71-43-2	
Ethylbenzene	ND	ug/kg	3.3	1		08/25/10 16:06	100-41-4	
Toluene	ND	ug/kg	3.3	1		08/25/10 16:06	108-88-3	
Xylene (Total)	ND	ug/kg	10.0	1		08/25/10 16:06	1330-20-7	
Dibromofluoromethane (S)	95	%	80-136	1		08/25/10 16:06	1868-53-7	
Toluene-d8 (S)	91	%	80-120	1		08/25/10 16:06	2037-26-5	
4-Bromofluorobenzene (S)	93	%	72-122	1		08/25/10 16:06	460-00-4	
1,2-Dichloroethane-d4 (S)	85	%	80-143	1		08/25/10 16:06	17060-07-0	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**25.6**	%	0.10	1		08/27/10 11:35		

Sample: GP5-2-2.5 **Lab ID: 254662003** Collected: 08/23/10 15:45 Received: 08/24/10 15:15 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS SG	Analytical Method: NWTPH-Dx Preparation Method: EPA 3546							
Diesel Range SG	**31.8**	mg/kg	24.7	1	08/31/10 22:45	09/01/10 18:50		
Motor Oil Range SG	ND	mg/kg	98.8	1	08/31/10 22:45	09/01/10 18:50	64742-65-0	
n-Octacosane (S) SG	84	%	50-150	1	08/31/10 22:45	09/01/10 18:50	630-02-4	
o-Terphenyl (S) SG	86	%	50-150	1	08/31/10 22:45	09/01/10 18:50	84-15-1	
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
Gasoline Range Organics	ND	mg/kg	7.2	1	08/28/10 19:00	08/29/10 06:27		

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ANALYTICAL RESULTS

Project: BPOLY
Pace Project No.: 254662

Sample: GP5-2-2.5 **Lab ID: 254662003** Collected: 08/23/10 15:45 Received: 08/24/10 15:15 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
a,a,a-Trifluorotoluene (S)	107	%	50-150	1	08/28/10 19:00	08/29/10 06:27	98-08-8	
4-Bromofluorobenzene (S)	102	%	50-150	1	08/28/10 19:00	08/29/10 06:27	460-00-4	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Arsenic	ND	mg/kg	12.4	5	08/27/10 07:06	08/30/10 12:28	7440-38-2	
Barium	**107**	mg/kg	24.8	1	08/27/10 07:06	08/30/10 13:36	7440-39-3	
Cadmium	ND	mg/kg	6.2	5	08/27/10 07:06	08/30/10 12:28	7440-43-9	
Chromium	**35.1**	mg/kg	1.2	1	08/27/10 07:06	08/30/10 13:36	7440-47-3	
Lead	**8.6**	mg/kg	1.2	1	08/27/10 07:06	08/30/10 13:36	7439-92-1	
Selenium	ND	mg/kg	6.2	5	08/27/10 07:06	08/30/10 12:28	7782-49-2	
Silver	ND	mg/kg	6.2	5	08/27/10 07:06	08/30/10 12:28	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	ND	mg/kg	0.11	1	08/26/10 08:21	08/26/10 12:12	7439-97-6	
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546							
Acenaphthene	ND	ug/kg	8.3	1	08/27/10 14:45	08/31/10 23:51	83-32-9	
Acenaphthylene	**10.5**	ug/kg	8.3	1	08/27/10 14:45	08/31/10 23:51	208-96-8	
Anthracene	**21.4**	ug/kg	8.3	1	08/27/10 14:45	08/31/10 23:51	120-12-7	
Benzo(a)anthracene	**22.7**	ug/kg	8.3	1	08/27/10 14:45	08/31/10 23:51	56-55-3	
Benzo(a)pyrene	**21.6**	ug/kg	8.3	1	08/27/10 14:45	08/31/10 23:51	50-32-8	
Benzo(b)fluoranthene	**26.9**	ug/kg	8.3	1	08/27/10 14:45	08/31/10 23:51	205-99-2	
Benzo(g,h,i)perylene	**18.5**	ug/kg	8.3	1	08/27/10 14:45	08/31/10 23:51	191-24-2	
Benzo(k)fluoranthene	**21.9**	ug/kg	8.3	1	08/27/10 14:45	08/31/10 23:51	207-08-9	
Chrysene	**31.2**	ug/kg	8.3	1	08/27/10 14:45	08/31/10 23:51	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	8.3	1	08/27/10 14:45	08/31/10 23:51	53-70-3	
Fluoranthene	**64.5**	ug/kg	8.3	1	08/27/10 14:45	08/31/10 23:51	206-44-0	
Fluorene	ND	ug/kg	8.3	1	08/27/10 14:45	08/31/10 23:51	86-73-7	
Indeno(1,2,3-cd)pyrene	**16.4**	ug/kg	8.3	1	08/27/10 14:45	08/31/10 23:51	193-39-5	
1-Methylnaphthalene	**39.7**	ug/kg	8.3	1	08/27/10 14:45	08/31/10 23:51	90-12-0	
2-Methylnaphthalene	**77.1**	ug/kg	8.3	1	08/27/10 14:45	08/31/10 23:51	91-57-6	
Naphthalene	**55.6**	ug/kg	8.3	1	08/27/10 14:45	08/31/10 23:51	91-20-3	
Phenanthrene	**59.4**	ug/kg	8.3	1	08/27/10 14:45	08/31/10 23:51	85-01-8	
Pyrene	**53.0**	ug/kg	8.3	1	08/27/10 14:45	08/31/10 23:51	129-00-0	
2-Fluorobiphenyl (S)	73	%	55-136	1	08/27/10 14:45	08/31/10 23:51	321-60-8	2n
Terphenyl-d14 (S)	73	%	60-144	1	08/27/10 14:45	08/31/10 23:51	1718-51-0	
8260/5035A Volatile Organics	Analytical Method: EPA 8260							
Benzene	ND	ug/kg	3.4	1		08/25/10 16:25	71-43-2	
Ethylbenzene	ND	ug/kg	3.4	1		08/25/10 16:25	100-41-4	
Toluene	ND	ug/kg	3.4	1		08/25/10 16:25	108-88-3	
Xylene (Total)	ND	ug/kg	10.2	1		08/25/10 16:25	1330-20-7	
Dibromofluoromethane (S)	96	%	80-136	1		08/25/10 16:25	1868-53-7	
Toluene-d8 (S)	93	%	80-120	1		08/25/10 16:25	2037-26-5	
4-Bromofluorobenzene (S)	93	%	72-122	1		08/25/10 16:25	460-00-4	

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ANALYTICAL RESULTS

Project: BPOLY
Pace Project No.: 254662

Sample: GP5-2-2.5 **Lab ID: 254662003** Collected: 08/23/10 15:45 Received: 08/24/10 15:15 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260/5035A Volatile Organics	Analytical Method: EPA 8260							
1,2-Dichloroethane-d4 (S)	85	%	80-143	1		08/25/10 16:25	17060-07-0	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**21.0**	%	0.10	1		08/27/10 11:39		

Sample: GP5-4-4.5 **Lab ID: 254662004** Collected: 08/23/10 16:00 Received: 08/24/10 15:15 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS SG	Analytical Method: NWTPH-Dx Preparation Method: EPA 3546							
Diesel Range SG	**3780**	mg/kg	43.6	1	09/01/10 19:05	09/02/10 15:52		
Motor Oil Range SG	**1040**	mg/kg	175	1	09/01/10 19:05	09/02/10 15:52	64742-65-0	
n-Octacosane (S) SG	95	%	50-150	1	09/01/10 19:05	09/02/10 15:52	630-02-4	
o-Terphenyl (S) SG	114	%	50-150	1	09/01/10 19:05	09/02/10 15:52	84-15-1	
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
Gasoline Range Organics	**875**	mg/kg	125	5	08/30/10 12:00	08/31/10 02:57		
a,a,a-Trifluorotoluene (S)	104	%	50-150	5	08/30/10 12:00	08/31/10 02:57	98-08-8	
4-Bromofluorobenzene (S)	120	%	50-150	5	08/30/10 12:00	08/31/10 02:57	460-00-4	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Arsenic	ND	mg/kg	21.0	5	08/27/10 07:06	08/30/10 12:30	7440-38-2	
Barium	**130**	mg/kg	41.9	1	08/27/10 07:06	08/30/10 13:44	7440-39-3	
Cadmium	ND	mg/kg	10.5	5	08/27/10 07:06	08/30/10 12:30	7440-43-9	
Chromium	**40.7**	mg/kg	2.1	1	08/27/10 07:06	08/30/10 13:44	7440-47-3	
Lead	**31.0**	mg/kg	2.1	1	08/27/10 07:06	08/30/10 13:44	7439-92-1	
Selenium	ND	mg/kg	10.5	5	08/27/10 07:06	08/30/10 12:30	7782-49-2	
Silver	ND	mg/kg	10.5	5	08/27/10 07:06	08/30/10 12:30	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	ND	mg/kg	0.17	1	08/26/10 08:21	08/26/10 12:18	7439-97-6	
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546							
Acenaphthene	**205**	ug/kg	14.7	1	08/27/10 14:45	09/01/10 00:08	83-32-9	
Acenaphthylene	**155**	ug/kg	14.7	1	08/27/10 14:45	09/01/10 00:08	208-96-8	
Anthracene	**80.2**	ug/kg	14.7	1	08/27/10 14:45	09/01/10 00:08	120-12-7	
Benzo(a)anthracene	**23.1**	ug/kg	14.7	1	08/27/10 14:45	09/01/10 00:08	56-55-3	
Benzo(a)pyrene	ND	ug/kg	14.7	1	08/27/10 14:45	09/01/10 00:08	50-32-8	
Benzo(b)fluoranthene	**15.2**	ug/kg	14.7	1	08/27/10 14:45	09/01/10 00:08	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	14.7	1	08/27/10 14:45	09/01/10 00:08	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	14.7	1	08/27/10 14:45	09/01/10 00:08	207-08-9	
Chrysene	**35.2**	ug/kg	14.7	1	08/27/10 14:45	09/01/10 00:08	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	14.7	1	08/27/10 14:45	09/01/10 00:08	53-70-3	

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ANALYTICAL RESULTS

Project: BPOLY
Pace Project No.: 254662

Sample: GP5-4-4.5 **Lab ID: 254662004** Collected: 08/23/10 16:00 Received: 08/24/10 15:15 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546							
Fluoranthene	**86.4**	ug/kg	14.7	1	08/27/10 14:45	09/01/10 00:08	206-44-0	
Fluorene	**856**	ug/kg	14.7	1	08/27/10 14:45	09/01/10 00:08	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	14.7	1	08/27/10 14:45	09/01/10 00:08	193-39-5	
1-Methylnaphthalene	**9560**	ug/kg	147	10	08/27/10 14:45	09/03/10 20:00	90-12-0	
2-Methylnaphthalene	**12300**	ug/kg	147	10	08/27/10 14:45	09/03/10 20:00	91-57-6	
Naphthalene	**4090**	ug/kg	147	10	08/27/10 14:45	09/03/10 20:00	91-20-3	
Phenanthrene	**1460**	ug/kg	14.7	1	08/27/10 14:45	09/01/10 00:08	85-01-8	
Pyrene	**125**	ug/kg	14.7	1	08/27/10 14:45	09/01/10 00:08	129-00-0	
2-Fluorobiphenyl (S)	61	%	55-136	1	08/27/10 14:45	09/01/10 00:08	321-60-8	2n
Terphenyl-d14 (S)	63	%	60-144	1	08/27/10 14:45	09/01/10 00:08	1718-51-0	
8260/5035A Volatile Organics	Analytical Method: EPA 8260							
Benzene	ND	ug/kg	9.5	1		08/25/10 16:44	71-43-2	
Ethylbenzene	ND	ug/kg	9.5	1		08/25/10 16:44	100-41-4	
Toluene	ND	ug/kg	9.5	1		08/25/10 16:44	108-88-3	
Xylene (Total)	**107**	ug/kg	28.4	1		08/25/10 16:44	1330-20-7	
Dibromofluoromethane (S)	101	%	80-136	1		08/25/10 16:44	1868-53-7	
Toluene-d8 (S)	92	%	80-120	1		08/25/10 16:44	2037-26-5	
4-Bromofluorobenzene (S)	241	%	72-122	1		08/25/10 16:44	460-00-4	S5
1,2-Dichloroethane-d4 (S)	96	%	80-143	1		08/25/10 16:44	17060-07-0	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**54.6**	%	0.10	1		08/27/10 11:41		

Sample: GP5-6-6.5 **Lab ID: 254662005** Collected: 08/23/10 16:10 Received: 08/24/10 15:15 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546							
Acenaphthene	**64.6**	ug/kg	28.8	1	08/27/10 14:45	09/01/10 01:14	83-32-9	
Acenaphthylene	**52.4**	ug/kg	28.8	1	08/27/10 14:45	09/01/10 01:14	208-96-8	
Anthracene	ND	ug/kg	28.8	1	08/27/10 14:45	09/01/10 01:14	120-12-7	
Benzo(a)anthracene	ND	ug/kg	28.8	1	08/27/10 14:45	09/01/10 01:14	56-55-3	
Benzo(a)pyrene	ND	ug/kg	28.8	1	08/27/10 14:45	09/01/10 01:14	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	28.8	1	08/27/10 14:45	09/01/10 01:14	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	28.8	1	08/27/10 14:45	09/01/10 01:14	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	28.8	1	08/27/10 14:45	09/01/10 01:14	207-08-9	
Chrysene	ND	ug/kg	28.8	1	08/27/10 14:45	09/01/10 01:14	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	28.8	1	08/27/10 14:45	09/01/10 01:14	53-70-3	
Fluoranthene	**51.7**	ug/kg	28.8	1	08/27/10 14:45	09/01/10 01:14	206-44-0	
Fluorene	**262**	ug/kg	28.8	1	08/27/10 14:45	09/01/10 01:14	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	28.8	1	08/27/10 14:45	09/01/10 01:14	193-39-5	
1-Methylnaphthalene	**2580**	ug/kg	28.8	1	08/27/10 14:45	09/01/10 01:14	90-12-0	

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ANALYTICAL RESULTS

Project: BPOLY
Pace Project No.: 254662

Sample: GP5-6-6.5 **Lab ID: 254662005** Collected: 08/23/10 16:10 Received: 08/24/10 15:15 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546							
2-Methylnaphthalene	**2840**	ug/kg	28.8	1	08/27/10 14:45	09/01/10 01:14	91-57-6	
Naphthalene	**988**	ug/kg	28.8	1	08/27/10 14:45	09/01/10 01:14	91-20-3	
Phenanthrene	**289**	ug/kg	28.8	1	08/27/10 14:45	09/01/10 01:14	85-01-8	
Pyrene	**47.8**	ug/kg	28.8	1	08/27/10 14:45	09/01/10 01:14	129-00-0	
2-Fluorobiphenyl (S)	59	%	55-136	1	08/27/10 14:45	09/01/10 01:14	321-60-8	
Terphenyl-d14 (S)	44	%	60-144	1	08/27/10 14:45	09/01/10 01:14	1718-51-0	2n,S0
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**76.9**	%	0.10	1		08/27/10 11:45		

Sample: MW6R-2-2.5 **Lab ID: 254662006** Collected: 08/23/10 13:30 Received: 08/24/10 15:15 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS SG	Analytical Method: NWTPH-Dx Preparation Method: EPA 3546							
Diesel Range SG	ND	mg/kg	22.5	1	09/01/10 19:05	09/02/10 16:24		
Motor Oil Range SG	ND	mg/kg	89.9	1	09/01/10 19:05	09/02/10 16:24	64742-65-0	
n-Octacosane (S) SG	105	%	50-150	1	09/01/10 19:05	09/02/10 16:24	630-02-4	
o-Terphenyl (S) SG	105	%	50-150	1	09/01/10 19:05	09/02/10 16:24	84-15-1	
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
Gasoline Range Organics	ND	mg/kg	6.5	1	08/28/10 19:00	08/29/10 07:15		
a,a,a-Trifluorotoluene (S)	112	%	50-150	1	08/28/10 19:00	08/29/10 07:15	98-08-8	
4-Bromofluorobenzene (S)	109	%	50-150	1	08/28/10 19:00	08/29/10 07:15	460-00-4	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Arsenic	ND	mg/kg	12.0	5	08/27/10 07:06	08/30/10 12:33	7440-38-2	
Barium	**110**	mg/kg	23.9	1	08/27/10 07:06	08/30/10 13:47	7440-39-3	
Cadmium	ND	mg/kg	6.0	5	08/27/10 07:06	08/30/10 12:33	7440-43-9	
Chromium	**39.4**	mg/kg	1.2	1	08/27/10 07:06	08/30/10 13:47	7440-47-3	
Lead	**4.3**	mg/kg	1.2	1	08/27/10 07:06	08/30/10 13:47	7439-92-1	
Selenium	ND	mg/kg	6.0	5	08/27/10 07:06	08/30/10 12:33	7782-49-2	
Silver	ND	mg/kg	6.0	5	08/27/10 07:06	08/30/10 12:33	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	ND	mg/kg	0.11	1	08/26/10 08:21	08/26/10 12:21	7439-97-6	
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546							
Acenaphthene	ND	ug/kg	8.0	1	08/27/10 14:45	08/31/10 21:55	83-32-9	
Acenaphthylene	ND	ug/kg	8.0	1	08/27/10 14:45	08/31/10 21:55	208-96-8	
Anthracene	ND	ug/kg	8.0	1	08/27/10 14:45	08/31/10 21:55	120-12-7	
Benzo(a)anthracene	ND	ug/kg	8.0	1	08/27/10 14:45	08/31/10 21:55	56-55-3	
Benzo(a)pyrene	ND	ug/kg	8.0	1	08/27/10 14:45	08/31/10 21:55	50-32-8	

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ANALYTICAL RESULTS

Project: BPOLY
Pace Project No.: 254662

Sample: MW6R-2-2.5 **Lab ID: 254662006** Collected: 08/23/10 13:30 Received: 08/24/10 15:15 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546							
Benzo(b)fluoranthene	ND	ug/kg	8.0	1	08/27/10 14:45	08/31/10 21:55	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	8.0	1	08/27/10 14:45	08/31/10 21:55	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	8.0	1	08/27/10 14:45	08/31/10 21:55	207-08-9	
Chrysene	ND	ug/kg	8.0	1	08/27/10 14:45	08/31/10 21:55	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	8.0	1	08/27/10 14:45	08/31/10 21:55	53-70-3	
Fluoranthene	ND	ug/kg	8.0	1	08/27/10 14:45	08/31/10 21:55	206-44-0	
Fluorene	ND	ug/kg	8.0	1	08/27/10 14:45	08/31/10 21:55	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	8.0	1	08/27/10 14:45	08/31/10 21:55	193-39-5	
1-Methylnaphthalene	ND	ug/kg	8.0	1	08/27/10 14:45	08/31/10 21:55	90-12-0	
2-Methylnaphthalene	ND	ug/kg	8.0	1	08/27/10 14:45	08/31/10 21:55	91-57-6	
Naphthalene	ND	ug/kg	8.0	1	08/27/10 14:45	08/31/10 21:55	91-20-3	
Phenanthrene	ND	ug/kg	8.0	1	08/27/10 14:45	08/31/10 21:55	85-01-8	
Pyrene	ND	ug/kg	8.0	1	08/27/10 14:45	08/31/10 21:55	129-00-0	
2-Fluorobiphenyl (S)	78	%	55-136	1	08/27/10 14:45	08/31/10 21:55	321-60-8	2n
Terphenyl-d14 (S)	76	%	60-144	1	08/27/10 14:45	08/31/10 21:55	1718-51-0	
8260/5035A Volatile Organics	Analytical Method: EPA 8260							
Benzene	ND	ug/kg	3.1	1		08/25/10 17:03	71-43-2	
Ethylbenzene	ND	ug/kg	3.1	1		08/25/10 17:03	100-41-4	
Toluene	ND	ug/kg	3.1	1		08/25/10 17:03	108-88-3	
Xylene (Total)	ND	ug/kg	9.4	1		08/25/10 17:03	1330-20-7	
Dibromofluoromethane (S)	100	%	80-136	1		08/25/10 17:03	1868-53-7	
Toluene-d8 (S)	90	%	80-120	1		08/25/10 17:03	2037-26-5	
4-Bromofluorobenzene (S)	95	%	72-122	1		08/25/10 17:03	460-00-4	
1,2-Dichloroethane-d4 (S)	90	%	80-143	1		08/25/10 17:03	17060-07-0	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**18.0**	%	0.10	1		08/27/10 11:49		

Sample: MW6R-4-4.5 **Lab ID: 254662007** Collected: 08/23/10 13:45 Received: 08/24/10 15:15 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS SG	Analytical Method: NWTPH-Dx Preparation Method: EPA 3546							
Diesel Range SG	**7060**	mg/kg	106	1	09/01/10 19:05	09/02/10 16:41		
Motor Oil Range SG	**1360**	mg/kg	424	1	09/01/10 19:05	09/02/10 16:41	64742-65-0	
n-Octacosane (S) SG	62	%	50-150	1	09/01/10 19:05	09/02/10 16:41	630-02-4	
o-Terphenyl (S) SG	75	%	50-150	1	09/01/10 19:05	09/02/10 16:41	84-15-1	
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
Gasoline Range Organics	**665**	mg/kg	60.7	1	08/30/10 12:00	08/31/10 03:21		
a,a,a-Trifluorotoluene (S)	107	%	50-150	1	08/30/10 12:00	08/31/10 03:21	98-08-8	
4-Bromofluorobenzene (S)	121	%	50-150	1	08/30/10 12:00	08/31/10 03:21	460-00-4	

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ANALYTICAL RESULTS

Project: BPOLY
Pace Project No.: 254662

Sample: MW6R-4-4.5 **Lab ID: 254662007** Collected: 08/23/10 13:45 Received: 08/24/10 15:15 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Arsenic	ND	mg/kg	10	1	08/27/10 07:06	08/30/10 13:49	7440-38-2	
Barium	ND	mg/kg	100	1	08/27/10 07:06	08/30/10 13:49	7440-39-3	
Cadmium	ND	mg/kg	5.0	1	08/27/10 07:06	08/30/10 13:49	7440-43-9	
Chromium	**5.0**	mg/kg	5.0	1	08/27/10 07:06	08/30/10 13:49	7440-47-3	
Lead	**12.6**	mg/kg	5.0	1	08/27/10 07:06	08/30/10 13:49	7439-92-1	
Selenium	ND	mg/kg	5.0	1	08/27/10 07:06	08/30/10 13:49	7782-49-2	
Silver	ND	mg/kg	5.0	1	08/27/10 07:06	08/30/10 13:49	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	ND	mg/kg	0.43	1	08/26/10 08:21	08/26/10 12:23	7439-97-6	
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546							
Acenaphthene	**486**	ug/kg	35.8	1	08/27/10 14:45	09/01/10 02:03	83-32-9	
Acenaphthylene	**330**	ug/kg	35.8	1	08/27/10 14:45	09/01/10 02:03	208-96-8	
Anthracene	**119**	ug/kg	35.8	1	08/27/10 14:45	09/01/10 02:03	120-12-7	
Benzo(a)anthracene	ND	ug/kg	35.8	1	08/27/10 14:45	09/01/10 02:03	56-55-3	
Benzo(a)pyrene	ND	ug/kg	35.8	1	08/27/10 14:45	09/01/10 02:03	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	35.8	1	08/27/10 14:45	09/01/10 02:03	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	35.8	1	08/27/10 14:45	09/01/10 02:03	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	35.8	1	08/27/10 14:45	09/01/10 02:03	207-08-9	
Chrysene	**39.5**	ug/kg	35.8	1	08/27/10 14:45	09/01/10 02:03	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	35.8	1	08/27/10 14:45	09/01/10 02:03	53-70-3	
Fluoranthene	**54.4**	ug/kg	35.8	1	08/27/10 14:45	09/01/10 02:03	206-44-0	
Fluorene	**1690**	ug/kg	35.8	1	08/27/10 14:45	09/01/10 02:03	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	35.8	1	08/27/10 14:45	09/01/10 02:03	193-39-5	
1-Methylnaphthalene	**13000**	ug/kg	358	10	08/27/10 14:45	09/09/10 15:11	90-12-0	
2-Methylnaphthalene	**16700**	ug/kg	358	10	08/27/10 14:45	09/09/10 15:11	91-57-6	
Naphthalene	**2480**	ug/kg	358	10	08/27/10 14:45	09/09/10 15:11	91-20-3	
Phenanthrene	**2900**	ug/kg	35.8	1	08/27/10 14:45	09/01/10 02:03	85-01-8	
Pyrene	**212**	ug/kg	35.8	1	08/27/10 14:45	09/01/10 02:03	129-00-0	
2-Fluorobiphenyl (S)	39	%	55-136	1	08/27/10 14:45	09/01/10 02:03	321-60-8	2n,S0
Terphenyl-d14 (S)	31	%	60-144	1	08/27/10 14:45	09/01/10 02:03	1718-51-0	S0
8260/5035A Volatile Organics	Analytical Method: EPA 8260							
Benzene	ND	ug/kg	21.5	1		08/25/10 17:21	71-43-2	
Ethylbenzene	ND	ug/kg	21.5	1		08/25/10 17:21	100-41-4	
Toluene	ND	ug/kg	21.5	1		08/25/10 17:21	108-88-3	
Xylene (Total)	ND	ug/kg	64.4	1		08/25/10 17:21	1330-20-7	
Dibromofluoromethane (S)	99	%	80-136	1		08/25/10 17:21	1868-53-7	
Toluene-d8 (S)	97	%	80-120	1		08/25/10 17:21	2037-26-5	
1,2-Dichloroethane-d4 (S)	90	%	80-143	1		08/25/10 17:21	17060-07-0	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**81.8**	%	0.10	1		08/27/10 11:52		

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ANALYTICAL RESULTS

Project: BPOLY
Pace Project No.: 254662

Sample: MW6R-6-6.5 **Lab ID: 254662008** Collected: 08/23/10 14:15 Received: 08/24/10 15:15 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546							
Acenaphthene	ND	ug/kg	10.1	1	08/27/10 14:45	08/31/10 22:12	83-32-9	
Acenaphthylene	ND	ug/kg	10.1	1	08/27/10 14:45	08/31/10 22:12	208-96-8	
Anthracene	ND	ug/kg	10.1	1	08/27/10 14:45	08/31/10 22:12	120-12-7	
Benzo(a)anthracene	ND	ug/kg	10.1	1	08/27/10 14:45	08/31/10 22:12	56-55-3	
Benzo(a)pyrene	ND	ug/kg	10.1	1	08/27/10 14:45	08/31/10 22:12	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	10.1	1	08/27/10 14:45	08/31/10 22:12	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	10.1	1	08/27/10 14:45	08/31/10 22:12	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	10.1	1	08/27/10 14:45	08/31/10 22:12	207-08-9	
Chrysene	ND	ug/kg	10.1	1	08/27/10 14:45	08/31/10 22:12	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	10.1	1	08/27/10 14:45	08/31/10 22:12	53-70-3	
Fluoranthene	ND	ug/kg	10.1	1	08/27/10 14:45	08/31/10 22:12	206-44-0	
Fluorene	ND	ug/kg	10.1	1	08/27/10 14:45	08/31/10 22:12	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	10.1	1	08/27/10 14:45	08/31/10 22:12	193-39-5	
1-Methylnaphthalene	**62.3**	ug/kg	10.1	1	08/27/10 14:45	08/31/10 22:12	90-12-0	
2-Methylnaphthalene	**56.8**	ug/kg	10.1	1	08/27/10 14:45	08/31/10 22:12	91-57-6	
Naphthalene	**17.7**	ug/kg	10.1	1	08/27/10 14:45	08/31/10 22:12	91-20-3	
Phenanthrene	ND	ug/kg	10.1	1	08/27/10 14:45	08/31/10 22:12	85-01-8	
Pyrene	ND	ug/kg	10.1	1	08/27/10 14:45	08/31/10 22:12	129-00-0	
2-Fluorobiphenyl (S)	59	%	55-136	1	08/27/10 14:45	08/31/10 22:12	321-60-8	
Terphenyl-d14 (S)	47	%	60-144	1	08/27/10 14:45	08/31/10 22:12	1718-51-0	2n,S0
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**34.6**	%	0.10	1		08/27/10 11:55		

Sample: GP9-2-2.5 **Lab ID: 254662009** Collected: 08/24/10 09:15 Received: 08/24/10 15:15 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS SG	Analytical Method: NWTPH-Dx Preparation Method: EPA 3546							
Diesel Range SG	ND	mg/kg	24.9	1	09/01/10 19:05	09/02/10 16:57		
Motor Oil Range SG	ND	mg/kg	99.6	1	09/01/10 19:05	09/02/10 16:57	64742-65-0	
n-Octacosane (S) SG	91	%	50-150	1	09/01/10 19:05	09/02/10 16:57	630-02-4	
o-Terphenyl (S) SG	100	%	50-150	1	09/01/10 19:05	09/02/10 16:57	84-15-1	
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
Gasoline Range Organics	ND	mg/kg	7.2	1	08/28/10 19:00	08/29/10 08:26		
a,a,a-Trifluorotoluene (S)	107	%	50-150	1	08/28/10 19:00	08/29/10 08:26	98-08-8	
4-Bromofluorobenzene (S)	105	%	50-150	1	08/28/10 19:00	08/29/10 08:26	460-00-4	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Arsenic	ND	mg/kg	12.4	5	08/27/10 07:06	08/30/10 12:44	7440-38-2	
Barium	**129**	mg/kg	24.8	1	08/27/10 07:06	08/30/10 13:52	7440-39-3	
Cadmium	ND	mg/kg	6.2	5	08/27/10 07:06	08/30/10 12:44	7440-43-9	

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ANALYTICAL RESULTS

Project: BPOLY
Pace Project No.: 254662

Sample: GP9-2-2.5 **Lab ID: 254662009** Collected: 08/24/10 09:15 Received: 08/24/10 15:15 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Chromium	**42.7**	mg/kg	1.2	1	08/27/10 07:06	08/30/10 13:52	7440-47-3	
Lead	**7.3**	mg/kg	1.2	1	08/27/10 07:06	08/30/10 13:52	7439-92-1	
Selenium	ND	mg/kg	6.2	5	08/27/10 07:06	08/30/10 12:44	7782-49-2	
Silver	ND	mg/kg	6.2	5	08/27/10 07:06	08/30/10 12:44	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	ND	mg/kg	0.12	1	08/26/10 08:21	08/26/10 12:25	7439-97-6	
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546							
Acenaphthene	ND	ug/kg	8.4	1	08/27/10 14:45	09/01/10 00:24	83-32-9	
Acenaphthylene	ND	ug/kg	8.4	1	08/27/10 14:45	09/01/10 00:24	208-96-8	
Anthracene	**12.6**	ug/kg	8.4	1	08/27/10 14:45	09/01/10 00:24	120-12-7	
Benzo(a)anthracene	**16.2**	ug/kg	8.4	1	08/27/10 14:45	09/01/10 00:24	56-55-3	
Benzo(a)pyrene	**14.7**	ug/kg	8.4	1	08/27/10 14:45	09/01/10 00:24	50-32-8	
Benzo(b)fluoranthene	**23.9**	ug/kg	8.4	1	08/27/10 14:45	09/01/10 00:24	205-99-2	
Benzo(g,h,i)perylene	**11.3**	ug/kg	8.4	1	08/27/10 14:45	09/01/10 00:24	191-24-2	
Benzo(k)fluoranthene	**13.9**	ug/kg	8.4	1	08/27/10 14:45	09/01/10 00:24	207-08-9	
Chrysene	**22.0**	ug/kg	8.4	1	08/27/10 14:45	09/01/10 00:24	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	8.4	1	08/27/10 14:45	09/01/10 00:24	53-70-3	
Fluoranthene	**42.4**	ug/kg	8.4	1	08/27/10 14:45	09/01/10 00:24	206-44-0	
Fluorene	ND	ug/kg	8.4	1	08/27/10 14:45	09/01/10 00:24	86-73-7	
Indeno(1,2,3-cd)pyrene	**11.2**	ug/kg	8.4	1	08/27/10 14:45	09/01/10 00:24	193-39-5	
1-Methylnaphthalene	**16.2**	ug/kg	8.4	1	08/27/10 14:45	09/01/10 00:24	90-12-0	
2-Methylnaphthalene	**24.8**	ug/kg	8.4	1	08/27/10 14:45	09/01/10 00:24	91-57-6	
Naphthalene	**18.1**	ug/kg	8.4	1	08/27/10 14:45	09/01/10 00:24	91-20-3	
Phenanthrene	**32.3**	ug/kg	8.4	1	08/27/10 14:45	09/01/10 00:24	85-01-8	
Pyrene	**29.0**	ug/kg	8.4	1	08/27/10 14:45	09/01/10 00:24	129-00-0	
2-Fluorobiphenyl (S)	63	%	55-136	1	08/27/10 14:45	09/01/10 00:24	321-60-8	2n
Terphenyl-d14 (S)	71	%	60-144	1	08/27/10 14:45	09/01/10 00:24	1718-51-0	
8260/5035A Volatile Organics	Analytical Method: EPA 8260							
Benzene	ND	ug/kg	3.1	1		08/25/10 17:40	71-43-2	
Ethylbenzene	ND	ug/kg	3.1	1		08/25/10 17:40	100-41-4	
Toluene	ND	ug/kg	3.1	1		08/25/10 17:40	108-88-3	
Xylene (Total)	ND	ug/kg	9.2	1		08/25/10 17:40	1330-20-7	
Dibromofluoromethane (S)	101	%	80-136	1		08/25/10 17:40	1868-53-7	
Toluene-d8 (S)	84	%	80-120	1		08/25/10 17:40	2037-26-5	
4-Bromofluorobenzene (S)	95	%	72-122	1		08/25/10 17:40	460-00-4	
1,2-Dichloroethane-d4 (S)	88	%	80-143	1		08/25/10 17:40	17060-07-0	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**22.5**	%	0.10	1		08/27/10 12:00		

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ANALYTICAL RESULTS

Project: BPOLY
Pace Project No.: 254662

Sample: GP9-4-4.5 **Lab ID: 254662010** Collected: 08/24/10 09:30 Received: 08/24/10 15:15 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546							
Acenaphthene	ND	ug/kg	8.9	1	08/27/10 14:45	09/01/10 00:41	83-32-9	
Acenaphthylene	ND	ug/kg	8.9	1	08/27/10 14:45	09/01/10 00:41	208-96-8	
Anthracene	ND	ug/kg	8.9	1	08/27/10 14:45	09/01/10 00:41	120-12-7	
Benzo(a)anthracene	**14.3**	ug/kg	8.9	1	08/27/10 14:45	09/01/10 00:41	56-55-3	
Benzo(a)pyrene	**14.2**	ug/kg	8.9	1	08/27/10 14:45	09/01/10 00:41	50-32-8	
Benzo(b)fluoranthene	**16.3**	ug/kg	8.9	1	08/27/10 14:45	09/01/10 00:41	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	8.9	1	08/27/10 14:45	09/01/10 00:41	191-24-2	
Benzo(k)fluoranthene	**14.8**	ug/kg	8.9	1	08/27/10 14:45	09/01/10 00:41	207-08-9	
Chrysene	**18.4**	ug/kg	8.9	1	08/27/10 14:45	09/01/10 00:41	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	8.9	1	08/27/10 14:45	09/01/10 00:41	53-70-3	
Fluoranthene	**40.5**	ug/kg	8.9	1	08/27/10 14:45	09/01/10 00:41	206-44-0	
Fluorene	ND	ug/kg	8.9	1	08/27/10 14:45	09/01/10 00:41	86-73-7	
Indeno(1,2,3-cd)pyrene	**9.3**	ug/kg	8.9	1	08/27/10 14:45	09/01/10 00:41	193-39-5	
1-Methylnaphthalene	ND	ug/kg	8.9	1	08/27/10 14:45	09/01/10 00:41	90-12-0	
2-Methylnaphthalene	**12.3**	ug/kg	8.9	1	08/27/10 14:45	09/01/10 00:41	91-57-6	
Naphthalene	**11.0**	ug/kg	8.9	1	08/27/10 14:45	09/01/10 00:41	91-20-3	
Phenanthrene	**25.3**	ug/kg	8.9	1	08/27/10 14:45	09/01/10 00:41	85-01-8	
Pyrene	**29.0**	ug/kg	8.9	1	08/27/10 14:45	09/01/10 00:41	129-00-0	
2-Fluorobiphenyl (S)	67	%	55-136	1	08/27/10 14:45	09/01/10 00:41	321-60-8	2n
Terphenyl-d14 (S)	67	%	60-144	1	08/27/10 14:45	09/01/10 00:41	1718-51-0	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**26.2**	%	0.10	1		08/27/10 12:03		

Sample: GP9-5.5-6 **Lab ID: 254662011** Collected: 08/24/10 09:45 Received: 08/24/10 15:15 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS SG	Analytical Method: NWTPH-Dx Preparation Method: EPA 3546							
Diesel Range SG	ND	mg/kg	25.0	1	09/01/10 19:05	09/02/10 17:13		
Motor Oil Range SG	ND	mg/kg	100	1	09/01/10 19:05	09/02/10 17:13	64742-65-0	
n-Octacosane (S) SG	89	%	50-150	1	09/01/10 19:05	09/02/10 17:13	630-02-4	
o-Terphenyl (S) SG	98	%	50-150	1	09/01/10 19:05	09/02/10 17:13	84-15-1	
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
Gasoline Range Organics	**13.8**	mg/kg	6.9	1	08/30/10 12:00	08/31/10 01:43		
a,a,a-Trifluorotoluene (S)	110	%	50-150	1	08/30/10 12:00	08/31/10 01:43	98-08-8	
4-Bromofluorobenzene (S)	105	%	50-150	1	08/30/10 12:00	08/31/10 01:43	460-00-4	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Arsenic	ND	mg/kg	13.0	5	08/27/10 07:06	08/30/10 12:46	7440-38-2	
Barium	**102**	mg/kg	26.1	1	08/27/10 07:06	08/30/10 13:55	7440-39-3	
Cadmium	ND	mg/kg	6.5	5	08/27/10 07:06	08/30/10 12:46	7440-43-9	

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ANALYTICAL RESULTS

Project: BPOLY
Pace Project No.: 254662

Sample: GP9-5.5-6 **Lab ID: 254662011** Collected: 08/24/10 09:45 Received: 08/24/10 15:15 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Chromium	**36.5**	mg/kg	1.3	1	08/27/10 07:06	08/30/10 13:55	7440-47-3	
Lead	**10.7**	mg/kg	1.3	1	08/27/10 07:06	08/30/10 13:55	7439-92-1	
Selenium	ND	mg/kg	6.5	5	08/27/10 07:06	08/30/10 12:46	7782-49-2	
Silver	ND	mg/kg	6.5	5	08/27/10 07:06	08/30/10 12:46	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	ND	mg/kg	0.11	1	08/26/10 08:21	08/26/10 12:27	7439-97-6	
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546							
Acenaphthene	ND	ug/kg	8.6	1	08/27/10 14:45	08/31/10 22:28	83-32-9	
Acenaphthylene	**8.6**	ug/kg	8.6	1	08/27/10 14:45	08/31/10 22:28	208-96-8	
Anthracene	**20.5**	ug/kg	8.6	1	08/27/10 14:45	08/31/10 22:28	120-12-7	
Benzo(a)anthracene	**33.9**	ug/kg	8.6	1	08/27/10 14:45	08/31/10 22:28	56-55-3	
Benzo(a)pyrene	**31.7**	ug/kg	8.6	1	08/27/10 14:45	08/31/10 22:28	50-32-8	
Benzo(b)fluoranthene	**27.7**	ug/kg	8.6	1	08/27/10 14:45	08/31/10 22:28	205-99-2	
Benzo(g,h,i)perylene	**17.7**	ug/kg	8.6	1	08/27/10 14:45	08/31/10 22:28	191-24-2	
Benzo(k)fluoranthene	**29.0**	ug/kg	8.6	1	08/27/10 14:45	08/31/10 22:28	207-08-9	
Chrysene	**33.4**	ug/kg	8.6	1	08/27/10 14:45	08/31/10 22:28	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	8.6	1	08/27/10 14:45	08/31/10 22:28	53-70-3	
Fluoranthene	**93.2**	ug/kg	8.6	1	08/27/10 14:45	08/31/10 22:28	206-44-0	
Fluorene	**16.7**	ug/kg	8.6	1	08/27/10 14:45	08/31/10 22:28	86-73-7	
Indeno(1,2,3-cd)pyrene	**17.2**	ug/kg	8.6	1	08/27/10 14:45	08/31/10 22:28	193-39-5	
1-Methylnaphthalene	**10.8**	ug/kg	8.6	1	08/27/10 14:45	08/31/10 22:28	90-12-0	
2-Methylnaphthalene	**18.0**	ug/kg	8.6	1	08/27/10 14:45	08/31/10 22:28	91-57-6	
Naphthalene	**18.4**	ug/kg	8.6	1	08/27/10 14:45	08/31/10 22:28	91-20-3	
Phenanthrene	**87.7**	ug/kg	8.6	1	08/27/10 14:45	08/31/10 22:28	85-01-8	
Pyrene	**65.2**	ug/kg	8.6	1	08/27/10 14:45	08/31/10 22:28	129-00-0	
2-Fluorobiphenyl (S)	72	%	55-136	1	08/27/10 14:45	08/31/10 22:28	321-60-8	2n
Terphenyl-d14 (S)	68	%	60-144	1	08/27/10 14:45	08/31/10 22:28	1718-51-0	
8260/5035A Volatile Organics	Analytical Method: EPA 8260							
Benzene	ND	ug/kg	3.1	1		08/25/10 18:00	71-43-2	
Ethylbenzene	ND	ug/kg	3.1	1		08/25/10 18:00	100-41-4	
Toluene	ND	ug/kg	3.1	1		08/25/10 18:00	108-88-3	
Xylene (Total)	ND	ug/kg	9.2	1		08/25/10 18:00	1330-20-7	
Dibromofluoromethane (S)	97	%	80-136	1		08/25/10 18:00	1868-53-7	
Toluene-d8 (S)	89	%	80-120	1		08/25/10 18:00	2037-26-5	
4-Bromofluorobenzene (S)	92	%	72-122	1		08/25/10 18:00	460-00-4	
1,2-Dichloroethane-d4 (S)	88	%	80-143	1		08/25/10 18:00	17060-07-0	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**23.3**	%	0.10	1		08/27/10 12:06		

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ANALYTICAL RESULTS

Project: BPOLY
Pace Project No.: 254662

Sample: MW7-2-2.5 **Lab ID: 254662012** Collected: 08/24/10 10:30 Received: 08/24/10 15:15 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS SG	Analytical Method: NWTPH-Dx Preparation Method: EPA 3546							
Diesel Range SG	ND	mg/kg	20.3	1	09/01/10 19:05	09/02/10 17:30		
Motor Oil Range SG	ND	mg/kg	81.0	1	09/01/10 19:05	09/02/10 17:30	64742-65-0	
n-Octacosane (S) SG	97	%	50-150	1	09/01/10 19:05	09/02/10 17:30	630-02-4	
o-Terphenyl (S) SG	106	%	50-150	1	09/01/10 19:05	09/02/10 17:30	84-15-1	
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
Gasoline Range Organics	ND	mg/kg	4.9	1	08/28/10 19:00	08/29/10 09:37		
a,a,a-Trifluorotoluene (S)	109	%	50-150	1	08/28/10 19:00	08/29/10 09:37	98-08-8	
4-Bromofluorobenzene (S)	106	%	50-150	1	08/28/10 19:00	08/29/10 09:37	460-00-4	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Arsenic	ND	mg/kg	10.5	5	08/27/10 07:06	08/30/10 12:49	7440-38-2	
Barium	**84.1**	mg/kg	20.9	1	08/27/10 07:06	08/30/10 13:58	7440-39-3	
Cadmium	ND	mg/kg	5.2	5	08/27/10 07:06	08/30/10 12:49	7440-43-9	
Chromium	**22.8**	mg/kg	1.0	1	08/27/10 07:06	08/30/10 13:58	7440-47-3	
Lead	**6.6**	mg/kg	1.0	1	08/27/10 07:06	08/30/10 13:58	7439-92-1	
Selenium	ND	mg/kg	5.2	5	08/27/10 07:06	08/30/10 12:49	7782-49-2	
Silver	ND	mg/kg	5.2	5	08/27/10 07:06	08/30/10 12:49	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	ND	mg/kg	0.11	1	08/26/10 08:21	08/26/10 12:29	7439-97-6	
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546							
Acenaphthene	ND	ug/kg	7.2	1	08/27/10 14:45	09/01/10 02:20	83-32-9	
Acenaphthylene	ND	ug/kg	7.2	1	08/27/10 14:45	09/01/10 02:20	208-96-8	
Anthracene	ND	ug/kg	7.2	1	08/27/10 14:45	09/01/10 02:20	120-12-7	
Benzo(a)anthracene	ND	ug/kg	7.2	1	08/27/10 14:45	09/01/10 02:20	56-55-3	
Benzo(a)pyrene	ND	ug/kg	7.2	1	08/27/10 14:45	09/01/10 02:20	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	7.2	1	08/27/10 14:45	09/01/10 02:20	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	7.2	1	08/27/10 14:45	09/01/10 02:20	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	7.2	1	08/27/10 14:45	09/01/10 02:20	207-08-9	
Chrysene	ND	ug/kg	7.2	1	08/27/10 14:45	09/01/10 02:20	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	7.2	1	08/27/10 14:45	09/01/10 02:20	53-70-3	
Fluoranthene	ND	ug/kg	7.2	1	08/27/10 14:45	09/01/10 02:20	206-44-0	
Fluorene	ND	ug/kg	7.2	1	08/27/10 14:45	09/01/10 02:20	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	7.2	1	08/27/10 14:45	09/01/10 02:20	193-39-5	
1-Methylnaphthalene	ND	ug/kg	7.2	1	08/27/10 14:45	09/01/10 02:20	90-12-0	
2-Methylnaphthalene	ND	ug/kg	7.2	1	08/27/10 14:45	09/01/10 02:20	91-57-6	
Naphthalene	ND	ug/kg	7.2	1	08/27/10 14:45	09/01/10 02:20	91-20-3	
Phenanthrene	ND	ug/kg	7.2	1	08/27/10 14:45	09/01/10 02:20	85-01-8	
Pyrene	ND	ug/kg	7.2	1	08/27/10 14:45	09/01/10 02:20	129-00-0	
2-Fluorobiphenyl (S)	61	%	55-136	1	08/27/10 14:45	09/01/10 02:20	321-60-8	
Terphenyl-d14 (S)	59	%	60-144	1	08/27/10 14:45	09/01/10 02:20	1718-51-0	2n,S0

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ANALYTICAL RESULTS

Project: BPOLY
Pace Project No.: 254662

Sample: MW7-2-2.5 **Lab ID: 254662012** Collected: 08/24/10 10:30 Received: 08/24/10 15:15 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260/5035A Volatile Organics	Analytical Method: EPA 8260							
Benzene	ND	ug/kg	3.0	1		08/25/10 18:18	71-43-2	
Ethylbenzene	ND	ug/kg	3.0	1		08/25/10 18:18	100-41-4	
Toluene	ND	ug/kg	3.0	1		08/25/10 18:18	108-88-3	
Xylene (Total)	ND	ug/kg	9.0	1		08/25/10 18:18	1330-20-7	
Dibromofluoromethane (S)	96	%	80-136	1		08/25/10 18:18	1868-53-7	
Toluene-d8 (S)	91	%	80-120	1		08/25/10 18:18	2037-26-5	
4-Bromofluorobenzene (S)	92	%	72-122	1		08/25/10 18:18	460-00-4	
1,2-Dichloroethane-d4 (S)	88	%	80-143	1		08/25/10 18:18	17060-07-0	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**8.2**	%	0.10	1		08/27/10 12:10		

Sample: MW7-4-4.5 **Lab ID: 254662013** Collected: 08/24/10 10:40 Received: 08/24/10 15:15 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**10.6**	%	0.10	1		08/27/10 12:13		

Sample: MW7-6-6.5 **Lab ID: 254662014** Collected: 08/24/10 10:50 Received: 08/24/10 15:15 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS SG	Analytical Method: NWTPH-Dx Preparation Method: EPA 3546							
Diesel Range SG	ND	mg/kg	24.3	1	09/01/10 19:05	09/02/10 18:18		
Motor Oil Range SG	ND	mg/kg	97.4	1	09/01/10 19:05	09/02/10 18:18	64742-65-0	
n-Octacosane (S) SG	104	%	50-150	1	09/01/10 19:05	09/02/10 18:18	630-02-4	
o-Terphenyl (S) SG	106	%	50-150	1	09/01/10 19:05	09/02/10 18:18	84-15-1	
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
Gasoline Range Organics	ND	mg/kg	6.8	1	08/30/10 12:00	08/31/10 02:08		
a,a,a-Trifluorotoluene (S)	115	%	50-150	1	08/30/10 12:00	08/31/10 02:08	98-08-8	
4-Bromofluorobenzene (S)	103	%	50-150	1	08/30/10 12:00	08/31/10 02:08	460-00-4	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Arsenic	ND	mg/kg	12.5	5	08/27/10 07:06	08/30/10 12:51	7440-38-2	
Barium	**123**	mg/kg	25.0	1	08/27/10 07:06	08/30/10 14:00	7440-39-3	
Cadmium	ND	mg/kg	6.2	5	08/27/10 07:06	08/30/10 12:51	7440-43-9	
Chromium	**34.4**	mg/kg	1.2	1	08/27/10 07:06	08/30/10 14:00	7440-47-3	
Lead	**10.7**	mg/kg	1.2	1	08/27/10 07:06	08/30/10 14:00	7439-92-1	
Selenium	ND	mg/kg	6.2	5	08/27/10 07:06	08/30/10 12:51	7782-49-2	

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ANALYTICAL RESULTS

Project: BPOLY
Pace Project No.: 254662

Sample: MW7-6-6.5 **Lab ID: 254662014** Collected: 08/24/10 10:50 Received: 08/24/10 15:15 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Silver	ND	mg/kg	6.2	5	08/27/10 07:06	08/30/10 12:51	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	ND	mg/kg	0.12	1	08/26/10 08:21	08/26/10 12:31	7439-97-6	
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546							
Acenaphthene	ND	ug/kg	8.5	1	08/27/10 14:45	08/31/10 23:01	83-32-9	
Acenaphthylene	ND	ug/kg	8.5	1	08/27/10 14:45	08/31/10 23:01	208-96-8	
Anthracene	ND	ug/kg	8.5	1	08/27/10 14:45	08/31/10 23:01	120-12-7	
Benzo(a)anthracene	ND	ug/kg	8.5	1	08/27/10 14:45	08/31/10 23:01	56-55-3	
Benzo(a)pyrene	ND	ug/kg	8.5	1	08/27/10 14:45	08/31/10 23:01	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	8.5	1	08/27/10 14:45	08/31/10 23:01	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	8.5	1	08/27/10 14:45	08/31/10 23:01	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	8.5	1	08/27/10 14:45	08/31/10 23:01	207-08-9	
Chrysene	ND	ug/kg	8.5	1	08/27/10 14:45	08/31/10 23:01	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	8.5	1	08/27/10 14:45	08/31/10 23:01	53-70-3	
Fluoranthene	ND	ug/kg	8.5	1	08/27/10 14:45	08/31/10 23:01	206-44-0	
Fluorene	ND	ug/kg	8.5	1	08/27/10 14:45	08/31/10 23:01	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	8.5	1	08/27/10 14:45	08/31/10 23:01	193-39-5	
1-Methylnaphthalene	ND	ug/kg	8.5	1	08/27/10 14:45	08/31/10 23:01	90-12-0	
2-Methylnaphthalene	ND	ug/kg	8.5	1	08/27/10 14:45	08/31/10 23:01	91-57-6	
Naphthalene	**9.2**	ug/kg	8.5	1	08/27/10 14:45	08/31/10 23:01	91-20-3	
Phenanthrene	ND	ug/kg	8.5	1	08/27/10 14:45	08/31/10 23:01	85-01-8	
Pyrene	ND	ug/kg	8.5	1	08/27/10 14:45	08/31/10 23:01	129-00-0	
2-Fluorobiphenyl (S)	73	%	55-136	1	08/27/10 14:45	08/31/10 23:01	321-60-8	2n
Terphenyl-d14 (S)	62	%	60-144	1	08/27/10 14:45	08/31/10 23:01	1718-51-0	
8260/5035A Volatile Organics	Analytical Method: EPA 8260							
Benzene	ND	ug/kg	3.1	1		08/26/10 19:13	71-43-2	
Ethylbenzene	ND	ug/kg	3.1	1		08/26/10 19:13	100-41-4	
Toluene	ND	ug/kg	3.1	1		08/26/10 19:13	108-88-3	
Xylene (Total)	ND	ug/kg	9.4	1		08/26/10 19:13	1330-20-7	
Dibromofluoromethane (S)	97	%	80-136	1		08/26/10 19:13	1868-53-7	
Toluene-d8 (S)	90	%	80-120	1		08/26/10 19:13	2037-26-5	
4-Bromofluorobenzene (S)	92	%	72-122	1		08/26/10 19:13	460-00-4	
1,2-Dichloroethane-d4 (S)	85	%	80-143	1		08/26/10 19:13	17060-07-0	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**22.2**	%	0.10	1		08/27/10 12:16		

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ANALYTICAL RESULTS

Project: BPOLY
Pace Project No.: 254662

Sample: MW8-2-2.5 **Lab ID: 254662015** Collected: 08/24/10 11:00 Received: 08/24/10 15:15 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS SG	Analytical Method: NWTPH-Dx Preparation Method: EPA 3546							
Diesel Range SG	ND	mg/kg	21.6	1	09/01/10 19:05	09/02/10 18:35		
Motor Oil Range SG	ND	mg/kg	86.3	1	09/01/10 19:05	09/02/10 18:35	64742-65-0	
n-Octacosane (S) SG	99	%	50-150	1	09/01/10 19:05	09/02/10 18:35	630-02-4	
o-Terphenyl (S) SG	101	%	50-150	1	09/01/10 19:05	09/02/10 18:35	84-15-1	
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
Gasoline Range Organics	ND	mg/kg	7.0	1	08/30/10 12:00	08/31/10 02:32		
a,a,a-Trifluorotoluene (S)	91	%	50-150	1	08/30/10 12:00	08/31/10 02:32	98-08-8	
4-Bromofluorobenzene (S)	82	%	50-150	1	08/30/10 12:00	08/31/10 02:32	460-00-4	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Arsenic	ND	mg/kg	10.9	5	08/27/10 07:06	08/30/10 12:54	7440-38-2	
Barium	**131**	mg/kg	21.9	1	08/27/10 07:06	08/30/10 14:03	7440-39-3	
Cadmium	ND	mg/kg	5.5	5	08/27/10 07:06	08/30/10 12:54	7440-43-9	
Chromium	**41.7**	mg/kg	1.1	1	08/27/10 07:06	08/30/10 14:03	7440-47-3	
Lead	**5.0**	mg/kg	1.1	1	08/27/10 07:06	08/30/10 14:03	7439-92-1	
Selenium	ND	mg/kg	5.5	5	08/27/10 07:06	08/30/10 12:54	7782-49-2	
Silver	ND	mg/kg	5.5	5	08/27/10 07:06	08/30/10 12:54	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	ND	mg/kg	0.11	1	08/26/10 08:21	08/26/10 12:34	7439-97-6	
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546							
Acenaphthene	ND	ug/kg	7.4	1	09/03/10 11:10	09/03/10 17:31	83-32-9	
Acenaphthylene	ND	ug/kg	7.4	1	09/03/10 11:10	09/03/10 17:31	208-96-8	
Anthracene	ND	ug/kg	7.4	1	09/03/10 11:10	09/03/10 17:31	120-12-7	
Benzo(a)anthracene	ND	ug/kg	7.4	1	09/03/10 11:10	09/03/10 17:31	56-55-3	
Benzo(a)pyrene	ND	ug/kg	7.4	1	09/03/10 11:10	09/03/10 17:31	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	7.4	1	09/03/10 11:10	09/03/10 17:31	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	7.4	1	09/03/10 11:10	09/03/10 17:31	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	7.4	1	09/03/10 11:10	09/03/10 17:31	207-08-9	
Chrysene	ND	ug/kg	7.4	1	09/03/10 11:10	09/03/10 17:31	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	7.4	1	09/03/10 11:10	09/03/10 17:31	53-70-3	
Fluoranthene	ND	ug/kg	7.4	1	09/03/10 11:10	09/03/10 17:31	206-44-0	
Fluorene	ND	ug/kg	7.4	1	09/03/10 11:10	09/03/10 17:31	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	7.4	1	09/03/10 11:10	09/03/10 17:31	193-39-5	
1-Methylnaphthalene	ND	ug/kg	7.4	1	09/03/10 11:10	09/03/10 17:31	90-12-0	
2-Methylnaphthalene	ND	ug/kg	7.4	1	09/03/10 11:10	09/03/10 17:31	91-57-6	
Naphthalene	ND	ug/kg	7.4	1	09/03/10 11:10	09/03/10 17:31	91-20-3	
Phenanthrene	ND	ug/kg	7.4	1	09/03/10 11:10	09/03/10 17:31	85-01-8	
Pyrene	ND	ug/kg	7.4	1	09/03/10 11:10	09/03/10 17:31	129-00-0	
2-Fluorobiphenyl (S)	58	%	55-136	1	09/03/10 11:10	09/03/10 17:31	321-60-8	
Terphenyl-d14 (S)	64	%	60-144	1	09/03/10 11:10	09/03/10 17:31	1718-51-0	

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ANALYTICAL RESULTS

Project: BPOLY
Pace Project No.: 254662

Sample: MW8-2-2.5 **Lab ID: 254662015** Collected: 08/24/10 11:00 Received: 08/24/10 15:15 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260/5035A Volatile Organics	Analytical Method: EPA 8260							
Benzene	ND	ug/kg	3.6	1		08/26/10 19:32	71-43-2	
Ethylbenzene	ND	ug/kg	3.6	1		08/26/10 19:32	100-41-4	
Toluene	ND	ug/kg	3.6	1		08/26/10 19:32	108-88-3	
Xylene (Total)	ND	ug/kg	10.9	1		08/26/10 19:32	1330-20-7	
Dibromofluoromethane (S)	99	%	80-136	1		08/26/10 19:32	1868-53-7	
Toluene-d8 (S)	90	%	80-120	1		08/26/10 19:32	2037-26-5	
4-Bromofluorobenzene (S)	92	%	72-122	1		08/26/10 19:32	460-00-4	
1,2-Dichloroethane-d4 (S)	87	%	80-143	1		08/26/10 19:32	17060-07-0	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**11.2**	%	0.10	1		08/27/10 12:19		

Sample: Trip Blank **Lab ID: 254662016** Collected: 08/24/10 00:00 Received: 08/24/10 15:15 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
Gasoline Range Organics	ND	mg/kg	5.0	1	08/30/10 12:00	08/31/10 01:19		
a,a,a-Trifluorotoluene (S)	109	%	50-150	1	08/30/10 12:00	08/31/10 01:19	98-08-8	
4-Bromofluorobenzene (S)	97	%	50-150	1	08/30/10 12:00	08/31/10 01:19	460-00-4	
8260/5035A Volatile Organics	Analytical Method: EPA 8260							
Benzene	ND	ug/kg	3.0	1		08/25/10 13:33	71-43-2	
Ethylbenzene	ND	ug/kg	3.0	1		08/25/10 13:33	100-41-4	
Toluene	ND	ug/kg	3.0	1		08/25/10 13:33	108-88-3	
Xylene (Total)	ND	ug/kg	9.0	1		08/25/10 13:33	1330-20-7	
Dibromofluoromethane (S)	98	%	80-136	1		08/25/10 13:33	1868-53-7	
Toluene-d8 (S)	91	%	80-120	1		08/25/10 13:33	2037-26-5	
4-Bromofluorobenzene (S)	91	%	72-122	1		08/25/10 13:33	460-00-4	
1,2-Dichloroethane-d4 (S)	87	%	80-143	1		08/25/10 13:33	17060-07-0	

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QUALITY CONTROL DATA

Project: BPOLY
Pace Project No.: 254662

QC Batch: OEXT/2590 — Analysis Method: NWTPH-Dx
QC Batch Method: EPA 3546 — Analysis Description: NWTPH-Dx GCS
Associated Lab Samples: 254662001, 254662002, 254662003

METHOD BLANK: 38442 — Matrix: Solid
Associated Lab Samples: 254662001, 254662002, 254662003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diesel Range SG	mg/kg	ND	20.0	09/01/10 17:12	
Motor Oil Range SG	mg/kg	ND	80.0	09/01/10 17:12	
n-Octacosane (S) SG	%	93	50-150	09/01/10 17:12	
o-Terphenyl (S) SG	%	97	50-150	09/01/10 17:12	

LABORATORY CONTROL SAMPLE: 38443

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range SG	mg/kg	500	341	68	56-124	
Motor Oil Range SG	mg/kg	500	372	74	50-150	
n-Octacosane (S) SG	%			80	50-150	
o-Terphenyl (S) SG	%			92	50-150	

SAMPLE DUPLICATE: 38444

Parameter	Units	254684010 Result	Dup Result	RPD	Qualifiers
Diesel Range SG	mg/kg	832	727	13	
Motor Oil Range SG	mg/kg	127	108	17	
n-Octacosane (S) SG	%	87	80	12	
o-Terphenyl (S) SG	%	82	76	11	

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QUALITY CONTROL DATA

Project: BPOLY
Pace Project No.: 254662

QC Batch: OEXT/2598 Analysis Method: NWTPH-Dx
QC Batch Method: EPA 3546 Analysis Description: NWTPH-Dx GCS
Associated Lab Samples: 254662004, 254662006, 254662007, 254662009, 254662011, 254662012, 254662014, 254662015

METHOD BLANK: 38662 Matrix: Solid
Associated Lab Samples: 254662004, 254662006, 254662007, 254662009, 254662011, 254662012, 254662014, 254662015

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diesel Range SG	mg/kg	ND	20.0	09/02/10 15:18	
Motor Oil Range SG	mg/kg	ND	80.0	09/02/10 15:18	
n-Octacosane (S) SG	%	104	50-150	09/02/10 15:18	
o-Terphenyl (S) SG	%	106	50-150	09/02/10 15:18	

LABORATORY CONTROL SAMPLE: 38663

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range SG	mg/kg	500	410	82	56-124	
Motor Oil Range SG	mg/kg	500	464	93	50-150	
n-Octacosane (S) SG	%			104	50-150	
o-Terphenyl (S) SG	%			114	50-150	

SAMPLE DUPLICATE: 38664

Parameter	Units	254662004 Result	Dup Result	RPD	Qualifiers
Diesel Range SG	mg/kg	3780	3310	13	
Motor Oil Range SG	mg/kg	1040	782	29	
n-Octacosane (S) SG	%	95	92	8	
o-Terphenyl (S) SG	%	114	114	5	

SAMPLE DUPLICATE: 38665

Parameter	Units	254703004 Result	Dup Result	RPD	Qualifiers
Diesel Range SG	mg/kg	ND	3.4J		
Motor Oil Range SG	mg/kg	ND	ND		
n-Octacosane (S) SG	%	102	102	7	
o-Terphenyl (S) SG	%	105	104	8	

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QUALITY CONTROL DATA

Project: BPOLY
Pace Project No.: 254662

QC Batch: GCV/1804 Analysis Method: NWTPH-Gx
QC Batch Method: NWTPH-Gx Analysis Description: NWTPH-Gx Solid GCV
Associated Lab Samples: 254662001, 254662002

METHOD BLANK: 38022 Matrix: Solid
Associated Lab Samples: 254662001, 254662002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Gasoline Range Organics	mg/kg	ND	5.0	08/28/10 08:02	
4-Bromofluorobenzene (S)	%	95	50-150	08/28/10 08:02	
a,a,a-Trifluorotoluene (S)	%	100	50-150	08/28/10 08:02	

LABORATORY CONTROL SAMPLE: 38023

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Gasoline Range Organics	mg/kg	12.5	14.6	117	54-156	
4-Bromofluorobenzene (S)	%			118	50-150	
a,a,a-Trifluorotoluene (S)	%			123	50-150	

SAMPLE DUPLICATE: 38290

Parameter	Units	254584008 Result	Dup Result	RPD	Qualifiers
Gasoline Range Organics	mg/kg	ND	1.4J		
4-Bromofluorobenzene (S)	%	99	89	11	
a,a,a-Trifluorotoluene (S)	%	104	101	3	

SAMPLE DUPLICATE: 38291

Parameter	Units	254639002 Result	Dup Result	RPD	Qualifiers
Gasoline Range Organics	mg/kg	ND	3.2J		
4-Bromofluorobenzene (S)	%	106	110	4	
a,a,a-Trifluorotoluene (S)	%	106	112	5	

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QUALITY CONTROL DATA

Project: BPOLY
Pace Project No.: 254662

QC Batch: GCV/1807 — Analysis Method: NWTPH-Gx
QC Batch Method: NWTPH-Gx — Analysis Description: NWTPH-Gx Solid GCV
Associated Lab Samples: 254662003, 254662006, 254662009, 254662012

METHOD BLANK: 38288 — Matrix: Solid
Associated Lab Samples: 254662003, 254662006, 254662009, 254662012

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Gasoline Range Organics	mg/kg	ND	5.0	08/29/10 06:03	
4-Bromofluorobenzene (S)	%	115	50-150	08/29/10 06:03	
a,a,a-Trifluorotoluene (S)	%	115	50-150	08/29/10 06:03	

LABORATORY CONTROL SAMPLE: 38289

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Gasoline Range Organics	mg/kg	12.5	16.5	132	54-156	
4-Bromofluorobenzene (S)	%			102	50-150	
a,a,a-Trifluorotoluene (S)	%			111	50-150	

SAMPLE DUPLICATE: 38293

Parameter	Units	254662009 Result	Dup Result	RPD	Qualifiers
Gasoline Range Organics	mg/kg	ND	2.9J		
4-Bromofluorobenzene (S)	%	105	104	.9	
a,a,a-Trifluorotoluene (S)	%	107	104	2	

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QUALITY CONTROL DATA

Project: BPOLY
Pace Project No.: 254662

QC Batch: GCV/1813 — Analysis Method: NWTPH-Gx
QC Batch Method: NWTPH-Gx — Analysis Description: NWTPH-Gx Solid GCV
Associated Lab Samples: 254662004, 254662007, 254662011, 254662014, 254662015, 254662016

METHOD BLANK: 38341 — Matrix: Solid
Associated Lab Samples: 254662004, 254662007, 254662011, 254662014, 254662015, 254662016

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Gasoline Range Organics	mg/kg	ND	5.0	08/30/10 20:04	
4-Bromofluorobenzene (S)	%	72	50-150	08/30/10 20:04	
a,a,a-Trifluorotoluene (S)	%	79	50-150	08/30/10 20:04	

LABORATORY CONTROL SAMPLE: 38342

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Gasoline Range Organics	mg/kg	12.5	11.8	94	54-156	
4-Bromofluorobenzene (S)	%			93	50-150	
a,a,a-Trifluorotoluene (S)	%			102	50-150	

SAMPLE DUPLICATE: 38497

Parameter	Units	254702002 Result	Dup Result	RPD	Qualifiers
Gasoline Range Organics	mg/kg	ND	2.9J		
4-Bromofluorobenzene (S)	%	99	100	1	
a,a,a-Trifluorotoluene (S)	%	107	106	.8	

SAMPLE DUPLICATE: 38498

Parameter	Units	254703001 Result	Dup Result	RPD	Qualifiers
Gasoline Range Organics	mg/kg	ND	3.1J		
4-Bromofluorobenzene (S)	%	93	83	12	
a,a,a-Trifluorotoluene (S)	%	101	90	12	

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QUALITY CONTROL DATA

Project: BPOLY
Pace Project No.: 254662

QC Batch: MPRP/1732 Analysis Method: EPA 6010
QC Batch Method: EPA 3050 Analysis Description: 6010 MET
Associated Lab Samples: 254662001, 254662002, 254662003, 254662004, 254662006, 254662007, 254662009, 254662011, 254662012, 254662014, 254662015

METHOD BLANK: 37584 Matrix: Solid
Associated Lab Samples: 254662001, 254662002, 254662003, 254662004, 254662006, 254662007, 254662009, 254662011, 254662012, 254662014, 254662015

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Arsenic	mg/kg	ND	2.0	08/30/10 12:09	
Barium	mg/kg	ND	20.0	08/30/10 12:09	
Cadmium	mg/kg	ND	1.0	08/30/10 12:09	
Chromium	mg/kg	ND	1.0	08/30/10 12:09	
Lead	mg/kg	ND	1.0	08/30/10 12:09	
Selenium	mg/kg	ND	1.0	08/30/10 12:09	
Silver	mg/kg	ND	1.0	08/30/10 12:09	

LABORATORY CONTROL SAMPLE: 37585

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	mg/kg	25	22.2	89	80-120	
Barium	mg/kg	25	22.2	89	80-120	
Cadmium	mg/kg	25	22.8	91	80-120	
Chromium	mg/kg	25	22.6	90	80-120	
Lead	mg/kg	25	23.2	93	80-120	
Selenium	mg/kg	25	22.5	90	80-120	
Silver	mg/kg	12.5	11.1	89	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 37586 37587

Parameter	Units	254661001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Qual
Arsenic	mg/kg	ND	27.8	28	33.4	36.5	110	120	75-125	9	
Barium	mg/kg	55.3	27.8	28	81.6	81.5	95	94	75-125	.2	
Cadmium	mg/kg	ND	27.8	28	31.0	32.7	112	117	75-125	5	
Chromium	mg/kg	30.1	27.8	28	53.3	56.4	84	94	75-125	6	
Lead	mg/kg	2.4	27.8	28	26.0	27.1	85	88	75-125	4	
Selenium	mg/kg	ND	27.8	28	29.3	31.2	105	111	75-125	6	
Silver	mg/kg	ND	13.8	14.1	15.2	16.4	110	117	75-125	8	

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QUALITY CONTROL DATA

Project: BPOLY
Pace Project No.: 254662

QC Batch: MERP/1236 Analysis Method: EPA 7471
QC Batch Method: EPA 7471 Analysis Description: 7471 Mercury
Associated Lab Samples: 254662001, 254662002, 254662003, 254662004, 254662006, 254662007, 254662009, 254662011, 254662012, 254662014, 254662015

METHOD BLANK: 37588 Matrix: Solid
Associated Lab Samples: 254662001, 254662002, 254662003, 254662004, 254662006, 254662007, 254662009, 254662011, 254662012, 254662014, 254662015

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	ND	0.10	08/26/10 11:54	

LABORATORY CONTROL SAMPLE: 37589

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.5	0.51	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 37590 37591

Parameter	Units	254638001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Qual
Mercury	mg/kg	ND	.5	.52	0.53	0.55	104	103	80-120	3	

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QUALITY CONTROL DATA

Project: BPOLY
Pace Project No.: 254662

QC Batch: OEXT/2573 — Analysis Method: EPA 8270 by SIM
QC Batch Method: EPA 3546 — Analysis Description: 8270/3546 MSSV PAH by SIM
Associated Lab Samples: 254662001, 254662002, 254662003, 254662004, 254662005, 254662006, 254662007, 254662008, 254662009, 254662010, 254662011, 254662012, 254662014

METHOD BLANK: 38057 — Matrix: Solid
Associated Lab Samples: 254662001, 254662002, 254662003, 254662004, 254662005, 254662006, 254662007, 254662008, 254662009, 254662010, 254662011, 254662012, 254662014

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1-Methylnaphthalene	ug/kg	ND	6.7	08/31/10 20:00	
2-Methylnaphthalene	ug/kg	ND	6.7	08/31/10 20:00	
Acenaphthene	ug/kg	ND	6.7	08/31/10 20:00	
Acenaphthylene	ug/kg	ND	6.7	08/31/10 20:00	
Anthracene	ug/kg	ND	6.7	08/31/10 20:00	
Benzo(a)anthracene	ug/kg	ND	6.7	08/31/10 20:00	
Benzo(a)pyrene	ug/kg	ND	6.7	08/31/10 20:00	
Benzo(b)fluoranthene	ug/kg	ND	6.7	08/31/10 20:00	
Benzo(g,h,i)perylene	ug/kg	ND	6.7	08/31/10 20:00	
Benzo(k)fluoranthene	ug/kg	ND	6.7	08/31/10 20:00	
Chrysene	ug/kg	ND	6.7	08/31/10 20:00	
Dibenz(a,h)anthracene	ug/kg	ND	6.7	08/31/10 20:00	
Fluoranthene	ug/kg	ND	6.7	08/31/10 20:00	
Fluorene	ug/kg	ND	6.7	08/31/10 20:00	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	6.7	08/31/10 20:00	
Naphthalene	ug/kg	ND	6.7	08/31/10 20:00	
Phenanthrene	ug/kg	ND	6.7	08/31/10 20:00	
Pyrene	ug/kg	ND	6.7	08/31/10 20:00	
2-Fluorobiphenyl (S)	%	72	55-136	08/31/10 20:00	
Terphenyl-d14 (S)	%	76	60-144	08/31/10 20:00	

LABORATORY CONTROL SAMPLE: 38058

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1-Methylnaphthalene	ug/kg	133	79.7	60	63-126	1n
2-Methylnaphthalene	ug/kg	133	79.7	60	60-145	
Acenaphthene	ug/kg	133	88.2	66	44-138	
Acenaphthylene	ug/kg	133	86.5	65	43-140	
Anthracene	ug/kg	133	91.0	68	58-138	
Benzo(a)anthracene	ug/kg	133	91.5	69	50-154	
Benzo(a)pyrene	ug/kg	133	95.9	72	47-154	
Benzo(b)fluoranthene	ug/kg	133	85.3	64	43-164	
Benzo(g,h,i)perylene	ug/kg	133	93.6	70	54-153	
Benzo(k)fluoranthene	ug/kg	133	109	82	61-145	
Chrysene	ug/kg	133	86.8	65	59-141	
Dibenz(a,h)anthracene	ug/kg	133	98.0	73	54-161	
Fluoranthene	ug/kg	133	92.5	69	43-160	
Fluorene	ug/kg	133	90.0	67	41-149	
Indeno(1,2,3-cd)pyrene	ug/kg	133	97.2	73	48-158	
Naphthalene	ug/kg	133	77.7	58	44-131	

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QUALITY CONTROL DATA

Project: BPOLY
Pace Project No.: 254662

LABORATORY CONTROL SAMPLE: 38058

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phenanthrene	ug/kg	133	83.7	63	46-144	
Pyrene	ug/kg	133	91.3	69	57-142	
2-Fluorobiphenyl (S)	%			65	55-136	
Terphenyl-d14 (S)	%			69	60-144	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 38059 38060

Parameter	Units	254693002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Qual
1-Methylnaphthalene	ug/kg	<1.0	155	152	103	116	66	76	-3.6-171	12	
2-Methylnaphthalene	ug/kg	<2.1	155	152	104	118	67	77	3-188	13	
Acenaphthene	ug/kg	<1.8	155	152	112	139	73	91	-1-182	21	
Acenaphthylene	ug/kg	<0.26	155	152	114	134	74	89	31-156	16	
Anthracene	ug/kg	<0.43	155	152	115	118	74	78	20-171	3	
Benzo(a)anthracene	ug/kg	<0.12	155	152	114	123	74	81	24-181	7	
Benzo(a)pyrene	ug/kg	<0.18	155	152	118	128	76	84	26-174	8	
Benzo(b)fluoranthene	ug/kg	<0.76	155	152	105	113	68	75	33-173	8	
Benzo(g,h,i)perylene	ug/kg	<0.34	155	152	114	122	74	80	15-178	7	
Benzo(k)fluoranthene	ug/kg	<0.55	155	152	130	140	84	92	20-167	8	
Chrysene	ug/kg	<0.35	155	152	107	117	69	77	15-174	9	
Dibenz(a,h)anthracene	ug/kg	<0.31	155	152	120	129	77	85	26-189	7	
Fluoranthene	ug/kg	<0.89	155	152	117	131	75	86	21-104	11	
Fluorene	ug/kg	<2.0	155	152	115	135	75	89	25-173	16	
Indeno(1,2,3-cd)pyrene	ug/kg	<0.29	155	152	118	126	76	83	19-182	6	
Naphthalene	ug/kg	<2.0	155	152	102	114	65	75	-3-165	11	
Phenanthrene	ug/kg	<3.6	155	152	104	117	67	77	25-163	12	
Pyrene	ug/kg	<0.34	155	152	113	126	73	83	30-165	11	
2-Fluorobiphenyl (S)	%						70	85	55-136		
Terphenyl-d14 (S)	%						70	78	60-144		

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QUALITY CONTROL DATA

Project: BPOLY
Pace Project No.: 254662

QC Batch: OEXT/2630 Analysis Method: EPA 8270 by SIM
QC Batch Method: EPA 3546 Analysis Description: 8270/3546 MSSV PAH by SIM
Associated Lab Samples: 254662015

METHOD BLANK: 39417 Matrix: Solid
Associated Lab Samples: 254662015

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1-Methylnaphthalene	ug/kg	ND	6.7	09/03/10 15:18	
2-Methylnaphthalene	ug/kg	ND	6.7	09/03/10 15:18	
Acenaphthene	ug/kg	ND	6.7	09/03/10 15:18	
Acenaphthylene	ug/kg	ND	6.7	09/03/10 15:18	
Anthracene	ug/kg	ND	6.7	09/03/10 15:18	
Benzo(a)anthracene	ug/kg	ND	6.7	09/03/10 15:18	
Benzo(a)pyrene	ug/kg	ND	6.7	09/03/10 15:18	
Benzo(b)fluoranthene	ug/kg	ND	6.7	09/03/10 15:18	
Benzo(g,h,i)perylene	ug/kg	ND	6.7	09/03/10 15:18	
Benzo(k)fluoranthene	ug/kg	ND	6.7	09/03/10 15:18	
Chrysene	ug/kg	ND	6.7	09/03/10 15:18	
Dibenz(a,h)anthracene	ug/kg	ND	6.7	09/03/10 15:18	
Fluoranthene	ug/kg	ND	6.7	09/03/10 15:18	
Fluorene	ug/kg	ND	6.7	09/03/10 15:18	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	6.7	09/03/10 15:18	
Naphthalene	ug/kg	ND	6.7	09/03/10 15:18	
Phenanthrene	ug/kg	ND	6.7	09/03/10 15:18	
Pyrene	ug/kg	ND	6.7	09/03/10 15:18	
2-Fluorobiphenyl (S)	%	68	55-136	09/03/10 15:18	
Terphenyl-d14 (S)	%	75	60-144	09/03/10 15:18	

LABORATORY CONTROL SAMPLE: 39418

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1-Methylnaphthalene	ug/kg	133	88.2	66	63-126	
2-Methylnaphthalene	ug/kg	133	92.8	70	60-145	
Acenaphthene	ug/kg	133	79.3	59	44-138	
Acenaphthylene	ug/kg	133	77.1	58	43-140	
Anthracene	ug/kg	133	94.9	71	58-138	
Benzo(a)anthracene	ug/kg	133	103	77	50-154	
Benzo(a)pyrene	ug/kg	133	108	81	47-154	
Benzo(b)fluoranthene	ug/kg	133	104	78	43-164	
Benzo(g,h,i)perylene	ug/kg	133	107	80	54-153	
Benzo(k)fluoranthene	ug/kg	133	108	81	61-145	
Chrysene	ug/kg	133	95.8	72	59-141	
Dibenz(a,h)anthracene	ug/kg	133	113	85	54-161	
Fluoranthene	ug/kg	133	103	77	43-160	
Fluorene	ug/kg	133	86.5	65	41-149	
Indeno(1,2,3-cd)pyrene	ug/kg	133	111	83	48-158	
Naphthalene	ug/kg	133	81.2	61	44-131	
Phenanthrene	ug/kg	133	90.7	68	46-144	

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QUALITY CONTROL DATA

Project: BPOLY
Pace Project No.: 254662

LABORATORY CONTROL SAMPLE: 39418

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Pyrene	ug/kg	133	97.1	73	57-142	
2-Fluorobiphenyl (S)	%			64	55-136	
Terphenyl-d14 (S)	%			79	60-144	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 39419 39420

Parameter	Units	254662015 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Qual
1-Methylnaphthalene	ug/kg	ND	149	150	93.8	94.8	63	63	-3.6-171	1	
2-Methylnaphthalene	ug/kg	ND	149	150	94.8	95.0	63	63	3-188	.3	
Acenaphthene	ug/kg	ND	149	150	92.5	91.1	62	61	-1-182	1	
Acenaphthylene	ug/kg	ND	149	150	93.6	94.0	63	63	31-156	.4	
Anthracene	ug/kg	ND	149	150	94.6	94.5	63	63	20-171	.1	
Benzo(a)anthracene	ug/kg	ND	149	150	97.5	99.1	65	66	24-181	2	
Benzo(a)pyrene	ug/kg	ND	149	150	99.9	100	67	67	26-174	.5	
Benzo(b)fluoranthene	ug/kg	ND	149	150	97.3	95.9	65	64	33-173	1	
Benzo(g,h,i)perylene	ug/kg	ND	149	150	95.0	96.0	64	64	15-178	1	
Benzo(k)fluoranthene	ug/kg	ND	149	150	102	103	68	69	20-167	.6	
Chrysene	ug/kg	ND	149	150	90.6	92.6	61	62	15-174	2	
Dibenz(a,h)anthracene	ug/kg	ND	149	150	100	101	67	68	26-189	.9	
Fluoranthene	ug/kg	ND	149	150	100	99.8	67	66	21-104	.3	
Fluorene	ug/kg	ND	149	150	95.5	95.2	64	64	25-173	.3	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	149	150	99.2	99.9	67	67	19-182	.7	
Naphthalene	ug/kg	ND	149	150	89.5	91.8	60	61	-3-165	3	
Phenanthrene	ug/kg	ND	149	150	92.1	91.9	61	61	25-163	.2	
Pyrene	ug/kg	ND	149	150	97.1	98.6	65	66	30-165	2	
2-Fluorobiphenyl (S)	%						59	64	55-136		
Terphenyl-d14 (S)	%						63	70	60-144		

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QUALITY CONTROL DATA

Project: BPOLY
Pace Project No.: 254662

QC Batch: MSV/2918 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV 5035A Volatile Organics
Associated Lab Samples: 254662001, 254662002, 254662003, 254662004, 254662006, 254662007, 254662009, 254662011, 254662012, 254662016

METHOD BLANK: 37571 Matrix: Solid
Associated Lab Samples: 254662001, 254662002, 254662003, 254662004, 254662006, 254662007, 254662009, 254662011, 254662012, 254662016

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Benzene	ug/kg	ND	3.0	08/25/10 11:23	
Ethylbenzene	ug/kg	ND	3.0	08/25/10 11:23	
Toluene	ug/kg	ND	3.0	08/25/10 11:23	
Xylene (Total)	ug/kg	ND	9.0	08/25/10 11:23	
1,2-Dichloroethane-d4 (S)	%	96	80-143	08/25/10 11:23	
4-Bromofluorobenzene (S)	%	89	72-122	08/25/10 11:23	
Dibromofluoromethane (S)	%	104	80-136	08/25/10 11:23	
Toluene-d8 (S)	%	82	80-120	08/25/10 11:23	

LABORATORY CONTROL SAMPLE & LCSD: 37572 37573

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Benzene	ug/kg	50	59.6	58.4	119	117	75-133	2	30	
Ethylbenzene	ug/kg	50	46.3	46.8	93	94	68-131	1	30	
Toluene	ug/kg	50	49.1	47.1	98	94	73-124	4	30	
Xylene (Total)	ug/kg	150	143	141	95	94	68-130	1	30	
1,2-Dichloroethane-d4 (S)	%				86	83	80-143			
4-Bromofluorobenzene (S)	%				97	100	72-122			
Dibromofluoromethane (S)	%				101	98	80-136			
Toluene-d8 (S)	%				87	84	80-120			

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QUALITY CONTROL DATA

Project: BPOLY
Pace Project No.: 254662

QC Batch: MSV/2934 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV 5035A Volatile Organics
Associated Lab Samples: 254662014, 254662015

METHOD BLANK: 37943 Matrix: Solid
Associated Lab Samples: 254662014, 254662015

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Benzene	ug/kg	ND	3.0	08/26/10 18:16	
Ethylbenzene	ug/kg	ND	3.0	08/26/10 18:16	
Toluene	ug/kg	ND	3.0	08/26/10 18:16	
Xylene (Total)	ug/kg	ND	9.0	08/26/10 18:16	
1,2-Dichloroethane-d4 (S)	%	83	80-143	08/26/10 18:16	
4-Bromofluorobenzene (S)	%	92	72-122	08/26/10 18:16	
Dibromofluoromethane (S)	%	94	80-136	08/26/10 18:16	
Toluene-d8 (S)	%	92	80-120	08/26/10 18:16	

LABORATORY CONTROL SAMPLE & LCSD: 37944 37945

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Benzene	ug/kg	50	50.6	50.0	101	100	75-133	1	30	
Ethylbenzene	ug/kg	50	45.0	44.4	90	89	68-131	1	30	
Toluene	ug/kg	50	50.6	47.8	101	96	73-124	6	30	
Xylene (Total)	ug/kg	150	139	137	93	91	68-130	1	30	
1,2-Dichloroethane-d4 (S)	%				82	81	80-143			
4-Bromofluorobenzene (S)	%				94	97	72-122			
Dibromofluoromethane (S)	%				96	96	80-136			
Toluene-d8 (S)	%				92	89	80-120			

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QUALITY CONTROL DATA

Project: BPOLY
Pace Project No.: 254662

QC Batch: PMST/1320
Analysis Method: ASTM D2974-87
QC Batch Method: ASTM D2974-87
Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 254662001, 254662002, 254662003, 254662004, 254662005, 254662006, 254662007, 254662008, 254662009, 254662010, 254662011, 254662012, 254662013, 254662014, 254662015

SAMPLE DUPLICATE: 38047

Parameter	Units	254662001 Result	Dup Result	RPD	Qualifiers
Percent Moisture	%	24.2	24.7	2	

SAMPLE DUPLICATE: 38048

Parameter	Units	254662012 Result	Dup Result	RPD	Qualifiers
Percent Moisture	%	8.2	8.1	.9	

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QUALIFIERS

Project: BPOLY
Pace Project No.: 254662

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is NELAP accredited. Contact your Pace PM for the current list of accredited analytes.

LABORATORIES

PASI-S	Pace Analytical Services - Seattle

ANALYTE QUALIFIERS

1n	Analyte recovery is below control limits. Associated samples reporting the analyte may be biased low.
2n	Results for all reported compounds were confirmed by the analysis of an out-of-hold re-extract sample. This sample was associated with an acceptable method blank and LCS, and had acceptable surrogate recoveries.
S0	Surrogate recovery outside laboratory control limits.
S5	Surrogate recovery outside control limits due to matrix interferences (not confirmed by re-analysis).

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: BPOLY
Pace Project No.: 254662

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
254662001	**GP4-2-2.5**	EPA 3546	OEXT/2590	NWTPH-Dx	GCSV/1853
254662002	**GP4-4-4.5**	EPA 3546	OEXT/2590	NWTPH-Dx	GCSV/1853
254662003	**GP5-2-2.5**	EPA 3546	OEXT/2590	NWTPH-Dx	GCSV/1853
254662004	**GP5-4-4.5**	EPA 3546	OEXT/2598	NWTPH-Dx	GCSV/1855
254662006	**MW6R-2-2.5**	EPA 3546	OEXT/2598	NWTPH-Dx	GCSV/1855
254662007	**MW6R-4-4.5**	EPA 3546	OEXT/2598	NWTPH-Dx	GCSV/1855
254662009	**GP9-2-2.5**	EPA 3546	OEXT/2598	NWTPH-Dx	GCSV/1855
254662011	**GP9-5.5-6**	EPA 3546	OEXT/2598	NWTPH-Dx	GCSV/1855
254662012	**MW7-2-2.5**	EPA 3546	OEXT/2598	NWTPH-Dx	GCSV/1855
254662014	**MW7-6-6.5**	EPA 3546	OEXT/2598	NWTPH-Dx	GCSV/1855
254662015	**MW8-2-2.5**	EPA 3546	OEXT/2598	NWTPH-Dx	GCSV/1855
254662001	**GP4-2-2.5**	NWTPH-Gx	GCV/1804	NWTPH-Gx	GCV/1808
254662002	**GP4-4-4.5**	NWTPH-Gx	GCV/1804	NWTPH-Gx	GCV/1808
254662003	**GP5-2-2.5**	NWTPH-Gx	GCV/1807	NWTPH-Gx	GCV/1835
254662004	**GP5-4-4.5**	NWTPH-Gx	GCV/1813	NWTPH-Gx	GCV/1816
254662006	**MW6R-2-2.5**	NWTPH-Gx	GCV/1807	NWTPH-Gx	GCV/1835
254662007	**MW6R-4-4.5**	NWTPH-Gx	GCV/1813	NWTPH-Gx	GCV/1816
254662009	**GP9-2-2.5**	NWTPH-Gx	GCV/1807	NWTPH-Gx	GCV/1835
254662011	**GP9-5.5-6**	NWTPH-Gx	GCV/1813	NWTPH-Gx	GCV/1816
254662012	**MW7-2-2.5**	NWTPH-Gx	GCV/1807	NWTPH-Gx	GCV/1835
254662014	**MW7-6-6.5**	NWTPH-Gx	GCV/1813	NWTPH-Gx	GCV/1816
254662015	**MW8-2-2.5**	NWTPH-Gx	GCV/1813	NWTPH-Gx	GCV/1816
254662016	**Trip Blank**	NWTPH-Gx	GCV/1813	NWTPH-Gx	GCV/1816
254662001	**GP4-2-2.5**	EPA 3050	MPRP/1732	EPA 6010	ICP/1652
254662002	**GP4-4-4.5**	EPA 3050	MPRP/1732	EPA 6010	ICP/1652
254662003	**GP5-2-2.5**	EPA 3050	MPRP/1732	EPA 6010	ICP/1652
254662004	**GP5-4-4.5**	EPA 3050	MPRP/1732	EPA 6010	ICP/1652
254662006	**MW6R-2-2.5**	EPA 3050	MPRP/1732	EPA 6010	ICP/1652
254662007	**MW6R-4-4.5**	EPA 3050	MPRP/1732	EPA 6010	ICP/1652
254662009	**GP9-2-2.5**	EPA 3050	MPRP/1732	EPA 6010	ICP/1652
254662011	**GP9-5.5-6**	EPA 3050	MPRP/1732	EPA 6010	ICP/1652
254662012	**MW7-2-2.5**	EPA 3050	MPRP/1732	EPA 6010	ICP/1652
254662014	**MW7-6-6.5**	EPA 3050	MPRP/1732	EPA 6010	ICP/1652
254662015	**MW8-2-2.5**	EPA 3050	MPRP/1732	EPA 6010	ICP/1652
254662001	**GP4-2-2.5**	EPA 7471	MERP/1236	EPA 7471	MERC/1252
254662002	**GP4-4-4.5**	EPA 7471	MERP/1236	EPA 7471	MERC/1252
254662003	**GP5-2-2.5**	EPA 7471	MERP/1236	EPA 7471	MERC/1252
254662004	**GP5-4-4.5**	EPA 7471	MERP/1236	EPA 7471	MERC/1252
254662006	**MW6R-2-2.5**	EPA 7471	MERP/1236	EPA 7471	MERC/1252
254662007	**MW6R-4-4.5**	EPA 7471	MERP/1236	EPA 7471	MERC/1252
254662009	**GP9-2-2.5**	EPA 7471	MERP/1236	EPA 7471	MERC/1252
254662011	**GP9-5.5-6**	EPA 7471	MERP/1236	EPA 7471	MERC/1252
254662012	**MW7-2-2.5**	EPA 7471	MERP/1236	EPA 7471	MERC/1252

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: BPOLY
Pace Project No.: 254662

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
254662014	**MW7-6-6.5**	EPA 7471	MERP/1236	EPA 7471	MERC/1252
254662015	**MW8-2-2.5**	EPA 7471	MERP/1236	EPA 7471	MERC/1252
254662001	**GP4-2-2.5**	EPA 3546	OEXT/2573	EPA 8270 by SIM	MSSV/1371
254662002	**GP4-4-4.5**	EPA 3546	OEXT/2573	EPA 8270 by SIM	MSSV/1371
254662003	**GP5-2-2.5**	EPA 3546	OEXT/2573	EPA 8270 by SIM	MSSV/1371
254662004	**GP5-4-4.5**	EPA 3546	OEXT/2573	EPA 8270 by SIM	MSSV/1371
254662005	**GP5-6-6.5**	EPA 3546	OEXT/2573	EPA 8270 by SIM	MSSV/1371
254662006	**MW6R-2-2.5**	EPA 3546	OEXT/2573	EPA 8270 by SIM	MSSV/1371
254662007	**MW6R-4-4.5**	EPA 3546	OEXT/2573	EPA 8270 by SIM	MSSV/1371
254662008	**MW6R-6-6.5**	EPA 3546	OEXT/2573	EPA 8270 by SIM	MSSV/1371
254662009	**GP9-2-2.5**	EPA 3546	OEXT/2573	EPA 8270 by SIM	MSSV/1371
254662010	**GP9-4-4.5**	EPA 3546	OEXT/2573	EPA 8270 by SIM	MSSV/1371
254662011	**GP9-5.5-6**	EPA 3546	OEXT/2573	EPA 8270 by SIM	MSSV/1371
254662012	**MW7-2-2.5**	EPA 3546	OEXT/2573	EPA 8270 by SIM	MSSV/1371
254662014	**MW7-6-6.5**	EPA 3546	OEXT/2573	EPA 8270 by SIM	MSSV/1371
254662015	**MW8-2-2.5**	EPA 3546	OEXT/2630	EPA 8270 by SIM	MSSV/1377
254662001	**GP4-2-2.5**	EPA 8260	MSV/2918		
254662002	**GP4-4-4.5**	EPA 8260	MSV/2918		
254662003	**GP5-2-2.5**	EPA 8260	MSV/2918		
254662004	**GP5-4-4.5**	EPA 8260	MSV/2918		
254662006	**MW6R-2-2.5**	EPA 8260	MSV/2918		
254662007	**MW6R-4-4.5**	EPA 8260	MSV/2918		
254662009	**GP9-2-2.5**	EPA 8260	MSV/2918		
254662011	**GP9-5.5-6**	EPA 8260	MSV/2918		
254662012	**MW7-2-2.5**	EPA 8260	MSV/2918		
254662014	**MW7-6-6.5**	EPA 8260	MSV/2934		
254662015	**MW8-2-2.5**	EPA 8260	MSV/2934		
254662016	**Trip Blank**	EPA 8260	MSV/2918		
254662001	**GP4-2-2.5**	ASTM D2974-87	PMST/1320		
254662002	**GP4-4-4.5**	ASTM D2974-87	PMST/1320		
254662003	**GP5-2-2.5**	ASTM D2974-87	PMST/1320		
254662004	**GP5-4-4.5**	ASTM D2974-87	PMST/1320		
254662005	**GP5-6-6.5**	ASTM D2974-87	PMST/1320		
254662006	**MW6R-2-2.5**	ASTM D2974-87	PMST/1320		
254662007	**MW6R-4-4.5**	ASTM D2974-87	PMST/1320		
254662008	**MW6R-6-6.5**	ASTM D2974-87	PMST/1320		
254662009	**GP9-2-2.5**	ASTM D2974-87	PMST/1320		
254662010	**GP9-4-4.5**	ASTM D2974-87	PMST/1320		
254662011	**GP9-5.5-6**	ASTM D2974-87	PMST/1320		
254662012	**MW7-2-2.5**	ASTM D2974-87	PMST/1320		
254662013	**MW7-4-4.5**	ASTM D2974-87	PMST/1320		
254662014	**MW7-6-6.5**	ASTM D2974-87	PMST/1320		
254662015	**MW8-2-2.5**	ASTM D2974-87	PMST/1320		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

254662

Page: of

1338850

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: ARCADIS	Report To: Alex Lopez	Attention:
Address: 111 SW Columbia Ste 725	Copy To:	Company Name:
PORTLAND OR 97201		Address:
Email To: Alex Lopez	Purchase Order No.:	Pace Quote Reference:
Phone: 5032208201 x1122 Fax: 5032208209	Project Name: BP OLY	Pace Project Manager:
Requested Due Date/TAT: 5xd	Project Number: GP09BPNAWA60.C0000	Pace Profile #: 22153/ L1

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER ______

Site Location STATE: WA

Section D Required Client Information

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Matrix Codes — MATRIX / CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED Composite Start DATE	COLLECTED Composite Start TIME	COLLECTED Composite End/Grab DATE	COLLECTED Composite End/Grab TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Y/N Analysis Test	Metals (Total) 6020	NWTPH Gx	NWTPH Dx SG	BTEX 8260	cPAHs 8270mod	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	GP4-2-2.5	SL	G			082310	1620		5	X									X	X	X	X	X		
2	GP4-4-4.5						1630		5										X	X	X	X	X		
3	GP5-2-2.5						1545		5										X	X	X	X	X		
4	GP5-4-4.5						1600		5										X	X	X	X	X		
5	GP5-6-6.5						1610		5																*HOLD*
6	MW6R-2-2.5						1330		5										X	X	X	X	X		
7	MW6R-4-4.5						1345		5										X	X	X	X	X		
8	MW6R-6-6.5						1415		5																*HOLD*
9																									
10																									
11																									
12																									

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
				Jyothi Swamy	8/24/10	~~1505~~ 15:15	3.6	Y	Y	Y
							Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: COLLEEN MARTIN

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 082410

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Pace Analytical® www.pacelabs.com

Page: of

1338849

Section A Required Client Information:

Company: ARCADIS
Address: 111 SW Columbia
Portland OR 97201
Email To: Alex Lopez
Phone: 5032208201x122 Fax: 5032205209
Requested Due Date/TAT: Std

Section B Required Project Information:

Report To: Alex Lopez III
Copy To:
Purchase Order No.:
Project Name: BPDLY
Project Number: GP09BPNAWA60.C0000

Section C Invoice Information:

Attention:
Company Name:
Address:
Pace Quote Reference:
Pace Project Manager:
Pace Profile #:

REGULATORY AGENCY

NPDES / GROUND WATER / DRINKING WATER / UST / RCRA / OTHER

Site Location STATE: WA

Section D Required Client Information

Matrix Codes MATRIX / CODE: Drinking Water DW, Water WT, Waste Water WW, Product P, Soil/Solid SL, Oil OL, Wipe WP, Air AR, Tissue TS, Other OT

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE	SAMPLE TYPE (G=GRAB C=COMP)	Composite Start DATE	Composite Start TIME	Composite End/Grab DATE	Composite End/Grab TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Metals (Total) 6020	NWTPH Gx	NWTPH Dx SG	Btex 8260	cPAHs 8270mod	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	GP9-2-2.5	SL	G	~~082410~~		082410	915		5	X		↑				X	X		X	X	X	X	X		
2	GP9-4-4.5	SL	G			082410	0936		5	X						X	X								HOLD
3	GP9-5.5-6	SL	G			082410	0945		5	X						X	X		X	X	X	X	X		
4	MW7-2-2.5	SL	G			082410	1030		5	X						X	V		X	X	X	X	X		
5	MW7-4-4.5	SL	G			|	1040		|	X						X	X								HOLD
6	MW7-6-6.5	SL	G			|	1050		|	X						X	X		X	X	X	X	X		
7	MW8-2-2.5	SL	G			|	1100		|	X						X	X		X	X	X	X	X		
8	TRIP BLANK								3											X		X			
9																									
10																									
11																									
12																									

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
				Jyothi Swamy	8/24/10	15:15	1.8	Y	Y	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Colleen Martin

SIGNATURE of SAMPLER: Colleen M

DATE Signed (MM/DD/YY): 082410

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Sample Container Count

Pace Analytical
www.pacelabs.com

CLIENT: Arcadis

COC PAGE 1 of 1
COC ID# 1338850

Sample Line Item	VG9H	AG1H	AG1U	BG1H	BP1U	BP2U	BP3U	BP2N	BP2S	WGFU	WGKU	DG9M	VG9W		Comments
1										1	1	1	2		
2										1	1	1	2		
3										1	1	1	2		
4										1	1	1	2		
5										1	1	1	2		
6										1	1	1	2		
7										1	1	1	2		
8										1	1	1	2		
9															
10															
11															
12															Trip Blank? No

AG1H	1 liter HCL amber glass		BP2S	500mL H2SO4 plastic	JGFU	4oz unpreserved amber wide
AG1U	1liter unpreserved amber glass		BP2U	500mL unpreserved plastic	R	terra core kit
AG2S	500mL H2SO4 amber glass		BP2Z	500mL NaOH, Zn Ac	U	Summa Can
AG2U	500mL unpreserved amber glass		BP3C	250mL NaOH plastic	VG9H	40mL HCL clear vial
AG3S	250mL H2SO4 amber glass		BP3N	250mL HNO3 plastic	VG9T	40mL Na Thio. clear vial
BG1H	1 liter HCL clear glass		BP3S	250mL H2SO4 plastic	VG9U	40mL unpreserved **clear** vial
BG1U	1 liter unpreserved glass		BP3U	250mL unpreserved plastic	VG9W	40mL glass vial preweighted (EPA 5035)
BP1N	1 liter HNO3 plastic		DG9B	40mL Na Bisulfate amber vial	VSG	Headspace septa vial & HCL
BP1S	1 liter H2SO4 plastic		DG9H	40mL HCL amber voa vial	WGFU	4oz clear soil jar
BP1U	1 liter unpreserved plastic		DG9M	40mL MeOH clear vial	WGFX	4oz wide jar w/hexane wipe
BP1Z	1 liter NaOH, Zn, Ac		DG9T	40mL Na Thio amber vial	ZPLC	Ziploc Bag
BP2N	500mL HNO3 plastic		DG9U	40mL unpreserved **amber** vial		
BP2O	500mL NaOH plastic		I	Wipe/Swab		

Sample Container Count

Pace Analytical
www.pacelabs.com

CLIENT: Arcadis

COC PAGE 1 of 1

COC ID# 1338849

Sample Line Item	VG9H	AG1H	AG1U	BG1H	BP1U	BP2U	BP3U	BP2N	BP2S	WGFU	WGKU	DG9M	VG9W		Comments
1										1	1	1	2		
2										1	1	1	2		
3										1	1	1	2		
4										1	1	1	2		
5										1	1	1	2		
6										1	1	1	2		
7										1	1	1	2		
8												1	2		
9															
10															
11															
12															Trip Blank? yes

AG1H	1 liter HCL amber glass		BP2S	500mL H2SO4 plastic	JGFU	4oz unpreserved amber wide
AG1U	1liter unpreserved amber glass		BP2U	500mL unpreserved plastic	R	terra core kit
AG2S	500mL H2SO4 amber glass		BP2Z	500mL NaOH, Zn Ac	U	Summa Can
AG2U	500mL unpreserved amber glass		BP3C	250mL NaOH plastic	VG9H	40mL HCL clear vial
AG3S	250mL H2SO4 amber glass		BP3N	250mL HNO3 plastic	VG9T	40mL Na Thio. clear vial
BG1H	1 liter HCL clear glass		BP3S	250mL H2SO4 plastic	VG9U	40mL unpreserved **clear** vial
BG1U	1 liter unpreserved glass		BP3U	250mL unpreserved plastic	VG9W	40mL glass vial preweighted (EPA 5035)
BP1N	1 liter HNO3 plastic		DG9B	40mL Na Bisulfate amber vial	VSG	Headspace septa vial & HCL
BP1S	1 liter H2SO4 plastic		DG9H	40mL HCL amber voa vial	WGFU	4oz clear soil jar
BP1U	1 liter unpreserved plastic		DG9M	40mL MeOH clear vial	WGFX	4oz wide jar w/hexane wipe
BP1Z	1 liter NaOH, Zn, Ac		DG9T	40mL Na Thio amber vial	ZPLC	Ziploc Bag
BP2N	500mL HNO3 plastic		DG9U	40mL unpreserved **amber** vial		
BP2O	500mL NaOH plastic		I	Wipe/Swab		

Sample Condition Upon Receipt

Pace Analytical

Client Name: Arcadis Project # 254662

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☑ Client ☐ Commercial ☐ Pace Other ______

Tracking #: ______

Custody Seal on Cooler/Box Present: ☑ Yes ☐ No Seals intact: ☑ Yes ☐ No

Packing Material: ☑ Bubble Wrap ☐ Bubble Bags ☐ None ☐ Other ______ Temp. Blank Yes ____ No ______

Thermometer Used 132013 or 101731962 or 226099 Type of Ice: Wet Blue None ☐ Samples on ice, cooling process has begun

Cooler Temperature 1.8 3.6 Biological Tissue is Frozen: Yes No

Temp should be above freezing ≤ 6°C

Date and Initials of person examining contents: NSS 8/24/10

				Comments:
Chain of Custody Present:	☑Yes	☐No	☐N/A	1.
Chain of Custody Filled Out:	☑Yes	☐No	☐N/A	2.
Chain of Custody Relinquished:	☑Yes	☐No	☐N/A	3.
Sampler Name & Signature on COC:	☑Yes	☐No	☐N/A	4.
Samples Arrived within Hold Time:	☑Yes	☐No	☐N/A	5.
Short Hold Time Analysis (<72hr):	☐Yes	☑No	☐N/A	6.
Rush Turn Around Time Requested:	☐Yes	☑No	☐N/A	7.
Sufficient Volume:	☑Yes	☐No	☐N/A	8.
Correct Containers Used:	☑Yes	☐No	☐N/A	9.
-Pace Containers Used:	☑Yes	☐No	☐N/A	
Containers Intact:	☑Yes	☐No	☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes	☐No	☑N/A	11.
Sample Labels match COC:	☑Yes	☐No	☐N/A	12.
-Includes date/time/ID/Analysis Matrix: Soil				
All containers needing preservation have been checked.	☐Yes	☐No	☑N/A	13. Terracore Kits
All containers needing preservation are found to be in compliance with EPA recommendation.	☐Yes	☐No	☑N/A	
Exceptions: VOA, coliform, TOC, O&G				Initial when completed ____ Lot # of added preservative ____
Samples checked for dechlorination:	☐Yes	☐No	☑N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes	☐No	☑N/A	15.
Trip Blanks Present:	☑Yes	☐No	☐N/A	16.
Trip Blank Custody Seals Present	☐Yes	☑No	☐N/A	
Pace Trip Blank Lot # (if purchased):______				

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: Alex Lopez Date/Time: 08/24/10

Comments/ Resolution:

Hold Samples: Extract & Hold PAHs on hold samples per Alex.

6010 Metals: Alex approved 6010 for this project.

Project Manager Review: RSM Date: 09/08/10 16:47

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical Services, Inc.
940 South Harney
Seattle, WA 98108
(206)767-5060

September 30, 2010

Alex Lopez
Arcadis
111 SW Columbia St.
Ste. 725
Portland, OR 97201

RE: Project: BPOLY
Pace Project No.: 254681

Dear Alex Lopez:

Enclosed are the analytical results for sample(s) received by the laboratory on August 25, 2010. The results relate only to the samples included in this report. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

Revised Report - PAHs added to samples MW-12 6-6.5 and MW-11 6-6.5 at client's request.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Regina Ste. Marie

Regina SteMarie

regina.stemarie@pacelabs.com
Project Manager

Enclosures

Pace Analytical Services, Inc.
940 South Harney
Seattle, WA 98108
(206)767-5060

CERTIFICATIONS

Project:	BPOLY
Pace Project No.:	254681

Washington Certification IDs

940 South Harney Street, Seattle, WA 98108
Alaska CS Certification #: UST-025
Alaska Drinking Water VOC Certification #: WA01230
Alaska Drinking Water Micro Certification #: WA01230
California Certification #: 01153CA
Florida/NELAP Certification #: E87617
Oregon Certification #: WA200007
Washington Certification #: C1229

Pace Analytical Services, Inc.
940 South Harney
Seattle, WA 98108
(206)767-5060

SAMPLE ANALYTE COUNT

Project: BPOLY
Pace Project No.: 254681

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
254681001	**MW8-4-4.5**	ASTM D2974-87	KJ1	1	PASI-S
254681002	**MW8-6-6.5**	NWTPH-Dx	ERB	4	PASI-S
		NWTPH-Gx	AY1	3	PASI-S
		EPA 6010	BGA	7	PASI-S
		EPA 7471	BGA	1	PASI-S
		EPA 8270 by SIM	DMT	20	PASI-S
		EPA 8260	ATH	8	PASI-S
		ASTM D2974-87	KJ1	1	PASI-S
254681003	**MW9-2-2.5**	NWTPH-Dx	ERB	4	PASI-S
		NWTPH-Gx	AY1	3	PASI-S
		EPA 6010	BGA	7	PASI-S
		EPA 7471	BGA	1	PASI-S
		EPA 8270 by SIM	DMT	20	PASI-S
		EPA 8260	ATH	8	PASI-S
		ASTM D2974-87	KJ1	1	PASI-S
254681004	**MW9-4-4.5**	ASTM D2974-87	KJ1	1	PASI-S
254681005	**MW9-6-6.5**	NWTPH-Dx	ERB	4	PASI-S
		NWTPH-Gx	AY1	3	PASI-S
		EPA 6010	BGA	7	PASI-S
		EPA 7471	BGA	1	PASI-S
		EPA 8270 by SIM	DMT	20	PASI-S
		EPA 8260	ATH	8	PASI-S
		ASTM D2974-87	KJ1	1	PASI-S
254681006	**MW12-2-2.5**	NWTPH-Dx	ERB	4	PASI-S
		NWTPH-Gx	AY1	3	PASI-S
		EPA 6010	BGA	7	PASI-S
		EPA 7471	BGA	1	PASI-S
		EPA 8270 by SIM	DMT	20	PASI-S
		EPA 8260	ATH	8	PASI-S
		ASTM D2974-87	KJ1	1	PASI-S
254681007	**MW12-4-4.5**	NWTPH-Dx	ERB	4	PASI-S
		NWTPH-Gx	AY1	3	PASI-S
		EPA 6010	BGA	7	PASI-S
		EPA 7471	BGA	1	PASI-S
		EPA 8270 by SIM	DMT	20	PASI-S
		EPA 8260	ATH	8	PASI-S
		ASTM D2974-87	KJ1	1	PASI-S

Pace Analytical Services, Inc.
940 South Harney
Seattle, WA 98108
(206)767-5060

SAMPLE ANALYTE COUNT

Project: BPOLY
Pace Project No.: 254681

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
254681008	**MW12-6-6.5**	EPA 8270 by SIM	DMT	20	PASI-S
		ASTM D2974-87	KJ1	1	PASI-S
254681009	**MW11-2-2.5**	NWTPH-Dx	ERB	4	PASI-S
		NWTPH-Gx	AY1	3	PASI-S
		EPA 6010	BGA	7	PASI-S
		EPA 7471	BGA	1	PASI-S
		EPA 8270 by SIM	DMT	20	PASI-S
		EPA 8260	ATH	8	PASI-S
		ASTM D2974-87	KJ1	1	PASI-S
254681010	**MW11-4-4.5**	NWTPH-Dx	ERB	4	PASI-S
		NWTPH-Gx	AY1	3	PASI-S
		EPA 6010	BGA	7	PASI-S
		EPA 7471	BGA	1	PASI-S
		EPA 8270 by SIM	DMT	20	PASI-S
		EPA 8260	ATH	8	PASI-S
		ASTM D2974-87	KJ1	1	PASI-S
254681011	**MW11-6-6.5**	EPA 8270 by SIM	DMT	20	PASI-S
		ASTM D2974-87	KJ1	1	PASI-S
254681012	**GP6-2-2.5**	NWTPH-Dx	ERB	4	PASI-S
		NWTPH-Gx	AY1	3	PASI-S
		EPA 6010	BGA	7	PASI-S
		EPA 7471	BGA	1	PASI-S
		EPA 8270 by SIM	DMT	20	PASI-S
		EPA 8260	ATH	8	PASI-S
		ASTM D2974-87	KJ1	1	PASI-S
254681013	**GP6-4-4.5**	NWTPH-Dx	ERB	4	PASI-S
		NWTPH-Gx	AY1	3	PASI-S
		EPA 6010	BGA	7	PASI-S
		EPA 7471	BGA	1	PASI-S
		EPA 8270 by SIM	DMT	20	PASI-S
		EPA 8260	ATH	8	PASI-S
		ASTM D2974-87	KJ1	1	PASI-S
254681014	**GP6-6-6.5**	NWTPH-Dx	ERB	4	PASI-S
		NWTPH-Gx	AY1	3	PASI-S
		EPA 6010	BGA	7	PASI-S
		EPA 7471	BGA	1	PASI-S
		EPA 8270 by SIM	DMT	20	PASI-S

Pace Analytical Services, Inc.
940 South Harney
Seattle, WA 98108
(206)767-5060

SAMPLE ANALYTE COUNT

Project: BPOLY
Pace Project No.: 254681

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 8260	ATH	8	PASI-S
		ASTM D2974-87	KJ1	1	PASI-S
254681015	**GP7-2-2.5**	NWTPH-Dx	ERB	4	PASI-S
		NWTPH-Gx	AY1	3	PASI-S
		EPA 6010	BGA	7	PASI-S
		EPA 7471	BGA	1	PASI-S
		EPA 8270 by SIM	DMT	20	PASI-S
		EPA 8260	ATH	8	PASI-S
		ASTM D2974-87	KJ1	1	PASI-S
254681016	**GP7-4-4.5**	ASTM D2974-87	KJ1	1	PASI-S
254681017	**GP7-6-6.5**	NWTPH-Dx	ERB	4	PASI-S
		NWTPH-Gx	AY1	3	PASI-S
		EPA 6010	BGA	7	PASI-S
		EPA 7471	BGA	1	PASI-S
		EPA 8270 by SIM	DMT	20	PASI-S
		EPA 8260	ATH	8	PASI-S
		ASTM D2974-87	KJ1	1	PASI-S
254681018	**MW10-2-2.5**	NWTPH-Dx	ERB	4	PASI-S
		NWTPH-Gx	AY1	3	PASI-S
		EPA 6010	BGA	7	PASI-S
		EPA 7471	BGA	1	PASI-S
		EPA 8270 by SIM	DMT	20	PASI-S
		EPA 8260	ATH	8	PASI-S
		ASTM D2974-87	KJ1	1	PASI-S
254681019	**MW10-4-4.5**	NWTPH-Dx	ERB	4	PASI-S
		NWTPH-Gx	AY1	3	PASI-S
		EPA 6010	BGA	7	PASI-S
		EPA 7471	BGA	1	PASI-S
		EPA 8270 by SIM	DMT	20	PASI-S
		EPA 8260	ATH	8	PASI-S
		ASTM D2974-87	KJ1	1	PASI-S
254681020	**MW10-6-6.5**	ASTM D2974-87	KJ1	1	PASI-S
254681021	**GP3-2-2.5**	NWTPH-Dx	ERB	4	PASI-S
		NWTPH-Gx	AY1	3	PASI-S
		EPA 6010	BGA	7	PASI-S
		EPA 7471	BGA	1	PASI-S
		EPA 8270 by SIM	DMT	20	PASI-S

Pace Analytical Services, Inc.
940 South Harney
Seattle, WA 98108
(206)767-5060

SAMPLE ANALYTE COUNT

Project: BPOLY
Pace Project No.: 254681

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 8260	ATH	8	PASI-S
		ASTM D2974-87	KJ1	1	PASI-S
254681022	**GP3-4-4.5**	NWTPH-Dx	ERB	4	PASI-S
		NWTPH-Gx	AY1	3	PASI-S
		EPA 6010	BGA	7	PASI-S
		EPA 7471	BGA	1	PASI-S
		EPA 8270 by SIM	DMT	20	PASI-S
		EPA 8260	ATH	8	PASI-S
		ASTM D2974-87	KJ1	1	PASI-S
254681023	**Trip Blank**	NWTPH-Gx	AY1	3	PASI-S
		EPA 8260	ATH	8	PASI-S

Pace Analytical Services, Inc.
940 South Harney
Seattle, WA 98108
(206)767-5060

PROJECT NARRATIVE

Project:	BPOLY
Pace Project No.:	254681

Method: **NWTPH-Dx**
Description: NWTPH-Dx GCS SG
Client: Arcadis OR
Date: September 30, 2010

General Information:
16 samples were analyzed for NWTPH-Dx. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3546 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, Inc.
940 South Harney
Seattle, WA 98108
(206)767-5060

PROJECT NARRATIVE

Project: BPOLY
Pace Project No.: 254681

Method: **NWTPH-Gx**
Description: NWTPH-Gx GCV
Client: Arcadis OR
Date: September 30, 2010

General Information:
17 samples were analyzed for NWTPH-Gx. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with NWTPH-Gx with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: BPOLY
Pace Project No.: 254681

Method: **EPA 6010**
Description: 6010 MET ICP
Client: Arcadis OR
Date: September 30, 2010

General Information:
16 samples were analyzed for EPA 6010. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3050 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MPRP/1737

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 254681002

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 37965)
  - Barium

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: BPOLY
Pace Project No.: 254681

Method: **EPA 7471**
Description: 7471 Mercury
Client: Arcadis OR
Date: September 30, 2010

General Information:
16 samples were analyzed for EPA 7471. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 7471 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: BPOLY
Pace Project No.: 254681

Method: **EPA 8270 by SIM**
Description: 8270 MSSV PAH by SIM
Client: Arcadis OR
Date: September 30, 2010

General Information:
18 samples were analyzed for EPA 8270 by SIM. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3546 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

Analyte Comments:

QC Batch: OEXT/2591

1n: Analyte was detected in the associated method blank. Analyte presence in method blank was less than 10 times that found in the sample, therefore acceptable per NELAC standard.

- GP6-4-4.5 (Lab ID: 254681013)
  - 2-Methylnaphthalene
  - Naphthalene

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PROJECT NARRATIVE

Project: BPOLY
Pace Project No.: 254681

Method: **EPA 8270 by SIM**
Description: 8270 MSSV PAH by SIM
Client: Arcadis OR
Date: September 30, 2010

Analyte Comments:

QC Batch: OEXT/2591

1n: Analyte was detected in the associated method blank. Analyte presence in method blank was less than 10 times that found in the sample, therefore acceptable per NELAC standard.

- MW11-2-2.5 (Lab ID: 254681009)
  - 2-Methylnaphthalene
  - Naphthalene
- MW12-2-2.5 (Lab ID: 254681006)
  - 2-Methylnaphthalene
  - Naphthalene
- MW12-4-4.5 (Lab ID: 254681007)
  - 2-Methylnaphthalene
  - Naphthalene

2n: Reported result is above the reporting limit for this analyte.

- BLANK (Lab ID: 38446)
  - 2-Methylnaphthalene
  - Naphthalene

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PROJECT NARRATIVE

Project: BPOLY
Pace Project No.: 254681

Method: **EPA 8260**
Description: 8260/5035A Volatile Organics
Client: Arcadis OR
Date: September 30, 2010

General Information:
17 samples were analyzed for EPA 8260. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

QC Batch: MSV/2938

S5: Surrogate recovery outside control limits due to matrix interferences (not confirmed by re-analysis).

- GP6-4-4.5 (Lab ID: 254681013)
  - 4-Bromofluorobenzene (S)
- GP6-6-6.5 (Lab ID: 254681014)
  - 4-Bromofluorobenzene (S)

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: BPOLY
Pace Project No.: 254681

Sample: MW8-4-4.5 **Lab ID: 254681001** Collected: 08/24/10 12:45 Received: 08/25/10 14:40 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**26.1**	%	0.10	1		08/27/10 12:32		

Sample: MW8-6-6.5 **Lab ID: 254681002** Collected: 08/24/10 13:00 Received: 08/25/10 14:40 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS SG	Analytical Method: NWTPH-Dx Preparation Method: EPA 3546							
Diesel Range SG	ND	mg/kg	25.4	1	09/01/10 19:05	09/02/10 20:13		
Motor Oil Range SG	ND	mg/kg	102	1	09/01/10 19:05	09/02/10 20:13	64742-65-0	
n-Octacosane (S) SG	85	%	50-150	1	09/01/10 19:05	09/02/10 20:13	630-02-4	
o-Terphenyl (S) SG	88	%	50-150	1	09/01/10 19:05	09/02/10 20:13	84-15-1	
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
Gasoline Range Organics	ND	mg/kg	7.9	1	08/30/10 12:00	08/31/10 07:24		
a,a,a-Trifluorotoluene (S)	106	%	50-150	1	08/30/10 12:00	08/31/10 07:24	98-08-8	
4-Bromofluorobenzene (S)	101	%	50-150	1	08/30/10 12:00	08/31/10 07:24	460-00-4	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Arsenic	ND	mg/kg	13.1	5	08/27/10 07:06	08/30/10 14:45	7440-38-2	
Barium	**140**	mg/kg	26.2	1	08/27/10 07:06	08/30/10 15:43	7440-39-3	
Cadmium	ND	mg/kg	6.6	5	08/27/10 07:06	08/30/10 14:45	7440-43-9	
Chromium	**41.9**	mg/kg	1.3	1	08/27/10 07:06	08/30/10 15:43	7440-47-3	
Lead	**4.1**	mg/kg	1.3	1	08/27/10 07:06	08/30/10 15:43	7439-92-1	
Selenium	ND	mg/kg	6.6	5	08/27/10 07:06	08/30/10 14:45	7782-49-2	
Silver	ND	mg/kg	6.6	5	08/27/10 07:06	08/30/10 14:45	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	ND	mg/kg	0.12	1	08/27/10 08:59	08/27/10 15:26	7439-97-6	
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546							
Acenaphthene	ND	ug/kg	9.0	1	08/31/10 22:00	09/02/10 03:36	83-32-9	
Acenaphthylene	ND	ug/kg	9.0	1	08/31/10 22:00	09/02/10 03:36	208-96-8	
Anthracene	ND	ug/kg	9.0	1	08/31/10 22:00	09/02/10 03:36	120-12-7	
Benzo(a)anthracene	ND	ug/kg	9.0	1	08/31/10 22:00	09/02/10 03:36	56-55-3	
Benzo(a)pyrene	ND	ug/kg	9.0	1	08/31/10 22:00	09/02/10 03:36	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	9.0	1	08/31/10 22:00	09/02/10 03:36	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	9.0	1	08/31/10 22:00	09/02/10 03:36	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	9.0	1	08/31/10 22:00	09/02/10 03:36	207-08-9	
Chrysene	ND	ug/kg	9.0	1	08/31/10 22:00	09/02/10 03:36	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	9.0	1	08/31/10 22:00	09/02/10 03:36	53-70-3	
Fluoranthene	ND	ug/kg	9.0	1	08/31/10 22:00	09/02/10 03:36	206-44-0	
Fluorene	ND	ug/kg	9.0	1	08/31/10 22:00	09/02/10 03:36	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	9.0	1	08/31/10 22:00	09/02/10 03:36	193-39-5	

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ANALYTICAL RESULTS

Project: BPOLY
Pace Project No.: 254681

Sample: MW8-6-6.5 **Lab ID: 254681002** Collected: 08/24/10 13:00 Received: 08/25/10 14:40 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546							
1-Methylnaphthalene	ND	ug/kg	9.0	1	08/31/10 22:00	09/02/10 03:36	90-12-0	
2-Methylnaphthalene	ND	ug/kg	9.0	1	08/31/10 22:00	09/02/10 03:36	91-57-6	B-
Naphthalene	ND	ug/kg	9.0	1	08/31/10 22:00	09/02/10 03:36	91-20-3	B-
Phenanthrene	ND	ug/kg	9.0	1	08/31/10 22:00	09/02/10 03:36	85-01-8	
Pyrene	ND	ug/kg	9.0	1	08/31/10 22:00	09/02/10 03:36	129-00-0	
2-Fluorobiphenyl (S)	91	%	55-136	1	08/31/10 22:00	09/02/10 03:36	321-60-8	
Terphenyl-d14 (S)	91	%	60-144	1	08/31/10 22:00	09/02/10 03:36	1718-51-0	
8260/5035A Volatile Organics	Analytical Method: EPA 8260							
Benzene	ND	ug/kg	3.6	1		08/26/10 19:51	71-43-2	
Ethylbenzene	ND	ug/kg	3.6	1		08/26/10 19:51	100-41-4	
Toluene	ND	ug/kg	3.6	1		08/26/10 19:51	108-88-3	
Xylene (Total)	ND	ug/kg	10.9	1		08/26/10 19:51	1330-20-7	
Dibromofluoromethane (S)	100	%	80-136	1		08/26/10 19:51	1868-53-7	
Toluene-d8 (S)	89	%	80-120	1		08/26/10 19:51	2037-26-5	
4-Bromofluorobenzene (S)	90	%	72-122	1		08/26/10 19:51	460-00-4	
1,2-Dichloroethane-d4 (S)	87	%	80-143	1		08/26/10 19:51	17060-07-0	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**25.3**	%	0.10	1		08/27/10 16:01		

Sample: MW9-2-2.5 **Lab ID: 254681003** Collected: 08/24/10 13:30 Received: 08/25/10 14:40 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS SG	Analytical Method: NWTPH-Dx Preparation Method: EPA 3546							
Diesel Range SG	ND	mg/kg	24.7	1	09/01/10 19:05	09/02/10 20:29		
Motor Oil Range SG	ND	mg/kg	98.7	1	09/01/10 19:05	09/02/10 20:29	64742-65-0	
n-Octacosane (S) SG	96	%	50-150	1	09/01/10 19:05	09/02/10 20:29	630-02-4	
o-Terphenyl (S) SG	96	%	50-150	1	09/01/10 19:05	09/02/10 20:29	84-15-1	
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
Gasoline Range Organics	ND	mg/kg	9.0	1	08/30/10 12:00	08/31/10 09:01		
a,a,a-Trifluorotoluene (S)	107	%	50-150	1	08/30/10 12:00	08/31/10 09:01	98-08-8	
4-Bromofluorobenzene (S)	98	%	50-150	1	08/30/10 12:00	08/31/10 09:01	460-00-4	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Arsenic	ND	mg/kg	10.0	5	08/27/10 07:06	08/30/10 14:52	7440-38-2	
Barium	**156**	mg/kg	20.0	1	08/27/10 07:06	08/30/10 15:51	7440-39-3	
Cadmium	ND	mg/kg	5.0	5	08/27/10 07:06	08/30/10 14:52	7440-43-9	
Chromium	**49.0**	mg/kg	1.0	1	08/27/10 07:06	08/30/10 15:51	7440-47-3	
Lead	**7.7**	mg/kg	5.0	5	08/27/10 07:06	08/30/10 14:52	7439-92-1	
Selenium	ND	mg/kg	5.0	5	08/27/10 07:06	08/30/10 14:52	7782-49-2	

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ANALYTICAL RESULTS

Project: BPOLY
Pace Project No.: 254681

Sample: MW9-2-2.5 **Lab ID: 254681003** Collected: 08/24/10 13:30 Received: 08/25/10 14:40 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Silver	ND	mg/kg	5.0	5	08/27/10 07:06	08/30/10 14:52	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	ND	mg/kg	0.13	1	08/27/10 08:59	08/27/10 15:33	7439-97-6	
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546							
Acenaphthene	ND	ug/kg	8.7	1	08/31/10 22:00	09/02/10 04:25	83-32-9	
Acenaphthylene	ND	ug/kg	8.7	1	08/31/10 22:00	09/02/10 04:25	208-96-8	
Anthracene	ND	ug/kg	8.7	1	08/31/10 22:00	09/02/10 04:25	120-12-7	
Benzo(a)anthracene	ND	ug/kg	8.7	1	08/31/10 22:00	09/02/10 04:25	56-55-3	
Benzo(a)pyrene	ND	ug/kg	8.7	1	08/31/10 22:00	09/02/10 04:25	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	8.7	1	08/31/10 22:00	09/02/10 04:25	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	8.7	1	08/31/10 22:00	09/02/10 04:25	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	8.7	1	08/31/10 22:00	09/02/10 04:25	207-08-9	
Chrysene	ND	ug/kg	8.7	1	08/31/10 22:00	09/02/10 04:25	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	8.7	1	08/31/10 22:00	09/02/10 04:25	53-70-3	
Fluoranthene	ND	ug/kg	8.7	1	08/31/10 22:00	09/02/10 04:25	206-44-0	
Fluorene	ND	ug/kg	8.7	1	08/31/10 22:00	09/02/10 04:25	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	8.7	1	08/31/10 22:00	09/02/10 04:25	193-39-5	
1-Methylnaphthalene	ND	ug/kg	8.7	1	08/31/10 22:00	09/02/10 04:25	90-12-0	
2-Methylnaphthalene	ND	ug/kg	8.7	1	08/31/10 22:00	09/02/10 04:25	91-57-6	B-
Naphthalene	ND	ug/kg	8.7	1	08/31/10 22:00	09/02/10 04:25	91-20-3	B-
Phenanthrene	ND	ug/kg	8.7	1	08/31/10 22:00	09/02/10 04:25	85-01-8	
Pyrene	ND	ug/kg	8.7	1	08/31/10 22:00	09/02/10 04:25	129-00-0	
2-Fluorobiphenyl (S)	81	%	55-136	1	08/31/10 22:00	09/02/10 04:25	321-60-8	
Terphenyl-d14 (S)	81	%	60-144	1	08/31/10 22:00	09/02/10 04:25	1718-51-0	
8260/5035A Volatile Organics	Analytical Method: EPA 8260							
Benzene	ND	ug/kg	4.2	1		08/26/10 20:10	71-43-2	
Ethylbenzene	ND	ug/kg	4.2	1		08/26/10 20:10	100-41-4	
Toluene	ND	ug/kg	4.2	1		08/26/10 20:10	108-88-3	
Xylene (Total)	ND	ug/kg	12.5	1		08/26/10 20:10	1330-20-7	
Dibromofluoromethane (S)	97	%	80-136	1		08/26/10 20:10	1868-53-7	
Toluene-d8 (S)	89	%	80-120	1		08/26/10 20:10	2037-26-5	
4-Bromofluorobenzene (S)	92	%	72-122	1		08/26/10 20:10	460-00-4	
1,2-Dichloroethane-d4 (S)	89	%	80-143	1		08/26/10 20:10	17060-07-0	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**24.4**	%	0.10	1		08/27/10 16:03		

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ANALYTICAL RESULTS

Project: BPOLY
Pace Project No.: 254681

Sample: MW9-4-4.5 **Lab ID: 254681004** Collected: 08/24/10 13:45 Received: 08/25/10 14:40 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**15.0**	%	0.10	1		08/27/10 16:04		

Sample: MW9-6-6.5 **Lab ID: 254681005** Collected: 08/24/10 14:00 Received: 08/25/10 14:40 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS SG	Analytical Method: NWTPH-Dx Preparation Method: EPA 3546							
Diesel Range SG	ND	mg/kg	25.6	1	09/01/10 19:05	09/02/10 21:19		
Motor Oil Range SG	ND	mg/kg	102	1	09/01/10 19:05	09/02/10 21:19	64742-65-0	
n-Octacosane (S) SG	92	%	50-150	1	09/01/10 19:05	09/02/10 21:19	630-02-4	
o-Terphenyl (S) SG	94	%	50-150	1	09/01/10 19:05	09/02/10 21:19	84-15-1	
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
Gasoline Range Organics	ND	mg/kg	8.3	1	08/30/10 12:00	08/31/10 09:25		
a,a,a-Trifluorotoluene (S)	106	%	50-150	1	08/30/10 12:00	08/31/10 09:25	98-08-8	
4-Bromofluorobenzene (S)	96	%	50-150	1	08/30/10 12:00	08/31/10 09:25	460-00-4	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Arsenic	ND	mg/kg	11.1	5	08/27/10 07:06	08/30/10 14:55	7440-38-2	
Barium	**126**	mg/kg	22.2	1	08/27/10 07:06	08/30/10 15:54	7440-39-3	
Cadmium	ND	mg/kg	5.6	5	08/27/10 07:06	08/30/10 14:55	7440-43-9	
Chromium	**46.0**	mg/kg	1.1	1	08/27/10 07:06	08/30/10 15:54	7440-47-3	
Lead	**6.1**	mg/kg	5.6	5	08/27/10 07:06	08/30/10 14:55	7439-92-1	
Selenium	ND	mg/kg	5.6	5	08/27/10 07:06	08/30/10 14:55	7782-49-2	
Silver	ND	mg/kg	5.6	5	08/27/10 07:06	08/30/10 14:55	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	ND	mg/kg	0.11	1	08/27/10 08:59	08/27/10 15:35	7439-97-6	
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546							
Acenaphthene	ND	ug/kg	8.9	1	09/03/10 11:10	09/03/10 18:20	83-32-9	
Acenaphthylene	ND	ug/kg	8.9	1	09/03/10 11:10	09/03/10 18:20	208-96-8	
Anthracene	ND	ug/kg	8.9	1	09/03/10 11:10	09/03/10 18:20	120-12-7	
Benzo(a)anthracene	ND	ug/kg	8.9	1	09/03/10 11:10	09/03/10 18:20	56-55-3	
Benzo(a)pyrene	ND	ug/kg	8.9	1	09/03/10 11:10	09/03/10 18:20	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	8.9	1	09/03/10 11:10	09/03/10 18:20	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	8.9	1	09/03/10 11:10	09/03/10 18:20	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	8.9	1	09/03/10 11:10	09/03/10 18:20	207-08-9	
Chrysene	ND	ug/kg	8.9	1	09/03/10 11:10	09/03/10 18:20	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	8.9	1	09/03/10 11:10	09/03/10 18:20	53-70-3	
Fluoranthene	ND	ug/kg	8.9	1	09/03/10 11:10	09/03/10 18:20	206-44-0	
Fluorene	ND	ug/kg	8.9	1	09/03/10 11:10	09/03/10 18:20	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	8.9	1	09/03/10 11:10	09/03/10 18:20	193-39-5	

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ANALYTICAL RESULTS

Project: BPOLY
Pace Project No.: 254681

Sample: MW9-6-6.5 | **Lab ID: 254681005** | Collected: 08/24/10 14:00 | Received: 08/25/10 14:40 | Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546							
1-Methylnaphthalene	ND	ug/kg	8.9	1	09/03/10 11:10	09/03/10 18:20	90-12-0	
2-Methylnaphthalene	ND	ug/kg	8.9	1	09/03/10 11:10	09/03/10 18:20	91-57-6	
Naphthalene	ND	ug/kg	8.9	1	09/03/10 11:10	09/03/10 18:20	91-20-3	
Phenanthrene	ND	ug/kg	8.9	1	09/03/10 11:10	09/03/10 18:20	85-01-8	
Pyrene	ND	ug/kg	8.9	1	09/03/10 11:10	09/03/10 18:20	129-00-0	
2-Fluorobiphenyl (S)	71	%	55-136	1	09/03/10 11:10	09/03/10 18:20	321-60-8	
Terphenyl-d14 (S)	71	%	60-144	1	09/03/10 11:10	09/03/10 18:20	1718-51-0	
8260/5035A Volatile Organics	Analytical Method: EPA 8260							
Benzene	ND	ug/kg	3.2	1		08/26/10 20:29	71-43-2	
Ethylbenzene	ND	ug/kg	3.2	1		08/26/10 20:29	100-41-4	
Toluene	ND	ug/kg	3.2	1		08/26/10 20:29	108-88-3	
Xylene (Total)	ND	ug/kg	9.7	1		08/26/10 20:29	1330-20-7	
Dibromofluoromethane (S)	97	%	80-136	1		08/26/10 20:29	1868-53-7	
Toluene-d8 (S)	91	%	80-120	1		08/26/10 20:29	2037-26-5	
4-Bromofluorobenzene (S)	90	%	72-122	1		08/26/10 20:29	460-00-4	
1,2-Dichloroethane-d4 (S)	84	%	80-143	1		08/26/10 20:29	17060-07-0	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**25.1**	%	0.10	1		08/27/10 16:06		

Sample: MW12-2-2.5 | **Lab ID: 254681006** | Collected: 08/25/10 11:00 | Received: 08/25/10 14:40 | Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS SG	Analytical Method: NWTPH-Dx Preparation Method: EPA 3546							
Diesel Range SG	**75.7**	mg/kg	25.0	1	09/01/10 19:05	09/02/10 21:35		
Motor Oil Range SG	**153**	mg/kg	100	1	09/01/10 19:05	09/02/10 21:35	64742-65-0	
n-Octacosane (S) SG	107	%	50-150	1	09/01/10 19:05	09/02/10 21:35	630-02-4	
o-Terphenyl (S) SG	105	%	50-150	1	09/01/10 19:05	09/02/10 21:35	84-15-1	
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
Gasoline Range Organics	ND	mg/kg	6.9	1	08/30/10 12:00	08/31/10 11:14		
a,a,a-Trifluorotoluene (S)	109	%	50-150	1	08/30/10 12:00	08/31/10 11:14	98-08-8	
4-Bromofluorobenzene (S)	97	%	50-150	1	08/30/10 12:00	08/31/10 11:14	460-00-4	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Arsenic	ND	mg/kg	12.3	5	08/27/10 07:06	08/30/10 14:58	7440-38-2	
Barium	**146**	mg/kg	24.6	1	08/27/10 07:06	08/30/10 15:56	7440-39-3	
Cadmium	ND	mg/kg	6.2	5	08/27/10 07:06	08/30/10 14:58	7440-43-9	
Chromium	**39.9**	mg/kg	1.2	1	08/27/10 07:06	08/30/10 15:56	7440-47-3	
Lead	**17.0**	mg/kg	1.2	1	08/27/10 07:06	08/30/10 15:56	7439-92-1	
Selenium	ND	mg/kg	6.2	5	08/27/10 07:06	08/30/10 14:58	7782-49-2	

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ANALYTICAL RESULTS

Project: BPOLY
Pace Project No.: 254681

Sample: MW12-2-2.5 **Lab ID: 254681006** Collected: 08/25/10 11:00 Received: 08/25/10 14:40 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Silver	ND	mg/kg	6.2	5	08/27/10 07:06	08/30/10 14:58	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	ND	mg/kg	0.12	1	08/27/10 08:59	08/27/10 15:37	7439-97-6	
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546							
Acenaphthene	**18.6**	ug/kg	8.4	1	08/31/10 22:00	09/02/10 08:16	83-32-9	
Acenaphthylene	**20.5**	ug/kg	8.4	1	08/31/10 22:00	09/02/10 08:16	208-96-8	
Anthracene	**51.7**	ug/kg	8.4	1	08/31/10 22:00	09/02/10 08:16	120-12-7	
Benzo(a)anthracene	**87.1**	ug/kg	8.4	1	08/31/10 22:00	09/02/10 08:16	56-55-3	
Benzo(a)pyrene	**94.1**	ug/kg	8.4	1	08/31/10 22:00	09/02/10 08:16	50-32-8	
Benzo(b)fluoranthene	**118**	ug/kg	8.4	1	08/31/10 22:00	09/02/10 08:16	205-99-2	
Benzo(g,h,i)perylene	**50.4**	ug/kg	8.4	1	08/31/10 22:00	09/02/10 08:16	191-24-2	
Benzo(k)fluoranthene	**86.6**	ug/kg	8.4	1	08/31/10 22:00	09/02/10 08:16	207-08-9	
Chrysene	**146**	ug/kg	8.4	1	08/31/10 22:00	09/02/10 08:16	218-01-9	
Dibenz(a,h)anthracene	**19.8**	ug/kg	8.4	1	08/31/10 22:00	09/02/10 08:16	53-70-3	
Fluoranthene	**292**	ug/kg	8.4	1	08/31/10 22:00	09/02/10 08:16	206-44-0	
Fluorene	**20.6**	ug/kg	8.4	1	08/31/10 22:00	09/02/10 08:16	86-73-7	
Indeno(1,2,3-cd)pyrene	**48.0**	ug/kg	8.4	1	08/31/10 22:00	09/02/10 08:16	193-39-5	
1-Methylnaphthalene	**141**	ug/kg	8.4	1	08/31/10 22:00	09/02/10 08:16	90-12-0	
2-Methylnaphthalene	**194**	ug/kg	8.4	1	08/31/10 22:00	09/02/10 08:16	91-57-6	1n
Naphthalene	**147**	ug/kg	8.4	1	08/31/10 22:00	09/02/10 08:16	91-20-3	1n
Phenanthrene	**257**	ug/kg	8.4	1	08/31/10 22:00	09/02/10 08:16	85-01-8	
Pyrene	**228**	ug/kg	8.4	1	08/31/10 22:00	09/02/10 08:16	129-00-0	
2-Fluorobiphenyl (S)	77	%	55-136	1	08/31/10 22:00	09/02/10 08:16	321-60-8	
Terphenyl-d14 (S)	83	%	60-144	1	08/31/10 22:00	09/02/10 08:16	1718-51-0	
8260/5035A Volatile Organics	Analytical Method: EPA 8260							
Benzene	ND	ug/kg	3.4	1		08/27/10 12:51	71-43-2	
Ethylbenzene	ND	ug/kg	3.4	1		08/27/10 12:51	100-41-4	
Toluene	ND	ug/kg	3.4	1		08/27/10 12:51	108-88-3	
Xylene (Total)	ND	ug/kg	10.1	1		08/27/10 12:51	1330-20-7	
Dibromofluoromethane (S)	96	%	80-136	1		08/27/10 12:51	1868-53-7	
Toluene-d8 (S)	87	%	80-120	1		08/27/10 12:51	2037-26-5	
4-Bromofluorobenzene (S)	90	%	72-122	1		08/27/10 12:51	460-00-4	
1,2-Dichloroethane-d4 (S)	86	%	80-143	1		08/27/10 12:51	17060-07-0	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**20.3**	%	0.10	1		08/27/10 16:07		

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ANALYTICAL RESULTS

Project: BPOLY
Pace Project No.: 254681

Sample: MW12-4-4.5 **Lab ID: 254681007** Collected: 08/25/10 11:10 Received: 08/25/10 14:40 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS SG	Analytical Method: NWTPH-Dx Preparation Method: EPA 3546							
Diesel Range SG	**43.1**	mg/kg	21.4	1	09/01/10 19:05	09/02/10 21:52		
Motor Oil Range SG	**154**	mg/kg	85.4	1	09/01/10 19:05	09/02/10 21:52	64742-65-0	
n-Octacosane (S) SG	106	%	50-150	1	09/01/10 19:05	09/02/10 21:52	630-02-4	
o-Terphenyl (S) SG	105	%	50-150	1	09/01/10 19:05	09/02/10 21:52	84-15-1	
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
Gasoline Range Organics	ND	mg/kg	7.2	1	08/30/10 12:00	08/31/10 11:38		
a,a,a-Trifluorotoluene (S)	108	%	50-150	1	08/30/10 12:00	08/31/10 11:38	98-08-8	
4-Bromofluorobenzene (S)	96	%	50-150	1	08/30/10 12:00	08/31/10 11:38	460-00-4	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Arsenic	ND	mg/kg	11.4	5	08/27/10 07:06	08/30/10 15:00	7440-38-2	
Barium	**103**	mg/kg	22.8	1	08/27/10 07:06	08/30/10 15:59	7440-39-3	
Cadmium	ND	mg/kg	5.7	5	08/27/10 07:06	08/30/10 15:00	7440-43-9	
Chromium	**27.9**	mg/kg	1.1	1	08/27/10 07:06	08/30/10 15:59	7440-47-3	
Lead	**49.7**	mg/kg	1.1	1	08/27/10 07:06	08/30/10 15:59	7439-92-1	
Selenium	ND	mg/kg	5.7	5	08/27/10 07:06	08/30/10 15:00	7782-49-2	
Silver	ND	mg/kg	5.7	5	08/27/10 07:06	08/30/10 15:00	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	ND	mg/kg	0.11	1	08/27/10 08:59	08/27/10 15:40	7439-97-6	
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546							
Acenaphthene	**9.3**	ug/kg	7.5	1	08/31/10 22:00	09/02/10 08:32	83-32-9	
Acenaphthylene	**23.2**	ug/kg	7.5	1	08/31/10 22:00	09/02/10 08:32	208-96-8	
Anthracene	**56.1**	ug/kg	7.5	1	08/31/10 22:00	09/02/10 08:32	120-12-7	
Benzo(a)anthracene	**84.9**	ug/kg	7.5	1	08/31/10 22:00	09/02/10 08:32	56-55-3	
Benzo(a)pyrene	**86.1**	ug/kg	7.5	1	08/31/10 22:00	09/02/10 08:32	50-32-8	
Benzo(b)fluoranthene	**136**	ug/kg	7.5	1	08/31/10 22:00	09/02/10 08:32	205-99-2	
Benzo(g,h,i)perylene	**47.2**	ug/kg	7.5	1	08/31/10 22:00	09/02/10 08:32	191-24-2	
Benzo(k)fluoranthene	**87.7**	ug/kg	7.5	1	08/31/10 22:00	09/02/10 08:32	207-08-9	
Chrysene	**134**	ug/kg	7.5	1	08/31/10 22:00	09/02/10 08:32	218-01-9	
Dibenz(a,h)anthracene	**17.4**	ug/kg	7.5	1	08/31/10 22:00	09/02/10 08:32	53-70-3	
Fluoranthene	**219**	ug/kg	7.5	1	08/31/10 22:00	09/02/10 08:32	206-44-0	
Fluorene	**13.6**	ug/kg	7.5	1	08/31/10 22:00	09/02/10 08:32	86-73-7	
Indeno(1,2,3-cd)pyrene	**49.2**	ug/kg	7.5	1	08/31/10 22:00	09/02/10 08:32	193-39-5	
1-Methylnaphthalene	**110**	ug/kg	7.5	1	08/31/10 22:00	09/02/10 08:32	90-12-0	
2-Methylnaphthalene	**149**	ug/kg	7.5	1	08/31/10 22:00	09/02/10 08:32	91-57-6	1n
Naphthalene	**101**	ug/kg	7.5	1	08/31/10 22:00	09/02/10 08:32	91-20-3	1n
Phenanthrene	**143**	ug/kg	7.5	1	08/31/10 22:00	09/02/10 08:32	85-01-8	
Pyrene	**165**	ug/kg	7.5	1	08/31/10 22:00	09/02/10 08:32	129-00-0	
2-Fluorobiphenyl (S)	82	%	55-136	1	08/31/10 22:00	09/02/10 08:32	321-60-8	
Terphenyl-d14 (S)	87	%	60-144	1	08/31/10 22:00	09/02/10 08:32	1718-51-0	

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ANALYTICAL RESULTS

Project: BPOLY
Pace Project No.: 254681

Sample: MW12-4-4.5 **Lab ID: 254681007** Collected: 08/25/10 11:10 Received: 08/25/10 14:40 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260/5035A Volatile Organics	Analytical Method: EPA 8260							
Benzene	ND	ug/kg	3.5	1		08/27/10 13:11	71-43-2	
Ethylbenzene	ND	ug/kg	3.5	1		08/27/10 13:11	100-41-4	
Toluene	ND	ug/kg	3.5	1		08/27/10 13:11	108-88-3	
Xylene (Total)	ND	ug/kg	10.5	1		08/27/10 13:11	1330-20-7	
Dibromofluoromethane (S)	99	%	80-136	1		08/27/10 13:11	1868-53-7	
Toluene-d8 (S)	91	%	80-120	1		08/27/10 13:11	2037-26-5	
4-Bromofluorobenzene (S)	94	%	72-122	1		08/27/10 13:11	460-00-4	
1,2-Dichloroethane-d4 (S)	86	%	80-143	1		08/27/10 13:11	17060-07-0	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**12.3**	%	0.10	1		08/27/10 16:09		

Sample: MW12-6-6.5 **Lab ID: 254681008** Collected: 08/25/10 11:45 Received: 08/25/10 14:40 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546							
Acenaphthene	ND	ug/kg	11.7	1	09/02/10 18:00	09/04/10 00:42	83-32-9	
Acenaphthylene	ND	ug/kg	11.7	1	09/02/10 18:00	09/04/10 00:42	208-96-8	
Anthracene	**22.5**	ug/kg	11.7	1	09/02/10 18:00	09/04/10 00:42	120-12-7	
Benzo(a)anthracene	**108**	ug/kg	11.7	1	09/02/10 18:00	09/04/10 00:42	56-55-3	
Benzo(a)pyrene	**114**	ug/kg	11.7	1	09/02/10 18:00	09/04/10 00:42	50-32-8	
Benzo(b)fluoranthene	**106**	ug/kg	11.7	1	09/02/10 18:00	09/04/10 00:42	205-99-2	
Benzo(g,h,i)perylene	**54.8**	ug/kg	11.7	1	09/02/10 18:00	09/04/10 00:42	191-24-2	
Benzo(k)fluoranthene	**88.2**	ug/kg	11.7	1	09/02/10 18:00	09/04/10 00:42	207-08-9	
Chrysene	**116**	ug/kg	11.7	1	09/02/10 18:00	09/04/10 00:42	218-01-9	
Dibenz(a,h)anthracene	**23.1**	ug/kg	11.7	1	09/02/10 18:00	09/04/10 00:42	53-70-3	
Fluoranthene	**244**	ug/kg	11.7	1	09/02/10 18:00	09/04/10 00:42	206-44-0	
Fluorene	**12.6**	ug/kg	11.7	1	09/02/10 18:00	09/04/10 00:42	86-73-7	
Indeno(1,2,3-cd)pyrene	**53.2**	ug/kg	11.7	1	09/02/10 18:00	09/04/10 00:42	193-39-5	
1-Methylnaphthalene	**28.2**	ug/kg	11.7	1	09/02/10 18:00	09/04/10 00:42	90-12-0	
2-Methylnaphthalene	**45.8**	ug/kg	11.7	1	09/02/10 18:00	09/04/10 00:42	91-57-6	
Naphthalene	**78.5**	ug/kg	11.7	1	09/02/10 18:00	09/04/10 00:42	91-20-3	
Phenanthrene	**94.5**	ug/kg	11.7	1	09/02/10 18:00	09/04/10 00:42	85-01-8	
Pyrene	**195**	ug/kg	11.7	1	09/02/10 18:00	09/04/10 00:42	129-00-0	
2-Fluorobiphenyl (S)	69	%	55-136	1	09/02/10 18:00	09/04/10 00:42	321-60-8	
Terphenyl-d14 (S)	65	%	60-144	1	09/02/10 18:00	09/04/10 00:42	1718-51-0	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**42.9**	%	0.10	1		08/27/10 16:10		

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ANALYTICAL RESULTS

Project: BPOLY
Pace Project No.: 254681

Sample: MW11-2-2.5 **Lab ID: 254681009** Collected: 08/25/10 09:50 Received: 08/25/10 14:40 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS SG	Analytical Method: NWTPH-Dx Preparation Method: EPA 3546							
Diesel Range SG	**72.3**	mg/kg	22.1	1	09/01/10 19:05	09/02/10 22:08		
Motor Oil Range SG	**176**	mg/kg	88.2	1	09/01/10 19:05	09/02/10 22:08	64742-65-0	
n-Octacosane (S) SG	103	%	50-150	1	09/01/10 19:05	09/02/10 22:08	630-02-4	
o-Terphenyl (S) SG	104	%	50-150	1	09/01/10 19:05	09/02/10 22:08	84-15-1	
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
Gasoline Range Organics	ND	mg/kg	7.0	1	08/30/10 12:00	08/31/10 12:02		
a,a,a-Trifluorotoluene (S)	108	%	50-150	1	08/30/10 12:00	08/31/10 12:02	98-08-8	
4-Bromofluorobenzene (S)	94	%	50-150	1	08/30/10 12:00	08/31/10 12:02	460-00-4	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Arsenic	ND	mg/kg	11.2	5	08/27/10 07:06	08/30/10 15:03	7440-38-2	
Barium	**131**	mg/kg	22.4	1	08/27/10 07:06	08/30/10 16:02	7440-39-3	
Cadmium	ND	mg/kg	5.6	5	08/27/10 07:06	08/30/10 15:03	7440-43-9	
Chromium	**28.0**	mg/kg	1.1	1	08/27/10 07:06	08/30/10 16:02	7440-47-3	
Lead	**58.3**	mg/kg	1.1	1	08/27/10 07:06	08/30/10 16:02	7439-92-1	
Selenium	ND	mg/kg	5.6	5	08/27/10 07:06	08/30/10 15:03	7782-49-2	
Silver	ND	mg/kg	5.6	5	08/27/10 07:06	08/30/10 15:03	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.12**	mg/kg	0.099	1	08/27/10 08:59	08/27/10 15:46	7439-97-6	
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546							
Acenaphthene	ND	ug/kg	7.6	1	08/31/10 22:00	09/02/10 08:49	83-32-9	
Acenaphthylene	**14.7**	ug/kg	7.6	1	08/31/10 22:00	09/02/10 08:49	208-96-8	
Anthracene	**27.7**	ug/kg	7.6	1	08/31/10 22:00	09/02/10 08:49	120-12-7	
Benzo(a)anthracene	**46.1**	ug/kg	7.6	1	08/31/10 22:00	09/02/10 08:49	56-55-3	
Benzo(a)pyrene	**46.0**	ug/kg	7.6	1	08/31/10 22:00	09/02/10 08:49	50-32-8	
Benzo(b)fluoranthene	**56.6**	ug/kg	7.6	1	08/31/10 22:00	09/02/10 08:49	205-99-2	
Benzo(g,h,i)perylene	**23.1**	ug/kg	7.6	1	08/31/10 22:00	09/02/10 08:49	191-24-2	
Benzo(k)fluoranthene	**35.6**	ug/kg	7.6	1	08/31/10 22:00	09/02/10 08:49	207-08-9	
Chrysene	**70.1**	ug/kg	7.6	1	08/31/10 22:00	09/02/10 08:49	218-01-9	
Dibenz(a,h)anthracene	**8.7**	ug/kg	7.6	1	08/31/10 22:00	09/02/10 08:49	53-70-3	
Fluoranthene	**94.3**	ug/kg	7.6	1	08/31/10 22:00	09/02/10 08:49	206-44-0	
Fluorene	**12.0**	ug/kg	7.6	1	08/31/10 22:00	09/02/10 08:49	86-73-7	
Indeno(1,2,3-cd)pyrene	**21.0**	ug/kg	7.6	1	08/31/10 22:00	09/02/10 08:49	193-39-5	
1-Methylnaphthalene	**146**	ug/kg	7.6	1	08/31/10 22:00	09/02/10 08:49	90-12-0	
2-Methylnaphthalene	**180**	ug/kg	7.6	1	08/31/10 22:00	09/02/10 08:49	91-57-6	1n
Naphthalene	**106**	ug/kg	7.6	1	08/31/10 22:00	09/02/10 08:49	91-20-3	1n
Phenanthrene	**125**	ug/kg	7.6	1	08/31/10 22:00	09/02/10 08:49	85-01-8	
Pyrene	**86.0**	ug/kg	7.6	1	08/31/10 22:00	09/02/10 08:49	129-00-0	
2-Fluorobiphenyl (S)	74	%	55-136	1	08/31/10 22:00	09/02/10 08:49	321-60-8	
Terphenyl-d14 (S)	82	%	60-144	1	08/31/10 22:00	09/02/10 08:49	1718-51-0	

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ANALYTICAL RESULTS

Project: BPOLY
Pace Project No.: 254681

Sample: MW11-2-2.5 **Lab ID: 254681009** Collected: 08/25/10 09:50 Received: 08/25/10 14:40 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260/5035A Volatile Organics	Analytical Method: EPA 8260							
Benzene	ND	ug/kg	3.3	1		08/27/10 13:30	71-43-2	
Ethylbenzene	ND	ug/kg	3.3	1		08/27/10 13:30	100-41-4	
Toluene	ND	ug/kg	3.3	1		08/27/10 13:30	108-88-3	
Xylene (Total)	ND	ug/kg	10	1		08/27/10 13:30	1330-20-7	
Dibromofluoromethane (S)	103	%	80-136	1		08/27/10 13:30	1868-53-7	
Toluene-d8 (S)	87	%	80-120	1		08/27/10 13:30	2037-26-5	
4-Bromofluorobenzene (S)	95	%	72-122	1		08/27/10 13:30	460-00-4	
1,2-Dichloroethane-d4 (S)	92	%	80-143	1		08/27/10 13:30	17060-07-0	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**13.4**	%	0.10	1		08/27/10 16:11		

Sample: MW11-4-4.5 **Lab ID: 254681010** Collected: 08/25/10 10:00 Received: 08/25/10 14:40 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS SG	Analytical Method: NWTPH-Dx Preparation Method: EPA 3546							
Diesel Range SG	**52.9**	mg/kg	21.8	1	09/01/10 19:05	09/02/10 22:24		
Motor Oil Range SG	**142**	mg/kg	87.4	1	09/01/10 19:05	09/02/10 22:24	64742-65-0	
n-Octacosane (S) SG	105	%	50-150	1	09/01/10 19:05	09/02/10 22:24	630-02-4	
o-Terphenyl (S) SG	104	%	50-150	1	09/01/10 19:05	09/02/10 22:24	84-15-1	
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
Gasoline Range Organics	ND	mg/kg	7.4	1	08/30/10 12:00	08/31/10 12:26		
a,a,a-Trifluorotoluene (S)	103	%	50-150	1	08/30/10 12:00	08/31/10 12:26	98-08-8	
4-Bromofluorobenzene (S)	96	%	50-150	1	08/30/10 12:00	08/31/10 12:26	460-00-4	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Arsenic	ND	mg/kg	11.5	5	08/27/10 07:06	08/30/10 15:11	7440-38-2	
Barium	**132**	mg/kg	23.1	1	08/27/10 07:06	08/30/10 16:04	7440-39-3	
Cadmium	ND	mg/kg	5.8	5	08/27/10 07:06	08/30/10 15:11	7440-43-9	
Chromium	**31.6**	mg/kg	1.2	1	08/27/10 07:06	08/30/10 16:04	7440-47-3	
Lead	**55.2**	mg/kg	1.2	1	08/27/10 07:06	08/30/10 16:04	7439-92-1	
Selenium	ND	mg/kg	5.8	5	08/27/10 07:06	08/30/10 15:11	7782-49-2	
Silver	ND	mg/kg	5.8	5	08/27/10 07:06	08/30/10 15:11	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.15**	mg/kg	0.096	1	08/27/10 08:59	08/27/10 15:48	7439-97-6	
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546							
Acenaphthene	ND	ug/kg	7.8	1	09/03/10 11:10	09/04/10 00:09	83-32-9	
Acenaphthylene	**10.5**	ug/kg	7.8	1	09/03/10 11:10	09/04/10 00:09	208-96-8	
Anthracene	**20.9**	ug/kg	7.8	1	09/03/10 11:10	09/04/10 00:09	120-12-7	

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ANALYTICAL RESULTS

Project: BPOLY
Pace Project No.: 254681

Sample: MW11-4-4.5 **Lab ID: 254681010** Collected: 08/25/10 10:00 Received: 08/25/10 14:40 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546							
Benzo(a)anthracene	**31.4**	ug/kg	7.8	1	09/03/10 11:10	09/04/10 00:09	56-55-3	
Benzo(a)pyrene	**32.8**	ug/kg	7.8	1	09/03/10 11:10	09/04/10 00:09	50-32-8	
Benzo(b)fluoranthene	**44.5**	ug/kg	7.8	1	09/03/10 11:10	09/04/10 00:09	205-99-2	
Benzo(g,h,i)perylene	**18.1**	ug/kg	7.8	1	09/03/10 11:10	09/04/10 00:09	191-24-2	
Benzo(k)fluoranthene	**35.2**	ug/kg	7.8	1	09/03/10 11:10	09/04/10 00:09	207-08-9	
Chrysene	**47.7**	ug/kg	7.8	1	09/03/10 11:10	09/04/10 00:09	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	7.8	1	09/03/10 11:10	09/04/10 00:09	53-70-3	
Fluoranthene	**69.0**	ug/kg	7.8	1	09/03/10 11:10	09/04/10 00:09	206-44-0	
Fluorene	ND	ug/kg	7.8	1	09/03/10 11:10	09/04/10 00:09	86-73-7	
Indeno(1,2,3-cd)pyrene	**17.3**	ug/kg	7.8	1	09/03/10 11:10	09/04/10 00:09	193-39-5	
1-Methylnaphthalene	**81.4**	ug/kg	7.8	1	09/03/10 11:10	09/04/10 00:09	90-12-0	
2-Methylnaphthalene	**101**	ug/kg	7.8	1	09/03/10 11:10	09/04/10 00:09	91-57-6	
Naphthalene	**58.5**	ug/kg	7.8	1	09/03/10 11:10	09/04/10 00:09	91-20-3	
Phenanthrene	**73.3**	ug/kg	7.8	1	09/03/10 11:10	09/04/10 00:09	85-01-8	
Pyrene	**56.4**	ug/kg	7.8	1	09/03/10 11:10	09/04/10 00:09	129-00-0	
2-Fluorobiphenyl (S)	68	%	55-136	1	09/03/10 11:10	09/04/10 00:09	321-60-8	
Terphenyl-d14 (S)	75	%	60-144	1	09/03/10 11:10	09/04/10 00:09	1718-51-0	
8260/5035A Volatile Organics	Analytical Method: EPA 8260							
Benzene	ND	ug/kg	3.6	1		08/27/10 13:48	71-43-2	
Ethylbenzene	ND	ug/kg	3.6	1		08/27/10 13:48	100-41-4	
Toluene	ND	ug/kg	3.6	1		08/27/10 13:48	108-88-3	
Xylene (Total)	ND	ug/kg	10.8	1		08/27/10 13:48	1330-20-7	
Dibromofluoromethane (S)	99	%	80-136	1		08/27/10 13:48	1868-53-7	
Toluene-d8 (S)	92	%	80-120	1		08/27/10 13:48	2037-26-5	
4-Bromofluorobenzene (S)	94	%	72-122	1		08/27/10 13:48	460-00-4	
1,2-Dichloroethane-d4 (S)	89	%	80-143	1		08/27/10 13:48	17060-07-0	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**15.8**	%	0.10	1		08/27/10 16:12		

Sample: MW11-6-6.5 **Lab ID: 254681011** Collected: 08/25/10 10:20 Received: 08/25/10 14:40 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546							
Acenaphthene	**72.6**	ug/kg	8.0	1	09/02/10 18:00	09/04/10 02:05	83-32-9	
Acenaphthylene	**21.0**	ug/kg	8.0	1	09/02/10 18:00	09/04/10 02:05	208-96-8	
Anthracene	**112**	ug/kg	8.0	1	09/02/10 18:00	09/04/10 02:05	120-12-7	
Benzo(a)anthracene	**154**	ug/kg	8.0	1	09/02/10 18:00	09/04/10 02:05	56-55-3	
Benzo(a)pyrene	**168**	ug/kg	8.0	1	09/02/10 18:00	09/04/10 02:05	50-32-8	
Benzo(b)fluoranthene	**181**	ug/kg	8.0	1	09/02/10 18:00	09/04/10 02:05	205-99-2	
Benzo(g,h,i)perylene	**74.5**	ug/kg	8.0	1	09/02/10 18:00	09/04/10 02:05	191-24-2	

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ANALYTICAL RESULTS

Project: BPOLY
Pace Project No.: 254681

Sample: MW11-6-6.5 **Lab ID: 254681011** Collected: 08/25/10 10:20 Received: 08/25/10 14:40 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546							
Benzo(k)fluoranthene	**120**	ug/kg	8.0	1	09/02/10 18:00	09/04/10 02:05	207-08-9	
Chrysene	**171**	ug/kg	8.0	1	09/02/10 18:00	09/04/10 02:05	218-01-9	
Dibenz(a,h)anthracene	**27.0**	ug/kg	8.0	1	09/02/10 18:00	09/04/10 02:05	53-70-3	
Fluoranthene	**415**	ug/kg	8.0	1	09/02/10 18:00	09/04/10 02:05	206-44-0	
Fluorene	**36.7**	ug/kg	8.0	1	09/02/10 18:00	09/04/10 02:05	86-73-7	
Indeno(1,2,3-cd)pyrene	**70.8**	ug/kg	8.0	1	09/02/10 18:00	09/04/10 02:05	193-39-5	
1-Methylnaphthalene	**105**	ug/kg	8.0	1	09/02/10 18:00	09/04/10 02:05	90-12-0	
2-Methylnaphthalene	**134**	ug/kg	8.0	1	09/02/10 18:00	09/04/10 02:05	91-57-6	
Naphthalene	**89.1**	ug/kg	8.0	1	09/02/10 18:00	09/04/10 02:05	91-20-3	
Phenanthrene	**426**	ug/kg	8.0	1	09/02/10 18:00	09/04/10 02:05	85-01-8	
Pyrene	**358**	ug/kg	8.0	1	09/02/10 18:00	09/04/10 02:05	129-00-0	
2-Fluorobiphenyl (S)	72	%	55-136	1	09/02/10 18:00	09/04/10 02:05	321-60-8	
Terphenyl-d14 (S)	75	%	60-144	1	09/02/10 18:00	09/04/10 02:05	1718-51-0	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**16.3**	%	0.10	1		08/27/10 16:14		

Sample: GP6-2-2.5 **Lab ID: 254681012** Collected: 08/25/10 09:15 Received: 08/25/10 14:40 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS SG	Analytical Method: NWTPH-Dx Preparation Method: EPA 3546							
Diesel Range SG	ND	mg/kg	23.3	1	09/02/10 16:05	09/03/10 21:35		
Motor Oil Range SG	ND	mg/kg	93.1	1	09/02/10 16:05	09/03/10 21:35	64742-65-0	
n-Octacosane (S) SG	98	%	50-150	1	09/02/10 16:05	09/03/10 21:35	630-02-4	
o-Terphenyl (S) SG	100	%	50-150	1	09/02/10 16:05	09/03/10 21:35	84-15-1	
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
Gasoline Range Organics	ND	mg/kg	6.6	1	08/30/10 12:00	08/31/10 12:50		
a,a,a-Trifluorotoluene (S)	104	%	50-150	1	08/30/10 12:00	08/31/10 12:50	98-08-8	
4-Bromofluorobenzene (S)	93	%	50-150	1	08/30/10 12:00	08/31/10 12:50	460-00-4	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Arsenic	ND	mg/kg	11.5	5	08/27/10 07:06	08/30/10 15:14	7440-38-2	
Barium	**127**	mg/kg	23.0	1	08/27/10 07:06	08/30/10 16:07	7440-39-3	
Cadmium	ND	mg/kg	5.7	5	08/27/10 07:06	08/30/10 15:14	7440-43-9	
Chromium	**41.5**	mg/kg	1.1	1	08/27/10 07:06	08/30/10 16:07	7440-47-3	
Lead	**6.4**	mg/kg	1.1	1	08/27/10 07:06	08/30/10 16:07	7439-92-1	
Selenium	ND	mg/kg	5.7	5	08/27/10 07:06	08/30/10 15:14	7782-49-2	
Silver	ND	mg/kg	5.7	5	08/27/10 07:06	08/30/10 15:14	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	ND	mg/kg	0.093	1	08/27/10 08:59	08/27/10 15:50	7439-97-6	

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ANALYTICAL RESULTS

Project: BPOLY
Pace Project No.: 254681

Sample: GP6-2-2.5 **Lab ID: 254681012** Collected: 08/25/10 09:15 Received: 08/25/10 14:40 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546							
Acenaphthene	ND	ug/kg	7.9	1	09/03/10 11:10	09/04/10 00:26	83-32-9	
Acenaphthylene	ND	ug/kg	7.9	1	09/03/10 11:10	09/04/10 00:26	208-96-8	
Anthracene	ND	ug/kg	7.9	1	09/03/10 11:10	09/04/10 00:26	120-12-7	
Benzo(a)anthracene	ND	ug/kg	7.9	1	09/03/10 11:10	09/04/10 00:26	56-55-3	
Benzo(a)pyrene	ND	ug/kg	7.9	1	09/03/10 11:10	09/04/10 00:26	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	7.9	1	09/03/10 11:10	09/04/10 00:26	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	7.9	1	09/03/10 11:10	09/04/10 00:26	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	7.9	1	09/03/10 11:10	09/04/10 00:26	207-08-9	
Chrysene	ND	ug/kg	7.9	1	09/03/10 11:10	09/04/10 00:26	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	7.9	1	09/03/10 11:10	09/04/10 00:26	53-70-3	
Fluoranthene	**14.0**	ug/kg	7.9	1	09/03/10 11:10	09/04/10 00:26	206-44-0	
Fluorene	ND	ug/kg	7.9	1	09/03/10 11:10	09/04/10 00:26	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	7.9	1	09/03/10 11:10	09/04/10 00:26	193-39-5	
1-Methylnaphthalene	ND	ug/kg	7.9	1	09/03/10 11:10	09/04/10 00:26	90-12-0	
2-Methylnaphthalene	ND	ug/kg	7.9	1	09/03/10 11:10	09/04/10 00:26	91-57-6	
Naphthalene	ND	ug/kg	7.9	1	09/03/10 11:10	09/04/10 00:26	91-20-3	
Phenanthrene	**10.9**	ug/kg	7.9	1	09/03/10 11:10	09/04/10 00:26	85-01-8	
Pyrene	**10**	ug/kg	7.9	1	09/03/10 11:10	09/04/10 00:26	129-00-0	
2-Fluorobiphenyl (S)	73	%	55-136	1	09/03/10 11:10	09/04/10 00:26	321-60-8	
Terphenyl-d14 (S)	81	%	60-144	1	09/03/10 11:10	09/04/10 00:26	1718-51-0	
8260/5035A Volatile Organics	Analytical Method: EPA 8260							
Benzene	ND	ug/kg	3.1	1		08/27/10 14:07	71-43-2	
Ethylbenzene	ND	ug/kg	3.1	1		08/27/10 14:07	100-41-4	
Toluene	ND	ug/kg	3.1	1		08/27/10 14:07	108-88-3	
Xylene (Total)	ND	ug/kg	9.4	1		08/27/10 14:07	1330-20-7	
Dibromofluoromethane (S)	99	%	80-136	1		08/27/10 14:07	1868-53-7	
Toluene-d8 (S)	86	%	80-120	1		08/27/10 14:07	2037-26-5	
4-Bromofluorobenzene (S)	92	%	72-122	1		08/27/10 14:07	460-00-4	
1,2-Dichloroethane-d4 (S)	90	%	80-143	1		08/27/10 14:07	17060-07-0	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**17.1**	%	0.10	1		08/27/10 16:15		

Sample: GP6-4-4.5 **Lab ID: 254681013** Collected: 08/25/10 09:30 Received: 08/25/10 14:40 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS SG	Analytical Method: NWTPH-Dx Preparation Method: EPA 3546							
Diesel Range SG	**899**	mg/kg	24.7	1	09/02/10 16:05	09/03/10 22:08		
Motor Oil Range SG	ND	mg/kg	98.7	1	09/02/10 16:05	09/03/10 22:08	64742-65-0	
n-Octacosane (S) SG	104	%	50-150	1	09/02/10 16:05	09/03/10 22:08	630-02-4	
o-Terphenyl (S) SG	105	%	50-150	1	09/02/10 16:05	09/03/10 22:08	84-15-1	

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(206)767-5060

ANALYTICAL RESULTS

Project: BPOLY
Pace Project No.: 254681

Sample: GP6-4-4.5 **Lab ID: 254681013** Collected: 08/25/10 09:30 Received: 08/25/10 14:40 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
Gasoline Range Organics	**486**	mg/kg	67.9	10	08/30/10 12:00	08/31/10 13:15		
a,a,a-Trifluorotoluene (S)	103	%	50-150	10	08/30/10 12:00	08/31/10 13:15	98-08-8	
4-Bromofluorobenzene (S)	135	%	50-150	10	08/30/10 12:00	08/31/10 13:15	460-00-4	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Arsenic	ND	mg/kg	12.1	5	08/27/10 07:06	08/30/10 15:17	7440-38-2	
Barium	**139**	mg/kg	24.2	1	08/27/10 07:06	08/30/10 16:15	7440-39-3	
Cadmium	ND	mg/kg	6.1	5	08/27/10 07:06	08/30/10 15:17	7440-43-9	
Chromium	**42.4**	mg/kg	1.2	1	08/27/10 07:06	08/30/10 16:15	7440-47-3	
Lead	**6.3**	mg/kg	1.2	1	08/27/10 07:06	08/30/10 16:15	7439-92-1	
Selenium	ND	mg/kg	6.1	5	08/27/10 07:06	08/30/10 15:17	7782-49-2	
Silver	ND	mg/kg	6.1	5	08/27/10 07:06	08/30/10 15:17	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	ND	mg/kg	0.11	1	08/27/10 08:59	08/27/10 15:53	7439-97-6	
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546							
Acenaphthene	**33.1**	ug/kg	7.7	1	08/31/10 22:00	09/02/10 04:58	83-32-9	
Acenaphthylene	**32.3**	ug/kg	7.7	1	08/31/10 22:00	09/02/10 04:58	208-96-8	
Anthracene	**11.3**	ug/kg	7.7	1	08/31/10 22:00	09/02/10 04:58	120-12-7	
Benzo(a)anthracene	**17.7**	ug/kg	7.7	1	08/31/10 22:00	09/02/10 04:58	56-55-3	
Benzo(a)pyrene	**12.4**	ug/kg	7.7	1	08/31/10 22:00	09/02/10 04:58	50-32-8	
Benzo(b)fluoranthene	**8.1**	ug/kg	7.7	1	08/31/10 22:00	09/02/10 04:58	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	7.7	1	08/31/10 22:00	09/02/10 04:58	191-24-2	
Benzo(k)fluoranthene	**12.0**	ug/kg	7.7	1	08/31/10 22:00	09/02/10 04:58	207-08-9	
Chrysene	**20.2**	ug/kg	7.7	1	08/31/10 22:00	09/02/10 04:58	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	7.7	1	08/31/10 22:00	09/02/10 04:58	53-70-3	
Fluoranthene	**35.9**	ug/kg	7.7	1	08/31/10 22:00	09/02/10 04:58	206-44-0	
Fluorene	**113**	ug/kg	7.7	1	08/31/10 22:00	09/02/10 04:58	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	7.7	1	08/31/10 22:00	09/02/10 04:58	193-39-5	
1-Methylnaphthalene	**532**	ug/kg	7.7	1	08/31/10 22:00	09/02/10 04:58	90-12-0	
2-Methylnaphthalene	**627**	ug/kg	7.7	1	08/31/10 22:00	09/02/10 04:58	91-57-6	1n
Naphthalene	**141**	ug/kg	7.7	1	08/31/10 22:00	09/02/10 04:58	91-20-3	1n
Phenanthrene	**152**	ug/kg	7.7	1	08/31/10 22:00	09/02/10 04:58	85-01-8	
Pyrene	**42.6**	ug/kg	7.7	1	08/31/10 22:00	09/02/10 04:58	129-00-0	
2-Fluorobiphenyl (S)	80	%	55-136	1	08/31/10 22:00	09/02/10 04:58	321-60-8	
Terphenyl-d14 (S)	88	%	60-144	1	08/31/10 22:00	09/02/10 04:58	1718-51-0	
8260/5035A Volatile Organics	Analytical Method: EPA 8260							
Benzene	ND	ug/kg	2.9	1		08/27/10 14:26	71-43-2	
Ethylbenzene	ND	ug/kg	2.9	1		08/27/10 14:26	100-41-4	
Toluene	ND	ug/kg	2.9	1		08/27/10 14:26	108-88-3	
Xylene (Total)	ND	ug/kg	8.7	1		08/27/10 14:26	1330-20-7	
Dibromofluoromethane (S)	97	%	80-136	1		08/27/10 14:26	1868-53-7	
Toluene-d8 (S)	89	%	80-120	1		08/27/10 14:26	2037-26-5	

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ANALYTICAL RESULTS

Project: BPOLY
Pace Project No.: 254681

Sample: GP6-4-4.5 **Lab ID: 254681013** Collected: 08/25/10 09:30 Received: 08/25/10 14:40 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260/5035A Volatile Organics	Analytical Method: EPA 8260							
4-Bromofluorobenzene (S)	387	%	72-122	1		08/27/10 14:26	460-00-4	S5
1,2-Dichloroethane-d4 (S)	88	%	80-143	1		08/27/10 14:26	17060-07-0	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**20.7**	%	0.10	1		08/27/10 16:17		

Sample: GP6-6-6.5 **Lab ID: 254681014** Collected: 08/25/10 09:45 Received: 08/25/10 14:40 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS SG	Analytical Method: NWTPH-Dx Preparation Method: EPA 3546							
Diesel Range SG	**57.1**	mg/kg	27.0	1	09/02/10 16:05	09/03/10 22:24		
Motor Oil Range SG	ND	mg/kg	108	1	09/02/10 16:05	09/03/10 22:24	64742-65-0	
n-Octacosane (S) SG	97	%	50-150	1	09/02/10 16:05	09/03/10 22:24	630-02-4	
o-Terphenyl (S) SG	98	%	50-150	1	09/02/10 16:05	09/03/10 22:24	84-15-1	
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
Gasoline Range Organics	**94.4**	mg/kg	8.9	1	08/30/10 12:00	08/31/10 14:03		
a,a,a-Trifluorotoluene (S)	104	%	50-150	1	08/30/10 12:00	08/31/10 14:03	98-08-8	
4-Bromofluorobenzene (S)	136	%	50-150	1	08/30/10 12:00	08/31/10 14:03	460-00-4	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Arsenic	ND	mg/kg	13.9	5	08/27/10 07:06	08/30/10 15:19	7440-38-2	
Barium	**112**	mg/kg	27.9	1	08/27/10 07:06	08/30/10 16:18	7440-39-3	
Cadmium	ND	mg/kg	7.0	5	08/27/10 07:06	08/30/10 15:19	7440-43-9	
Chromium	**44.2**	mg/kg	1.4	1	08/27/10 07:06	08/30/10 16:18	7440-47-3	
Lead	**7.1**	mg/kg	1.4	1	08/27/10 07:06	08/30/10 16:18	7439-92-1	
Selenium	ND	mg/kg	7.0	5	08/27/10 07:06	08/30/10 15:19	7782-49-2	
Silver	ND	mg/kg	7.0	5	08/27/10 07:06	08/30/10 15:19	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	ND	mg/kg	0.11	1	08/27/10 08:59	08/27/10 15:55	7439-97-6	
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546							
Acenaphthene	ND	ug/kg	9.7	1	09/03/10 11:10	09/03/10 18:37	83-32-9	
Acenaphthylene	ND	ug/kg	9.7	1	09/03/10 11:10	09/03/10 18:37	208-96-8	
Anthracene	ND	ug/kg	9.7	1	09/03/10 11:10	09/03/10 18:37	120-12-7	
Benzo(a)anthracene	ND	ug/kg	9.7	1	09/03/10 11:10	09/03/10 18:37	56-55-3	
Benzo(a)pyrene	ND	ug/kg	9.7	1	09/03/10 11:10	09/03/10 18:37	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	9.7	1	09/03/10 11:10	09/03/10 18:37	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	9.7	1	09/03/10 11:10	09/03/10 18:37	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	9.7	1	09/03/10 11:10	09/03/10 18:37	207-08-9	
Chrysene	ND	ug/kg	9.7	1	09/03/10 11:10	09/03/10 18:37	218-01-9	

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ANALYTICAL RESULTS

Project: BPOLY
Pace Project No.: 254681

Sample: GP6-6-6.5 **Lab ID: 254681014** Collected: 08/25/10 09:45 Received: 08/25/10 14:40 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546							
Dibenz(a,h)anthracene	ND	ug/kg	9.7	1	09/03/10 11:10	09/03/10 18:37	53-70-3	
Fluoranthene	ND	ug/kg	9.7	1	09/03/10 11:10	09/03/10 18:37	206-44-0	
Fluorene	ND	ug/kg	9.7	1	09/03/10 11:10	09/03/10 18:37	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	9.7	1	09/03/10 11:10	09/03/10 18:37	193-39-5	
1-Methylnaphthalene	**21.8**	ug/kg	9.7	1	09/03/10 11:10	09/03/10 18:37	90-12-0	
2-Methylnaphthalene	**21.7**	ug/kg	9.7	1	09/03/10 11:10	09/03/10 18:37	91-57-6	
Naphthalene	**13.5**	ug/kg	9.7	1	09/03/10 11:10	09/03/10 18:37	91-20-3	
Phenanthrene	ND	ug/kg	9.7	1	09/03/10 11:10	09/03/10 18:37	85-01-8	
Pyrene	ND	ug/kg	9.7	1	09/03/10 11:10	09/03/10 18:37	129-00-0	
2-Fluorobiphenyl (S)	73	%	55-136	1	09/03/10 11:10	09/03/10 18:37	321-60-8	
Terphenyl-d14 (S)	73	%	60-144	1	09/03/10 11:10	09/03/10 18:37	1718-51-0	
8260/5035A Volatile Organics	Analytical Method: EPA 8260							
Benzene	ND	ug/kg	3.8	1		08/27/10 14:46	71-43-2	
Ethylbenzene	ND	ug/kg	3.8	1		08/27/10 14:46	100-41-4	
Toluene	ND	ug/kg	3.8	1		08/27/10 14:46	108-88-3	
Xylene (Total)	ND	ug/kg	11.4	1		08/27/10 14:46	1330-20-7	
Dibromofluoromethane (S)	94	%	80-136	1		08/27/10 14:46	1868-53-7	
Toluene-d8 (S)	90	%	80-120	1		08/27/10 14:46	2037-26-5	
4-Bromofluorobenzene (S)	127	%	72-122	1		08/27/10 14:46	460-00-4	S5
1,2-Dichloroethane-d4 (S)	82	%	80-143	1		08/27/10 14:46	17060-07-0	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**31.6**	%	0.10	1		08/27/10 16:18		

Sample: GP7-2-2.5 **Lab ID: 254681015** Collected: 08/24/10 15:45 Received: 08/25/10 14:40 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS SG	Analytical Method: NWTPH-Dx Preparation Method: EPA 3546							
Diesel Range SG	ND	mg/kg	23.0	1	09/02/10 16:05	09/03/10 23:14		
Motor Oil Range SG	ND	mg/kg	92.1	1	09/02/10 16:05	09/03/10 23:14	64742-65-0	
n-Octacosane (S) SG	99	%	50-150	1	09/02/10 16:05	09/03/10 23:14	630-02-4	
o-Terphenyl (S) SG	101	%	50-150	1	09/02/10 16:05	09/03/10 23:14	84-15-1	
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
Gasoline Range Organics	ND	mg/kg	7.3	1	08/30/10 12:00	08/31/10 20:30		
a,a,a-Trifluorotoluene (S)	104	%	50-150	1	08/30/10 12:00	08/31/10 20:30	98-08-8	
4-Bromofluorobenzene (S)	91	%	50-150	1	08/30/10 12:00	08/31/10 20:30	460-00-4	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Arsenic	ND	mg/kg	11.5	5	08/27/10 07:06	08/30/10 15:22	7440-38-2	
Barium	**154**	mg/kg	23.1	1	08/27/10 07:06	08/30/10 16:20	7440-39-3	

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ANALYTICAL RESULTS

Project: BPOLY
Pace Project No.: 254681

Sample: GP7-2-2.5 **Lab ID: 254681015** Collected: 08/24/10 15:45 Received: 08/25/10 14:40 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Cadmium	ND	mg/kg	5.8	5	08/27/10 07:06	08/30/10 15:22	7440-43-9	
Chromium	**45.0**	mg/kg	1.2	1	08/27/10 07:06	08/30/10 16:20	7440-47-3	
Lead	**6.8**	mg/kg	5.8	5	08/27/10 07:06	08/30/10 15:22	7439-92-1	
Selenium	ND	mg/kg	5.8	5	08/27/10 07:06	08/30/10 15:22	7782-49-2	
Silver	ND	mg/kg	5.8	5	08/27/10 07:06	08/30/10 15:22	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	ND	mg/kg	0.11	1	08/27/10 08:59	08/27/10 15:57	7439-97-6	
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546							
Acenaphthene	ND	ug/kg	8.1	1	09/03/10 11:10	09/03/10 23:19	83-32-9	
Acenaphthylene	ND	ug/kg	8.1	1	09/03/10 11:10	09/03/10 23:19	208-96-8	
Anthracene	ND	ug/kg	8.1	1	09/03/10 11:10	09/03/10 23:19	120-12-7	
Benzo(a)anthracene	ND	ug/kg	8.1	1	09/03/10 11:10	09/03/10 23:19	56-55-3	
Benzo(a)pyrene	ND	ug/kg	8.1	1	09/03/10 11:10	09/03/10 23:19	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	8.1	1	09/03/10 11:10	09/03/10 23:19	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	8.1	1	09/03/10 11:10	09/03/10 23:19	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	8.1	1	09/03/10 11:10	09/03/10 23:19	207-08-9	
Chrysene	ND	ug/kg	8.1	1	09/03/10 11:10	09/03/10 23:19	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	8.1	1	09/03/10 11:10	09/03/10 23:19	53-70-3	
Fluoranthene	ND	ug/kg	8.1	1	09/03/10 11:10	09/03/10 23:19	206-44-0	
Fluorene	ND	ug/kg	8.1	1	09/03/10 11:10	09/03/10 23:19	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	8.1	1	09/03/10 11:10	09/03/10 23:19	193-39-5	
1-Methylnaphthalene	ND	ug/kg	8.1	1	09/03/10 11:10	09/03/10 23:19	90-12-0	
2-Methylnaphthalene	ND	ug/kg	8.1	1	09/03/10 11:10	09/03/10 23:19	91-57-6	
Naphthalene	ND	ug/kg	8.1	1	09/03/10 11:10	09/03/10 23:19	91-20-3	
Phenanthrene	ND	ug/kg	8.1	1	09/03/10 11:10	09/03/10 23:19	85-01-8	
Pyrene	ND	ug/kg	8.1	1	09/03/10 11:10	09/03/10 23:19	129-00-0	
2-Fluorobiphenyl (S)	70	%	55-136	1	09/03/10 11:10	09/03/10 23:19	321-60-8	
Terphenyl-d14 (S)	78	%	60-144	1	09/03/10 11:10	09/03/10 23:19	1718-51-0	
8260/5035A Volatile Organics	Analytical Method: EPA 8260							
Benzene	ND	ug/kg	4.1	1		08/27/10 15:05	71-43-2	
Ethylbenzene	ND	ug/kg	4.1	1		08/27/10 15:05	100-41-4	
Toluene	ND	ug/kg	4.1	1		08/27/10 15:05	108-88-3	
Xylene (Total)	ND	ug/kg	12.2	1		08/27/10 15:05	1330-20-7	
Dibromofluoromethane (S)	98	%	80-136	1		08/27/10 15:05	1868-53-7	
Toluene-d8 (S)	90	%	80-120	1		08/27/10 15:05	2037-26-5	
4-Bromofluorobenzene (S)	93	%	72-122	1		08/27/10 15:05	460-00-4	
1,2-Dichloroethane-d4 (S)	88	%	80-143	1		08/27/10 15:05	17060-07-0	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**18.3**	%	0.10	1		08/27/10 16:19		

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ANALYTICAL RESULTS

Project: BPOLY
Pace Project No.: 254681

Sample: GP7-4-4.5 **Lab ID: 254681016** Collected: 08/24/10 16:00 Received: 08/25/10 14:40 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**23.6**	%	0.10	1		08/30/10 14:42		

Sample: GP7-6-6.5 **Lab ID: 254681017** Collected: 08/24/10 16:15 Received: 08/25/10 14:40 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS SG	Analytical Method: NWTPH-Dx Preparation Method: EPA 3546							
Diesel Range SG	ND	mg/kg	24.5	1	09/02/10 16:05	09/03/10 23:30		
Motor Oil Range SG	ND	mg/kg	98.2	1	09/02/10 16:05	09/03/10 23:30	64742-65-0	
n-Octacosane (S) SG	102	%	50-150	1	09/02/10 16:05	09/03/10 23:30	630-02-4	
o-Terphenyl (S) SG	100	%	50-150	1	09/02/10 16:05	09/03/10 23:30	84-15-1	
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
Gasoline Range Organics	ND	mg/kg	7.2	1	08/30/10 12:00	08/31/10 21:19		
a,a,a-Trifluorotoluene (S)	105	%	50-150	1	08/30/10 12:00	08/31/10 21:19	98-08-8	
4-Bromofluorobenzene (S)	97	%	50-150	1	08/30/10 12:00	08/31/10 21:19	460-00-4	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Arsenic	ND	mg/kg	12.7	5	08/27/10 07:06	08/30/10 15:25	7440-38-2	
Barium	**113**	mg/kg	25.3	1	08/27/10 07:06	08/30/10 16:23	7440-39-3	
Cadmium	ND	mg/kg	6.3	5	08/27/10 07:06	08/30/10 15:25	7440-43-9	
Chromium	**39.9**	mg/kg	1.3	1	08/27/10 07:06	08/30/10 16:23	7440-47-3	
Lead	**4.3**	mg/kg	1.3	1	08/27/10 07:06	08/30/10 16:23	7439-92-1	
Selenium	ND	mg/kg	6.3	5	08/27/10 07:06	08/30/10 15:25	7782-49-2	
Silver	ND	mg/kg	6.3	5	08/27/10 07:06	08/30/10 15:25	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	ND	mg/kg	0.12	1	08/27/10 08:59	08/27/10 15:59	7439-97-6	
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546							
Acenaphthene	ND	ug/kg	8.5	1	08/31/10 22:00	09/02/10 05:48	83-32-9	
Acenaphthylene	ND	ug/kg	8.5	1	08/31/10 22:00	09/02/10 05:48	208-96-8	
Anthracene	ND	ug/kg	8.5	1	08/31/10 22:00	09/02/10 05:48	120-12-7	
Benzo(a)anthracene	ND	ug/kg	8.5	1	08/31/10 22:00	09/02/10 05:48	56-55-3	
Benzo(a)pyrene	ND	ug/kg	8.5	1	08/31/10 22:00	09/02/10 05:48	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	8.5	1	08/31/10 22:00	09/02/10 05:48	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	8.5	1	08/31/10 22:00	09/02/10 05:48	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	8.5	1	08/31/10 22:00	09/02/10 05:48	207-08-9	
Chrysene	ND	ug/kg	8.5	1	08/31/10 22:00	09/02/10 05:48	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	8.5	1	08/31/10 22:00	09/02/10 05:48	53-70-3	
Fluoranthene	ND	ug/kg	8.5	1	08/31/10 22:00	09/02/10 05:48	206-44-0	
Fluorene	ND	ug/kg	8.5	1	08/31/10 22:00	09/02/10 05:48	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	8.5	1	08/31/10 22:00	09/02/10 05:48	193-39-5	

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ANALYTICAL RESULTS

Project: BPOLY
Pace Project No.: 254681

Sample: GP7-6-6.5 **Lab ID: 254681017** Collected: 08/24/10 16:15 Received: 08/25/10 14:40 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546							
1-Methylnaphthalene	ND	ug/kg	8.5	1	08/31/10 22:00	09/02/10 05:48	90-12-0	
2-Methylnaphthalene	ND	ug/kg	8.5	1	08/31/10 22:00	09/02/10 05:48	91-57-6	B-
Naphthalene	ND	ug/kg	8.5	1	08/31/10 22:00	09/02/10 05:48	91-20-3	B-
Phenanthrene	ND	ug/kg	8.5	1	08/31/10 22:00	09/02/10 05:48	85-01-8	
Pyrene	ND	ug/kg	8.5	1	08/31/10 22:00	09/02/10 05:48	129-00-0	
2-Fluorobiphenyl (S)	86	%	55-136	1	08/31/10 22:00	09/02/10 05:48	321-60-8	
Terphenyl-d14 (S)	87	%	60-144	1	08/31/10 22:00	09/02/10 05:48	1718-51-0	
8260/5035A Volatile Organics	Analytical Method: EPA 8260							
Benzene	ND	ug/kg	3.1	1		08/27/10 15:24	71-43-2	
Ethylbenzene	ND	ug/kg	3.1	1		08/27/10 15:24	100-41-4	
Toluene	ND	ug/kg	3.1	1		08/27/10 15:24	108-88-3	
Xylene (Total)	ND	ug/kg	9.3	1		08/27/10 15:24	1330-20-7	
Dibromofluoromethane (S)	98	%	80-136	1		08/27/10 15:24	1868-53-7	
Toluene-d8 (S)	91	%	80-120	1		08/27/10 15:24	2037-26-5	
4-Bromofluorobenzene (S)	93	%	72-122	1		08/27/10 15:24	460-00-4	
1,2-Dichloroethane-d4 (S)	89	%	80-143	1		08/27/10 15:24	17060-07-0	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**22.5**	%	0.10	1		08/30/10 14:45		

Sample: MW10-2-2.5 **Lab ID: 254681018** Collected: 08/24/10 14:40 Received: 08/25/10 14:40 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS SG	Analytical Method: NWTPH-Dx Preparation Method: EPA 3546							
Diesel Range SG	ND	mg/kg	23.4	1	09/02/10 16:05	09/03/10 23:47		
Motor Oil Range SG	ND	mg/kg	93.4	1	09/02/10 16:05	09/03/10 23:47	64742-65-0	
n-Octacosane (S) SG	100	%	50-150	1	09/02/10 16:05	09/03/10 23:47	630-02-4	
o-Terphenyl (S) SG	103	%	50-150	1	09/02/10 16:05	09/03/10 23:47	84-15-1	
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
Gasoline Range Organics	ND	mg/kg	8.1	1	08/31/10 12:00	09/01/10 04:09		
a,a,a-Trifluorotoluene (S)	101	%	50-150	1	08/31/10 12:00	09/01/10 04:09	98-08-8	
4-Bromofluorobenzene (S)	89	%	50-150	1	08/31/10 12:00	09/01/10 04:09	460-00-4	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Arsenic	ND	mg/kg	12.4	5	08/27/10 07:06	08/30/10 15:27	7440-38-2	
Barium	**118**	mg/kg	24.7	1	08/27/10 07:06	08/30/10 16:26	7440-39-3	
Cadmium	ND	mg/kg	6.2	5	08/27/10 07:06	08/30/10 15:27	7440-43-9	
Chromium	**45.8**	mg/kg	1.2	1	08/27/10 07:06	08/30/10 16:26	7440-47-3	
Lead	**4.9**	mg/kg	1.2	1	08/27/10 07:06	08/30/10 16:26	7439-92-1	
Selenium	ND	mg/kg	6.2	5	08/27/10 07:06	08/30/10 15:27	7782-49-2	

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ANALYTICAL RESULTS

Project: BPOLY
Pace Project No.: 254681

Sample: MW10-2-2.5 **Lab ID: 254681018** Collected: 08/24/10 14:40 Received: 08/25/10 14:40 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Silver	ND	mg/kg	6.2	5	08/27/10 07:06	08/30/10 15:27	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	ND	mg/kg	0.12	1	08/27/10 08:59	08/27/10 16:01	7439-97-6	
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546							
Acenaphthene	ND	ug/kg	8.1	1	08/31/10 22:00	09/02/10 06:04	83-32-9	
Acenaphthylene	ND	ug/kg	8.1	1	08/31/10 22:00	09/02/10 06:04	208-96-8	
Anthracene	ND	ug/kg	8.1	1	08/31/10 22:00	09/02/10 06:04	120-12-7	
Benzo(a)anthracene	ND	ug/kg	8.1	1	08/31/10 22:00	09/02/10 06:04	56-55-3	
Benzo(a)pyrene	ND	ug/kg	8.1	1	08/31/10 22:00	09/02/10 06:04	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	8.1	1	08/31/10 22:00	09/02/10 06:04	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	8.1	1	08/31/10 22:00	09/02/10 06:04	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	8.1	1	08/31/10 22:00	09/02/10 06:04	207-08-9	
Chrysene	ND	ug/kg	8.1	1	08/31/10 22:00	09/02/10 06:04	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	8.1	1	08/31/10 22:00	09/02/10 06:04	53-70-3	
Fluoranthene	ND	ug/kg	8.1	1	08/31/10 22:00	09/02/10 06:04	206-44-0	
Fluorene	ND	ug/kg	8.1	1	08/31/10 22:00	09/02/10 06:04	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	8.1	1	08/31/10 22:00	09/02/10 06:04	193-39-5	
1-Methylnaphthalene	ND	ug/kg	8.1	1	08/31/10 22:00	09/02/10 06:04	90-12-0	
2-Methylnaphthalene	ND	ug/kg	8.1	1	08/31/10 22:00	09/02/10 06:04	91-57-6	B-
Naphthalene	ND	ug/kg	8.1	1	08/31/10 22:00	09/02/10 06:04	91-20-3	B-
Phenanthrene	ND	ug/kg	8.1	1	08/31/10 22:00	09/02/10 06:04	85-01-8	
Pyrene	ND	ug/kg	8.1	1	08/31/10 22:00	09/02/10 06:04	129-00-0	
2-Fluorobiphenyl (S)	83	%	55-136	1	08/31/10 22:00	09/02/10 06:04	321-60-8	
Terphenyl-d14 (S)	85	%	60-144	1	08/31/10 22:00	09/02/10 06:04	1718-51-0	
8260/5035A Volatile Organics	Analytical Method: EPA 8260							
Benzene	ND	ug/kg	3.9	1		08/27/10 15:43	71-43-2	
Ethylbenzene	ND	ug/kg	3.9	1		08/27/10 15:43	100-41-4	
Toluene	ND	ug/kg	3.9	1		08/27/10 15:43	108-88-3	
Xylene (Total)	ND	ug/kg	11.6	1		08/27/10 15:43	1330-20-7	
Dibromofluoromethane (S)	103	%	80-136	1		08/27/10 15:43	1868-53-7	
Toluene-d8 (S)	86	%	80-120	1		08/27/10 15:43	2037-26-5	
4-Bromofluorobenzene (S)	92	%	72-122	1		08/27/10 15:43	460-00-4	
1,2-Dichloroethane-d4 (S)	90	%	80-143	1		08/27/10 15:43	17060-07-0	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**20.7**	%	0.10	1		08/30/10 14:46		

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ANALYTICAL RESULTS

Project: BPOLY
Pace Project No.: 254681

Sample: MW10-4-4.5 **Lab ID: 254681019** Collected: 08/24/10 14:50 Received: 08/25/10 14:40 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS SG	Analytical Method: NWTPH-Dx Preparation Method: EPA 3546							
Diesel Range SG	ND	mg/kg	26.9	1	09/02/10 16:05	09/04/10 00:03		
Motor Oil Range SG	ND	mg/kg	107	1	09/02/10 16:05	09/04/10 00:03	64742-65-0	
n-Octacosane (S) SG	98	%	50-150	1	09/02/10 16:05	09/04/10 00:03	630-02-4	
o-Terphenyl (S) SG	99	%	50-150	1	09/02/10 16:05	09/04/10 00:03	84-15-1	
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
Gasoline Range Organics	ND	mg/kg	7.8	1	08/31/10 12:00	09/01/10 04:58		
a,a,a-Trifluorotoluene (S)	98	%	50-150	1	08/31/10 12:00	09/01/10 04:58	98-08-8	
4-Bromofluorobenzene (S)	91	%	50-150	1	08/31/10 12:00	09/01/10 04:58	460-00-4	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Arsenic	ND	mg/kg	13.2	5	08/27/10 07:06	08/30/10 15:30	7440-38-2	
Barium	**126**	mg/kg	26.3	1	08/27/10 07:06	08/30/10 16:28	7440-39-3	
Cadmium	ND	mg/kg	6.6	5	08/27/10 07:06	08/30/10 15:30	7440-43-9	
Chromium	**42.0**	mg/kg	1.3	1	08/27/10 07:06	08/30/10 16:28	7440-47-3	
Lead	**14.0**	mg/kg	1.3	1	08/27/10 07:06	08/30/10 16:28	7439-92-1	
Selenium	ND	mg/kg	6.6	5	08/27/10 07:06	08/30/10 15:30	7782-49-2	
Silver	ND	mg/kg	6.6	5	08/27/10 07:06	08/30/10 15:30	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	ND	mg/kg	0.14	1	08/27/10 08:59	08/27/10 16:03	7439-97-6	
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546							
Acenaphthene	ND	ug/kg	8.9	1	08/31/10 22:00	09/02/10 06:21	83-32-9	
Acenaphthylene	ND	ug/kg	8.9	1	08/31/10 22:00	09/02/10 06:21	208-96-8	
Anthracene	ND	ug/kg	8.9	1	08/31/10 22:00	09/02/10 06:21	120-12-7	
Benzo(a)anthracene	ND	ug/kg	8.9	1	08/31/10 22:00	09/02/10 06:21	56-55-3	
Benzo(a)pyrene	ND	ug/kg	8.9	1	08/31/10 22:00	09/02/10 06:21	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	8.9	1	08/31/10 22:00	09/02/10 06:21	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	8.9	1	08/31/10 22:00	09/02/10 06:21	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	8.9	1	08/31/10 22:00	09/02/10 06:21	207-08-9	
Chrysene	ND	ug/kg	8.9	1	08/31/10 22:00	09/02/10 06:21	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	8.9	1	08/31/10 22:00	09/02/10 06:21	53-70-3	
Fluoranthene	ND	ug/kg	8.9	1	08/31/10 22:00	09/02/10 06:21	206-44-0	
Fluorene	ND	ug/kg	8.9	1	08/31/10 22:00	09/02/10 06:21	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	8.9	1	08/31/10 22:00	09/02/10 06:21	193-39-5	
1-Methylnaphthalene	ND	ug/kg	8.9	1	08/31/10 22:00	09/02/10 06:21	90-12-0	
2-Methylnaphthalene	ND	ug/kg	8.9	1	08/31/10 22:00	09/02/10 06:21	91-57-6	B-
Naphthalene	ND	ug/kg	8.9	1	08/31/10 22:00	09/02/10 06:21	91-20-3	B-
Phenanthrene	ND	ug/kg	8.9	1	08/31/10 22:00	09/02/10 06:21	85-01-8	
Pyrene	ND	ug/kg	8.9	1	08/31/10 22:00	09/02/10 06:21	129-00-0	
2-Fluorobiphenyl (S)	87	%	55-136	1	08/31/10 22:00	09/02/10 06:21	321-60-8	
Terphenyl-d14 (S)	85	%	60-144	1	08/31/10 22:00	09/02/10 06:21	1718-51-0	

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ANALYTICAL RESULTS

Project: BPOLY
Pace Project No.: 254681

Sample: MW10-4-4.5 **Lab ID: 254681019** Collected: 08/24/10 14:50 Received: 08/25/10 14:40 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260/5035A Volatile Organics	Analytical Method: EPA 8260							
Benzene	ND	ug/kg	3.3	1		08/27/10 16:02	71-43-2	
Ethylbenzene	ND	ug/kg	3.3	1		08/27/10 16:02	100-41-4	
Toluene	ND	ug/kg	3.3	1		08/27/10 16:02	108-88-3	
Xylene (Total)	ND	ug/kg	10.0	1		08/27/10 16:02	1330-20-7	
Dibromofluoromethane (S)	98	%	80-136	1		08/27/10 16:02	1868-53-7	
Toluene-d8 (S)	90	%	80-120	1		08/27/10 16:02	2037-26-5	
4-Bromofluorobenzene (S)	93	%	72-122	1		08/27/10 16:02	460-00-4	
1,2-Dichloroethane-d4 (S)	90	%	80-143	1		08/27/10 16:02	17060-07-0	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**26.2**	%	0.10	1		08/30/10 14:48		

Sample: MW10-6-6.5 **Lab ID: 254681020** Collected: 08/24/10 15:10 Received: 08/25/10 14:40 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**37.7**	%	0.10	1		08/30/10 14:51		

Sample: GP3-2-2.5 **Lab ID: 254681021** Collected: 08/24/10 14:15 Received: 08/25/10 14:40 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS SG	Analytical Method: NWTPH-Dx Preparation Method: EPA 3546							
Diesel Range SG	ND	mg/kg	21.8	1	09/02/10 16:05	09/04/10 00:19		
Motor Oil Range SG	ND	mg/kg	87.1	1	09/02/10 16:05	09/04/10 00:19	64742-65-0	
n-Octacosane (S) SG	98	%	50-150	1	09/02/10 16:05	09/04/10 00:19	630-02-4	
o-Terphenyl (S) SG	98	%	50-150	1	09/02/10 16:05	09/04/10 00:19	84-15-1	
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
Gasoline Range Organics	ND	mg/kg	6.2	1	08/31/10 12:00	09/01/10 05:22		
a,a,a-Trifluorotoluene (S)	96	%	50-150	1	08/31/10 12:00	09/01/10 05:22	98-08-8	
4-Bromofluorobenzene (S)	88	%	50-150	1	08/31/10 12:00	09/01/10 05:22	460-00-4	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Arsenic	ND	mg/kg	10.9	5	08/27/10 07:06	08/30/10 15:33	7440-38-2	
Barium	**107**	mg/kg	21.9	1	08/27/10 07:06	08/30/10 16:31	7440-39-3	
Cadmium	ND	mg/kg	5.5	5	08/27/10 07:06	08/30/10 15:33	7440-43-9	
Chromium	**34.5**	mg/kg	1.1	1	08/27/10 07:06	08/30/10 16:31	7440-47-3	
Lead	**5.2**	mg/kg	1.1	1	08/27/10 07:06	08/30/10 16:31	7439-92-1	
Selenium	ND	mg/kg	5.5	5	08/27/10 07:06	08/30/10 15:33	7782-49-2	

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ANALYTICAL RESULTS

Project: BPOLY
Pace Project No.: 254681

Sample: GP3-2-2.5 **Lab ID: 254681021** Collected: 08/24/10 14:15 Received: 08/25/10 14:40 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Silver	ND	mg/kg	5.5	5	08/27/10 07:06	08/30/10 15:33	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	ND	mg/kg	0.11	1	08/27/10 08:59	08/27/10 16:10	7439-97-6	
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546							
Acenaphthene	ND	ug/kg	7.5	1	09/02/10 18:00	09/03/10 22:13	83-32-9	
Acenaphthylene	ND	ug/kg	7.5	1	09/02/10 18:00	09/03/10 22:13	208-96-8	
Anthracene	ND	ug/kg	7.5	1	09/02/10 18:00	09/03/10 22:13	120-12-7	
Benzo(a)anthracene	ND	ug/kg	7.5	1	09/02/10 18:00	09/03/10 22:13	56-55-3	
Benzo(a)pyrene	ND	ug/kg	7.5	1	09/02/10 18:00	09/03/10 22:13	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	7.5	1	09/02/10 18:00	09/03/10 22:13	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	7.5	1	09/02/10 18:00	09/03/10 22:13	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	7.5	1	09/02/10 18:00	09/03/10 22:13	207-08-9	
Chrysene	ND	ug/kg	7.5	1	09/02/10 18:00	09/03/10 22:13	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	7.5	1	09/02/10 18:00	09/03/10 22:13	53-70-3	
Fluoranthene	ND	ug/kg	7.5	1	09/02/10 18:00	09/03/10 22:13	206-44-0	
Fluorene	ND	ug/kg	7.5	1	09/02/10 18:00	09/03/10 22:13	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	7.5	1	09/02/10 18:00	09/03/10 22:13	193-39-5	
1-Methylnaphthalene	ND	ug/kg	7.5	1	09/02/10 18:00	09/03/10 22:13	90-12-0	
2-Methylnaphthalene	ND	ug/kg	7.5	1	09/02/10 18:00	09/03/10 22:13	91-57-6	
Naphthalene	ND	ug/kg	7.5	1	09/02/10 18:00	09/03/10 22:13	91-20-3	
Phenanthrene	ND	ug/kg	7.5	1	09/02/10 18:00	09/03/10 22:13	85-01-8	
Pyrene	ND	ug/kg	7.5	1	09/02/10 18:00	09/03/10 22:13	129-00-0	
2-Fluorobiphenyl (S)	67	%	55-136	1	09/02/10 18:00	09/03/10 22:13	321-60-8	
Terphenyl-d14 (S)	74	%	60-144	1	09/02/10 18:00	09/03/10 22:13	1718-51-0	
8260/5035A Volatile Organics	Analytical Method: EPA 8260							
Benzene	ND	ug/kg	3.4	1		08/27/10 16:21	71-43-2	
Ethylbenzene	ND	ug/kg	3.4	1		08/27/10 16:21	100-41-4	
Toluene	ND	ug/kg	3.4	1		08/27/10 16:21	108-88-3	
Xylene (Total)	ND	ug/kg	10.1	1		08/27/10 16:21	1330-20-7	
Dibromofluoromethane (S)	97	%	80-136	1		08/27/10 16:21	1868-53-7	
Toluene-d8 (S)	90	%	80-120	1		08/27/10 16:21	2037-26-5	
4-Bromofluorobenzene (S)	93	%	72-122	1		08/27/10 16:21	460-00-4	
1,2-Dichloroethane-d4 (S)	87	%	80-143	1		08/27/10 16:21	17060-07-0	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**12.1**	%	0.10	1		08/30/10 14:52		

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ANALYTICAL RESULTS

Project: BPOLY
Pace Project No.: 254681

Sample: GP3-4-4.5 **Lab ID: 254681022** Collected: 08/24/10 14:25 Received: 08/25/10 14:40 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS SG	Analytical Method: NWTPH-Dx Preparation Method: EPA 3546							
Diesel Range SG	**31.1**	mg/kg	25.7	1	09/02/10 16:05	09/04/10 00:36		
Motor Oil Range SG	ND	mg/kg	103	1	09/02/10 16:05	09/04/10 00:36	64742-65-0	
n-Octacosane (S) SG	87	%	50-150	1	09/02/10 16:05	09/04/10 00:36	630-02-4	
o-Terphenyl (S) SG	100	%	50-150	1	09/02/10 16:05	09/04/10 00:36	84-15-1	
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
Gasoline Range Organics	ND	mg/kg	8.6	1	08/31/10 12:00	09/01/10 06:11		
a,a,a-Trifluorotoluene (S)	103	%	50-150	1	08/31/10 12:00	09/01/10 06:11	98-08-8	
4-Bromofluorobenzene (S)	97	%	50-150	1	08/31/10 12:00	09/01/10 06:11	460-00-4	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Arsenic	ND	mg/kg	12.4	5	08/27/10 07:06	08/30/10 15:35	7440-38-2	
Barium	**101**	mg/kg	24.7	1	08/27/10 07:06	08/30/10 16:33	7440-39-3	
Cadmium	ND	mg/kg	6.2	5	08/27/10 07:06	08/30/10 15:35	7440-43-9	
Chromium	**40.4**	mg/kg	1.2	1	08/27/10 07:06	08/30/10 16:33	7440-47-3	
Lead	**4.0**	mg/kg	1.2	1	08/27/10 07:06	08/30/10 16:33	7439-92-1	
Selenium	ND	mg/kg	6.2	5	08/27/10 07:06	08/30/10 15:35	7782-49-2	
Silver	ND	mg/kg	6.2	5	08/27/10 07:06	08/30/10 15:35	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	ND	mg/kg	0.12	1	08/27/10 08:59	08/27/10 16:12	7439-97-6	
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546							
Acenaphthene	ND	ug/kg	8.7	1	09/02/10 18:00	09/03/10 22:29	83-32-9	
Acenaphthylene	ND	ug/kg	8.7	1	09/02/10 18:00	09/03/10 22:29	208-96-8	
Anthracene	ND	ug/kg	8.7	1	09/02/10 18:00	09/03/10 22:29	120-12-7	
Benzo(a)anthracene	ND	ug/kg	8.7	1	09/02/10 18:00	09/03/10 22:29	56-55-3	
Benzo(a)pyrene	ND	ug/kg	8.7	1	09/02/10 18:00	09/03/10 22:29	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	8.7	1	09/02/10 18:00	09/03/10 22:29	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	8.7	1	09/02/10 18:00	09/03/10 22:29	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	8.7	1	09/02/10 18:00	09/03/10 22:29	207-08-9	
Chrysene	ND	ug/kg	8.7	1	09/02/10 18:00	09/03/10 22:29	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	8.7	1	09/02/10 18:00	09/03/10 22:29	53-70-3	
Fluoranthene	ND	ug/kg	8.7	1	09/02/10 18:00	09/03/10 22:29	206-44-0	
Fluorene	ND	ug/kg	8.7	1	09/02/10 18:00	09/03/10 22:29	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	8.7	1	09/02/10 18:00	09/03/10 22:29	193-39-5	
1-Methylnaphthalene	**14.3**	ug/kg	8.7	1	09/02/10 18:00	09/03/10 22:29	90-12-0	
2-Methylnaphthalene	**19.9**	ug/kg	8.7	1	09/02/10 18:00	09/03/10 22:29	91-57-6	
Naphthalene	ND	ug/kg	8.7	1	09/02/10 18:00	09/03/10 22:29	91-20-3	
Phenanthrene	**10.3**	ug/kg	8.7	1	09/02/10 18:00	09/03/10 22:29	85-01-8	
Pyrene	ND	ug/kg	8.7	1	09/02/10 18:00	09/03/10 22:29	129-00-0	
2-Fluorobiphenyl (S)	74	%	55-136	1	09/02/10 18:00	09/03/10 22:29	321-60-8	
Terphenyl-d14 (S)	75	%	60-144	1	09/02/10 18:00	09/03/10 22:29	1718-51-0	

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ANALYTICAL RESULTS

Project: BPOLY
Pace Project No.: 254681

Sample: GP3-4-4.5 **Lab ID: 254681022** Collected: 08/24/10 14:25 Received: 08/25/10 14:40 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260/5035A Volatile Organics	Analytical Method: EPA 8260							
Benzene	ND	ug/kg	3.8	1		08/27/10 16:41	71-43-2	
Ethylbenzene	ND	ug/kg	3.8	1		08/27/10 16:41	100-41-4	
Toluene	ND	ug/kg	3.8	1		08/27/10 16:41	108-88-3	
Xylene (Total)	ND	ug/kg	11.3	1		08/27/10 16:41	1330-20-7	
Dibromofluoromethane (S)	99	%	80-136	1		08/27/10 16:41	1868-53-7	
Toluene-d8 (S)	91	%	80-120	1		08/27/10 16:41	2037-26-5	
4-Bromofluorobenzene (S)	94	%	72-122	1		08/27/10 16:41	460-00-4	
1,2-Dichloroethane-d4 (S)	85	%	80-143	1		08/27/10 16:41	17060-07-0	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**24.4**	%	0.10	1		08/30/10 14:53		

Sample: Trip Blank **Lab ID: 254681023** Collected: 08/24/10 00:00 Received: 08/25/10 14:40 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
Gasoline Range Organics	ND	mg/kg	5.0	1	08/31/10 12:00	09/01/10 04:33		
a,a,a-Trifluorotoluene (S)	107	%	50-150	1	08/31/10 12:00	09/01/10 04:33	98-08-8	
4-Bromofluorobenzene (S)	98	%	50-150	1	08/31/10 12:00	09/01/10 04:33	460-00-4	
8260/5035A Volatile Organics	Analytical Method: EPA 8260							
Benzene	ND	ug/kg	3.0	1		08/27/10 12:32	71-43-2	
Ethylbenzene	ND	ug/kg	3.0	1		08/27/10 12:32	100-41-4	
Toluene	ND	ug/kg	3.0	1		08/27/10 12:32	108-88-3	
Xylene (Total)	ND	ug/kg	9.0	1		08/27/10 12:32	1330-20-7	
Dibromofluoromethane (S)	96	%	80-136	1		08/27/10 12:32	1868-53-7	
Toluene-d8 (S)	89	%	80-120	1		08/27/10 12:32	2037-26-5	
4-Bromofluorobenzene (S)	88	%	72-122	1		08/27/10 12:32	460-00-4	
1,2-Dichloroethane-d4 (S)	81	%	80-143	1		08/27/10 12:32	17060-07-0	

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QUALITY CONTROL DATA

Project: BPOLY
Pace Project No.: 254681

QC Batch: OEXT/2598 Analysis Method: NWTPH-Dx
QC Batch Method: EPA 3546 Analysis Description: NWTPH-Dx GCS
Associated Lab Samples: 254681002, 254681003, 254681005, 254681006, 254681007, 254681009, 254681010

METHOD BLANK: 38662 Matrix: Solid

Associated Lab Samples: 254681002, 254681003, 254681005, 254681006, 254681007, 254681009, 254681010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diesel Range SG	mg/kg	ND	20.0	09/02/10 15:18	
Motor Oil Range SG	mg/kg	ND	80.0	09/02/10 15:18	
n-Octacosane (S) SG	%	104	50-150	09/02/10 15:18	
o-Terphenyl (S) SG	%	106	50-150	09/02/10 15:18	

LABORATORY CONTROL SAMPLE: 38663

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range SG	mg/kg	500	410	82	56-124	
Motor Oil Range SG	mg/kg	500	464	93	50-150	
n-Octacosane (S) SG	%			104	50-150	
o-Terphenyl (S) SG	%			114	50-150	

SAMPLE DUPLICATE: 38664

Parameter	Units	254662004 Result	Dup Result	RPD	Qualifiers
Diesel Range SG	mg/kg	3780	3310	13	
Motor Oil Range SG	mg/kg	1040	782	29	
n-Octacosane (S) SG	%	95	92	8	
o-Terphenyl (S) SG	%	114	114	5	

SAMPLE DUPLICATE: 38665

Parameter	Units	254703004 Result	Dup Result	RPD	Qualifiers
Diesel Range SG	mg/kg	ND	3.4J		
Motor Oil Range SG	mg/kg	ND	ND		
n-Octacosane (S) SG	%	102	102	7	
o-Terphenyl (S) SG	%	105	104	8	

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QUALITY CONTROL DATA

Project: BPOLY
Pace Project No.: 254681

QC Batch: OEXT/2608 Analysis Method: NWTPH-Dx
QC Batch Method: EPA 3546 Analysis Description: NWTPH-Dx GCS
Associated Lab Samples: 254681012, 254681013, 254681014, 254681015, 254681017, 254681018, 254681019, 254681021, 254681022

METHOD BLANK: 38791 Matrix: Solid
Associated Lab Samples: 254681012, 254681013, 254681014, 254681015, 254681017, 254681018, 254681019, 254681021, 254681022

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diesel Range SG	mg/kg	ND	20.0	09/03/10 21:02	
Motor Oil Range SG	mg/kg	ND	80.0	09/03/10 21:02	
n-Octacosane (S) SG	%	98	50-150	09/03/10 21:02	
o-Terphenyl (S) SG	%	99	50-150	09/03/10 21:02	

LABORATORY CONTROL SAMPLE: 38792

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range SG	mg/kg	500	400	80	56-124	
Motor Oil Range SG	mg/kg	500	450	90	50-150	
n-Octacosane (S) SG	%			98	50-150	
o-Terphenyl (S) SG	%			86	50-150	

SAMPLE DUPLICATE: 38793

Parameter	Units	254681012 Result	Dup Result	RPD	Qualifiers
Diesel Range SG	mg/kg	ND	4J		
Motor Oil Range SG	mg/kg	ND	ND		
n-Octacosane (S) SG	%	98	99	.2	
o-Terphenyl (S) SG	%	100	103	2	

SAMPLE DUPLICATE: 38794

Parameter	Units	254717001 Result	Dup Result	RPD	Qualifiers
Diesel Range SG	mg/kg	30.4	27.9	9	
Motor Oil Range SG	mg/kg	198	191	4	
n-Octacosane (S) SG	%	116	121	6	
o-Terphenyl (S) SG	%	102	105	5	

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QUALITY CONTROL DATA

Project: BPOLY
Pace Project No.: 254681

QC Batch: GCV/1814 — Analysis Method: NWTPH-Gx
QC Batch Method: NWTPH-Gx — Analysis Description: NWTPH-Gx Solid GCV
Associated Lab Samples: 254681002, 254681003, 254681005, 254681006, 254681007, 254681009, 254681010, 254681012, 254681013, 254681014, 254681015, 254681017

METHOD BLANK: 38413 — Matrix: Solid
Associated Lab Samples: 254681002, 254681003, 254681005, 254681006, 254681007, 254681009, 254681010, 254681012, 254681013, 254681014, 254681015, 254681017

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Gasoline Range Organics	mg/kg	ND	5.0	08/30/10 12:44	
4-Bromofluorobenzene (S)	%	106	50-150	08/30/10 12:44	
a,a,a-Trifluorotoluene (S)	%	105	50-150	08/30/10 12:44	

LABORATORY CONTROL SAMPLE: 38414

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Gasoline Range Organics	mg/kg	12.5	15.8	126	54-156	
4-Bromofluorobenzene (S)	%			117	50-150	
a,a,a-Trifluorotoluene (S)	%			124	50-150	

SAMPLE DUPLICATE: 38494

Parameter	Units	254681002 Result	Dup Result	RPD	Qualifiers
Gasoline Range Organics	mg/kg	ND	23.2		
4-Bromofluorobenzene (S)	%	101	103	2	
a,a,a-Trifluorotoluene (S)	%	106	104	1	

SAMPLE DUPLICATE: 38495

Parameter	Units	254681014 Result	Dup Result	RPD	Qualifiers
Gasoline Range Organics	mg/kg	94.4	95.3	1	
4-Bromofluorobenzene (S)	%	136	138	1	
a,a,a-Trifluorotoluene (S)	%	104	106	2	

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QUALITY CONTROL DATA

Project: BPOLY
Pace Project No.: 254681

QC Batch: GCV/1821 | Analysis Method: NWTPH-Gx
QC Batch Method: NWTPH-Gx | Analysis Description: NWTPH-Gx Solid GCV
Associated Lab Samples: 254681018, 254681019, 254681021, 254681022, 254681023

METHOD BLANK: 38623 | Matrix: Solid
Associated Lab Samples: 254681018, 254681019, 254681021, 254681022, 254681023

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Gasoline Range Organics	mg/kg	ND	5.0	08/31/10 17:16	
4-Bromofluorobenzene (S)	%	98	50-150	08/31/10 17:16	
a,a,a-Trifluorotoluene (S)	%	113	50-150	08/31/10 17:16	

LABORATORY CONTROL SAMPLE: 38624

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Gasoline Range Organics	mg/kg	12.5	13.7	110	54-156	
4-Bromofluorobenzene (S)	%			100	50-150	
a,a,a-Trifluorotoluene (S)	%			111	50-150	

SAMPLE DUPLICATE: 38653

Parameter	Units	254681018 Result	Dup Result	RPD	Qualifiers
Gasoline Range Organics	mg/kg	ND	1.8J		
4-Bromofluorobenzene (S)	%	89	96	8	
a,a,a-Trifluorotoluene (S)	%	101	101	.1	

SAMPLE DUPLICATE: 38654

Parameter	Units	254711005 Result	Dup Result	RPD	Qualifiers
Gasoline Range Organics	mg/kg	ND	1.7J		
4-Bromofluorobenzene (S)	%	80	96	18	
a,a,a-Trifluorotoluene (S)	%	88	100	13	

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QUALITY CONTROL DATA

Project: BPOLY
Pace Project No.: 254681

QC Batch: MPRP/1737 Analysis Method: EPA 6010
QC Batch Method: EPA 3050 Analysis Description: 6010 MET
Associated Lab Samples: 254681002, 254681003, 254681005, 254681006, 254681007, 254681009, 254681010, 254681012, 254681013, 254681014, 254681015, 254681017, 254681018

METHOD BLANK: 37963 Matrix: Solid
Associated Lab Samples: 254681002, 254681003, 254681005, 254681006, 254681007, 254681009, 254681010, 254681012, 254681013, 254681014, 254681015, 254681017, 254681018, 254681019, 254681021, 254681022

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Arsenic	mg/kg	ND	2.0	08/30/10 14:39	
Barium	mg/kg	ND	20.0	08/30/10 14:39	
Cadmium	mg/kg	ND	1.0	08/30/10 14:39	
Chromium	mg/kg	ND	1.0	08/30/10 14:39	
Lead	mg/kg	ND	1.0	08/30/10 14:39	
Selenium	mg/kg	ND	1.0	08/30/10 14:39	
Silver	mg/kg	ND	1.0	08/30/10 14:39	

LABORATORY CONTROL SAMPLE: 37964

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	mg/kg	25	22.3	89	80-120	
Barium	mg/kg	25	22.4	90	80-120	
Cadmium	mg/kg	25	23.3	93	80-120	
Chromium	mg/kg	25	23.1	92	80-120	
Lead	mg/kg	25	23.4	94	80-120	
Selenium	mg/kg	25	22.8	91	80-120	
Silver	mg/kg	12.5	11.3	90	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 37965 37966

Parameter	Units	254681002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Qual
Arsenic	mg/kg	ND	32.5	32.8	40.3	40.5	114	113	75-125	.3	
Barium	mg/kg	140	32.5	32.8	163	171	70	92	75-125	4	M1
Cadmium	mg/kg	ND	32.5	32.8	35.5	36.9	109	113	75-125	4	
Chromium	mg/kg	41.9	32.5	32.8	70.1	75.2	87	101	75-125	7	
Lead	mg/kg	4.1	32.5	32.8	30.9	32.1	83	85	75-125	4	
Selenium	mg/kg	ND	32.5	32.8	33.3	33.5	102	102	75-125	.8	
Silver	mg/kg	ND	16.2	16.5	18.8	19.1	116	117	75-125	2	

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QUALITY CONTROL DATA

Project: BPOLY
Pace Project No.: 254681

QC Batch: MERP/1242 Analysis Method: EPA 7471
QC Batch Method: EPA 7471 Analysis Description: 7471 Mercury
Associated Lab Samples: 254681002, 254681003, 254681005, 254681006, 254681007, 254681009, 254681010, 254681012, 254681013, 254681014, 254681015, 254681017, 254681018, 254681019, 254681021, 254681022

METHOD BLANK: 37959 Matrix: Solid
Associated Lab Samples: 254681002, 254681003, 254681005, 254681006, 254681007, 254681009, 254681010, 254681012, 254681013, 254681014, 254681015, 254681017, 254681018, 254681019, 254681021, 254681022

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	ND	0.10	08/27/10 15:22	

LABORATORY CONTROL SAMPLE: 37960

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.5	0.53	106	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 37961 37962

Parameter	Units	254681002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Qual
Mercury	mg/kg	ND	.6	.63	0.69	0.70	107	105	80-120	2	

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QUALITY CONTROL DATA

Project: BPOLY
Pace Project No.: 254681

QC Batch: OEXT/2591 Analysis Method: EPA 8270 by SIM
QC Batch Method: EPA 3546 Analysis Description: 8270/3546 MSSV PAH by SIM
Associated Lab Samples: 254681002, 254681003, 254681006, 254681007, 254681009, 254681013, 254681017, 254681018, 254681019

METHOD BLANK: 38446 Matrix: Solid
Associated Lab Samples: 254681002, 254681003, 254681006, 254681007, 254681009, 254681013, 254681017, 254681018, 254681019

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1-Methylnaphthalene	ug/kg	ND	6.7	09/02/10 02:46	
2-Methylnaphthalene	ug/kg	9.6	6.7	09/02/10 02:46	2n
Acenaphthene	ug/kg	ND	6.7	09/02/10 02:46	
Acenaphthylene	ug/kg	ND	6.7	09/02/10 02:46	
Anthracene	ug/kg	ND	6.7	09/02/10 02:46	
Benzo(a)anthracene	ug/kg	ND	6.7	09/02/10 02:46	
Benzo(a)pyrene	ug/kg	ND	6.7	09/02/10 02:46	
Benzo(b)fluoranthene	ug/kg	ND	6.7	09/02/10 02:46	
Benzo(g,h,i)perylene	ug/kg	ND	6.7	09/02/10 02:46	
Benzo(k)fluoranthene	ug/kg	ND	6.7	09/02/10 02:46	
Chrysene	ug/kg	ND	6.7	09/02/10 02:46	
Dibenz(a,h)anthracene	ug/kg	ND	6.7	09/02/10 02:46	
Fluoranthene	ug/kg	ND	6.7	09/02/10 02:46	
Fluorene	ug/kg	ND	6.7	09/02/10 02:46	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	6.7	09/02/10 02:46	
Naphthalene	ug/kg	9.4	6.7	09/02/10 02:46	2n
Phenanthrene	ug/kg	ND	6.7	09/02/10 02:46	
Pyrene	ug/kg	ND	6.7	09/02/10 02:46	
2-Fluorobiphenyl (S)	%	89	55-136	09/02/10 02:46	
Terphenyl-d14 (S)	%	95	60-144	09/02/10 02:46	

LABORATORY CONTROL SAMPLE: 38447

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1-Methylnaphthalene	ug/kg	133	117	88	63-126	
2-Methylnaphthalene	ug/kg	133	118	89	60-145	
Acenaphthene	ug/kg	133	116	87	44-138	
Acenaphthylene	ug/kg	133	122	92	43-140	
Anthracene	ug/kg	133	121	91	58-138	
Benzo(a)anthracene	ug/kg	133	126	95	50-154	
Benzo(a)pyrene	ug/kg	133	131	98	47-154	
Benzo(b)fluoranthene	ug/kg	133	121	90	43-164	
Benzo(g,h,i)perylene	ug/kg	133	127	95	54-153	
Benzo(k)fluoranthene	ug/kg	133	143	107	61-145	
Chrysene	ug/kg	133	116	87	59-141	
Dibenz(a,h)anthracene	ug/kg	133	134	100	54-161	
Fluoranthene	ug/kg	133	129	96	43-160	
Fluorene	ug/kg	133	127	95	41-149	
Indeno(1,2,3-cd)pyrene	ug/kg	133	132	99	48-158	
Naphthalene	ug/kg	133	111	83	44-131	
Phenanthrene	ug/kg	133	117	88	46-144	

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QUALITY CONTROL DATA

Project: BPOLY
Pace Project No.: 254681

LABORATORY CONTROL SAMPLE: 38447

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Pyrene	ug/kg	133	124	93	57-142	
2-Fluorobiphenyl (S)	%			88	55-136	
Terphenyl-d14 (S)	%			91	60-144	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 38448 38449

Parameter	Units	254681002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Qual
1-Methylnaphthalene	ug/kg	ND	173	173	153	151	87	86	-3.6-171	1	
2-Methylnaphthalene	ug/kg	ND	173	173	154	153	87	86	3-188	.4	
Acenaphthene	ug/kg	ND	173	173	157	151	91	87	-1-182	4	
Acenaphthylene	ug/kg	ND	173	173	160	159	93	92	31-156	1	
Anthracene	ug/kg	ND	173	173	150	154	87	89	20-171	3	
Benzo(a)anthracene	ug/kg	ND	173	173	157	156	91	90	24-181	.6	
Benzo(a)pyrene	ug/kg	ND	173	173	163	166	94	96	26-174	2	
Benzo(b)fluoranthene	ug/kg	ND	173	173	151	150	87	87	33-173	.2	
Benzo(g,h,i)perylene	ug/kg	ND	173	173	155	159	90	92	15-178	2	
Benzo(k)fluoranthene	ug/kg	ND	173	173	171	179	99	103	20-167	5	
Chrysene	ug/kg	ND	173	173	144	146	83	84	15-174	2	
Dibenz(a,h)anthracene	ug/kg	ND	173	173	163	166	95	96	26-189	2	
Fluoranthene	ug/kg	ND	173	173	160	163	92	93	21-104	1	
Fluorene	ug/kg	ND	173	173	164	159	95	92	25-173	3	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	173	173	162	165	94	95	19-182	2	
Naphthalene	ug/kg	ND	173	173	147	142	83	80	-3-165	3	
Phenanthrene	ug/kg	ND	173	173	149	148	85	85	25-163	.5	
Pyrene	ug/kg	ND	173	173	156	156	90	90	30-165	.01	
2-Fluorobiphenyl (S)	%						90	90	55-136		
Terphenyl-d14 (S)	%						88	90	60-144		

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: BPOLY
Pace Project No.: 254681

QC Batch: OEXT/2601 — Analysis Method: EPA 8270 by SIM
QC Batch Method: EPA 3546 — Analysis Description: 8270/3546 MSSV PAH by SIM
Associated Lab Samples: 254681008, 254681011, 254681021, 254681022

METHOD BLANK: 38719 — Matrix: Solid
Associated Lab Samples: 254681008, 254681011, 254681021, 254681022

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1-Methylnaphthalene	ug/kg	ND	6.7	09/03/10 20:17	
2-Methylnaphthalene	ug/kg	ND	6.7	09/03/10 20:17	
Acenaphthene	ug/kg	ND	6.7	09/03/10 20:17	
Acenaphthylene	ug/kg	ND	6.7	09/03/10 20:17	
Anthracene	ug/kg	ND	6.7	09/03/10 20:17	
Benzo(a)anthracene	ug/kg	ND	6.7	09/03/10 20:17	
Benzo(a)pyrene	ug/kg	ND	6.7	09/03/10 20:17	
Benzo(b)fluoranthene	ug/kg	ND	6.7	09/03/10 20:17	
Benzo(g,h,i)perylene	ug/kg	ND	6.7	09/03/10 20:17	
Benzo(k)fluoranthene	ug/kg	ND	6.7	09/03/10 20:17	
Chrysene	ug/kg	ND	6.7	09/03/10 20:17	
Dibenz(a,h)anthracene	ug/kg	ND	6.7	09/03/10 20:17	
Fluoranthene	ug/kg	ND	6.7	09/03/10 20:17	
Fluorene	ug/kg	ND	6.7	09/03/10 20:17	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	6.7	09/03/10 20:17	
Naphthalene	ug/kg	ND	6.7	09/03/10 20:17	
Phenanthrene	ug/kg	ND	6.7	09/03/10 20:17	
Pyrene	ug/kg	ND	6.7	09/03/10 20:17	
2-Fluorobiphenyl (S)	%	74	55-136	09/03/10 20:17	
Terphenyl-d14 (S)	%	81	60-144	09/03/10 20:17	

LABORATORY CONTROL SAMPLE: 38720

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1-Methylnaphthalene	ug/kg	133	96.1	72	63-126	
2-Methylnaphthalene	ug/kg	133	95.2	71	60-145	
Acenaphthene	ug/kg	133	98.0	73	44-138	
Acenaphthylene	ug/kg	133	101	76	43-140	
Anthracene	ug/kg	133	103	77	58-138	
Benzo(a)anthracene	ug/kg	133	108	81	50-154	
Benzo(a)pyrene	ug/kg	133	112	84	47-154	
Benzo(b)fluoranthene	ug/kg	133	97.4	73	43-164	
Benzo(g,h,i)perylene	ug/kg	133	108	81	54-153	
Benzo(k)fluoranthene	ug/kg	133	127	96	61-145	
Chrysene	ug/kg	133	99.2	74	59-141	
Dibenz(a,h)anthracene	ug/kg	133	114	86	54-161	
Fluoranthene	ug/kg	133	111	83	43-160	
Fluorene	ug/kg	133	106	79	41-149	
Indeno(1,2,3-cd)pyrene	ug/kg	133	113	85	48-158	
Naphthalene	ug/kg	133	91.4	69	44-131	
Phenanthrene	ug/kg	133	98.0	74	46-144	

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QUALITY CONTROL DATA

Project: BPOLY
Pace Project No.: 254681

LABORATORY CONTROL SAMPLE: 38720

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Pyrene	ug/kg	133	105	79	57-142	
2-Fluorobiphenyl (S)	%			73	55-136	
Terphenyl-d14 (S)	%			80	60-144	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 38721 38722

Parameter	Units	254933001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Qual
1-Methylnaphthalene	ug/kg	ND	133	130	99.9	96.0	75	74	-3.6-171	4	
2-Methylnaphthalene	ug/kg	ND	133	130	102	95.8	76	73	3-188	6	
Acenaphthene	ug/kg	ND	133	130	93.5	95.4	71	74	-1-182	2	
Acenaphthylene	ug/kg	ND	133	130	98.8	98.8	75	76	31-156	.01	
Anthracene	ug/kg	ND	133	130	98.1	93.4	74	72	20-171	5	
Benzo(a)anthracene	ug/kg	ND	133	130	105	99.1	79	77	24-181	6	
Benzo(a)pyrene	ug/kg	ND	133	130	107	102	81	79	26-174	5	
Benzo(b)fluoranthene	ug/kg	ND	133	130	95.6	90.1	72	70	33-173	6	
Benzo(g,h,i)perylene	ug/kg	ND	133	130	105	96.9	79	75	15-178	8	
Benzo(k)fluoranthene	ug/kg	ND	133	130	120	116	91	89	20-167	4	
Chrysene	ug/kg	ND	133	130	96.1	90.3	72	69	15-174	6	
Dibenz(a,h)anthracene	ug/kg	ND	133	130	111	105	84	81	26-189	6	
Fluoranthene	ug/kg	ND	133	130	111	105	82	80	21-104	5	
Fluorene	ug/kg	ND	133	130	105	103	79	80	25-173	1	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	133	130	109	102	82	78	19-182	7	
Naphthalene	ug/kg	ND	133	130	93.2	87.2	69	66	-3-165	7	
Phenanthrene	ug/kg	ND	133	130	99.4	94.5	73	71	25-163	5	
Pyrene	ug/kg	ND	133	130	101	96.1	76	74	30-165	5	
2-Fluorobiphenyl (S)	%						76	76	55-136		
Terphenyl-d14 (S)	%						81	77	60-144		

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QUALITY CONTROL DATA

Project: BPOLY
Pace Project No.: 254681

QC Batch: OEXT/2630 Analysis Method: EPA 8270 by SIM
QC Batch Method: EPA 3546 Analysis Description: 8270/3546 MSSV PAH by SIM
Associated Lab Samples: 254681005, 254681010, 254681012, 254681014, 254681015

METHOD BLANK: 39417 Matrix: Solid
Associated Lab Samples: 254681005, 254681010, 254681012, 254681014, 254681015

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1-Methylnaphthalene	ug/kg	ND	6.7	09/03/10 15:18	
2-Methylnaphthalene	ug/kg	ND	6.7	09/03/10 15:18	
Acenaphthene	ug/kg	ND	6.7	09/03/10 15:18	
Acenaphthylene	ug/kg	ND	6.7	09/03/10 15:18	
Anthracene	ug/kg	ND	6.7	09/03/10 15:18	
Benzo(a)anthracene	ug/kg	ND	6.7	09/03/10 15:18	
Benzo(a)pyrene	ug/kg	ND	6.7	09/03/10 15:18	
Benzo(b)fluoranthene	ug/kg	ND	6.7	09/03/10 15:18	
Benzo(g,h,i)perylene	ug/kg	ND	6.7	09/03/10 15:18	
Benzo(k)fluoranthene	ug/kg	ND	6.7	09/03/10 15:18	
Chrysene	ug/kg	ND	6.7	09/03/10 15:18	
Dibenz(a,h)anthracene	ug/kg	ND	6.7	09/03/10 15:18	
Fluoranthene	ug/kg	ND	6.7	09/03/10 15:18	
Fluorene	ug/kg	ND	6.7	09/03/10 15:18	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	6.7	09/03/10 15:18	
Naphthalene	ug/kg	ND	6.7	09/03/10 15:18	
Phenanthrene	ug/kg	ND	6.7	09/03/10 15:18	
Pyrene	ug/kg	ND	6.7	09/03/10 15:18	
2-Fluorobiphenyl (S)	%	68	55-136	09/03/10 15:18	
Terphenyl-d14 (S)	%	75	60-144	09/03/10 15:18	

LABORATORY CONTROL SAMPLE: 39418

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1-Methylnaphthalene	ug/kg	133	88.2	66	63-126	
2-Methylnaphthalene	ug/kg	133	92.8	70	60-145	
Acenaphthene	ug/kg	133	79.3	59	44-138	
Acenaphthylene	ug/kg	133	77.1	58	43-140	
Anthracene	ug/kg	133	94.9	71	58-138	
Benzo(a)anthracene	ug/kg	133	103	77	50-154	
Benzo(a)pyrene	ug/kg	133	108	81	47-154	
Benzo(b)fluoranthene	ug/kg	133	104	78	43-164	
Benzo(g,h,i)perylene	ug/kg	133	107	80	54-153	
Benzo(k)fluoranthene	ug/kg	133	108	81	61-145	
Chrysene	ug/kg	133	95.8	72	59-141	
Dibenz(a,h)anthracene	ug/kg	133	113	85	54-161	
Fluoranthene	ug/kg	133	103	77	43-160	
Fluorene	ug/kg	133	86.5	65	41-149	
Indeno(1,2,3-cd)pyrene	ug/kg	133	111	83	48-158	
Naphthalene	ug/kg	133	81.2	61	44-131	
Phenanthrene	ug/kg	133	90.7	68	46-144	

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QUALITY CONTROL DATA

Project: BPOLY
Pace Project No.: 254681

LABORATORY CONTROL SAMPLE: 39418

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Pyrene	ug/kg	133	97.1	73	57-142	
2-Fluorobiphenyl (S)	%			64	55-136	
Terphenyl-d14 (S)	%			79	60-144	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 39419 39420

Parameter	Units	254662015 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Qual
1-Methylnaphthalene	ug/kg	ND	149	150	93.8	94.8	63	63	-3.6-171	1	
2-Methylnaphthalene	ug/kg	ND	149	150	94.8	95.0	63	63	3-188	.3	
Acenaphthene	ug/kg	ND	149	150	92.5	91.1	62	61	-1-182	1	
Acenaphthylene	ug/kg	ND	149	150	93.6	94.0	63	63	31-156	.4	
Anthracene	ug/kg	ND	149	150	94.6	94.5	63	63	20-171	.1	
Benzo(a)anthracene	ug/kg	ND	149	150	97.5	99.1	65	66	24-181	2	
Benzo(a)pyrene	ug/kg	ND	149	150	99.9	100	67	67	26-174	.5	
Benzo(b)fluoranthene	ug/kg	ND	149	150	97.3	95.9	65	64	33-173	1	
Benzo(g,h,i)perylene	ug/kg	ND	149	150	95.0	96.0	64	64	15-178	1	
Benzo(k)fluoranthene	ug/kg	ND	149	150	102	103	68	69	20-167	.6	
Chrysene	ug/kg	ND	149	150	90.6	92.6	61	62	15-174	2	
Dibenz(a,h)anthracene	ug/kg	ND	149	150	100	101	67	68	26-189	.9	
Fluoranthene	ug/kg	ND	149	150	100	99.8	67	66	21-104	.3	
Fluorene	ug/kg	ND	149	150	95.5	95.2	64	64	25-173	.3	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	149	150	99.2	99.9	67	67	19-182	.7	
Naphthalene	ug/kg	ND	149	150	89.5	91.8	60	61	-3-165	3	
Phenanthrene	ug/kg	ND	149	150	92.1	91.9	61	61	25-163	.2	
Pyrene	ug/kg	ND	149	150	97.1	98.6	65	66	30-165	2	
2-Fluorobiphenyl (S)	%						59	64	55-136		
Terphenyl-d14 (S)	%						63	70	60-144		

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QUALITY CONTROL DATA

Project: BPOLY
Pace Project No.: 254681

QC Batch: MSV/2934 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV 5035A Volatile Organics
Associated Lab Samples: 254681002, 254681003, 254681005

METHOD BLANK: 37943 Matrix: Solid
Associated Lab Samples: 254681002, 254681003, 254681005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Benzene	ug/kg	ND	3.0	08/26/10 18:16	
Ethylbenzene	ug/kg	ND	3.0	08/26/10 18:16	
Toluene	ug/kg	ND	3.0	08/26/10 18:16	
Xylene (Total)	ug/kg	ND	9.0	08/26/10 18:16	
1,2-Dichloroethane-d4 (S)	%	83	80-143	08/26/10 18:16	
4-Bromofluorobenzene (S)	%	92	72-122	08/26/10 18:16	
Dibromofluoromethane (S)	%	94	80-136	08/26/10 18:16	
Toluene-d8 (S)	%	92	80-120	08/26/10 18:16	

LABORATORY CONTROL SAMPLE & LCSD: 37944 37945

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Benzene	ug/kg	50	50.6	50.0	101	100	75-133	1	30	
Ethylbenzene	ug/kg	50	45.0	44.4	90	89	68-131	1	30	
Toluene	ug/kg	50	50.6	47.8	101	96	73-124	6	30	
Xylene (Total)	ug/kg	150	139	137	93	91	68-130	1	30	
1,2-Dichloroethane-d4 (S)	%				82	81	80-143			
4-Bromofluorobenzene (S)	%				94	97	72-122			
Dibromofluoromethane (S)	%				96	96	80-136			
Toluene-d8 (S)	%				92	89	80-120			

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QUALITY CONTROL DATA

Project: BPOLY
Pace Project No.: 254681

QC Batch: MSV/2938 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV 5035A Volatile Organics
Associated Lab Samples: 254681006, 254681007, 254681009, 254681010, 254681012, 254681013, 254681014, 254681015, 254681017, 254681018, 254681019, 254681021, 254681022, 254681023

METHOD BLANK: 38049 Matrix: Solid
Associated Lab Samples: 254681006, 254681007, 254681009, 254681010, 254681012, 254681013, 254681014, 254681015, 254681017, 254681018, 254681019, 254681021, 254681022, 254681023

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Benzene	ug/kg	ND	3.0	08/27/10 12:13	
Ethylbenzene	ug/kg	ND	3.0	08/27/10 12:13	
Toluene	ug/kg	ND	3.0	08/27/10 12:13	
Xylene (Total)	ug/kg	ND	9.0	08/27/10 12:13	
1,2-Dichloroethane-d4 (S)	%	94	80-143	08/27/10 12:13	
4-Bromofluorobenzene (S)	%	88	72-122	08/27/10 12:13	
Dibromofluoromethane (S)	%	102	80-136	08/27/10 12:13	
Toluene-d8 (S)	%	87	80-120	08/27/10 12:13	

LABORATORY CONTROL SAMPLE & LCSD: 38050 38431

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Benzene	ug/kg	50	49.2	49.3	98	99	75-133	.3	30	
Ethylbenzene	ug/kg	50	43.7	44.7	87	89	68-131	2	30	
Toluene	ug/kg	50	44.7	48.2	89	96	73-124	7	30	
Xylene (Total)	ug/kg	150	135	137	90	92	68-130	1	30	
1,2-Dichloroethane-d4 (S)	%				84	84	80-143			
4-Bromofluorobenzene (S)	%				96	96	72-122			
Dibromofluoromethane (S)	%				99	99	80-136			
Toluene-d8 (S)	%				87	93	80-120			

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QUALITY CONTROL DATA

Project: BPOLY
Pace Project No.: 254681

QC Batch: PMST/1320 Analysis Method: ASTM D2974-87
QC Batch Method: ASTM D2974-87 Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 254681001

SAMPLE DUPLICATE: 38047

Parameter	Units	254662001 Result	Dup Result	RPD	Qualifiers
Percent Moisture	%	24.2	24.7	2	

SAMPLE DUPLICATE: 38048

Parameter	Units	254662012 Result	Dup Result	RPD	Qualifiers
Percent Moisture	%	8.2	8.1	.9	

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QUALITY CONTROL DATA

Project: BPOLY
Pace Project No.: 254681

QC Batch: PMST/1321
Analysis Method: ASTM D2974-87
QC Batch Method: ASTM D2974-87
Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 254681002, 254681003, 254681004, 254681005, 254681006, 254681007, 254681008, 254681009, 254681010, 254681011, 254681012, 254681013, 254681014, 254681015

SAMPLE DUPLICATE: 38175

Parameter	Units	254712001 Result	Dup Result	RPD	Qualifiers
Percent Moisture	%	22.0	22.0	.3	

SAMPLE DUPLICATE: 38176

Parameter	Units	254681006 Result	Dup Result	RPD	Qualifiers
Percent Moisture	%	20.3	20.8	2	

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QUALITY CONTROL DATA

Project: BPOLY
Pace Project No.: 254681

QC Batch: PMST/1322 Analysis Method: ASTM D2974-87
QC Batch Method: ASTM D2974-87 Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 254681016, 254681017, 254681018, 254681019, 254681020, 254681021, 254681022

SAMPLE DUPLICATE: 38367

Parameter	Units	254734001 Result	Dup Result	RPD	Qualifiers
Percent Moisture	%	4.9	4.5	8	

SAMPLE DUPLICATE: 38368

Parameter	Units	254681022 Result	Dup Result	RPD	Qualifiers
Percent Moisture	%	24.4	23.8	2	

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940 South Harney
Seattle, WA 98108
(206)767-5060

QUALIFIERS

Project: BPOLY
Pace Project No.: 254681

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is NELAP accredited. Contact your Pace PM for the current list of accredited analytes.

LABORATORIES

PASI-S	Pace Analytical Services - Seattle

ANALYTE QUALIFIERS

1n	Analyte was detected in the associated method blank. Analyte presence in method blank was less than 10 times that found in the sample, therefore acceptable per NELAC standard.
2n	Reported result is above the reporting limit for this analyte.
B-	Analyte detected in method blank but was not detected in the associated samples.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
S5	Surrogate recovery outside control limits due to matrix interferences (not confirmed by re-analysis).

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: BPOLY
Pace Project No.: 254681

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
254681002	**MW8-6-6.5**	EPA 3546	OEXT/2598	NWTPH-Dx	GCSV/1855
254681003	**MW9-2-2.5**	EPA 3546	OEXT/2598	NWTPH-Dx	GCSV/1855
254681005	**MW9-6-6.5**	EPA 3546	OEXT/2598	NWTPH-Dx	GCSV/1855
254681006	**MW12-2-2.5**	EPA 3546	OEXT/2598	NWTPH-Dx	GCSV/1855
254681007	**MW12-4-4.5**	EPA 3546	OEXT/2598	NWTPH-Dx	GCSV/1855
254681009	**MW11-2-2.5**	EPA 3546	OEXT/2598	NWTPH-Dx	GCSV/1855
254681010	**MW11-4-4.5**	EPA 3546	OEXT/2598	NWTPH-Dx	GCSV/1855
254681012	**GP6-2-2.5**	EPA 3546	OEXT/2608	NWTPH-Dx	GCSV/1861
254681013	**GP6-4-4.5**	EPA 3546	OEXT/2608	NWTPH-Dx	GCSV/1861
254681014	**GP6-6-6.5**	EPA 3546	OEXT/2608	NWTPH-Dx	GCSV/1861
254681015	**GP7-2-2.5**	EPA 3546	OEXT/2608	NWTPH-Dx	GCSV/1861
254681017	**GP7-6-6.5**	EPA 3546	OEXT/2608	NWTPH-Dx	GCSV/1861
254681018	**MW10-2-2.5**	EPA 3546	OEXT/2608	NWTPH-Dx	GCSV/1861
254681019	**MW10-4-4.5**	EPA 3546	OEXT/2608	NWTPH-Dx	GCSV/1861
254681021	**GP3-2-2.5**	EPA 3546	OEXT/2608	NWTPH-Dx	GCSV/1861
254681022	**GP3-4-4.5**	EPA 3546	OEXT/2608	NWTPH-Dx	GCSV/1861
254681002	**MW8-6-6.5**	NWTPH-Gx	GCV/1814	NWTPH-Gx	GCV/1825
254681003	**MW9-2-2.5**	NWTPH-Gx	GCV/1814	NWTPH-Gx	GCV/1825
254681005	**MW9-6-6.5**	NWTPH-Gx	GCV/1814	NWTPH-Gx	GCV/1825
254681006	**MW12-2-2.5**	NWTPH-Gx	GCV/1814	NWTPH-Gx	GCV/1825
254681007	**MW12-4-4.5**	NWTPH-Gx	GCV/1814	NWTPH-Gx	GCV/1825
254681009	**MW11-2-2.5**	NWTPH-Gx	GCV/1814	NWTPH-Gx	GCV/1825
254681010	**MW11-4-4.5**	NWTPH-Gx	GCV/1814	NWTPH-Gx	GCV/1825
254681012	**GP6-2-2.5**	NWTPH-Gx	GCV/1814	NWTPH-Gx	GCV/1825
254681013	**GP6-4-4.5**	NWTPH-Gx	GCV/1814	NWTPH-Gx	GCV/1825
254681014	**GP6-6-6.5**	NWTPH-Gx	GCV/1814	NWTPH-Gx	GCV/1825
254681015	**GP7-2-2.5**	NWTPH-Gx	GCV/1814	NWTPH-Gx	GCV/1825
254681017	**GP7-6-6.5**	NWTPH-Gx	GCV/1814	NWTPH-Gx	GCV/1825
254681018	**MW10-2-2.5**	NWTPH-Gx	GCV/1821	NWTPH-Gx	GCV/1826
254681019	**MW10-4-4.5**	NWTPH-Gx	GCV/1821	NWTPH-Gx	GCV/1826
254681021	**GP3-2-2.5**	NWTPH-Gx	GCV/1821	NWTPH-Gx	GCV/1826
254681022	**GP3-4-4.5**	NWTPH-Gx	GCV/1821	NWTPH-Gx	GCV/1826
254681023	**Trip Blank**	NWTPH-Gx	GCV/1821	NWTPH-Gx	GCV/1826
254681002	**MW8-6-6.5**	EPA 3050	MPRP/1737	EPA 6010	ICP/1653
254681003	**MW9-2-2.5**	EPA 3050	MPRP/1737	EPA 6010	ICP/1653
254681005	**MW9-6-6.5**	EPA 3050	MPRP/1737	EPA 6010	ICP/1653
254681006	**MW12-2-2.5**	EPA 3050	MPRP/1737	EPA 6010	ICP/1653
254681007	**MW12-4-4.5**	EPA 3050	MPRP/1737	EPA 6010	ICP/1653
254681009	**MW11-2-2.5**	EPA 3050	MPRP/1737	EPA 6010	ICP/1653
254681010	**MW11-4-4.5**	EPA 3050	MPRP/1737	EPA 6010	ICP/1653
254681012	**GP6-2-2.5**	EPA 3050	MPRP/1737	EPA 6010	ICP/1653
254681013	**GP6-4-4.5**	EPA 3050	MPRP/1737	EPA 6010	ICP/1653
254681014	**GP6-6-6.5**	EPA 3050	MPRP/1737	EPA 6010	ICP/1653
254681015	**GP7-2-2.5**	EPA 3050	MPRP/1737	EPA 6010	ICP/1653
254681017	**GP7-6-6.5**	EPA 3050	MPRP/1737	EPA 6010	ICP/1653
254681018	**MW10-2-2.5**	EPA 3050	MPRP/1737	EPA 6010	ICP/1653
254681019	**MW10-4-4.5**	EPA 3050	MPRP/1737	EPA 6010	ICP/1653

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(206)767-5060

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: BPOLY
Pace Project No.: 254681

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
254681021	**GP3-2-2.5**	EPA 3050	MPRP/1737	EPA 6010	ICP/1653
254681022	**GP3-4-4.5**	EPA 3050	MPRP/1737	EPA 6010	ICP/1653
254681002	**MW8-6-6.5**	EPA 7471	MERP/1242	EPA 7471	MERC/1257
254681003	**MW9-2-2.5**	EPA 7471	MERP/1242	EPA 7471	MERC/1257
254681005	**MW9-6-6.5**	EPA 7471	MERP/1242	EPA 7471	MERC/1257
254681006	**MW12-2-2.5**	EPA 7471	MERP/1242	EPA 7471	MERC/1257
254681007	**MW12-4-4.5**	EPA 7471	MERP/1242	EPA 7471	MERC/1257
254681009	**MW11-2-2.5**	EPA 7471	MERP/1242	EPA 7471	MERC/1257
254681010	**MW11-4-4.5**	EPA 7471	MERP/1242	EPA 7471	MERC/1257
254681012	**GP6-2-2.5**	EPA 7471	MERP/1242	EPA 7471	MERC/1257
254681013	**GP6-4-4.5**	EPA 7471	MERP/1242	EPA 7471	MERC/1257
254681014	**GP6-6-6.5**	EPA 7471	MERP/1242	EPA 7471	MERC/1257
254681015	**GP7-2-2.5**	EPA 7471	MERP/1242	EPA 7471	MERC/1257
254681017	**GP7-6-6.5**	EPA 7471	MERP/1242	EPA 7471	MERC/1257
254681018	**MW10-2-2.5**	EPA 7471	MERP/1242	EPA 7471	MERC/1257
254681019	**MW10-4-4.5**	EPA 7471	MERP/1242	EPA 7471	MERC/1257
254681021	**GP3-2-2.5**	EPA 7471	MERP/1242	EPA 7471	MERC/1257
254681022	**GP3-4-4.5**	EPA 7471	MERP/1242	EPA 7471	MERC/1257
254681002	**MW8-6-6.5**	EPA 3546	OEXT/2591	EPA 8270 by SIM	MSSV/1372
254681003	**MW9-2-2.5**	EPA 3546	OEXT/2591	EPA 8270 by SIM	MSSV/1372
254681005	**MW9-6-6.5**	EPA 3546	OEXT/2630	EPA 8270 by SIM	MSSV/1377
254681006	**MW12-2-2.5**	EPA 3546	OEXT/2591	EPA 8270 by SIM	MSSV/1372
254681007	**MW12-4-4.5**	EPA 3546	OEXT/2591	EPA 8270 by SIM	MSSV/1372
254681008	**MW12-6-6.5**	EPA 3546	OEXT/2601	EPA 8270 by SIM	MSSV/1376
254681009	**MW11-2-2.5**	EPA 3546	OEXT/2591	EPA 8270 by SIM	MSSV/1372
254681010	**MW11-4-4.5**	EPA 3546	OEXT/2630	EPA 8270 by SIM	MSSV/1377
254681011	**MW11-6-6.5**	EPA 3546	OEXT/2601	EPA 8270 by SIM	MSSV/1376
254681012	**GP6-2-2.5**	EPA 3546	OEXT/2630	EPA 8270 by SIM	MSSV/1377
254681013	**GP6-4-4.5**	EPA 3546	OEXT/2591	EPA 8270 by SIM	MSSV/1372
254681014	**GP6-6-6.5**	EPA 3546	OEXT/2630	EPA 8270 by SIM	MSSV/1377
254681015	**GP7-2-2.5**	EPA 3546	OEXT/2630	EPA 8270 by SIM	MSSV/1377
254681017	**GP7-6-6.5**	EPA 3546	OEXT/2591	EPA 8270 by SIM	MSSV/1372
254681018	**MW10-2-2.5**	EPA 3546	OEXT/2591	EPA 8270 by SIM	MSSV/1372
254681019	**MW10-4-4.5**	EPA 3546	OEXT/2591	EPA 8270 by SIM	MSSV/1372
254681021	**GP3-2-2.5**	EPA 3546	OEXT/2601	EPA 8270 by SIM	MSSV/1376
254681022	**GP3-4-4.5**	EPA 3546	OEXT/2601	EPA 8270 by SIM	MSSV/1376
254681002	**MW8-6-6.5**	EPA 8260	MSV/2934		
254681003	**MW9-2-2.5**	EPA 8260	MSV/2934		
254681005	**MW9-6-6.5**	EPA 8260	MSV/2934		
254681006	**MW12-2-2.5**	EPA 8260	MSV/2938		
254681007	**MW12-4-4.5**	EPA 8260	MSV/2938		

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Seattle, WA 98108
(206)767-5060

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: BPOLY
Pace Project No.: 254681

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
254681009	**MW11-2-2.5**	EPA 8260	MSV/2938		
254681010	**MW11-4-4.5**	EPA 8260	MSV/2938		
254681012	**GP6-2-2.5**	EPA 8260	MSV/2938		
254681013	**GP6-4-4.5**	EPA 8260	MSV/2938		
254681014	**GP6-6-6.5**	EPA 8260	MSV/2938		
254681015	**GP7-2-2.5**	EPA 8260	MSV/2938		
254681017	**GP7-6-6.5**	EPA 8260	MSV/2938		
254681018	**MW10-2-2.5**	EPA 8260	MSV/2938		
254681019	**MW10-4-4.5**	EPA 8260	MSV/2938		
254681021	**GP3-2-2.5**	EPA 8260	MSV/2938		
254681022	**GP3-4-4.5**	EPA 8260	MSV/2938		
254681023	**Trip Blank**	EPA 8260	MSV/2938		
254681001	**MW8-4-4.5**	ASTM D2974-87	PMST/1320		
254681002	**MW8-6-6.5**	ASTM D2974-87	PMST/1321		
254681003	**MW9-2-2.5**	ASTM D2974-87	PMST/1321		
254681004	**MW9-4-4.5**	ASTM D2974-87	PMST/1321		
254681005	**MW9-6-6.5**	ASTM D2974-87	PMST/1321		
254681006	**MW12-2-2.5**	ASTM D2974-87	PMST/1321		
254681007	**MW12-4-4.5**	ASTM D2974-87	PMST/1321		
254681008	**MW12-6-6.5**	ASTM D2974-87	PMST/1321		
254681009	**MW11-2-2.5**	ASTM D2974-87	PMST/1321		
254681010	**MW11-4-4.5**	ASTM D2974-87	PMST/1321		
254681011	**MW11-6-6.5**	ASTM D2974-87	PMST/1321		
254681012	**GP6-2-2.5**	ASTM D2974-87	PMST/1321		
254681013	**GP6-4-4.5**	ASTM D2974-87	PMST/1321		
254681014	**GP6-6-6.5**	ASTM D2974-87	PMST/1321		
254681015	**GP7-2-2.5**	ASTM D2974-87	PMST/1321		
254681016	**GP7-4-4.5**	ASTM D2974-87	PMST/1322		
254681017	**GP7-6-6.5**	ASTM D2974-87	PMST/1322		
254681018	**MW10-2-2.5**	ASTM D2974-87	PMST/1322		
254681019	**MW10-4-4.5**	ASTM D2974-87	PMST/1322		
254681020	**MW10-6-6.5**	ASTM D2974-87	PMST/1322		
254681021	**GP3-2-2.5**	ASTM D2974-87	PMST/1322		
254681022	**GP3-4-4.5**	ASTM D2974-87	PMST/1322		

254681

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

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1338851

Section A
Required Client Information:

Company: ARCADIS
Address: 111 SW Columbia Ste 725
PDX, OR 97201
Email To: Alex Lopez
Phone: 5032208201 Fax: 5032208209
Requested Due Date/TAT:

Section B
Required Project Information:

Report To: Alex Lopez
Copy To:
Purchase Order No.:
Project Name: BPDLY
Project Number: GP09BPNAWA60.C0000

Section C
Invoice Information:

Attention:
Company Name:
Address:
Pace Quote Reference:
Pace Project Manager:
Pace Profile #: 22153

REGULATORY AGENCY

NPDES / GROUND WATER / DRINKING WATER
UST / RCRA / OTHER

Site Location STATE: WA

Section D Required Client Information

Matrix Codes MATRIX / CODE: Drinking Water DW, Water WT, Waste Water WW, Product P, Soil/Solid SL, Oil OL, Wipe WP, Air AR, Tissue TS, Other OT

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE	SAMPLE TYPE (G=GRAB C=COMP)	Composite Start DATE	Composite Start TIME	Composite End/Grab DATE	Composite End/Grab TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Total Metals	NWTPH Gx	NWTPH Dx SG	BTEX 8260	cPAHs 8270mod	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	MW8-4-4.5	SL	G			082410	1245		5	X						X	X							*HOLD*
2	MW8-6-6.5					082410	1300											X	X	X	X	X		
3	MW9-2-2.5					082410	1330											X	X	X	X	X		
4	MW9-4-4.5					082410	1345																	*HOLD*
5	MW9-6-6.5					082410	1400											X	X	X	X	X		
6	MW12-2-2.5					082510	1100											X	X	X	X	X		
7	MW12-4-4.5					082510	1110											X	X	X	X	X		
8	MW12-6-6.5					082510	1145																	*HOLD*
9	MW11-2-2.5					082510	0950											X	X	X	X	X		
10	MW11-4-4.5					082510	1000											X	X	X	X	X		
11	MW11-6-6.5					082510	1020																	*HOLD*
12	GP6-2-2.5					082510	0915											X	X	X	X	X		

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
				Jyothi Swamy	8/25/10	14:40	5.4	Y	Y	Y
							2.0			
							1.4			

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Colleen Martin
SIGNATURE of SAMPLER: Colleen Martin DATE Signed (MM/DD/YY): 082510

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page:	of
1338852	

Section A — **Required** Client Information:

- Company: ARCADIS
- Address: 111 SW Columbia Ste 725 Portland OR 97201
- Email To: Alex Lopez
- Phone: 503 2208201 x122 Fax: 503 2208209
- Requested Due Date/TAT: Std

Section B — **Required** Project Information:

- Report To: Alex Lopez
- Copy To:
- Purchase Order No.:
- Project Name: BP OLY
- Project Number: GP09BPNA.WA60.C0000

Section C — Invoice Information:

- Attention:
- Company Name:
- Address:
- Pace Quote Reference:
- Pace Project Manager:
- Pace Profile #:

REGULATORY AGENCY

- NPDES
- GROUND WATER
- DRINKING WATER
- UST
- RCRA
- OTHER ______

Site Location STATE: WA

Section D Required Client Information

Matrix Codes MATRIX / CODE: Drinking Water DW, Water WT, Waste Water WW, Product P, Soil/Solid SL, Oil OL, Wipe WP, Air AR, Tissue TS, Other OT

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Total Metals	NWTPH-Gx	NWTPH-Dx SG	BTEX 8260	cPAHs 8270 mod	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	GP6-4-4.5	SL	G			082510	0930		5	2						2	1		X	X	X	X	X		
2	GP6-6-6.5					082510	0945												X	X	X	X	X		
3	GP7-2-2.5					082410	1545												X	X	X	X	X		
4	GP7-4-4.5					082410	1600																		*HOLD*
5	GP7-6-6.5					082410	1615												X	X	X	X	X		
6	MW10-2-2.5					082410	1440												X	X	X	X	X		
7	MW10-4-4.5					082410	1450												X	X	X	X	X		
8	MW10-6-6.5					082410	1510																		*HOLD*
9	GP3-2-2.5					082410	1415												X	X	X	X	X		
10	GP3-4-4.5					082410	1425												X	X	X	X	X		
11	TRIPBLANK																			X		X			
12																									

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
				Jyothi Swamy	8/25/10	14:40	5.4	Y	Y	Y
							2.0			
							1.4			
							Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Colleen Martin

SIGNATURE of SAMPLER: [signature]

DATE Signed (MM/DD/YY): 082510

Sample Container Count

CLIENT: Arcadis

COC PAGE 1 of 2
COC ID# 133851

Sample Line Item	VG9H	AG1H	AG1U	BG1H	BP1U	BP2U	BP3U	BP2N	BP2S	WGFU	WGKU	DG9M	VG9W		Comments
1										1	1	1	2		
2										1	1	1	2		
3										1	1	1	2		
4										1	1	1	2		
5										1	1	1	2		
6										1	1	1	2		
7										1	1	1	2		
8										1	1	1	2		
9										1	1	1	2		
10										1	1	1	2		
11										1	1	1	2		
12										1	1	1	2		Trip Blank? Yes

AG1H	1 liter HCL amber glass		BP2S	500mL H2SO4 plastic	JGFU	4oz unpreserved amber wide
AG1U	1liter unpreserved amber glass		BP2U	500mL unpreserved plastic	R	terra core kit
AG2S	500mL H2SO4 amber glass		BP2Z	500mL NaOH, Zn Ac	U	Summa Can
AG2U	500mL unpreserved amber glass		BP3C	250mL NaOH plastic	VG9H	40mL HCL clear vial
AG3S	250mL H2SO4 amber glass		BP3N	250mL HNO3 plastic	VG9T	40mL Na Thio. clear vial
BG1H	1 liter HCL clear glass		BP3S	250mL H2SO4 plastic	VG9U	40mL unpreserved **clear** vial
BG1U	1 liter unpreserved glass		BP3U	250mL unpreserved plastic	VG9W	40mL glass vial preweighted (EPA 5035)
BP1N	1 liter HNO3 plastic		DG9B	40mL Na Bisulfate amber vial	VSG	Headspace septa vial & HCL
BP1S	1 liter H2SO4 plastic		DG9H	40mL HCL amber voa vial	WGFU	4oz clear soil jar
BP1U	1 liter unpreserved plastic		DG9M	40mL MeOH clear vial	WGFX	4oz wide jar w/hexane wipe
BP1Z	1 liter NaOH, Zn, Ac		DG9T	40mL Na Thio amber vial	ZPLC	Ziploc Bag
BP2N	500mL HNO3 plastic		DG9U	40mL unpreserved **amber** vial		
BP2O	500mL NaOH plastic		I	Wipe/Swab		

Sample Container Count

CLIENT: Arcadis

COC PAGE 2 of 2
COC ID# 133852

Sample Line Item	VG9H	AG1H	AG1U	BG1H	BP1U	BP2U	BP3U	BP2N	BP2S	WGFU	WGKU	DG9M	VG9W		Comments
1										1	1	1	2		
2										1	1	1	2		
3										1	1	1	2		
4										1	1	1	2		
5										1	1	1	2		
6										1	1	1	2		
7										1	1	1	2		
8										1	1	1	2		
9										1	1	1	2		
10										1	1	1	2		
11												2	4		
12															Trip Blank? yes

AG1H	1 liter HCL amber glass		BP2S	500mL H2SO4 plastic	JGFU	4oz unpreserved amber wide
AG1U	1liter unpreserved amber glass		BP2U	500mL unpreserved plastic	R	terra core kit
AG2S	500mL H2SO4 amber glass		BP2Z	500mL NaOH, Zn Ac	U	Summa Can
AG2U	500mL unpreserved amber glass		BP3C	250mL NaOH plastic	VG9H	40mL HCL clear vial
AG3S	250mL H2SO4 amber glass		BP3N	250mL HNO3 plastic	VG9T	40mL Na Thio. clear vial
BG1H	1 liter HCL clear glass		BP3S	250mL H2SO4 plastic	VG9U	40mL unpreserved **clear** vial
BG1U	1 liter unpreserved glass		BP3U	250mL unpreserved plastic	VG9W	40mL glass vial preweighted (EPA 5035)
BP1N	1 liter HNO3 plastic		DG9B	40mL Na Bisulfate amber vial	VSG	Headspace septa vial & HCL
BP1S	1 liter H2SO4 plastic		DG9H	40mL HCL amber voa vial	WGFU	4oz clear soil jar
BP1U	1 liter unpreserved plastic		DG9M	40mL MeOH clear vial	WGFX	4oz wide jar w/hexane wipe
BP1Z	1 liter NaOH, Zn, Ac		DG9T	40mL Na Thio amber vial	ZPLC	Ziploc Bag
BP2N	500mL HNO3 plastic		DG9U	40mL unpreserved **amber** vial		
BP2O	500mL NaOH plastic		I	Wipe/Swab		

Sample Condition Upon Receipt

Pace Analytical

Client Name: Arcadis   Project # 254681

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other Private Vendor

Tracking #: —

Custody Seal on Cooler/Box Present: ☑ Yes ☐ No   Seals intact: ☑ Yes ☐ No

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☐ None ☐ Other ____   Temp. Blank Yes ____ No

Thermometer Used 132013 or 101731962 or 226099 **Type of Ice:** Wet Blue None   ☐ Samples on ice, cooling process has begun

Cooler Temperature 5.4, 2.0, 1.4   **Biological Tissue is Frozen:** Yes No

Temp should be above freezing ≤ 6°C

Date and Initials of person examining contents: NJS 8/25/10

		Comments:
Chain of Custody Present:	☑ Yes ☐ No ☐ N/A	1.
Chain of Custody Filled Out:	☑ Yes ☐ No ☐ N/A	2.
Chain of Custody Relinquished:	☑ Yes ☐ No ☐ N/A	3.
Sampler Name & Signature on COC:	☑ Yes ☐ No ☐ N/A	4.
Samples Arrived within Hold Time:	☑ Yes ☐ No ☐ N/A	5.
Short Hold Time Analysis (<72hr):	☐ Yes ☑ No ☐ N/A	6.
Rush Turn Around Time Requested:	☐ Yes ☑ No ☐ N/A	7.
Sufficient Volume:	☑ Yes ☐ No ☐ N/A	8.
Correct Containers Used:	☑ Yes ☐ No ☐ N/A	9.
-Pace Containers Used:	☑ Yes ☐ No ☐ N/A	
Containers Intact:	☑ Yes ☐ No ☐ N/A	10.
Filtered volume received for Dissolved tests	☐ Yes ☐ No ☑ N/A	11.
Sample Labels match COC:	☑ Yes ☐ No ☐ N/A	12.
-Includes date/time/ID/Analysis Matrix: Soil		
All containers needing preservation have been checked.	☐ Yes ☐ No ☑ N/A	13. Terracore Kits
All containers needing preservation are found to be in compliance with EPA recommendation.	☐ Yes ☐ No ☑ N/A	
Exceptions: VOA, coliform, TOC, O&G		Initial when completed / Lot # of added preservative
Samples checked for dechlorination:	☐ Yes ☐ No ☑ N/A	14.
Headspace in VOA Vials (>6mm):	☐ Yes ☐ No ☑ N/A	15.
Trip Blanks Present:	☑ Yes ☐ No ☐ N/A	16.
Trip Blank Custody Seals Present	☐ Yes ☑ No ☐ N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: ____   Date/Time: ____

Comments/ Resolution:

Project Manager Review: RSM   **Date:** 08/26/10

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical Services, Inc.
940 South Harney
Seattle, WA 98108
(206)767-5060

September 30, 2010

Alex Lopez
Arcadis
111 SW Columbia St.
Ste. 725
Portland, OR 97201

RE: Project: BP Oly
Pace Project No.: 254717

Dear Alex Lopez:

Enclosed are the analytical results for sample(s) received by the laboratory on August 27, 2010. The results relate only to the samples included in this report. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

Revised Report - PAH results added to GP-1 6-6.5 and GP-8 4-4.5 at client's request.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Regina Ste. Marie

Regina SteMarie

regina.stemarie@pacelabs.com
Project Manager

Enclosures

Pace Analytical Services, Inc.
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Seattle, WA 98108
(206)767-5060

CERTIFICATIONS

Project:	BP Oly
Pace Project No.:	254717

Washington Certification IDs

940 South Harney Street, Seattle, WA 98108
Alaska CS Certification #: UST-025
Alaska Drinking Water VOC Certification #: WA01230
Alaska Drinking Water Micro Certification #: WA01230
California Certification #: 01153CA
Florida/NELAP Certification #: E87617
Oregon Certification #: WA200007
Washington Certification #: C1229

Pace Analytical Services, Inc.
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Seattle, WA 98108
(206)767-5060

SAMPLE ANALYTE COUNT

Project: BP Oly
Pace Project No.: 254717

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
254717001	**GP1-2-2.5**	NWTPH-Dx	ERB	4	PASI-S
		NWTPH-Gx	AY1	3	PASI-S
		EPA 6010	BGA	7	PASI-S
		EPA 7471	BGA	1	PASI-S
		EPA 8270 by SIM	DMT	20	PASI-S
		EPA 8260	ATH	8	PASI-S
		ASTM D2974-87	KJ1	1	PASI-S
254717002	**GP1-4-4.5**	NWTPH-Dx	ERB	4	PASI-S
		NWTPH-Gx	AY1	3	PASI-S
		EPA 6010	BGA	7	PASI-S
		EPA 7471	BGA	1	PASI-S
		EPA 8270 by SIM	DMT	20	PASI-S
		EPA 8260	ATH	8	PASI-S
		ASTM D2974-87	KJ1	1	PASI-S
254717003	**GP1-6-6.5**	EPA 8270 by SIM	DMT	20	PASI-S
		ASTM D2974-87	KJ1	1	PASI-S
254717004	**GP2-2-2.5**	NWTPH-Dx	ERB	4	PASI-S
		NWTPH-Gx	AY1	3	PASI-S
		EPA 6010	BGA	7	PASI-S
		EPA 7471	BGA	1	PASI-S
		EPA 8270 by SIM	DMT	20	PASI-S
		EPA 8260	ATH	8	PASI-S
		ASTM D2974-87	KJ1	1	PASI-S
254717005	**GP2-4-4.5**	NWTPH-Dx	ERB	4	PASI-S
		NWTPH-Gx	AY1	3	PASI-S
		EPA 6010	BGA	7	PASI-S
		EPA 7471	BGA	1	PASI-S
		EPA 8270 by SIM	DMT	20	PASI-S
		EPA 8260	ATH	8	PASI-S
		ASTM D2974-87	KJ1	1	PASI-S
254717006	**GP8-2-2.5**	NWTPH-Dx	ERB	4	PASI-S
		NWTPH-Gx	AY1	3	PASI-S
		EPA 6010	BGA	7	PASI-S
		EPA 7471	BGA	1	PASI-S
		EPA 8270 by SIM	DMT	20	PASI-S
		EPA 8260	ATH	8	PASI-S
		ASTM D2974-87	DMT	1	PASI-S

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SAMPLE ANALYTE COUNT

Project: BP Oly
Pace Project No.: 254717

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
254717007	**GP8-4-4.5**	EPA 8270 by SIM	DMT	20	PASI-S
		ASTM D2974-87	DMT	1	PASI-S
254717008	**GP8-6-6.5**	NWTPH-Dx	ERB	4	PASI-S
		NWTPH-Gx	AY1	3	PASI-S
		EPA 6010	BGA	7	PASI-S
		EPA 7471	BGA	1	PASI-S
		EPA 8270 by SIM	DMT	20	PASI-S
		EPA 8260	ATH	8	PASI-S
		ASTM D2974-87	DMT	1	PASI-S
254717009	**Trip Blank**	NWTPH-Gx	AY1	3	PASI-S
		EPA 8260	ATH	8	PASI-S

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PROJECT NARRATIVE

Project: BP Oly
Pace Project No.: 254717

Method: **NWTPH-Dx**
Description: NWTPH-Dx GCS SG
Client: Arcadis OR
Date: September 30, 2010

General Information:
6 samples were analyzed for NWTPH-Dx. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3546 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, Inc.
940 South Harney
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PROJECT NARRATIVE

Project: BP Oly
Pace Project No.: 254717

Method: **NWTPH-Gx**
Description: NWTPH-Gx GCV
Client: Arcadis OR
Date: September 30, 2010

General Information:
7 samples were analyzed for NWTPH-Gx. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with NWTPH-Gx with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, Inc.
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PROJECT NARRATIVE

Project: BP Oly
Pace Project No.: 254717

Method: **EPA 6010**
Description: 6010 MET ICP
Client: Arcadis OR
Date: September 30, 2010

General Information:
6 samples were analyzed for EPA 6010. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3050 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MPRP/1739

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 254708001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 38268)
  - Barium
- MSD (Lab ID: 38269)
  - Barium

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: BP Oly
Pace Project No.: 254717

Method: **EPA 7471**
Description: 7471 Mercury
Client: Arcadis OR
Date: September 30, 2010

General Information:
6 samples were analyzed for EPA 7471. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 7471 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, Inc.
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PROJECT NARRATIVE

Project: BP Oly
Pace Project No.: 254717

Method: **EPA 8270 by SIM**
Description: 8270 MSSV PAH by SIM
Client: Arcadis OR
Date: September 30, 2010

General Information:
8 samples were analyzed for EPA 8270 by SIM. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3546 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

QC Batch: OEXT/2601

S0: Surrogate recovery outside laboratory control limits.

- GP1-6-6.5 (Lab ID: 254717003)
  - Terphenyl-d14 (S)
- GP2-4-4.5 (Lab ID: 254717005)
  - Terphenyl-d14 (S)

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: BP Oly
Pace Project No.: 254717

Method: **EPA 8270 by SIM**
Description: 8270 MSSV PAH by SIM
Client: Arcadis OR
Date: September 30, 2010

Analyte Comments:

QC Batch: OEXT/2601

1n: Results for all reported compounds were confirmed by the analysis of an out-of-hold re-extract sample. This sample was associated with an acceptable method blank and LCS, and had passing surrogate recoveries.

- GP1-6-6.5 (Lab ID: 254717003)
  - Terphenyl-d14 (S)
- GP2-4-4.5 (Lab ID: 254717005)
  - Terphenyl-d14 (S)

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PROJECT NARRATIVE

Project: BP Oly
Pace Project No.: 254717

Method: **EPA 8260**
Description: 8260/5035A Volatile Organics
Client: Arcadis OR
Date: September 30, 2010

General Information:
7 samples were analyzed for EPA 8260. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

QC Batch: MSV/2946

S5: Surrogate recovery outside control limits due to matrix interferences (not confirmed by re-analysis).
- GP2-4-4.5 (Lab ID: 254717005)
  - 1,2-Dichloroethane-d4 (S)
  - 4-Bromofluorobenzene (S)

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
940 South Harney
Seattle, WA 98108
(206)767-5060

ANALYTICAL RESULTS

Project: BP Oly
Pace Project No.: 254717

Sample: GP1-2-2.5 **Lab ID: 254717001** Collected: 08/25/10 14:30 Received: 08/27/10 10:15 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS SG	Analytical Method: NWTPH-Dx Preparation Method: EPA 3546							
Diesel Range SG	**30.4**	mg/kg	25.0	1	09/02/10 16:05	09/04/10 01:09		
Motor Oil Range SG	**198**	mg/kg	99.9	1	09/02/10 16:05	09/04/10 01:09	64742-65-0	
n-Octacosane (S) SG	116	%	50-150	1	09/02/10 16:05	09/04/10 01:09	630-02-4	
o-Terphenyl (S) SG	102	%	50-150	1	09/02/10 16:05	09/04/10 01:09	84-15-1	
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
Gasoline Range Organics	ND	mg/kg	8.6	1	09/01/10 17:00	09/02/10 06:29		
a,a,a-Trifluorotoluene (S)	104	%	50-150	1	09/01/10 17:00	09/02/10 06:29	98-08-8	
4-Bromofluorobenzene (S)	98	%	50-150	1	09/01/10 17:00	09/02/10 06:29	460-00-4	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Arsenic	ND	mg/kg	12.3	5	08/28/10 13:15	08/31/10 10:35	7440-38-2	
Barium	**80.6**	mg/kg	24.6	1	08/28/10 13:15	08/31/10 11:05	7440-39-3	
Cadmium	ND	mg/kg	6.2	5	08/28/10 13:15	08/31/10 10:35	7440-43-9	
Chromium	**26.7**	mg/kg	1.2	1	08/28/10 13:15	08/31/10 11:05	7440-47-3	
Lead	**4.7**	mg/kg	1.2	1	08/28/10 13:15	08/31/10 11:05	7439-92-1	
Selenium	ND	mg/kg	6.2	5	08/28/10 13:15	08/31/10 10:35	7782-49-2	
Silver	ND	mg/kg	6.2	5	08/28/10 13:15	08/31/10 10:35	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	ND	mg/kg	0.12	1	09/01/10 10:10	09/01/10 14:20	7439-97-6	
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546							
Acenaphthene	ND	ug/kg	8.7	1	09/02/10 18:00	09/04/10 02:38	83-32-9	
Acenaphthylene	ND	ug/kg	8.7	1	09/02/10 18:00	09/04/10 02:38	208-96-8	
Anthracene	ND	ug/kg	8.7	1	09/02/10 18:00	09/04/10 02:38	120-12-7	
Benzo(a)anthracene	ND	ug/kg	8.7	1	09/02/10 18:00	09/04/10 02:38	56-55-3	
Benzo(a)pyrene	ND	ug/kg	8.7	1	09/02/10 18:00	09/04/10 02:38	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	8.7	1	09/02/10 18:00	09/04/10 02:38	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	8.7	1	09/02/10 18:00	09/04/10 02:38	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	8.7	1	09/02/10 18:00	09/04/10 02:38	207-08-9	
Chrysene	ND	ug/kg	8.7	1	09/02/10 18:00	09/04/10 02:38	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	8.7	1	09/02/10 18:00	09/04/10 02:38	53-70-3	
Fluoranthene	ND	ug/kg	8.7	1	09/02/10 18:00	09/04/10 02:38	206-44-0	
Fluorene	ND	ug/kg	8.7	1	09/02/10 18:00	09/04/10 02:38	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	8.7	1	09/02/10 18:00	09/04/10 02:38	193-39-5	
1-Methylnaphthalene	ND	ug/kg	8.7	1	09/02/10 18:00	09/04/10 02:38	90-12-0	
2-Methylnaphthalene	**11.1**	ug/kg	8.7	1	09/02/10 18:00	09/04/10 02:38	91-57-6	
Naphthalene	**8.7**	ug/kg	8.7	1	09/02/10 18:00	09/04/10 02:38	91-20-3	
Phenanthrene	**11.4**	ug/kg	8.7	1	09/02/10 18:00	09/04/10 02:38	85-01-8	
Pyrene	ND	ug/kg	8.7	1	09/02/10 18:00	09/04/10 02:38	129-00-0	
2-Fluorobiphenyl (S)	61	%	55-136	1	09/02/10 18:00	09/04/10 02:38	321-60-8	
Terphenyl-d14 (S)	62	%	60-144	1	09/02/10 18:00	09/04/10 02:38	1718-51-0	

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ANALYTICAL RESULTS

Project: BP Oly
Pace Project No.: 254717

Sample: GP1-2-2.5 **Lab ID: 254717001** Collected: 08/25/10 14:30 Received: 08/27/10 10:15 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260/5035A Volatile Organics	Analytical Method: EPA 8260							
Benzene	ND	ug/kg	4.7	1		08/27/10 20:37	71-43-2	
Ethylbenzene	ND	ug/kg	4.7	1		08/27/10 20:37	100-41-4	
Toluene	ND	ug/kg	4.7	1		08/27/10 20:37	108-88-3	
Xylene (Total)	ND	ug/kg	14.0	1		08/27/10 20:37	1330-20-7	
Dibromofluoromethane (S)	97	%	80-136	1		08/27/10 20:37	1868-53-7	
Toluene-d8 (S)	90	%	80-120	1		08/27/10 20:37	2037-26-5	
4-Bromofluorobenzene (S)	92	%	72-122	1		08/27/10 20:37	460-00-4	
1,2-Dichloroethane-d4 (S)	86	%	80-143	1		08/27/10 20:37	17060-07-0	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**24.2**	%	0.10	1		08/31/10 12:49		

Sample: GP1-4-4.5 **Lab ID: 254717002** Collected: 08/25/10 14:45 Received: 08/27/10 10:15 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS SG	Analytical Method: NWTPH-Dx Preparation Method: EPA 3546							
Diesel Range SG	**60.9**	mg/kg	51.0	1	09/02/10 16:05	09/04/10 02:14		
Motor Oil Range SG	**481**	mg/kg	204	1	09/02/10 16:05	09/04/10 02:14	64742-65-0	
n-Octacosane (S) SG	117	%	50-150	1	09/02/10 16:05	09/04/10 02:14	630-02-4	
o-Terphenyl (S) SG	95	%	50-150	1	09/02/10 16:05	09/04/10 02:14	84-15-1	
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
Gasoline Range Organics	ND	mg/kg	47.0	1	09/02/10 17:00	09/03/10 02:50		
a,a,a-Trifluorotoluene (S)	99	%	50-150	1	09/02/10 17:00	09/03/10 02:50	98-08-8	
4-Bromofluorobenzene (S)	76	%	50-150	1	09/02/10 17:00	09/03/10 02:50	460-00-4	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Arsenic	ND	mg/kg	4.8	1	08/28/10 13:15	08/31/10 11:07	7440-38-2	
Barium	**52.7**	mg/kg	47.7	1	08/28/10 13:15	08/31/10 11:07	7440-39-3	
Cadmium	ND	mg/kg	2.4	1	08/28/10 13:15	08/31/10 11:07	7440-43-9	
Chromium	**10.4**	mg/kg	2.4	1	08/28/10 13:15	08/31/10 11:07	7440-47-3	
Lead	**5.2**	mg/kg	2.4	1	08/28/10 13:15	08/31/10 11:07	7439-92-1	
Selenium	ND	mg/kg	2.4	1	08/28/10 13:15	08/31/10 11:07	7782-49-2	
Silver	ND	mg/kg	2.4	1	08/28/10 13:15	08/31/10 11:07	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	ND	mg/kg	0.27	1	09/01/10 10:10	09/01/10 14:23	7439-97-6	
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546							
Acenaphthene	ND	ug/kg	17.8	1	09/02/10 18:00	09/04/10 02:55	83-32-9	
Acenaphthylene	ND	ug/kg	17.8	1	09/02/10 18:00	09/04/10 02:55	208-96-8	
Anthracene	ND	ug/kg	17.8	1	09/02/10 18:00	09/04/10 02:55	120-12-7	

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ANALYTICAL RESULTS

Project: BP Oly
Pace Project No.: 254717

Sample: GP1-4-4.5 **Lab ID: 254717002** Collected: 08/25/10 14:45 Received: 08/27/10 10:15 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546							
Benzo(a)anthracene	ND	ug/kg	17.8	1	09/02/10 18:00	09/04/10 02:55	56-55-3	
Benzo(a)pyrene	ND	ug/kg	17.8	1	09/02/10 18:00	09/04/10 02:55	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	17.8	1	09/02/10 18:00	09/04/10 02:55	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	17.8	1	09/02/10 18:00	09/04/10 02:55	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	17.8	1	09/02/10 18:00	09/04/10 02:55	207-08-9	
Chrysene	ND	ug/kg	17.8	1	09/02/10 18:00	09/04/10 02:55	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	17.8	1	09/02/10 18:00	09/04/10 02:55	53-70-3	
Fluoranthene	**23.7**	ug/kg	17.8	1	09/02/10 18:00	09/04/10 02:55	206-44-0	
Fluorene	ND	ug/kg	17.8	1	09/02/10 18:00	09/04/10 02:55	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	17.8	1	09/02/10 18:00	09/04/10 02:55	193-39-5	
1-Methylnaphthalene	ND	ug/kg	17.8	1	09/02/10 18:00	09/04/10 02:55	90-12-0	
2-Methylnaphthalene	ND	ug/kg	17.8	1	09/02/10 18:00	09/04/10 02:55	91-57-6	
Naphthalene	ND	ug/kg	17.8	1	09/02/10 18:00	09/04/10 02:55	91-20-3	
Phenanthrene	**30.2**	ug/kg	17.8	1	09/02/10 18:00	09/04/10 02:55	85-01-8	
Pyrene	ND	ug/kg	17.8	1	09/02/10 18:00	09/04/10 02:55	129-00-0	
2-Fluorobiphenyl (S)	59	%	55-136	1	09/02/10 18:00	09/04/10 02:55	321-60-8	
Terphenyl-d14 (S)	60	%	60-144	1	09/02/10 18:00	09/04/10 02:55	1718-51-0	
8260/5035A Volatile Organics	Analytical Method: EPA 8260							
Benzene	ND	ug/kg	18.9	1		08/27/10 20:56	71-43-2	
Ethylbenzene	ND	ug/kg	18.9	1		08/27/10 20:56	100-41-4	
Toluene	**34.2**	ug/kg	18.9	1		08/27/10 20:56	108-88-3	
Xylene (Total)	ND	ug/kg	56.7	1		08/27/10 20:56	1330-20-7	
Dibromofluoromethane (S)	99	%	80-136	1		08/27/10 20:56	1868-53-7	
Toluene-d8 (S)	95	%	80-120	1		08/27/10 20:56	2037-26-5	
4-Bromofluorobenzene (S)	102	%	72-122	1		08/27/10 20:56	460-00-4	
1,2-Dichloroethane-d4 (S)	89	%	80-143	1		08/27/10 20:56	17060-07-0	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**62.6**	%	0.10	1		08/31/10 12:51		

Sample: GP1-6-6.5 **Lab ID: 254717003** Collected: 08/25/10 14:55 Received: 08/27/10 10:15 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546							
Acenaphthene	ND	ug/kg	45.1	1	09/02/10 18:00	09/03/10 22:46	83-32-9	
Acenaphthylene	ND	ug/kg	45.1	1	09/02/10 18:00	09/03/10 22:46	208-96-8	
Anthracene	ND	ug/kg	45.1	1	09/02/10 18:00	09/03/10 22:46	120-12-7	
Benzo(a)anthracene	ND	ug/kg	45.1	1	09/02/10 18:00	09/03/10 22:46	56-55-3	
Benzo(a)pyrene	ND	ug/kg	45.1	1	09/02/10 18:00	09/03/10 22:46	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	45.1	1	09/02/10 18:00	09/03/10 22:46	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	45.1	1	09/02/10 18:00	09/03/10 22:46	191-24-2	

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ANALYTICAL RESULTS

Project: BP Oly
Pace Project No.: 254717

Sample: GP1-6-6.5 **Lab ID: 254717003** Collected: 08/25/10 14:55 Received: 08/27/10 10:15 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546							
Benzo(k)fluoranthene	ND	ug/kg	45.1	1	09/02/10 18:00	09/03/10 22:46	207-08-9	
Chrysene	ND	ug/kg	45.1	1	09/02/10 18:00	09/03/10 22:46	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	45.1	1	09/02/10 18:00	09/03/10 22:46	53-70-3	
Fluoranthene	**54.0**	ug/kg	45.1	1	09/02/10 18:00	09/03/10 22:46	206-44-0	
Fluorene	ND	ug/kg	45.1	1	09/02/10 18:00	09/03/10 22:46	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	45.1	1	09/02/10 18:00	09/03/10 22:46	193-39-5	
1-Methylnaphthalene	ND	ug/kg	45.1	1	09/02/10 18:00	09/03/10 22:46	90-12-0	
2-Methylnaphthalene	ND	ug/kg	45.1	1	09/02/10 18:00	09/03/10 22:46	91-57-6	
Naphthalene	ND	ug/kg	45.1	1	09/02/10 18:00	09/03/10 22:46	91-20-3	
Phenanthrene	ND	ug/kg	45.1	1	09/02/10 18:00	09/03/10 22:46	85-01-8	
Pyrene	**62.5**	ug/kg	45.1	1	09/02/10 18:00	09/03/10 22:46	129-00-0	
2-Fluorobiphenyl (S)	59	%	55-136	1	09/02/10 18:00	09/03/10 22:46	321-60-8	
Terphenyl-d14 (S)	45	%	60-144	1	09/02/10 18:00	09/03/10 22:46	1718-51-0	1n,S0
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**85.4**	%	0.10	1		08/31/10 12:53		

Sample: GP2-2-2.5 **Lab ID: 254717004** Collected: 08/25/10 13:40 Received: 08/27/10 10:15 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS SG	Analytical Method: NWTPH-Dx Preparation Method: EPA 3546							
Diesel Range SG	**732**	mg/kg	31.1	1	09/02/10 16:05	09/04/10 02:31		
Motor Oil Range SG	ND	mg/kg	124	1	09/02/10 16:05	09/04/10 02:31	64742-65-0	
n-Octacosane (S) SG	98	%	50-150	1	09/02/10 16:05	09/04/10 02:31	630-02-4	
o-Terphenyl (S) SG	103	%	50-150	1	09/02/10 16:05	09/04/10 02:31	84-15-1	
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
Gasoline Range Organics	ND	mg/kg	9.8	1	09/01/10 17:00	09/02/10 07:43		
a,a,a-Trifluorotoluene (S)	100	%	50-150	1	09/01/10 17:00	09/02/10 07:43	98-08-8	
4-Bromofluorobenzene (S)	96	%	50-150	1	09/01/10 17:00	09/02/10 07:43	460-00-4	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Arsenic	ND	mg/kg	13.3	5	08/28/10 13:15	08/31/10 10:41	7440-38-2	
Barium	**53.6**	mg/kg	26.6	1	08/28/10 13:15	08/31/10 11:10	7440-39-3	
Cadmium	ND	mg/kg	6.6	5	08/28/10 13:15	08/31/10 10:41	7440-43-9	
Chromium	**24.6**	mg/kg	1.3	1	08/28/10 13:15	08/31/10 11:10	7440-47-3	
Lead	**4.1**	mg/kg	1.3	1	08/28/10 13:15	08/31/10 11:10	7439-92-1	
Selenium	ND	mg/kg	6.6	5	08/28/10 13:15	08/31/10 10:41	7782-49-2	
Silver	ND	mg/kg	6.6	5	08/28/10 13:15	08/31/10 10:41	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	ND	mg/kg	0.15	1	09/01/10 10:10	09/01/10 14:29	7439-97-6	

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ANALYTICAL RESULTS

Project: BP Oly
Pace Project No.: 254717

Sample: GP2-2-2.5 **Lab ID: 254717004** Collected: 08/25/10 13:40 Received: 08/27/10 10:15 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546							
Acenaphthene	ND	ug/kg	10.4	1	09/02/10 18:00	09/03/10 23:03	83-32-9	
Acenaphthylene	**10.7**	ug/kg	10.4	1	09/02/10 18:00	09/03/10 23:03	208-96-8	
Anthracene	ND	ug/kg	10.4	1	09/02/10 18:00	09/03/10 23:03	120-12-7	
Benzo(a)anthracene	ND	ug/kg	10.4	1	09/02/10 18:00	09/03/10 23:03	56-55-3	
Benzo(a)pyrene	ND	ug/kg	10.4	1	09/02/10 18:00	09/03/10 23:03	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	10.4	1	09/02/10 18:00	09/03/10 23:03	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	10.4	1	09/02/10 18:00	09/03/10 23:03	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	10.4	1	09/02/10 18:00	09/03/10 23:03	207-08-9	
Chrysene	ND	ug/kg	10.4	1	09/02/10 18:00	09/03/10 23:03	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	10.4	1	09/02/10 18:00	09/03/10 23:03	53-70-3	
Fluoranthene	ND	ug/kg	10.4	1	09/02/10 18:00	09/03/10 23:03	206-44-0	
Fluorene	**13.6**	ug/kg	10.4	1	09/02/10 18:00	09/03/10 23:03	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	10.4	1	09/02/10 18:00	09/03/10 23:03	193-39-5	
1-Methylnaphthalene	**21.7**	ug/kg	10.4	1	09/02/10 18:00	09/03/10 23:03	90-12-0	
2-Methylnaphthalene	**22.8**	ug/kg	10.4	1	09/02/10 18:00	09/03/10 23:03	91-57-6	
Naphthalene	ND	ug/kg	10.4	1	09/02/10 18:00	09/03/10 23:03	91-20-3	
Phenanthrene	**38.3**	ug/kg	10.4	1	09/02/10 18:00	09/03/10 23:03	85-01-8	
Pyrene	ND	ug/kg	10.4	1	09/02/10 18:00	09/03/10 23:03	129-00-0	
2-Fluorobiphenyl (S)	76	%	55-136	1	09/02/10 18:00	09/03/10 23:03	321-60-8	
Terphenyl-d14 (S)	64	%	60-144	1	09/02/10 18:00	09/03/10 23:03	1718-51-0	
8260/5035A Volatile Organics	Analytical Method: EPA 8260							
Benzene	ND	ug/kg	4.2	1		08/27/10 21:16	71-43-2	
Ethylbenzene	ND	ug/kg	4.2	1		08/27/10 21:16	100-41-4	
Toluene	ND	ug/kg	4.2	1		08/27/10 21:16	108-88-3	
Xylene (Total)	ND	ug/kg	12.6	1		08/27/10 21:16	1330-20-7	
Dibromofluoromethane (S)	101	%	80-136	1		08/27/10 21:16	1868-53-7	
Toluene-d8 (S)	91	%	80-120	1		08/27/10 21:16	2037-26-5	
4-Bromofluorobenzene (S)	95	%	72-122	1		08/27/10 21:16	460-00-4	
1,2-Dichloroethane-d4 (S)	91	%	80-143	1		08/27/10 21:16	17060-07-0	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**36.2**	%	0.10	1		08/31/10 12:55		

Sample: GP2-4-4.5 **Lab ID: 254717005** Collected: 08/25/10 13:50 Received: 08/27/10 10:15 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS SG	Analytical Method: NWTPH-Dx Preparation Method: EPA 3546							
Diesel Range SG	**3120**	mg/kg	45.5	1	09/02/10 16:05	09/04/10 02:47		
Motor Oil Range SG	**296**	mg/kg	182	1	09/02/10 16:05	09/04/10 02:47	64742-65-0	
n-Octacosane (S) SG	120	%	50-150	1	09/02/10 16:05	09/04/10 02:47	630-02-4	
o-Terphenyl (S) SG	92	%	50-150	1	09/02/10 16:05	09/04/10 02:47	84-15-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: BP Oly
Pace Project No.: 254717

Sample: GP2-4-4.5 **Lab ID: 254717005** Collected: 08/25/10 13:50 Received: 08/27/10 10:15 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
Gasoline Range Organics	**264**	mg/kg	22.8	1	09/02/10 17:00	09/03/10 03:39		
a,a,a-Trifluorotoluene (S)	90	%	50-150	1	09/02/10 17:00	09/03/10 03:39	98-08-8	
4-Bromofluorobenzene (S)	101	%	50-150	1	09/02/10 17:00	09/03/10 03:39	460-00-4	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Arsenic	ND	mg/kg	4.4	1	08/28/10 13:15	08/31/10 11:13	7440-38-2	
Barium	**50.0**	mg/kg	44.4	1	08/28/10 13:15	08/31/10 11:13	7440-39-3	
Cadmium	ND	mg/kg	2.2	1	08/28/10 13:15	08/31/10 11:13	7440-43-9	
Chromium	**17.5**	mg/kg	2.2	1	08/28/10 13:15	08/31/10 11:13	7440-47-3	
Lead	**4.9**	mg/kg	2.2	1	08/28/10 13:15	08/31/10 11:13	7439-92-1	
Selenium	ND	mg/kg	2.2	1	08/28/10 13:15	08/31/10 11:13	7782-49-2	
Silver	ND	mg/kg	2.2	1	08/28/10 13:15	08/31/10 11:13	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	ND	mg/kg	0.24	1	09/01/10 10:10	09/01/10 14:31	7439-97-6	
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546							
Acenaphthene	**89.6**	ug/kg	16.3	1	09/02/10 18:00	09/04/10 01:48	83-32-9	
Acenaphthylene	**68.8**	ug/kg	16.3	1	09/02/10 18:00	09/04/10 01:48	208-96-8	
Anthracene	**194**	ug/kg	16.3	1	09/02/10 18:00	09/04/10 01:48	120-12-7	
Benzo(a)anthracene	**315**	ug/kg	16.3	1	09/02/10 18:00	09/04/10 01:48	56-55-3	
Benzo(a)pyrene	**233**	ug/kg	16.3	1	09/02/10 18:00	09/04/10 01:48	50-32-8	
Benzo(b)fluoranthene	**165**	ug/kg	16.3	1	09/02/10 18:00	09/04/10 01:48	205-99-2	
Benzo(g,h,i)perylene	**42.9**	ug/kg	16.3	1	09/02/10 18:00	09/04/10 01:48	191-24-2	
Benzo(k)fluoranthene	**205**	ug/kg	16.3	1	09/02/10 18:00	09/04/10 01:48	207-08-9	
Chrysene	**338**	ug/kg	16.3	1	09/02/10 18:00	09/04/10 01:48	218-01-9	
Dibenz(a,h)anthracene	**49.8**	ug/kg	16.3	1	09/02/10 18:00	09/04/10 01:48	53-70-3	
Fluoranthene	**488**	ug/kg	16.3	1	09/02/10 18:00	09/04/10 01:48	206-44-0	
Fluorene	**294**	ug/kg	16.3	1	09/02/10 18:00	09/04/10 01:48	86-73-7	
Indeno(1,2,3-cd)pyrene	**55.0**	ug/kg	16.3	1	09/02/10 18:00	09/04/10 01:48	193-39-5	
1-Methylnaphthalene	**449**	ug/kg	16.3	1	09/02/10 18:00	09/04/10 01:48	90-12-0	
2-Methylnaphthalene	**463**	ug/kg	16.3	1	09/02/10 18:00	09/04/10 01:48	91-57-6	
Naphthalene	**192**	ug/kg	16.3	1	09/02/10 18:00	09/04/10 01:48	91-20-3	
Phenanthrene	**999**	ug/kg	16.3	1	09/02/10 18:00	09/04/10 01:48	85-01-8	
Pyrene	**522**	ug/kg	16.3	1	09/02/10 18:00	09/04/10 01:48	129-00-0	
2-Fluorobiphenyl (S)	60	%	55-136	1	09/02/10 18:00	09/04/10 01:48	321-60-8	
Terphenyl-d14 (S)	53	%	60-144	1	09/02/10 18:00	09/04/10 01:48	1718-51-0	1n,S0
8260/5035A Volatile Organics	Analytical Method: EPA 8260							
Benzene	ND	ug/kg	8.6	1		08/28/10 15:30	71-43-2	
Ethylbenzene	ND	ug/kg	8.6	1		08/28/10 15:30	100-41-4	
Toluene	ND	ug/kg	8.6	1		08/28/10 15:30	108-88-3	
Xylene (Total)	ND	ug/kg	25.9	1		08/28/10 15:30	1330-20-7	
Dibromofluoromethane (S)	90	%	80-136	1		08/28/10 15:30	1868-53-7	
Toluene-d8 (S)	98	%	80-120	1		08/28/10 15:30	2037-26-5	

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ANALYTICAL RESULTS

Project: BP Oly
Pace Project No.: 254717

Sample: GP2-4-4.5 **Lab ID: 254717005** Collected: 08/25/10 13:50 Received: 08/27/10 10:15 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260/5035A Volatile Organics	Analytical Method: EPA 8260							
4-Bromofluorobenzene (S)	191	%	72-122	1		08/28/10 15:30	460-00-4	S5
1,2-Dichloroethane-d4 (S)	68	%	80-143	1		08/28/10 15:30	17060-07-0	S5
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**59.7**	%	0.10	1		08/31/10 12:57		

Sample: GP8-2-2.5 **Lab ID: 254717006** Collected: 08/25/10 09:55 Received: 08/27/10 10:15 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS SG	Analytical Method: NWTPH-Dx Preparation Method: EPA 3546							
Diesel Range SG	ND	mg/kg	19.3	1	09/02/10 16:05	09/04/10 03:04		
Motor Oil Range SG	ND	mg/kg	77.1	1	09/02/10 16:05	09/04/10 03:04	64742-65-0	
n-Octacosane (S) SG	106	%	50-150	1	09/02/10 16:05	09/04/10 03:04	630-02-4	
o-Terphenyl (S) SG	100	%	50-150	1	09/02/10 16:05	09/04/10 03:04	84-15-1	
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
Gasoline Range Organics	ND	mg/kg	6.2	1	09/01/10 17:00	09/02/10 08:07		
a,a,a-Trifluorotoluene (S)	110	%	50-150	1	09/01/10 17:00	09/02/10 08:07	98-08-8	
4-Bromofluorobenzene (S)	102	%	50-150	1	09/01/10 17:00	09/02/10 08:07	460-00-4	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Arsenic	ND	mg/kg	10.3	5	08/28/10 13:15	08/31/10 10:52	7440-38-2	
Barium	**50.9**	mg/kg	20.7	1	08/28/10 13:15	08/31/10 11:15	7440-39-3	
Cadmium	ND	mg/kg	5.2	5	08/28/10 13:15	08/31/10 10:52	7440-43-9	
Chromium	**26.7**	mg/kg	1.0	1	08/28/10 13:15	08/31/10 11:15	7440-47-3	
Lead	**8.8**	mg/kg	1.0	1	08/28/10 13:15	08/31/10 11:15	7439-92-1	
Selenium	ND	mg/kg	5.2	5	08/28/10 13:15	08/31/10 10:52	7782-49-2	
Silver	ND	mg/kg	5.2	5	08/28/10 13:15	08/31/10 10:52	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	ND	mg/kg	0.096	1	09/01/10 10:10	09/01/10 14:33	7439-97-6	
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546							
Acenaphthene	ND	ug/kg	7.0	1	09/02/10 18:00	09/04/10 00:59	83-32-9	
Acenaphthylene	ND	ug/kg	7.0	1	09/02/10 18:00	09/04/10 00:59	208-96-8	
Anthracene	ND	ug/kg	7.0	1	09/02/10 18:00	09/04/10 00:59	120-12-7	
Benzo(a)anthracene	ND	ug/kg	7.0	1	09/02/10 18:00	09/04/10 00:59	56-55-3	
Benzo(a)pyrene	ND	ug/kg	7.0	1	09/02/10 18:00	09/04/10 00:59	50-32-8	
Benzo(b)fluoranthene	**10.5**	ug/kg	7.0	1	09/02/10 18:00	09/04/10 00:59	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	7.0	1	09/02/10 18:00	09/04/10 00:59	191-24-2	
Benzo(k)fluoranthene	**7.8**	ug/kg	7.0	1	09/02/10 18:00	09/04/10 00:59	207-08-9	
Chrysene	**11.1**	ug/kg	7.0	1	09/02/10 18:00	09/04/10 00:59	218-01-9	

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ANALYTICAL RESULTS

Project: BP Oly
Pace Project No.: 254717

Sample: GP8-2-2.5 **Lab ID: 254717006** Collected: 08/25/10 09:55 Received: 08/27/10 10:15 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546							
Dibenz(a,h)anthracene	ND	ug/kg	7.0	1	09/02/10 18:00	09/04/10 00:59	53-70-3	
Fluoranthene	**15.8**	ug/kg	7.0	1	09/02/10 18:00	09/04/10 00:59	206-44-0	
Fluorene	ND	ug/kg	7.0	1	09/02/10 18:00	09/04/10 00:59	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	7.0	1	09/02/10 18:00	09/04/10 00:59	193-39-5	
1-Methylnaphthalene	**9.0**	ug/kg	7.0	1	09/02/10 18:00	09/04/10 00:59	90-12-0	
2-Methylnaphthalene	**12.5**	ug/kg	7.0	1	09/02/10 18:00	09/04/10 00:59	91-57-6	
Naphthalene	**9.2**	ug/kg	7.0	1	09/02/10 18:00	09/04/10 00:59	91-20-3	
Phenanthrene	**12.7**	ug/kg	7.0	1	09/02/10 18:00	09/04/10 00:59	85-01-8	
Pyrene	**12.4**	ug/kg	7.0	1	09/02/10 18:00	09/04/10 00:59	129-00-0	
2-Fluorobiphenyl (S)	65	%	55-136	1	09/02/10 18:00	09/04/10 00:59	321-60-8	
Terphenyl-d14 (S)	74	%	60-144	1	09/02/10 18:00	09/04/10 00:59	1718-51-0	
8260/5035A Volatile Organics	Analytical Method: EPA 8260							
Benzene	ND	ug/kg	3.0	1		08/28/10 15:49	71-43-2	
Ethylbenzene	ND	ug/kg	3.0	1		08/28/10 15:49	100-41-4	
Toluene	ND	ug/kg	3.0	1		08/28/10 15:49	108-88-3	
Xylene (Total)	ND	ug/kg	9.0	1		08/28/10 15:49	1330-20-7	
Dibromofluoromethane (S)	91	%	80-136	1		08/28/10 15:49	1868-53-7	
Toluene-d8 (S)	91	%	80-120	1		08/28/10 15:49	2037-26-5	
4-Bromofluorobenzene (S)	93	%	72-122	1		08/28/10 15:49	460-00-4	
1,2-Dichloroethane-d4 (S)	80	%	80-143	1		08/28/10 15:49	17060-07-0	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**5.2**	%	0.10	1		08/31/10 20:27		

Sample: GP8-4-4.5 **Lab ID: 254717007** Collected: 08/25/10 10:05 Received: 08/27/10 10:15 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546							
Acenaphthene	ND	ug/kg	7.1	1	09/02/10 18:00	09/04/10 01:15	83-32-9	
Acenaphthylene	ND	ug/kg	7.1	1	09/02/10 18:00	09/04/10 01:15	208-96-8	
Anthracene	ND	ug/kg	7.1	1	09/02/10 18:00	09/04/10 01:15	120-12-7	
Benzo(a)anthracene	ND	ug/kg	7.1	1	09/02/10 18:00	09/04/10 01:15	56-55-3	
Benzo(a)pyrene	ND	ug/kg	7.1	1	09/02/10 18:00	09/04/10 01:15	50-32-8	
Benzo(b)fluoranthene	**8.5**	ug/kg	7.1	1	09/02/10 18:00	09/04/10 01:15	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	7.1	1	09/02/10 18:00	09/04/10 01:15	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	7.1	1	09/02/10 18:00	09/04/10 01:15	207-08-9	
Chrysene	**8.9**	ug/kg	7.1	1	09/02/10 18:00	09/04/10 01:15	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	7.1	1	09/02/10 18:00	09/04/10 01:15	53-70-3	
Fluoranthene	**14.3**	ug/kg	7.1	1	09/02/10 18:00	09/04/10 01:15	206-44-0	
Fluorene	ND	ug/kg	7.1	1	09/02/10 18:00	09/04/10 01:15	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	7.1	1	09/02/10 18:00	09/04/10 01:15	193-39-5	

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ANALYTICAL RESULTS

Project: BP Oly
Pace Project No.: 254717

Sample: GP8-4-4.5 **Lab ID: 254717007** Collected: 08/25/10 10:05 Received: 08/27/10 10:15 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546							
1-Methylnaphthalene	**7.5**	ug/kg	7.1	1	09/02/10 18:00	09/04/10 01:15	90-12-0	
2-Methylnaphthalene	**10.9**	ug/kg	7.1	1	09/02/10 18:00	09/04/10 01:15	91-57-6	
Naphthalene	**8.9**	ug/kg	7.1	1	09/02/10 18:00	09/04/10 01:15	91-20-3	
Phenanthrene	**12.2**	ug/kg	7.1	1	09/02/10 18:00	09/04/10 01:15	85-01-8	
Pyrene	**12.0**	ug/kg	7.1	1	09/02/10 18:00	09/04/10 01:15	129-00-0	
2-Fluorobiphenyl (S)	65	%	55-136	1	09/02/10 18:00	09/04/10 01:15	321-60-8	
Terphenyl-d14 (S)	74	%	60-144	1	09/02/10 18:00	09/04/10 01:15	1718-51-0	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**6.3**	%	0.10	1		08/31/10 20:28		

Sample: GP8-6-6.5 **Lab ID: 254717008** Collected: 08/25/10 10:15 Received: 08/27/10 10:15 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS SG	Analytical Method: NWTPH-Dx Preparation Method: EPA 3546							
Diesel Range SG	ND	mg/kg	22.3	1	09/02/10 16:05	09/04/10 03:20		
Motor Oil Range SG	ND	mg/kg	89.3	1	09/02/10 16:05	09/04/10 03:20	64742-65-0	
n-Octacosane (S) SG	102	%	50-150	1	09/02/10 16:05	09/04/10 03:20	630-02-4	
o-Terphenyl (S) SG	100	%	50-150	1	09/02/10 16:05	09/04/10 03:20	84-15-1	
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
Gasoline Range Organics	ND	mg/kg	6.6	1	09/01/10 17:00	09/02/10 08:31		
a,a,a-Trifluorotoluene (S)	125	%	50-150	1	09/01/10 17:00	09/02/10 08:31	98-08-8	
4-Bromofluorobenzene (S)	120	%	50-150	1	09/01/10 17:00	09/02/10 08:31	460-00-4	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Arsenic	ND	mg/kg	11.8	5	08/28/10 13:15	08/31/10 10:54	7440-38-2	
Barium	**71.8**	mg/kg	23.5	1	08/28/10 13:15	08/31/10 11:24	7440-39-3	
Cadmium	ND	mg/kg	5.9	5	08/28/10 13:15	08/31/10 10:54	7440-43-9	
Chromium	**32.8**	mg/kg	1.2	1	08/28/10 13:15	08/31/10 11:24	7440-47-3	
Lead	**10.1**	mg/kg	1.2	1	08/28/10 13:15	08/31/10 11:24	7439-92-1	
Selenium	ND	mg/kg	5.9	5	08/28/10 13:15	08/31/10 10:54	7782-49-2	
Silver	ND	mg/kg	5.9	5	08/28/10 13:15	08/31/10 10:54	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	ND	mg/kg	0.10	1	09/01/10 10:10	09/01/10 14:35	7439-97-6	
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546							
Acenaphthene	ND	ug/kg	7.7	1	09/02/10 18:00	09/04/10 01:32	83-32-9	
Acenaphthylene	ND	ug/kg	7.7	1	09/02/10 18:00	09/04/10 01:32	208-96-8	
Anthracene	ND	ug/kg	7.7	1	09/02/10 18:00	09/04/10 01:32	120-12-7	
Benzo(a)anthracene	ND	ug/kg	7.7	1	09/02/10 18:00	09/04/10 01:32	56-55-3	

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ANALYTICAL RESULTS

Project: BP Oly
Pace Project No.: 254717

Sample: GP8-6-6.5 **Lab ID: 254717008** Collected: 08/25/10 10:15 Received: 08/27/10 10:15 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546							
Benzo(a)pyrene	ND	ug/kg	7.7	1	09/02/10 18:00	09/04/10 01:32	50-32-8	
Benzo(b)fluoranthene	**8.9**	ug/kg	7.7	1	09/02/10 18:00	09/04/10 01:32	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	7.7	1	09/02/10 18:00	09/04/10 01:32	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	7.7	1	09/02/10 18:00	09/04/10 01:32	207-08-9	
Chrysene	**9.2**	ug/kg	7.7	1	09/02/10 18:00	09/04/10 01:32	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	7.7	1	09/02/10 18:00	09/04/10 01:32	53-70-3	
Fluoranthene	**14.2**	ug/kg	7.7	1	09/02/10 18:00	09/04/10 01:32	206-44-0	
Fluorene	ND	ug/kg	7.7	1	09/02/10 18:00	09/04/10 01:32	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	7.7	1	09/02/10 18:00	09/04/10 01:32	193-39-5	
1-Methylnaphthalene	**10.2**	ug/kg	7.7	1	09/02/10 18:00	09/04/10 01:32	90-12-0	
2-Methylnaphthalene	**14.8**	ug/kg	7.7	1	09/02/10 18:00	09/04/10 01:32	91-57-6	
Naphthalene	**11.2**	ug/kg	7.7	1	09/02/10 18:00	09/04/10 01:32	91-20-3	
Phenanthrene	**13.4**	ug/kg	7.7	1	09/02/10 18:00	09/04/10 01:32	85-01-8	
Pyrene	**11.0**	ug/kg	7.7	1	09/02/10 18:00	09/04/10 01:32	129-00-0	
2-Fluorobiphenyl (S)	69	%	55-136	1	09/02/10 18:00	09/04/10 01:32	321-60-8	
Terphenyl-d14 (S)	79	%	60-144	1	09/02/10 18:00	09/04/10 01:32	1718-51-0	
8260/5035A Volatile Organics	Analytical Method: EPA 8260							
Benzene	ND	ug/kg	3.1	1		08/28/10 16:08	71-43-2	
Ethylbenzene	ND	ug/kg	3.1	1		08/28/10 16:08	100-41-4	
Toluene	ND	ug/kg	3.1	1		08/28/10 16:08	108-88-3	
Xylene (Total)	ND	ug/kg	9.3	1		08/28/10 16:08	1330-20-7	
Dibromofluoromethane (S)	97	%	80-136	1		08/28/10 16:08	1868-53-7	
Toluene-d8 (S)	89	%	80-120	1		08/28/10 16:08	2037-26-5	
4-Bromofluorobenzene (S)	95	%	72-122	1		08/28/10 16:08	460-00-4	
1,2-Dichloroethane-d4 (S)	85	%	80-143	1		08/28/10 16:08	17060-07-0	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**15.1**	%	0.10	1		08/31/10 20:29		

Sample: Trip Blank **Lab ID: 254717009** Collected: 08/25/10 00:00 Received: 08/27/10 10:15 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
Gasoline Range Organics	ND	mg/kg	5.0	1	09/01/10 17:00	09/02/10 05:16		
a,a,a-Trifluorotoluene (S)	109	%	50-150	1	09/01/10 17:00	09/02/10 05:16	98-08-8	
4-Bromofluorobenzene (S)	102	%	50-150	1	09/01/10 17:00	09/02/10 05:16	460-00-4	
8260/5035A Volatile Organics	Analytical Method: EPA 8260							
Benzene	ND	ug/kg	3.0	1		09/03/10 13:13	71-43-2	
Ethylbenzene	ND	ug/kg	3.0	1		09/03/10 13:13	100-41-4	
Toluene	ND	ug/kg	3.0	1		09/03/10 13:13	108-88-3	

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ANALYTICAL RESULTS

Project: BP Oly
Pace Project No.: 254717

Sample: Trip Blank **Lab ID: 254717009** Collected: 08/25/10 00:00 Received: 08/27/10 10:15 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260/5035A Volatile Organics	Analytical Method: EPA 8260							
Xylene (Total)	ND	ug/kg	9.0	1		09/03/10 13:13	1330-20-7	
Dibromofluoromethane (S)	99	%	80-136	1		09/03/10 13:13	1868-53-7	
Toluene-d8 (S)	86	%	80-120	1		09/03/10 13:13	2037-26-5	
4-Bromofluorobenzene (S)	89	%	72-122	1		09/03/10 13:13	460-00-4	
1,2-Dichloroethane-d4 (S)	86	%	80-143	1		09/03/10 13:13	17060-07-0	

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QUALITY CONTROL DATA

Project: BP Oly
Pace Project No.: 254717

QC Batch: OEXT/2608 Analysis Method: NWTPH-Dx
QC Batch Method: EPA 3546 Analysis Description: NWTPH-Dx GCS
Associated Lab Samples: 254717001, 254717002, 254717004, 254717005, 254717006, 254717008

METHOD BLANK: 38791 Matrix: Solid
Associated Lab Samples: 254717001, 254717002, 254717004, 254717005, 254717006, 254717008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diesel Range SG	mg/kg	ND	20.0	09/03/10 21:02	
Motor Oil Range SG	mg/kg	ND	80.0	09/03/10 21:02	
n-Octacosane (S) SG	%	98	50-150	09/03/10 21:02	
o-Terphenyl (S) SG	%	99	50-150	09/03/10 21:02	

LABORATORY CONTROL SAMPLE: 38792

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range SG	mg/kg	500	400	80	56-124	
Motor Oil Range SG	mg/kg	500	450	90	50-150	
n-Octacosane (S) SG	%			98	50-150	
o-Terphenyl (S) SG	%			86	50-150	

SAMPLE DUPLICATE: 38793

Parameter	Units	254681012 Result	Dup Result	RPD	Qualifiers
Diesel Range SG	mg/kg	ND	4J		
Motor Oil Range SG	mg/kg	ND	ND		
n-Octacosane (S) SG	%	98	99	.2	
o-Terphenyl (S) SG	%	100	103	2	

SAMPLE DUPLICATE: 38794

Parameter	Units	254717001 Result	Dup Result	RPD	Qualifiers
Diesel Range SG	mg/kg	30.4	27.9	9	
Motor Oil Range SG	mg/kg	198	191	4	
n-Octacosane (S) SG	%	116	121	6	
o-Terphenyl (S) SG	%	102	105	5	

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QUALITY CONTROL DATA

Project: BP Oly
Pace Project No.: 254717

QC Batch: GCV/1822 | Analysis Method: NWTPH-Gx
QC Batch Method: NWTPH-Gx | Analysis Description: NWTPH-Gx Solid GCV
Associated Lab Samples: 254717001, 254717004, 254717006, 254717008, 254717009

METHOD BLANK: 38655 | Matrix: Solid
Associated Lab Samples: 254717001, 254717004, 254717006, 254717008, 254717009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Gasoline Range Organics	mg/kg	ND	5.0	09/02/10 03:15	
4-Bromofluorobenzene (S)	%	102	50-150	09/02/10 03:15	
a,a,a-Trifluorotoluene (S)	%	108	50-150	09/02/10 03:15	

LABORATORY CONTROL SAMPLE: 38656

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Gasoline Range Organics	mg/kg	12.5	12.7	101	54-156	
4-Bromofluorobenzene (S)	%			104	50-150	
a,a,a-Trifluorotoluene (S)	%			110	50-150	

SAMPLE DUPLICATE: 38929

Parameter	Units	254708007 Result	Dup Result	RPD	Qualifiers
Gasoline Range Organics	mg/kg	ND	2.2J		
4-Bromofluorobenzene (S)	%	100	106	5	
a,a,a-Trifluorotoluene (S)	%	108	113	5	

SAMPLE DUPLICATE: 38930

Parameter	Units	254717004 Result	Dup Result	RPD	Qualifiers
Gasoline Range Organics	mg/kg	ND	3.7J		
4-Bromofluorobenzene (S)	%	96	98	2	
a,a,a-Trifluorotoluene (S)	%	100	103	3	

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QUALITY CONTROL DATA

Project: BP Oly
Pace Project No.: 254717

QC Batch: GCV/1829 — Analysis Method: NWTPH-Gx
QC Batch Method: NWTPH-Gx — Analysis Description: NWTPH-Gx Solid GCV
Associated Lab Samples: 254717002, 254717005

METHOD BLANK: 38891 — Matrix: Solid
Associated Lab Samples: 254717002, 254717005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Gasoline Range Organics	mg/kg	ND	5.0	09/03/10 02:26	
4-Bromofluorobenzene (S)	%	101	50-150	09/03/10 02:26	
a,a,a-Trifluorotoluene (S)	%	112	50-150	09/03/10 02:26	

LABORATORY CONTROL SAMPLE: 38892

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Gasoline Range Organics	mg/kg	12.5	13.5	108	54-156	
4-Bromofluorobenzene (S)	%			112	50-150	
a,a,a-Trifluorotoluene (S)	%			124	50-150	

SAMPLE DUPLICATE: 39037

Parameter	Units	254717005 Result	Dup Result	RPD	Qualifiers
Gasoline Range Organics	mg/kg	264	250	5	
4-Bromofluorobenzene (S)	%	101	129	25	
a,a,a-Trifluorotoluene (S)	%	90	122	30	

SAMPLE DUPLICATE: 39038

Parameter	Units	254721017 Result	Dup Result	RPD	Qualifiers
Gasoline Range Organics	mg/kg	19.6	19.0	3	
4-Bromofluorobenzene (S)	%	117	130	11	
a,a,a-Trifluorotoluene (S)	%	110	125	12	

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QUALITY CONTROL DATA

Project: BP Oly
Pace Project No.: 254717

QC Batch: MPRP/1739 Analysis Method: EPA 6010
QC Batch Method: EPA 3050 Analysis Description: 6010 MET
Associated Lab Samples: 254717001, 254717002, 254717004, 254717005, 254717006, 254717008

METHOD BLANK: 38266 Matrix: Solid
Associated Lab Samples: 254717001, 254717002, 254717004, 254717005, 254717006, 254717008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Arsenic	mg/kg	ND	2.0	08/31/10 10:22	
Barium	mg/kg	ND	20.0	08/31/10 10:22	
Cadmium	mg/kg	ND	1.0	08/31/10 10:22	
Chromium	mg/kg	ND	1.0	08/31/10 10:22	
Lead	mg/kg	ND	1.0	08/31/10 10:22	
Selenium	mg/kg	ND	1.0	08/31/10 10:22	
Silver	mg/kg	ND	1.0	08/31/10 10:22	

LABORATORY CONTROL SAMPLE: 38267

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	mg/kg	25	23.1	92	80-120	
Barium	mg/kg	25	23.4	94	80-120	
Cadmium	mg/kg	25	22.4	90	80-120	
Chromium	mg/kg	25	24.7	99	80-120	
Lead	mg/kg	25	23.0	92	80-120	
Selenium	mg/kg	25	21.9	88	80-120	
Silver	mg/kg	12.5	11.6	92	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 38268 38269

Parameter	Units	254708001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Qual
Arsenic	mg/kg	ND	27.8	27.8	36.0	32.5	109	96	75-125	10	
Barium	mg/kg	67.6	27.8	27.8	110	111	154	154	75-125	.2	M1
Cadmium	mg/kg	ND	27.8	27.8	29.1	25.4	105	91	75-125	14	
Chromium	mg/kg	31.8	27.8	27.8	60.7	60.7	104	104	75-125	.09	
Lead	mg/kg	7.4	27.8	27.8	28.6	30.8	76	84	75-125	7	
Selenium	mg/kg	ND	27.8	27.8	25.7	23.6	92	85	75-125	9	
Silver	mg/kg	ND	13.9	13.9	16.3	13.6	117	98	75-125	18	

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QUALITY CONTROL DATA

Project: BP Oly
Pace Project No.: 254717

QC Batch: MERP/1245 Analysis Method: EPA 7471
QC Batch Method: EPA 7471 Analysis Description: 7471 Mercury
Associated Lab Samples: 254717001, 254717002, 254717004, 254717005, 254717006, 254717008

METHOD BLANK: 38581 Matrix: Solid
Associated Lab Samples: 254717001, 254717002, 254717004, 254717005, 254717006, 254717008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	ND	0.10	09/01/10 14:05	

LABORATORY CONTROL SAMPLE: 38582

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.5	0.51	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 38583 38584

Parameter	Units	254693001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Qual
Mercury	mg/kg	0.034J	.63	.63	0.70	0.72	105	109	80-120	3	

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QUALITY CONTROL DATA

Project: BP Oly
Pace Project No.: 254717

QC Batch: OEXT/2601 — Analysis Method: EPA 8270 by SIM
QC Batch Method: EPA 3546 — Analysis Description: 8270/3546 MSSV PAH by SIM
Associated Lab Samples: 254717001, 254717002, 254717003, 254717004, 254717005, 254717006, 254717007, 254717008

METHOD BLANK: 38719 — Matrix: Solid
Associated Lab Samples: 254717001, 254717002, 254717003, 254717004, 254717005, 254717006, 254717007, 254717008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1-Methylnaphthalene	ug/kg	ND	6.7	09/03/10 20:17	
2-Methylnaphthalene	ug/kg	ND	6.7	09/03/10 20:17	
Acenaphthene	ug/kg	ND	6.7	09/03/10 20:17	
Acenaphthylene	ug/kg	ND	6.7	09/03/10 20:17	
Anthracene	ug/kg	ND	6.7	09/03/10 20:17	
Benzo(a)anthracene	ug/kg	ND	6.7	09/03/10 20:17	
Benzo(a)pyrene	ug/kg	ND	6.7	09/03/10 20:17	
Benzo(b)fluoranthene	ug/kg	ND	6.7	09/03/10 20:17	
Benzo(g,h,i)perylene	ug/kg	ND	6.7	09/03/10 20:17	
Benzo(k)fluoranthene	ug/kg	ND	6.7	09/03/10 20:17	
Chrysene	ug/kg	ND	6.7	09/03/10 20:17	
Dibenz(a,h)anthracene	ug/kg	ND	6.7	09/03/10 20:17	
Fluoranthene	ug/kg	ND	6.7	09/03/10 20:17	
Fluorene	ug/kg	ND	6.7	09/03/10 20:17	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	6.7	09/03/10 20:17	
Naphthalene	ug/kg	ND	6.7	09/03/10 20:17	
Phenanthrene	ug/kg	ND	6.7	09/03/10 20:17	
Pyrene	ug/kg	ND	6.7	09/03/10 20:17	
2-Fluorobiphenyl (S)	%	74	55-136	09/03/10 20:17	
Terphenyl-d14 (S)	%	81	60-144	09/03/10 20:17	

LABORATORY CONTROL SAMPLE: 38720

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1-Methylnaphthalene	ug/kg	133	96.1	72	63-126	
2-Methylnaphthalene	ug/kg	133	95.2	71	60-145	
Acenaphthene	ug/kg	133	98.0	73	44-138	
Acenaphthylene	ug/kg	133	101	76	43-140	
Anthracene	ug/kg	133	103	77	58-138	
Benzo(a)anthracene	ug/kg	133	108	81	50-154	
Benzo(a)pyrene	ug/kg	133	112	84	47-154	
Benzo(b)fluoranthene	ug/kg	133	97.4	73	43-164	
Benzo(g,h,i)perylene	ug/kg	133	108	81	54-153	
Benzo(k)fluoranthene	ug/kg	133	127	96	61-145	
Chrysene	ug/kg	133	99.2	74	59-141	
Dibenz(a,h)anthracene	ug/kg	133	114	86	54-161	
Fluoranthene	ug/kg	133	111	83	43-160	
Fluorene	ug/kg	133	106	79	41-149	
Indeno(1,2,3-cd)pyrene	ug/kg	133	113	85	48-158	
Naphthalene	ug/kg	133	91.4	69	44-131	
Phenanthrene	ug/kg	133	98.0	74	46-144	

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QUALITY CONTROL DATA

Project: BP Oly
Pace Project No.: 254717

LABORATORY CONTROL SAMPLE: 38720

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Pyrene	ug/kg	133	105	79	57-142	
2-Fluorobiphenyl (S)	%			73	55-136	
Terphenyl-d14 (S)	%			80	60-144	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 38721 38722

Parameter	Units	254933001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Qual
1-Methylnaphthalene	ug/kg	ND	133	130	99.9	96.0	75	74	-3.6-171	4	
2-Methylnaphthalene	ug/kg	ND	133	130	102	95.8	76	73	3-188	6	
Acenaphthene	ug/kg	ND	133	130	93.5	95.4	71	74	-1-182	2	
Acenaphthylene	ug/kg	ND	133	130	98.8	98.8	75	76	31-156	.01	
Anthracene	ug/kg	ND	133	130	98.1	93.4	74	72	20-171	5	
Benzo(a)anthracene	ug/kg	ND	133	130	105	99.1	79	77	24-181	6	
Benzo(a)pyrene	ug/kg	ND	133	130	107	102	81	79	26-174	5	
Benzo(b)fluoranthene	ug/kg	ND	133	130	95.6	90.1	72	70	33-173	6	
Benzo(g,h,i)perylene	ug/kg	ND	133	130	105	96.9	79	75	15-178	8	
Benzo(k)fluoranthene	ug/kg	ND	133	130	120	116	91	89	20-167	4	
Chrysene	ug/kg	ND	133	130	96.1	90.3	72	69	15-174	6	
Dibenz(a,h)anthracene	ug/kg	ND	133	130	111	105	84	81	26-189	6	
Fluoranthene	ug/kg	ND	133	130	111	105	82	80	21-104	5	
Fluorene	ug/kg	ND	133	130	105	103	79	80	25-173	1	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	133	130	109	102	82	78	19-182	7	
Naphthalene	ug/kg	ND	133	130	93.2	87.2	69	66	-3-165	7	
Phenanthrene	ug/kg	ND	133	130	99.4	94.5	73	71	25-163	5	
Pyrene	ug/kg	ND	133	130	101	96.1	76	74	30-165	5	
2-Fluorobiphenyl (S)	%						76	76	55-136		
Terphenyl-d14 (S)	%						81	77	60-144		

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QUALITY CONTROL DATA

Project: BP Oly
Pace Project No.: 254717

QC Batch: MSV/2945 | Analysis Method: EPA 8260
QC Batch Method: EPA 8260 | Analysis Description: 8260 MSV 5035A Volatile Organics
Associated Lab Samples: 254717001, 254717002, 254717004

METHOD BLANK: 38202 | Matrix: Solid
Associated Lab Samples: 254717001, 254717002, 254717004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Benzene	ug/kg	ND	3.0	08/27/10 17:05	
Ethylbenzene	ug/kg	ND	3.0	08/27/10 17:05	
Toluene	ug/kg	ND	3.0	08/27/10 17:05	
Xylene (Total)	ug/kg	ND	9.0	08/27/10 17:05	
1,2-Dichloroethane-d4 (S)	%	86	80-143	08/27/10 17:05	
4-Bromofluorobenzene (S)	%	92	72-122	08/27/10 17:05	
Dibromofluoromethane (S)	%	100	80-136	08/27/10 17:05	
Toluene-d8 (S)	%	89	80-120	08/27/10 17:05	

LABORATORY CONTROL SAMPLE & LCSD: 38203 38204

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Benzene	ug/kg	50	49.9	47.5	100	95	75-133	5	30	
Ethylbenzene	ug/kg	50	44.4	42.6	89	85	68-131	4	30	
Toluene	ug/kg	50	45.7	44.5	91	89	73-124	3	30	
Xylene (Total)	ug/kg	150	136	130	91	87	68-130	4	30	
1,2-Dichloroethane-d4 (S)	%				81	82	80-143			
4-Bromofluorobenzene (S)	%				101	99	72-122			
Dibromofluoromethane (S)	%				96	96	80-136			
Toluene-d8 (S)	%				90	92	80-120			

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QUALITY CONTROL DATA

Project: BP Oly
Pace Project No.: 254717

QC Batch: MSV/2946 — Analysis Method: EPA 8260
QC Batch Method: EPA 8260 — Analysis Description: 8260 MSV 5035A Volatile Organics
Associated Lab Samples: 254717005, 254717006, 254717008

METHOD BLANK: 38282 — Matrix: Solid
Associated Lab Samples: 254717005, 254717006, 254717008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Benzene	ug/kg	ND	3.0	08/28/10 14:52	
Ethylbenzene	ug/kg	ND	3.0	08/28/10 14:52	
Toluene	ug/kg	ND	3.0	08/28/10 14:52	
Xylene (Total)	ug/kg	ND	9.0	08/28/10 14:52	
1,2-Dichloroethane-d4 (S)	%	87	80-143	08/28/10 14:52	
4-Bromofluorobenzene (S)	%	92	72-122	08/28/10 14:52	
Dibromofluoromethane (S)	%	100	80-136	08/28/10 14:52	
Toluene-d8 (S)	%	87	80-120	08/28/10 14:52	

LABORATORY CONTROL SAMPLE & LCSD: 38283 — 38284

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Benzene	ug/kg	50	53.1	43.5	106	87	75-133	20	30	
Ethylbenzene	ug/kg	50	47.6	38.7	95	77	68-131	21	30	
Toluene	ug/kg	50	47.9	40.1	96	80	73-124	18	30	
Xylene (Total)	ug/kg	150	144	118	96	79	68-130	20	30	
1,2-Dichloroethane-d4 (S)	%				82	80	80-143			
4-Bromofluorobenzene (S)	%				98	99	72-122			
Dibromofluoromethane (S)	%				98	95	80-136			
Toluene-d8 (S)	%				90	92	80-120			

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QUALITY CONTROL DATA

Project: BP Oly
Pace Project No.: 254717

QC Batch: MSV/2988 — Analysis Method: EPA 8260
QC Batch Method: EPA 8260 — Analysis Description: 8260 MSV 5035A Volatile Organics
Associated Lab Samples: 254717009

METHOD BLANK: 38963 — Matrix: Solid
Associated Lab Samples: 254717009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Benzene	ug/kg	ND	3.0	09/03/10 12:53	
Ethylbenzene	ug/kg	ND	3.0	09/03/10 12:53	
Toluene	ug/kg	ND	3.0	09/03/10 12:53	
Xylene (Total)	ug/kg	ND	9.0	09/03/10 12:53	
1,2-Dichloroethane-d4 (S)	%	96	80-143	09/03/10 12:53	
4-Bromofluorobenzene (S)	%	88	72-122	09/03/10 12:53	
Dibromofluoromethane (S)	%	105	80-136	09/03/10 12:53	
Toluene-d8 (S)	%	83	80-120	09/03/10 12:53	

LABORATORY CONTROL SAMPLE & LCSD: 38964 — 38965

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Benzene	ug/kg	50	55.5	56.5	111	113	75-133	2	30	
Ethylbenzene	ug/kg	50	47.6	47.9	95	96	68-131	.6	30	
Toluene	ug/kg	50	51.0	47.2	102	94	73-124	8	30	
Xylene (Total)	ug/kg	150	147	147	98	98	68-130	.01	30	
1,2-Dichloroethane-d4 (S)	%				85	85	80-143			
4-Bromofluorobenzene (S)	%				97	96	72-122			
Dibromofluoromethane (S)	%				100	105	80-136			
Toluene-d8 (S)	%				92	86	80-120			

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QUALITY CONTROL DATA

Project: BP Oly
Pace Project No.: 254717

QC Batch: PMST/1325 | Analysis Method: ASTM D2974-87
QC Batch Method: ASTM D2974-87 | Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 254717001, 254717002, 254717003, 254717004, 254717005

SAMPLE DUPLICATE: 38489

Parameter	Units	254745001 Result	Dup Result	RPD	Qualifiers
Percent Moisture	%	16.8	16.7	.4	

SAMPLE DUPLICATE: 38490

Parameter	Units	254711002 Result	Dup Result	RPD	Qualifiers
Percent Moisture	%	9.2	10	8	

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QUALITY CONTROL DATA

Project: BP Oly
Pace Project No.: 254717

QC Batch: PMST/1326 — Analysis Method: ASTM D2974-87
QC Batch Method: ASTM D2974-87 — Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 254717006, 254717007, 254717008

SAMPLE DUPLICATE: 38558

Parameter	Units	254748001 Result	Dup Result	RPD	Qualifiers
Percent Moisture	%	5.5	4.5	20	

SAMPLE DUPLICATE: 38559

Parameter	Units	254721004 Result	Dup Result	RPD	Qualifiers
Percent Moisture	%	9.1	8.6	6	

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QUALIFIERS

Project: BP Oly
Pace Project No.: 254717

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

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LABORATORIES

PASI-S	Pace Analytical Services - Seattle

ANALYTE QUALIFIERS

1n	Results for all reported compounds were confirmed by the analysis of an out-of-hold re-extract sample. This sample was associated with an acceptable method blank and LCS, and had passing surrogate recoveries.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
S0	Surrogate recovery outside laboratory control limits.
S5	Surrogate recovery outside control limits due to matrix interferences (not confirmed by re-analysis).

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: BP Oly
Pace Project No.: 254717

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
254717001	**GP1-2-2.5**	EPA 3546	OEXT/2608	NWTPH-Dx	GCSV/1861
254717002	**GP1-4-4.5**	EPA 3546	OEXT/2608	NWTPH-Dx	GCSV/1861
254717004	**GP2-2-2.5**	EPA 3546	OEXT/2608	NWTPH-Dx	GCSV/1861
254717005	**GP2-4-4.5**	EPA 3546	OEXT/2608	NWTPH-Dx	GCSV/1861
254717006	**GP8-2-2.5**	EPA 3546	OEXT/2608	NWTPH-Dx	GCSV/1861
254717008	**GP8-6-6.5**	EPA 3546	OEXT/2608	NWTPH-Dx	GCSV/1861
254717001	**GP1-2-2.5**	NWTPH-Gx	GCV/1822	NWTPH-Gx	GCV/1832
254717002	**GP1-4-4.5**	NWTPH-Gx	GCV/1829	NWTPH-Gx	GCV/1834
254717004	**GP2-2-2.5**	NWTPH-Gx	GCV/1822	NWTPH-Gx	GCV/1832
254717005	**GP2-4-4.5**	NWTPH-Gx	GCV/1829	NWTPH-Gx	GCV/1834
254717006	**GP8-2-2.5**	NWTPH-Gx	GCV/1822	NWTPH-Gx	GCV/1832
254717008	**GP8-6-6.5**	NWTPH-Gx	GCV/1822	NWTPH-Gx	GCV/1832
254717009	**Trip Blank**	NWTPH-Gx	GCV/1822	NWTPH-Gx	GCV/1832
254717001	**GP1-2-2.5**	EPA 3050	MPRP/1739	EPA 6010	ICP/1655
254717002	**GP1-4-4.5**	EPA 3050	MPRP/1739	EPA 6010	ICP/1655
254717004	**GP2-2-2.5**	EPA 3050	MPRP/1739	EPA 6010	ICP/1655
254717005	**GP2-4-4.5**	EPA 3050	MPRP/1739	EPA 6010	ICP/1655
254717006	**GP8-2-2.5**	EPA 3050	MPRP/1739	EPA 6010	ICP/1655
254717008	**GP8-6-6.5**	EPA 3050	MPRP/1739	EPA 6010	ICP/1655
254717001	**GP1-2-2.5**	EPA 7471	MERP/1245	EPA 7471	MERC/1260
254717002	**GP1-4-4.5**	EPA 7471	MERP/1245	EPA 7471	MERC/1260
254717004	**GP2-2-2.5**	EPA 7471	MERP/1245	EPA 7471	MERC/1260
254717005	**GP2-4-4.5**	EPA 7471	MERP/1245	EPA 7471	MERC/1260
254717006	**GP8-2-2.5**	EPA 7471	MERP/1245	EPA 7471	MERC/1260
254717008	**GP8-6-6.5**	EPA 7471	MERP/1245	EPA 7471	MERC/1260
254717001	**GP1-2-2.5**	EPA 3546	OEXT/2601	EPA 8270 by SIM	MSSV/1376
254717002	**GP1-4-4.5**	EPA 3546	OEXT/2601	EPA 8270 by SIM	MSSV/1376
254717003	**GP1-6-6.5**	EPA 3546	OEXT/2601	EPA 8270 by SIM	MSSV/1376
254717004	**GP2-2-2.5**	EPA 3546	OEXT/2601	EPA 8270 by SIM	MSSV/1376
254717005	**GP2-4-4.5**	EPA 3546	OEXT/2601	EPA 8270 by SIM	MSSV/1376
254717006	**GP8-2-2.5**	EPA 3546	OEXT/2601	EPA 8270 by SIM	MSSV/1376
254717007	**GP8-4-4.5**	EPA 3546	OEXT/2601	EPA 8270 by SIM	MSSV/1376
254717008	**GP8-6-6.5**	EPA 3546	OEXT/2601	EPA 8270 by SIM	MSSV/1376
254717001	**GP1-2-2.5**	EPA 8260	MSV/2945		
254717002	**GP1-4-4.5**	EPA 8260	MSV/2945		
254717004	**GP2-2-2.5**	EPA 8260	MSV/2945		
254717005	**GP2-4-4.5**	EPA 8260	MSV/2946		
254717006	**GP8-2-2.5**	EPA 8260	MSV/2946		
254717008	**GP8-6-6.5**	EPA 8260	MSV/2946		
254717009	**Trip Blank**	EPA 8260	MSV/2988		
254717001	**GP1-2-2.5**	ASTM D2974-87	PMST/1325		
254717002	**GP1-4-4.5**	ASTM D2974-87	PMST/1325		
254717003	**GP1-6-6.5**	ASTM D2974-87	PMST/1325		

Pace Analytical Services, Inc.
940 South Harney
Seattle, WA 98108
(206)767-5060

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: BP Oly
Pace Project No.: 254717

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
254717004	**GP2-2-2.5**	ASTM D2974-87	PMST/1325		
254717005	**GP2-4-4.5**	ASTM D2974-87	PMST/1325		
254717006	**GP8-2-2.5**	ASTM D2974-87	PMST/1326		
254717007	**GP8-4-4.5**	ASTM D2974-87	PMST/1326		
254717008	**GP8-6-6.5**	ASTM D2974-87	PMST/1326		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

254717

Page: of

1338853

Section A — **Required** Client Information:

- Company: ARCADIS - Alex Lopez
- Address: 111 SW Columbia Ste 725
- Portland OR 97201
- Email To: Alex Lopez
- Phone: 5032208201 Fax: 5032208209
- Requested Due Date/TAT: Std

Section B — **Required** Project Information:

- Report To: Alex Lopez
- Copy To:
- Purchase Order No.:
- Project Name: BP OLY
- Project Number: GP09BPNAWA60.C0000

Section C — Invoice Information:

- Attention:
- Company Name:
- Address:
- Pace Quote Reference:
- Pace Project Manager:
- Pace Profile #: 22153 / L19L2

REGULATORY AGENCY

- NPDES
- GROUND WATER
- DRINKING WATER
- UST
- RCRA
- OTHER ______

Site Location STATE: WA

Section D — **Required** Client Information

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Matrix Codes — MATRIX / CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Total Metals	NWTPH-Gx	NWTPH-Dx SG	BTEX 8260	cPAHs 8270mod	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	GP1-2-2.5	SL	G			082510	1430		5	X						X	X		X	X	X	X	X		
2	GP1-4-4.5	↓	↓			↓	1445		↓	↓						↓	↓		X	X	X	X	X		
3	GP1-6-6.5						1455																		*HOLD*
4	GP2-2-2.5						1340												X	X	X	X	X		
5	GP2-4-4.5						1350												X	X	X	X	X		
6	~~GP2-6-6.5~~ CM																								
7	GP8-2-2.5	SL	G			082510	0950		5	X						X	X		X	X	X	X	X		
8	GP8-4-4.5	↓	↓			↓	1005		↓	X						X	X								*HOLD*
9	GP8-6-6.5	↓	↓			↓	1015		↓	X						X	X		X	X	X	X	X		
10	TRIP BLANK																			X		X			
11																									
12																									

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
				Jyothi Swamy	8/27/10	10:15	3.8	Y	N	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Colleen Martin

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 082610

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Sample Container Count

Pace Analytical
www.pacelabs.com

CLIENT: Arcadis

COC PAGE 1 of 1

COC ID# 1338853

Sample Line Item	VG9H	AG1H	AG1U	BG1H	BP1U	BP2U	BP3U	BP2N	BP2S	WGFU	WGKU	DG9M	VG9D		Comments
1										1	1	1	2		
2										1	1	1	2		
3										1	1	1	2		
4										1	1	1	2		
5										1	1	1	2		
6										1	1	1	2		
7										1	1	1	2		
8										1	1	1	2		
9												1	2		
10															
11															
12															Trip Blank? yes

AG1H	1 liter HCL amber glass		BP2S	500mL H2SO4 plastic	JGFU	4oz unpreserved amber wide
AG1U	1liter unpreserved amber glass		BP2U	500mL unpreserved plastic	R	terra core kit
AG2S	500mL H2SO4 amber glass		BP2Z	500mL NaOH, Zn Ac	U	Summa Can
AG2U	500mL unpreserved amber glass		BP3C	250mL NaOH plastic	VG9H	40mL HCL clear vial
AG3S	250mL H2SO4 amber glass		BP3N	250mL HNO3 plastic	VG9T	40mL Na Thio. clear vial
BG1H	1 liter HCL clear glass		BP3S	250mL H2SO4 plastic	VG9U	40mL unpreserved clear vial
BG1U	1 liter unpreserved glass		BP3U	250mL unpreserved plastic	VG9W	40mL glass vial preweighted (EPA 5035)
BP1N	1 liter HNO3 plastic		DG9B	40mL Na Bisulfate amber vial	VSG	Headspace septa vial & HCL
BP1S	1 liter H2SO4 plastic		DG9H	40mL HCL amber voa vial	WGFU	4oz clear soil jar
BP1U	1 liter unpreserved plastic		DG9M	40mL MeOH clear vial	WGFX	4oz wide jar w/hexane wipe
BP1Z	1 liter NaOH, Zn, Ac		DG9T	40mL Na Thio amber vial	ZPLC	Ziploc Bag
BP2N	500mL HNO3 plastic		DG9U	40mL unpreserved amber vial		
BP2O	500mL NaOH plastic		I	Wipe/Swab		

Sample Condition Upon Receipt

Pace Analytical

Client Name: Arcadis   Project # 254717

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other PCS

Tracking #: 1335047

Custody Seal on Cooler/Box Present: ☐ Yes ☑ No   Seals intact: ☐ Yes ☐ No

Packing Material: ☑ Bubble Wrap ☐ Bubble Bags ☐ None ☐ Other ______   Temp. Blank Yes (No)

Thermometer Used 132013 or 101731962 or 226099   Type of Ice: (Wet) Blue None   ☐ Samples on ice, cooling process has begun

Cooler Temperature 3.8   Biological Tissue is Frozen: Yes No

Temp should be above freezing ≤ 6°C

Date and Initials of person examining contents: NJS 8/28/10

		Comments:
Chain of Custody Present:	☑ Yes ☐ No ☐ N/A	1.
Chain of Custody Filled Out:	☑ Yes ☐ No ☐ N/A	2.
Chain of Custody Relinquished:	☑ Yes ☐ No ☐ N/A	3.
Sampler Name & Signature on COC:	☑ Yes ☐ No ☐ N/A	4.
Samples Arrived within Hold Time:	☑ Yes ☐ No ☐ N/A	5.
Short Hold Time Analysis (<72hr):	NJS ~~☑ Yes~~ ☑ No ☐ N/A	6. Terracore Kits.
Rush Turn Around Time Requested:	☐ Yes ☑ No ☐ N/A	7.
Sufficient Volume:	☑ Yes ☐ No ☐ N/A	8.
Correct Containers Used:	☑ Yes ☐ No ☐ N/A	9.
-Pace Containers Used:	☑ Yes ☐ No ☐ N/A	
Containers Intact:	☑ Yes ☐ No ☐ N/A	10.
Filtered volume received for Dissolved tests	☐ Yes ☐ No ☑ N/A	11.
Sample Labels match COC: -Includes date/time/ID/Analysis Matrix: Soil	☑ Yes ☐ No ☐ N/A	12.
All containers needing preservation have been checked.	☐ Yes ☐ No ☑ N/A	13. Terracore Kits.
All containers needing preservation are found to be in compliance with EPA recommendation.	☐ Yes ☐ No ☑ N/A	
Exceptions: VOA, coliform, TOC, O&G		Initial when completed / Lot # of added preservative
Samples checked for dechlorination:	☐ Yes ☐ No ☑ N/A	14.
Headspace in VOA Vials (>6mm):	☐ Yes ☐ No ☑ N/A	15.
Trip Blanks Present:	☑ Yes ☐ No ☐ N/A	16.
Trip Blank Custody Seals Present	☐ Yes ☑ No ☐ N/A	
Pace Trip Blank Lot # (if purchased): ______		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: ______ Date/Time: ______

Comments/ Resolution: ______

Project Manager Review: RSM   **Date:** 08/31/10

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

F-SEA-C-021-rev.00 03Aug2010   Pace Analytical Services, Inc - SEA Lab

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Seattle
5755 8th Street East
Tacoma, WA 98424
Tel: (253)922-2310

TestAmerica Job ID: 580-22003-1
Client Project/Site: BP OLY

For:
ARCADIS U.S., Inc.
2300 Eastlake Avenue East
Suite 200
Seattle, Washington 98102

Attn: Alex Lopez

Authorized for release by:
10/15/2010 12:52 PM

Melissa Armstrong
Project Manager I
melissa.armstrong@testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Table of Contents

Job Narrative
580-22003-1

Receipt
The following samples required pH adjustment for Dx in both containers and total metals analysis upon login.
MW-7(10-1-10)
MW-8(10-1-10)
Preservative blank was created and added to workorder upon login for these analsys.
Hydrochloric Acid lot # 50064
Nitric Acid lot # H14024

GC/MS VOA (NWTPH-Gx)
All samples were reanalyzed due to a low Bromofluorobenzene surrogate in the associated CCV.

GC Semi VOA (NWTPH-Dx)
For samples MW-7 (10-01-2010) (580-22003-2), MW-8 (10-01-2010) (580-22003-3), and MW-9 (10-01-2010) (580-22003-4), the results in the C10-C24 range are due to a mixture of heavily weathered diesel fuel and overlap from the results in the gasoline range. The affected analyte ranges are qualified with the "Y" qualifier and repoted.

Metals (6020)
For Lead, the ICP-MS ICSA standard contains trace impurities derived from the manufacturing process, which may cause these standards to fail method QC criteria. Regrettably corrective action can not be performed for any outliers other than to note deficiencies in the laboratory’s QC report section. The data was qualified “^” and reported.

Qualifiers

GC Semi VOA

Qualifier	Qualifier Description
Y	The chromatographic response resembles a typical fuel pattern.

Metals

Qualifier	Qualifier Description
^	ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related QC exceeds the control limits.

Glossary

Glossary	Glossary Description
☼	Listed under the "D" column to designate that the result is reported on a dry weight basis.

Client Sample ID: MW-6R (10-01-10)

Date Collected: 10/01/10 13:55
Date Received: 10/01/10 15:10

Lab Sample ID: 580-22003-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0		ug/L			10/11/10 14:14	1
Ethylbenzene	ND		1.0		ug/L			10/11/10 14:14	1
m-Xylene & p-Xylene	ND		2.0		ug/L			10/11/10 14:14	1
o-Xylene	ND		1.0		ug/L			10/11/10 14:14	1
Toluene	ND		1.0		ug/L			10/11/10 14:14	1
Xylenes, Total	ND		2.0		ug/L			10/11/10 14:14	1

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*98*		*75 - 120*		*10/11/10 14:14*	*1*
Ethylbenzene-d10	*101*		*80 - 120*		*10/11/10 14:14*	*1*
Fluorobenzene (Surr)	*100*		*80 - 120*		*10/11/10 14:14*	*1*
Toluene-d8 (Surr)	*101*		*85 - 120*		*10/11/10 14:14*	*1*
Trifluorotoluene (Surr)	*86*		*80 - 120*		*10/11/10 14:14*	*1*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		50		ug/L			10/13/10 02:57	1

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*97*		*50 - 150*		*10/13/10 02:57*	*1*
Trifluorotoluene (Surr)	*106*		*50 - 150*		*10/13/10 02:57*	*1*
Ethylbenzene-d10	*99*		*50 - 150*		*10/13/10 02:57*	*1*
Fluorobenzene (Surr)	*104*		*50 - 150*		*10/13/10 02:57*	*1*
Toluene-d8 (Surr)	*104*		*50 - 150*		*10/13/10 02:57*	*1*

Method: 8270C SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	**0.010**		0.0097		ug/L		10/06/10 15:47	10/08/10 17:51	1
2-Methylnaphthalene	ND		0.013		ug/L		10/06/10 15:47	10/08/10 17:51	1
1-Methylnaphthalene	ND		0.0097		ug/L		10/06/10 15:47	10/08/10 17:51	1
Acenaphthylene	ND		0.0097		ug/L		10/06/10 15:47	10/08/10 17:51	1
Acenaphthene	ND		0.0097		ug/L		10/06/10 15:47	10/08/10 17:51	1
Fluorene	ND		0.0097		ug/L		10/06/10 15:47	10/08/10 17:51	1
Phenanthrene	ND		0.0097		ug/L		10/06/10 15:47	10/08/10 17:51	1
Anthracene	ND		0.0097		ug/L		10/06/10 15:47	10/08/10 17:51	1
Fluoranthene	**0.013**		0.0097		ug/L		10/06/10 15:47	10/08/10 17:51	1
Pyrene	**0.017**		0.0097		ug/L		10/06/10 15:47	10/08/10 17:51	1
Benzo[a]anthracene	ND		0.0097		ug/L		10/06/10 15:47	10/08/10 17:51	1
Chrysene	**0.011**		0.0097		ug/L		10/06/10 15:47	10/08/10 17:51	1
Benzo[b]fluoranthene	**0.017**		0.0097		ug/L		10/06/10 15:47	10/08/10 17:51	1
Benzo[k]fluoranthene	ND		0.0097		ug/L		10/06/10 15:47	10/08/10 17:51	1
Benzo[a]pyrene	**0.019**		0.019		ug/L		10/06/10 15:47	10/08/10 17:51	1
Indeno[1,2,3-cd]pyrene	**0.011**		0.0097		ug/L		10/06/10 15:47	10/08/10 17:51	1
Dibenz(a,h)anthracene	ND		0.0097		ug/L		10/06/10 15:47	10/08/10 17:51	1
Benzo[g,h,i]perylene	**0.013**		0.0097		ug/L		10/06/10 15:47	10/08/10 17:51	1

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Terphenyl-d14	*74*		*20 - 150*	*10/06/10 15:47*	*10/08/10 17:51*	*1*

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.12		mg/L		10/08/10 14:14	10/11/10 14:58	1

Client: ARCADIS U.S., Inc.
Project/Site: BP OLY

TestAmerica Job ID: 580-22003-1

Client Sample ID: MW-6R (10-01-10)
Date Collected: 10/01/10 13:55
Date Received: 10/01/10 15:10

Lab Sample ID: 580-22003-1
Matrix: Water

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Motor Oil (>C24-C36)	ND		0.24		mg/L		10/08/10 14:14	10/11/10 14:58	1

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*73*		*50 - 150*	*10/08/10 14:14*	*10/11/10 14:58*	*1*

Method: 6020 - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	ND	^	2.0		ug/L		10/12/10 09:55	10/12/10 19:03	5

Method: 6020 - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	ND	^	2.0		ug/L		10/12/10 09:55	10/12/10 20:55	5

1 2 3 4 5 6 7 8 9 10 11

Client Sample ID: MW-7 (10-01-10)

Date Collected: 10/01/10 08:25
Date Received: 10/01/10 15:10

Lab Sample ID: 580-22003-2

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0		ug/L			10/11/10 15:31	1
Ethylbenzene	ND		1.0		ug/L			10/11/10 15:31	1
m-Xylene & p-Xylene	ND		2.0		ug/L			10/11/10 15:31	1
o-Xylene	ND		1.0		ug/L			10/11/10 15:31	1
Toluene	ND		1.0		ug/L			10/11/10 15:31	1
Xylenes, Total	ND		2.0		ug/L			10/11/10 15:31	1

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*98*		*75 - 120*		*10/11/10 15:31*	*1*
Ethylbenzene-d10	*101*		*80 - 120*		*10/11/10 15:31*	*1*
Fluorobenzene (Surr)	*101*		*80 - 120*		*10/11/10 15:31*	*1*
Toluene-d8 (Surr)	*101*		*85 - 120*		*10/11/10 15:31*	*1*
Trifluorotoluene (Surr)	*96*		*80 - 120*		*10/11/10 15:31*	*1*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		50		ug/L			10/13/10 03:23	1

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*99*		*50 - 150*		*10/13/10 03:23*	*1*
Trifluorotoluene (Surr)	*98*		*50 - 150*		*10/13/10 03:23*	*1*
Ethylbenzene-d10	*99*		*50 - 150*		*10/13/10 03:23*	*1*
Fluorobenzene (Surr)	*105*		*50 - 150*		*10/13/10 03:23*	*1*
Toluene-d8 (Surr)	*105*		*50 - 150*		*10/13/10 03:23*	*1*

Method: 8270C SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	**0.086**		0.0097		ug/L		10/06/10 15:47	10/08/10 18:11	1
2-Methylnaphthalene	**0.16**		0.013		ug/L		10/06/10 15:47	10/08/10 18:11	1
1-Methylnaphthalene	**0.23**		0.0097		ug/L		10/06/10 15:47	10/08/10 18:11	1
Acenaphthylene	ND		0.0097		ug/L		10/06/10 15:47	10/08/10 18:11	1
Acenaphthene	**0.051**		0.0097		ug/L		10/06/10 15:47	10/08/10 18:11	1
Fluorene	**0.063**		0.0097		ug/L		10/06/10 15:47	10/08/10 18:11	1
Phenanthrene	**0.048**		0.0097		ug/L		10/06/10 15:47	10/08/10 18:11	1
Anthracene	**0.011**		0.0097		ug/L		10/06/10 15:47	10/08/10 18:11	1
Fluoranthene	**0.010**		0.0097		ug/L		10/06/10 15:47	10/08/10 18:11	1
Pyrene	ND		0.0097		ug/L		10/06/10 15:47	10/08/10 18:11	1
Benzo[a]anthracene	**0.017**		0.0097		ug/L		10/06/10 15:47	10/08/10 18:11	1
Chrysene	ND		0.0097		ug/L		10/06/10 15:47	10/08/10 18:11	1
Benzo[b]fluoranthene	ND		0.0097		ug/L		10/06/10 15:47	10/08/10 18:11	1
Benzo[k]fluoranthene	ND		0.0097		ug/L		10/06/10 15:47	10/08/10 18:11	1
Benzo[a]pyrene	ND		0.019		ug/L		10/06/10 15:47	10/08/10 18:11	1
Indeno[1,2,3-cd]pyrene	ND		0.0097		ug/L		10/06/10 15:47	10/08/10 18:11	1
Dibenz(a,h)anthracene	ND		0.0097		ug/L		10/06/10 15:47	10/08/10 18:11	1
Benzo[g,h,i]perylene	ND		0.0097		ug/L		10/06/10 15:47	10/08/10 18:11	1

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Terphenyl-d14	*75*		*20 - 150*	*10/06/10 15:47*	*10/08/10 18:11*	*1*

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	**0.15**	**Y**	0.12		mg/L		10/08/10 14:14	10/11/10 15:18	1

Client Sample ID: MW-7 (10-01-10)
Lab Sample ID: 580-22003-2
Date Collected: 10/01/10 08:25
Matrix: Water
Date Received: 10/01/10 15:10

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Motor Oil (>C24-C36)	ND		0.25		mg/L		10/08/10 14:14	10/11/10 15:18	1

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*87*		*50 - 150*	*10/08/10 14:14*	*10/11/10 15:18*	*1*

Method: 6020 - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	ND	^	2.0		ug/L		10/12/10 09:55	10/12/10 20:02	5

Method: 6020 - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	ND	^	2.0		ug/L		10/12/10 09:55	10/12/10 21:02	5

Client Sample ID: MW-8 (10-01-10)

Lab Sample ID: 580-22003-3

Date Collected: 10/01/10 09:20
Matrix: Water
Date Received: 10/01/10 15:10

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0		ug/L			10/11/10 16:47	1
Ethylbenzene	ND		1.0		ug/L			10/11/10 16:47	1
m-Xylene & p-Xylene	ND		2.0		ug/L			10/11/10 16:47	1
o-Xylene	ND		1.0		ug/L			10/11/10 16:47	1
Toluene	ND		1.0		ug/L			10/11/10 16:47	1
Xylenes, Total	ND		2.0		ug/L			10/11/10 16:47	1

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*98*		*75 - 120*		*10/11/10 16:47*	*1*
Ethylbenzene-d10	*101*		*80 - 120*		*10/11/10 16:47*	*1*
Fluorobenzene (Surr)	*101*		*80 - 120*		*10/11/10 16:47*	*1*
Toluene-d8 (Surr)	*101*		*85 - 120*		*10/11/10 16:47*	*1*
Trifluorotoluene (Surr)	*87*		*80 - 120*		*10/11/10 16:47*	*1*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		50		ug/L			10/13/10 05:30	1

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*103*		*50 - 150*		*10/13/10 05:30*	*1*
Trifluorotoluene (Surr)	*93*		*50 - 150*		*10/13/10 05:30*	*1*
Ethylbenzene-d10	*100*		*50 - 150*		*10/13/10 05:30*	*1*
Fluorobenzene (Surr)	*106*		*50 - 150*		*10/13/10 05:30*	*1*
Toluene-d8 (Surr)	*105*		*50 - 150*		*10/13/10 05:30*	*1*

Method: 8270C SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	**0.085**		0.0097		ug/L		10/06/10 15:47	10/08/10 18:30	1
2-Methylnaphthalene	**0.038**		0.013		ug/L		10/06/10 15:47	10/08/10 18:30	1
1-Methylnaphthalene	**0.11**		0.0097		ug/L		10/06/10 15:47	10/08/10 18:30	1
Acenaphthylene	ND		0.0097		ug/L		10/06/10 15:47	10/08/10 18:30	1
Acenaphthene	**0.033**		0.0097		ug/L		10/06/10 15:47	10/08/10 18:30	1
Fluorene	**0.029**		0.0097		ug/L		10/06/10 15:47	10/08/10 18:30	1
Phenanthrene	**0.028**		0.0097		ug/L		10/06/10 15:47	10/08/10 18:30	1
Anthracene	**0.018**		0.0097		ug/L		10/06/10 15:47	10/08/10 18:30	1
Fluoranthene	**0.011**		0.0097		ug/L		10/06/10 15:47	10/08/10 18:30	1
Pyrene	**0.0098**		0.0097		ug/L		10/06/10 15:47	10/08/10 18:30	1
Benzo[a]anthracene	ND		0.0097		ug/L		10/06/10 15:47	10/08/10 18:30	1
Chrysene	**0.053**		0.0097		ug/L		10/06/10 15:47	10/08/10 18:30	1
Benzo[b]fluoranthene	ND		0.0097		ug/L		10/06/10 15:47	10/08/10 18:30	1
Benzo[k]fluoranthene	ND		0.0097		ug/L		10/06/10 15:47	10/08/10 18:30	1
Benzo[a]pyrene	ND		0.019		ug/L		10/06/10 15:47	10/08/10 18:30	1
Indeno[1,2,3-cd]pyrene	ND		0.0097		ug/L		10/06/10 15:47	10/08/10 18:30	1
Dibenz(a,h)anthracene	ND		0.0097		ug/L		10/06/10 15:47	10/08/10 18:30	1
Benzo[g,h,i]perylene	ND		0.0097		ug/L		10/06/10 15:47	10/08/10 18:30	1

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Terphenyl-d14	*67*		*20 - 150*	*10/06/10 15:47*	*10/08/10 18:30*	*1*

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	**0.20**	**Y**	0.12		mg/L		10/08/10 14:14	10/11/10 15:38	1

Client: ARCADIS U.S., Inc.
Project/Site: BP OLY

TestAmerica Job ID: 580-22003-1

Client Sample ID: MW-8 (10-01-10)
Date Collected: 10/01/10 09:20
Date Received: 10/01/10 15:10

Lab Sample ID: 580-22003-3
Matrix: Water

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Motor Oil (>C24-C36)	ND		0.24		mg/L		10/08/10 14:14	10/11/10 15:38	1

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*82*		*50 - 150*	*10/08/10 14:14*	*10/11/10 15:38*	*1*

Method: 6020 - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	ND	^	2.0		ug/L		10/12/10 09:55	10/12/10 20:09	5

Method: 6020 - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	ND	^	2.0		ug/L		10/12/10 09:55	10/12/10 21:21	5

Analytical Data

Client: ARCADIS U.S., Inc.
Project/Site: BP OLY

TestAmerica Job ID: 580-22003-1

Client Sample ID: MW-9 (10-01-10)
Date Collected: 10/01/10 10:15
Date Received: 10/01/10 15:10

Lab Sample ID: 580-22003-4
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0		ug/L			10/11/10 17:13	1
Ethylbenzene	ND		1.0		ug/L			10/11/10 17:13	1
m-Xylene & p-Xylene	ND		2.0		ug/L			10/11/10 17:13	1
o-Xylene	ND		1.0		ug/L			10/11/10 17:13	1
Toluene	ND		1.0		ug/L			10/11/10 17:13	1
Xylenes, Total	ND		2.0		ug/L			10/11/10 17:13	1

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*95*		*75 - 120*		*10/11/10 17:13*	*1*
Ethylbenzene-d10	*102*		*80 - 120*		*10/11/10 17:13*	*1*
Fluorobenzene (Surr)	*100*		*80 - 120*		*10/11/10 17:13*	*1*
Toluene-d8 (Surr)	*100*		*85 - 120*		*10/11/10 17:13*	*1*
Trifluorotoluene (Surr)	*99*		*80 - 120*		*10/11/10 17:13*	*1*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	**110**		50		ug/L			10/13/10 05:55	1

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*95*		*50 - 150*		*10/13/10 05:55*	*1*
Trifluorotoluene (Surr)	*106*		*50 - 150*		*10/13/10 05:55*	*1*
Ethylbenzene-d10	*98*		*50 - 150*		*10/13/10 05:55*	*1*
Fluorobenzene (Surr)	*104*		*50 - 150*		*10/13/10 05:55*	*1*
Toluene-d8 (Surr)	*103*		*50 - 150*		*10/13/10 05:55*	*1*

Method: 8270C SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	**0.40**		0.0094		ug/L		10/06/10 15:47	10/08/10 18:50	1
2-Methylnaphthalene	**0.013**		0.012		ug/L		10/06/10 15:47	10/08/10 18:50	1
1-Methylnaphthalene	**0.019**		0.0094		ug/L		10/06/10 15:47	10/08/10 18:50	1
Acenaphthylene	ND		0.0094		ug/L		10/06/10 15:47	10/08/10 18:50	1
Acenaphthene	ND		0.0094		ug/L		10/06/10 15:47	10/08/10 18:50	1
Fluorene	ND		0.0094		ug/L		10/06/10 15:47	10/08/10 18:50	1
Phenanthrene	**0.011**		0.0094		ug/L		10/06/10 15:47	10/08/10 18:50	1
Anthracene	ND		0.0094		ug/L		10/06/10 15:47	10/08/10 18:50	1
Fluoranthene	ND		0.0094		ug/L		10/06/10 15:47	10/08/10 18:50	1
Pyrene	ND		0.0094		ug/L		10/06/10 15:47	10/08/10 18:50	1
Benzo[a]anthracene	ND		0.0094		ug/L		10/06/10 15:47	10/08/10 18:50	1
Chrysene	ND		0.0094		ug/L		10/06/10 15:47	10/08/10 18:50	1
Benzo[b]fluoranthene	ND		0.0094		ug/L		10/06/10 15:47	10/08/10 18:50	1
Benzo[k]fluoranthene	ND		0.0094		ug/L		10/06/10 15:47	10/08/10 18:50	1
Benzo[a]pyrene	ND		0.019		ug/L		10/06/10 15:47	10/08/10 18:50	1
Indeno[1,2,3-cd]pyrene	ND		0.0094		ug/L		10/06/10 15:47	10/08/10 18:50	1
Dibenz(a,h)anthracene	ND		0.0094		ug/L		10/06/10 15:47	10/08/10 18:50	1
Benzo[g,h,i]perylene	ND		0.0094		ug/L		10/06/10 15:47	10/08/10 18:50	1

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Terphenyl-d14	*71*		*20 - 150*	*10/06/10 15:47*	*10/08/10 18:50*	*1*

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	**0.16**	**Y**	0.12		mg/L		10/08/10 14:14	10/11/10 15:57	1

Analytical Data

Client Sample ID: MW-9 (10-01-10)

Lab Sample ID: 580-22003-4

Date Collected: 10/01/10 10:15

Matrix: Water

Date Received: 10/01/10 15:10

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Motor Oil (>C24-C36)	ND		0.25		mg/L		10/08/10 14:14	10/11/10 15:57	1

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*85*		*50 - 150*	*10/08/10 14:14*	*10/11/10 15:57*	*1*

Method: 6020 - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	ND	^	2.0		ug/L		10/12/10 09:55	10/12/10 20:15	5

Method: 6020 - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	ND	^	2.0		ug/L		10/12/10 09:55	10/12/10 21:28	5

Analytical Data

Client: ARCADIS U.S., Inc.
Project/Site: BP OLY

TestAmerica Job ID: 580-22003-1

Client Sample ID: MW-10 (10-01-10)

Date Collected: 10/01/10 11:10
Date Received: 10/01/10 15:10

Lab Sample ID: 580-22003-5
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0		ug/L			10/11/10 17:38	1
Ethylbenzene	ND		1.0		ug/L			10/11/10 17:38	1
m-Xylene & p-Xylene	ND		2.0		ug/L			10/11/10 17:38	1
o-Xylene	ND		1.0		ug/L			10/11/10 17:38	1
Toluene	ND		1.0		ug/L			10/11/10 17:38	1
Xylenes, Total	ND		2.0		ug/L			10/11/10 17:38	1

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*97*		*75 - 120*		*10/11/10 17:38*	*1*
Ethylbenzene-d10	*102*		*80 - 120*		*10/11/10 17:38*	*1*
Fluorobenzene (Surr)	*100*		*80 - 120*		*10/11/10 17:38*	*1*
Toluene-d8 (Surr)	*100*		*85 - 120*		*10/11/10 17:38*	*1*
Trifluorotoluene (Surr)	*99*		*80 - 120*		*10/11/10 17:38*	*1*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		50		ug/L			10/13/10 06:20	1

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*99*		*50 - 150*		*10/13/10 06:20*	*1*
Trifluorotoluene (Surr)	*102*		*50 - 150*		*10/13/10 06:20*	*1*
Ethylbenzene-d10	*99*		*50 - 150*		*10/13/10 06:20*	*1*
Fluorobenzene (Surr)	*105*		*50 - 150*		*10/13/10 06:20*	*1*
Toluene-d8 (Surr)	*104*		*50 - 150*		*10/13/10 06:20*	*1*

Method: 8270C SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	ND		0.0094		ug/L		10/06/10 15:47	10/08/10 19:09	1
2-Methylnaphthalene	ND		0.012		ug/L		10/06/10 15:47	10/08/10 19:09	1
1-Methylnaphthalene	ND		0.0094		ug/L		10/06/10 15:47	10/08/10 19:09	1
Acenaphthylene	ND		0.0094		ug/L		10/06/10 15:47	10/08/10 19:09	1
Acenaphthene	ND		0.0094		ug/L		10/06/10 15:47	10/08/10 19:09	1
Fluorene	ND		0.0094		ug/L		10/06/10 15:47	10/08/10 19:09	1
Phenanthrene	ND		0.0094		ug/L		10/06/10 15:47	10/08/10 19:09	1
Anthracene	ND		0.0094		ug/L		10/06/10 15:47	10/08/10 19:09	1
Fluoranthene	ND		0.0094		ug/L		10/06/10 15:47	10/08/10 19:09	1
Pyrene	ND		0.0094		ug/L		10/06/10 15:47	10/08/10 19:09	1
Benzo[a]anthracene	ND		0.0094		ug/L		10/06/10 15:47	10/08/10 19:09	1
Chrysene	ND		0.0094		ug/L		10/06/10 15:47	10/08/10 19:09	1
Benzo[b]fluoranthene	ND		0.0094		ug/L		10/06/10 15:47	10/08/10 19:09	1
Benzo[k]fluoranthene	ND		0.0094		ug/L		10/06/10 15:47	10/08/10 19:09	1
Benzo[a]pyrene	ND		0.019		ug/L		10/06/10 15:47	10/08/10 19:09	1
Indeno[1,2,3-cd]pyrene	ND		0.0094		ug/L		10/06/10 15:47	10/08/10 19:09	1
Dibenz(a,h)anthracene	ND		0.0094		ug/L		10/06/10 15:47	10/08/10 19:09	1
Benzo[g,h,i]perylene	ND		0.0094		ug/L		10/06/10 15:47	10/08/10 19:09	1

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Terphenyl-d14	*74*		*20 - 150*	*10/06/10 15:47*	*10/08/10 19:09*	*1*

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.12		mg/L		10/08/10 14:14	10/11/10 16:17	1

1 2 3 4 5 6 7 8 9 10 11

Client Sample ID: MW-10 (10-01-10)

Lab Sample ID: 580-22003-5

Date Collected: 10/01/10 11:10

Matrix: Water

Date Received: 10/01/10 15:10

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Motor Oil (>C24-C36)	ND		0.24		mg/L		10/08/10 14:14	10/11/10 16:17	1

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*85*		*50 - 150*	*10/08/10 14:14*	*10/11/10 16:17*	*1*

Method: 6020 - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	ND	^	2.0		ug/L		10/12/10 09:55	10/12/10 20:22	5

Method: 6020 - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	ND	^	2.0		ug/L		10/12/10 09:55	10/12/10 21:35	5

Client Sample ID: MW-11 (10-01-10)
Date Collected: 10/01/10 12:00
Date Received: 10/01/10 15:10

Lab Sample ID: 580-22003-6
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0		ug/L			10/11/10 18:04	1
Ethylbenzene	ND		1.0		ug/L			10/11/10 18:04	1
m-Xylene & p-Xylene	ND		2.0		ug/L			10/11/10 18:04	1
o-Xylene	ND		1.0		ug/L			10/11/10 18:04	1
Toluene	ND		1.0		ug/L			10/11/10 18:04	1
Xylenes, Total	ND		2.0		ug/L			10/11/10 18:04	1

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*98*		*75 - 120*		*10/11/10 18:04*	*1*
Ethylbenzene-d10	*103*		*80 - 120*		*10/11/10 18:04*	*1*
Fluorobenzene (Surr)	*101*		*80 - 120*		*10/11/10 18:04*	*1*
Toluene-d8 (Surr)	*101*		*85 - 120*		*10/11/10 18:04*	*1*
Trifluorotoluene (Surr)	*98*		*80 - 120*		*10/11/10 18:04*	*1*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		50		ug/L			10/13/10 06:46	1

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*99*		*50 - 150*		*10/13/10 06:46*	*1*
Trifluorotoluene (Surr)	*101*		*50 - 150*		*10/13/10 06:46*	*1*
Ethylbenzene-d10	*99*		*50 - 150*		*10/13/10 06:46*	*1*
Fluorobenzene (Surr)	*104*		*50 - 150*		*10/13/10 06:46*	*1*
Toluene-d8 (Surr)	*103*		*50 - 150*		*10/13/10 06:46*	*1*

Method: 8270C SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	**0.012**		0.0098		ug/L		10/06/10 15:47	10/08/10 19:29	1
2-Methylnaphthalene	ND		0.013		ug/L		10/06/10 15:47	10/08/10 19:29	1
1-Methylnaphthalene	ND		0.0098		ug/L		10/06/10 15:47	10/08/10 19:29	1
Acenaphthylene	ND		0.0098		ug/L		10/06/10 15:47	10/08/10 19:29	1
Acenaphthene	ND		0.0098		ug/L		10/06/10 15:47	10/08/10 19:29	1
Fluorene	ND		0.0098		ug/L		10/06/10 15:47	10/08/10 19:29	1
Phenanthrene	ND		0.0098		ug/L		10/06/10 15:47	10/08/10 19:29	1
Anthracene	ND		0.0098		ug/L		10/06/10 15:47	10/08/10 19:29	1
Fluoranthene	ND		0.0098		ug/L		10/06/10 15:47	10/08/10 19:29	1
Pyrene	ND		0.0098		ug/L		10/06/10 15:47	10/08/10 19:29	1
Benzo[a]anthracene	ND		0.0098		ug/L		10/06/10 15:47	10/08/10 19:29	1
Chrysene	ND		0.0098		ug/L		10/06/10 15:47	10/08/10 19:29	1
Benzo[b]fluoranthene	ND		0.0098		ug/L		10/06/10 15:47	10/08/10 19:29	1
Benzo[k]fluoranthene	ND		0.0098		ug/L		10/06/10 15:47	10/08/10 19:29	1
Benzo[a]pyrene	ND		0.020		ug/L		10/06/10 15:47	10/08/10 19:29	1
Indeno[1,2,3-cd]pyrene	ND		0.0098		ug/L		10/06/10 15:47	10/08/10 19:29	1
Dibenz(a,h)anthracene	ND		0.0098		ug/L		10/06/10 15:47	10/08/10 19:29	1
Benzo[g,h,i]perylene	ND		0.0098		ug/L		10/06/10 15:47	10/08/10 19:29	1

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Terphenyl-d14	*69*		*20 - 150*	*10/06/10 15:47*	*10/08/10 19:29*	*1*

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.12		mg/L		10/08/10 14:14	10/11/10 16:37	1

Client Sample ID: MW-11 (10-01-10)

Lab Sample ID: 580-22003-6

Date Collected: 10/01/10 12:00

Matrix: Water

Date Received: 10/01/10 15:10

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Motor Oil (>C24-C36)	ND		0.24		mg/L		10/08/10 14:14	10/11/10 16:37	1

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*83*		*50 - 150*	*10/08/10 14:14*	*10/11/10 16:37*	*1*

Method: 6020 - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	ND	^	2.0		ug/L		10/12/10 09:55	10/12/10 20:29	5

Method: 6020 - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	ND	^	2.0		ug/L		10/12/10 09:58	10/12/10 21:41	5

Client: ARCADIS U.S., Inc.
Project/Site: BP OLY

TestAmerica Job ID: 580-22003-1

Client Sample ID: MW-12 (10-01-10)
Date Collected: 10/01/10 12:50
Date Received: 10/01/10 15:10

Lab Sample ID: 580-22003-7
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0		ug/L			10/11/10 18:29	1
Ethylbenzene	ND		1.0		ug/L			10/11/10 18:29	1
m-Xylene & p-Xylene	ND		2.0		ug/L			10/11/10 18:29	1
o-Xylene	ND		1.0		ug/L			10/11/10 18:29	1
Toluene	ND		1.0		ug/L			10/11/10 18:29	1
Xylenes, Total	ND		2.0		ug/L			10/11/10 18:29	1

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*98*		*75 - 120*		*10/11/10 18:29*	*1*
Ethylbenzene-d10	*102*		*80 - 120*		*10/11/10 18:29*	*1*
Fluorobenzene (Surr)	*100*		*80 - 120*		*10/11/10 18:29*	*1*
Toluene-d8 (Surr)	*101*		*85 - 120*		*10/11/10 18:29*	*1*
Trifluorotoluene (Surr)	*97*		*80 - 120*		*10/11/10 18:29*	*1*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		50		ug/L			10/13/10 07:11	1

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*98*		*50 - 150*		*10/13/10 07:11*	*1*
Trifluorotoluene (Surr)	*101*		*50 - 150*		*10/13/10 07:11*	*1*
Ethylbenzene-d10	*99*		*50 - 150*		*10/13/10 07:11*	*1*
Fluorobenzene (Surr)	*104*		*50 - 150*		*10/13/10 07:11*	*1*
Toluene-d8 (Surr)	*104*		*50 - 150*		*10/13/10 07:11*	*1*

Method: 8270C SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	**0.019**		0.0097		ug/L		10/06/10 15:47	10/08/10 19:48	1
2-Methylnaphthalene	ND		0.013		ug/L		10/06/10 15:47	10/08/10 19:48	1
1-Methylnaphthalene	ND		0.0097		ug/L		10/06/10 15:47	10/08/10 19:48	1
Acenaphthylene	ND		0.0097		ug/L		10/06/10 15:47	10/08/10 19:48	1
Acenaphthene	ND		0.0097		ug/L		10/06/10 15:47	10/08/10 19:48	1
Fluorene	ND		0.0097		ug/L		10/06/10 15:47	10/08/10 19:48	1
Phenanthrene	ND		0.0097		ug/L		10/06/10 15:47	10/08/10 19:48	1
Anthracene	ND		0.0097		ug/L		10/06/10 15:47	10/08/10 19:48	1
Fluoranthene	ND		0.0097		ug/L		10/06/10 15:47	10/08/10 19:48	1
Pyrene	ND		0.0097		ug/L		10/06/10 15:47	10/08/10 19:48	1
Benzo[a]anthracene	ND		0.0097		ug/L		10/06/10 15:47	10/08/10 19:48	1
Chrysene	ND		0.0097		ug/L		10/06/10 15:47	10/08/10 19:48	1
Benzo[b]fluoranthene	ND		0.0097		ug/L		10/06/10 15:47	10/08/10 19:48	1
Benzo[k]fluoranthene	ND		0.0097		ug/L		10/06/10 15:47	10/08/10 19:48	1
Benzo[a]pyrene	ND		0.019		ug/L		10/06/10 15:47	10/08/10 19:48	1
Indeno[1,2,3-cd]pyrene	ND		0.0097		ug/L		10/06/10 15:47	10/08/10 19:48	1
Dibenz(a,h)anthracene	ND		0.0097		ug/L		10/06/10 15:47	10/08/10 19:48	1
Benzo[g,h,i]perylene	ND		0.0097		ug/L		10/06/10 15:47	10/08/10 19:48	1

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Terphenyl-d14	*77*		*20 - 150*	*10/06/10 15:47*	*10/08/10 19:48*	*1*

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.12		mg/L		10/08/10 14:14	10/11/10 16:57	1

Client Sample ID: MW-12 (10-01-10)

Lab Sample ID: 580-22003-7

Date Collected: 10/01/10 12:50

Matrix: Water

Date Received: 10/01/10 15:10

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Motor Oil (>C24-C36)	ND		0.24		mg/L		10/08/10 14:14	10/11/10 16:57	1

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*80*		*50 - 150*	*10/08/10 14:14*	*10/11/10 16:57*	*1*

Method: 6020 - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	ND	^	2.0		ug/L		10/12/10 09:55	10/12/10 20:35	5

Method: 6020 - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	ND	^	2.0		ug/L		10/12/10 09:58	10/12/10 21:48	5

Client Sample ID: DUP-1 (10-01-10)
Lab Sample ID: 580-22003-8

Date Collected: 10/01/10 00:00
Matrix: Water
Date Received: 10/01/10 15:10

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0		ug/L			10/11/10 18:55	1
Ethylbenzene	ND		1.0		ug/L			10/11/10 18:55	1
m-Xylene & p-Xylene	ND		2.0		ug/L			10/11/10 18:55	1
o-Xylene	ND		1.0		ug/L			10/11/10 18:55	1
Toluene	ND		1.0		ug/L			10/11/10 18:55	1
Xylenes, Total	ND		2.0		ug/L			10/11/10 18:55	1

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*96*		*75 - 120*		*10/11/10 18:55*	*1*
Ethylbenzene-d10	*103*		*80 - 120*		*10/11/10 18:55*	*1*
Fluorobenzene (Surr)	*101*		*80 - 120*		*10/11/10 18:55*	*1*
Toluene-d8 (Surr)	*101*		*85 - 120*		*10/11/10 18:55*	*1*
Trifluorotoluene (Surr)	*98*		*80 - 120*		*10/11/10 18:55*	*1*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		50		ug/L			10/13/10 07:37	1

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*101*		*50 - 150*		*10/13/10 07:37*	*1*
Trifluorotoluene (Surr)	*102*		*50 - 150*		*10/13/10 07:37*	*1*
Ethylbenzene-d10	*100*		*50 - 150*		*10/13/10 07:37*	*1*
Fluorobenzene (Surr)	*106*		*50 - 150*		*10/13/10 07:37*	*1*
Toluene-d8 (Surr)	*105*		*50 - 150*		*10/13/10 07:37*	*1*

Method: 8270C SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	**0.020**		0.0096		ug/L		10/06/10 15:47	10/08/10 20:08	1
2-Methylnaphthalene	ND		0.012		ug/L		10/06/10 15:47	10/08/10 20:08	1
1-Methylnaphthalene	ND		0.0096		ug/L		10/06/10 15:47	10/08/10 20:08	1
Acenaphthylene	ND		0.0096		ug/L		10/06/10 15:47	10/08/10 20:08	1
Acenaphthene	ND		0.0096		ug/L		10/06/10 15:47	10/08/10 20:08	1
Fluorene	ND		0.0096		ug/L		10/06/10 15:47	10/08/10 20:08	1
Phenanthrene	ND		0.0096		ug/L		10/06/10 15:47	10/08/10 20:08	1
Anthracene	ND		0.0096		ug/L		10/06/10 15:47	10/08/10 20:08	1
Fluoranthene	ND		0.0096		ug/L		10/06/10 15:47	10/08/10 20:08	1
Pyrene	ND		0.0096		ug/L		10/06/10 15:47	10/08/10 20:08	1
Benzo[a]anthracene	ND		0.0096		ug/L		10/06/10 15:47	10/08/10 20:08	1
Chrysene	ND		0.0096		ug/L		10/06/10 15:47	10/08/10 20:08	1
Benzo[b]fluoranthene	ND		0.0096		ug/L		10/06/10 15:47	10/08/10 20:08	1
Benzo[k]fluoranthene	ND		0.0096		ug/L		10/06/10 15:47	10/08/10 20:08	1
Benzo[a]pyrene	ND		0.019		ug/L		10/06/10 15:47	10/08/10 20:08	1
Indeno[1,2,3-cd]pyrene	ND		0.0096		ug/L		10/06/10 15:47	10/08/10 20:08	1
Dibenz(a,h)anthracene	ND		0.0096		ug/L		10/06/10 15:47	10/08/10 20:08	1
Benzo[g,h,i]perylene	ND		0.0096		ug/L		10/06/10 15:47	10/08/10 20:08	1

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Terphenyl-d14	*64*		*20 - 150*	*10/06/10 15:47*	*10/08/10 20:08*	*1*

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.12		mg/L		10/08/10 14:14	10/11/10 17:17	1

Client Sample ID: DUP-1 (10-01-10)
Date Collected: 10/01/10 00:00
Date Received: 10/01/10 15:10

Lab Sample ID: 580-22003-8
Matrix: Water

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Motor Oil (>C24-C36)	ND		0.24		mg/L		10/08/10 14:14	10/11/10 17:17	1

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*85*		*50 - 150*	*10/08/10 14:14*	*10/11/10 17:17*	*1*

Method: 6020 - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	ND	^	2.0		ug/L		10/12/10 09:55	10/12/10 20:42	5

Method: 6020 - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	ND	^	2.0		ug/L		10/12/10 09:58	10/12/10 21:54	5

Client Sample ID: Preservative Blank

Lab Sample ID: 580-22003-10

Date Collected: 10/05/10 00:00

Matrix: Water

Date Received: 10/05/10 15:10

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.12		mg/L		10/08/10 14:14	10/11/10 17:37	1
Motor Oil (>C24-C36)	ND		0.25		mg/L		10/08/10 14:14	10/11/10 17:37	1

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*79*		*50 - 150*	*10/08/10 14:14*	*10/11/10 17:37*	*1*

Method: 6020 - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	ND	^	2.0		ug/L		10/12/10 09:55	10/12/10 20:48	5

Client: ARCADIS U.S., Inc.
Project/Site: BP OLY

TestAmerica Job ID: 580-22003-1

1 2 3 4 5 6 7 8 9 10 11

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 580-73321/4
Matrix: Water
Analysis Batch: 73321

Client Sample ID: MB 580-73321/4
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0		ug/L			10/11/10 12:07	1
Ethylbenzene	ND		1.0		ug/L			10/11/10 12:07	1
m-Xylene & p-Xylene	ND		2.0		ug/L			10/11/10 12:07	1
o-Xylene	ND		1.0		ug/L			10/11/10 12:07	1
Toluene	ND		1.0		ug/L			10/11/10 12:07	1
Xylenes, Total	ND		2.0		ug/L			10/11/10 12:07	1

Surrogate	*MB % Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*97*		*75 - 120*		*10/11/10 12:07*	*1*
Ethylbenzene-d10	*102*		*80 - 120*		*10/11/10 12:07*	*1*
Fluorobenzene (Surr)	*100*		*80 - 120*		*10/11/10 12:07*	*1*
Toluene-d8 (Surr)	*101*		*85 - 120*		*10/11/10 12:07*	*1*
Trifluorotoluene (Surr)	*99*		*80 - 120*		*10/11/10 12:07*	*1*

Lab Sample ID: LCS 580-73321/5
Matrix: Water
Analysis Batch: 73321

Client Sample ID: LCS 580-73321/5
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	% Rec	% Rec. Limits
Benzene	25.0	22.7		ug/L		91	80 - 120
Ethylbenzene	25.0	24.7		ug/L		99	75 - 125
m-Xylene & p-Xylene	50.0	48.6		ug/L		97	75 - 130
o-Xylene	25.0	25.4		ug/L		101	80 - 120
Toluene	25.0	24.2		ug/L		97	75 - 120

Surrogate	*LCS % Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*98*		*75 - 120*
Ethylbenzene-d10	*100*		*80 - 120*
Fluorobenzene (Surr)	*100*		*80 - 120*
Toluene-d8 (Surr)	*100*		*85 - 120*
Trifluorotoluene (Surr)	*89*		*80 - 120*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Lab Sample ID: MB 580-73471/6
Matrix: Water
Analysis Batch: 73471

Client Sample ID: MB 580-73471/6
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		50		ug/L			10/13/10 00:25	1

Surrogate	*MB % Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*100*		*50 - 150*		*10/13/10 00:25*	*1*
Trifluorotoluene (Surr)	*106*		*50 - 150*		*10/13/10 00:25*	*1*
Ethylbenzene-d10	*99*		*50 - 150*		*10/13/10 00:25*	*1*
Fluorobenzene (Surr)	*104*		*50 - 150*		*10/13/10 00:25*	*1*
Toluene-d8 (Surr)	*104*		*50 - 150*		*10/13/10 00:25*	*1*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC) (Continued)

Lab Sample ID: LCS 580-73471/9
Matrix: Water
Analysis Batch: 73471

Client Sample ID: LCS 580-73471/9
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	% Rec	% Rec. Limits
Gasoline			1000	977		ug/L		98	79 - 110

Surrogate	*LCS % Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*102*		*50 - 150*
Trifluorotoluene (Surr)	*103*		*50 - 150*
Ethylbenzene-d10	*100*		*50 - 150*
Fluorobenzene (Surr)	*99*		*50 - 150*
Toluene-d8 (Surr)	*101*		*50 - 150*

Lab Sample ID: LCSD 580-73471/10
Matrix: Water
Analysis Batch: 73471

Client Sample ID: LCSD 580-73471/10
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	% Rec	% Rec. Limits	RPD	RPD Limit
Gasoline			1000	940		ug/L		94	79 - 110	4	20

Surrogate	*LCSD % Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*101*		*50 - 150*
Trifluorotoluene (Surr)	*97*		*50 - 150*
Ethylbenzene-d10	*100*		*50 - 150*
Fluorobenzene (Surr)	*100*		*50 - 150*
Toluene-d8 (Surr)	*101*		*50 - 150*

Lab Sample ID: 580-22003-2 MS
Matrix: Water
Analysis Batch: 73471

Client Sample ID: MW-7 (10-01-10)
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	% Rec	% Rec. Limits
Gasoline	ND		1160	1110		ug/L		94	50 - 150

Surrogate	*MS % Recovery*	*MS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*100*		*50 - 150*
Trifluorotoluene (Surr)	*96*		*50 - 150*
Ethylbenzene-d10	*100*		*50 - 150*
Fluorobenzene (Surr)	*100*		*50 - 150*
Toluene-d8 (Surr)	*102*		*50 - 150*

Lab Sample ID: 580-22003-2 MSD
Matrix: Water
Analysis Batch: 73471

Client Sample ID: MW-7 (10-01-10)
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	% Rec	% Rec. Limits	RPD	RPD Limit
Gasoline	ND		1160	1100		ug/L		93	50 - 150	1	35

Surrogate	*MSD % Recovery*	*MSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*102*		*50 - 150*
Trifluorotoluene (Surr)	*98*		*50 - 150*
Ethylbenzene-d10	*100*		*50 - 150*
Fluorobenzene (Surr)	*101*		*50 - 150*
Toluene-d8 (Surr)	*103*		*50 - 150*

Method: 8270C SIM - Semivolatile Organic Compounds (GC/MS SIM)

Lab Sample ID: MB 580-73124/1-A
Matrix: Water
Analysis Batch: 73260

Client Sample ID: MB 580-73124/1-A
Prep Type: Total/NA
Prep Batch: 73124

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	ND		0.010		ug/L		10/06/10 14:39	10/08/10 15:55	1
2-Methylnaphthalene	ND		0.013		ug/L		10/06/10 14:39	10/08/10 15:55	1
1-Methylnaphthalene	ND		0.010		ug/L		10/06/10 14:39	10/08/10 15:55	1
Acenaphthylene	ND		0.010		ug/L		10/06/10 14:39	10/08/10 15:55	1
Acenaphthene	ND		0.010		ug/L		10/06/10 14:39	10/08/10 15:55	1
Fluorene	ND		0.010		ug/L		10/06/10 14:39	10/08/10 15:55	1
Phenanthrene	ND		0.010		ug/L		10/06/10 14:39	10/08/10 15:55	1
Anthracene	ND		0.010		ug/L		10/06/10 14:39	10/08/10 15:55	1
Fluoranthene	ND		0.010		ug/L		10/06/10 14:39	10/08/10 15:55	1
Pyrene	ND		0.010		ug/L		10/06/10 14:39	10/08/10 15:55	1
Benzo[a]anthracene	ND		0.010		ug/L		10/06/10 14:39	10/08/10 15:55	1
Chrysene	ND		0.010		ug/L		10/06/10 14:39	10/08/10 15:55	1
Benzo[b]fluoranthene	ND		0.010		ug/L		10/06/10 14:39	10/08/10 15:55	1
Benzo[k]fluoranthene	ND		0.010		ug/L		10/06/10 14:39	10/08/10 15:55	1
Benzo[a]pyrene	ND		0.020		ug/L		10/06/10 14:39	10/08/10 15:55	1
Indeno[1,2,3-cd]pyrene	ND		0.010		ug/L		10/06/10 14:39	10/08/10 15:55	1
Dibenz(a,h)anthracene	ND		0.010		ug/L		10/06/10 14:39	10/08/10 15:55	1
Benzo[g,h,i]perylene	ND		0.010		ug/L		10/06/10 14:39	10/08/10 15:55	1

Surrogate	*MB % Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Terphenyl-d14	*63*		*20 - 150*	*10/06/10 14:39*	*10/08/10 15:55*	*1*

Lab Sample ID: LCS 580-73124/2-A
Matrix: Water
Analysis Batch: 73260

Client Sample ID: LCS 580-73124/2-A
Prep Type: Total/NA
Prep Batch: 73124

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	% Rec	% Rec. Limits
Naphthalene	1.00	0.636		ug/L		64	50 - 125
2-Methylnaphthalene	1.00	0.644		ug/L		64	60 - 130
1-Methylnaphthalene	1.00	0.645		ug/L		64	50 - 125
Acenaphthylene	1.00	0.750		ug/L		75	60 - 140
Acenaphthene	1.00	0.682		ug/L		68	60 - 125
Fluorene	1.01	0.700		ug/L		69	65 - 125
Phenanthrene	1.00	0.713		ug/L		71	60 - 125
Anthracene	1.00	0.762		ug/L		76	60 - 130
Fluoranthene	1.00	0.775		ug/L		77	70 - 140
Pyrene	1.00	0.741		ug/L		74	65 - 130
Benzo[a]anthracene	1.00	0.743		ug/L		74	65 - 125
Chrysene	1.00	0.944		ug/L		94	65 - 125
Benzo[b]fluoranthene	1.00	0.754		ug/L		75	65 - 130
Benzo[k]fluoranthene	1.00	0.967		ug/L		97	65 - 130
Benzo[a]pyrene	1.00	0.839		ug/L		84	65 - 130
Indeno[1,2,3-cd]pyrene	1.00	0.916		ug/L		91	55 - 140
Dibenz(a,h)anthracene	1.00	0.940		ug/L		94	55 - 135
Benzo[g,h,i]perylene	1.00	0.906		ug/L		90	55 - 130

Surrogate	*LCS % Recovery*	*LCS Qualifier*	*Limits*
Terphenyl-d14	*67*		*20 - 150*

Method: 8270C SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Lab Sample ID: LCSD 580-73124/3-A
Matrix: Water
Analysis Batch: 73260

Client Sample ID: LCSD 580-73124/3-A
Prep Type: Total/NA
Prep Batch: 73124

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	% Rec	% Rec. Limits	RPD	RPD Limit
Naphthalene	1.00	0.632		ug/L		63	50 - 125	1	20
2-Methylnaphthalene	1.00	0.640		ug/L		64	60 - 130	1	20
1-Methylnaphthalene	1.00	0.647		ug/L		64	50 - 125	0	20
Acenaphthylene	1.00	0.742		ug/L		74	60 - 140	1	20
Acenaphthene	1.00	0.678		ug/L		68	60 - 125	1	20
Fluorene	1.01	0.698		ug/L		69	65 - 125	0	20
Phenanthrene	1.00	0.735		ug/L		74	60 - 125	3	20
Anthracene	1.00	0.791		ug/L		79	60 - 130	4	20
Fluoranthene	1.00	0.809		ug/L		81	70 - 140	4	20
Pyrene	1.00	0.784		ug/L		78	65 - 130	6	20
Benzo[a]anthracene	1.00	0.765		ug/L		77	65 - 125	3	20
Chrysene	1.00	0.939		ug/L		94	65 - 125	0	20
Benzo[b]fluoranthene	1.00	0.809		ug/L		81	65 - 130	7	20
Benzo[k]fluoranthene	1.00	0.917		ug/L		92	65 - 130	5	20
Benzo[a]pyrene	1.00	0.847		ug/L		85	65 - 130	1	20
Indeno[1,2,3-cd]pyrene	1.00	0.918		ug/L		92	55 - 140	0	20
Dibenz(a,h)anthracene	1.00	0.944		ug/L		94	55 - 135	0	20
Benzo[g,h,i]perylene	1.00	0.900		ug/L		90	55 - 130	1	20

Surrogate	*LCSD % Recovery*	*LCSD Qualifier*	*Limits*
Terphenyl-d14	*72*		*20 - 150*

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Lab Sample ID: MB 580-73267/1-B
Matrix: Water
Analysis Batch: 73312

Client Sample ID: MB 580-73267/1-B
Prep Type: Total/NA
Prep Batch: 73267

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.12		mg/L		10/08/10 14:14	10/11/10 13:19	1
Motor Oil (>C24-C36)	ND		0.25		mg/L		10/08/10 14:14	10/11/10 13:19	1

Surrogate	*MB % Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*86*		*50 - 150*	*10/08/10 14:14*	*10/11/10 13:19*	*1*

Lab Sample ID: LCS 580-73267/2-B
Matrix: Water
Analysis Batch: 73312

Client Sample ID: LCS 580-73267/2-B
Prep Type: Total/NA
Prep Batch: 73267

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	% Rec	% Rec. Limits
#2 Diesel (C10-C24)	5.00	4.11		mg/L		82	70 - 130
Motor Oil (>C24-C36)	5.00	4.60		mg/L		92	70 - 130

Surrogate	*LCS % Recovery*	*LCS Qualifier*	*Limits*
o-Terphenyl	*92*		*50 - 150*

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC) (Continued)

Lab Sample ID: LCSD 580-73267/3-B
Client Sample ID: LCSD 580-73267/3-B
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 73312
Prep Batch: 73267

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	% Rec	% Rec. Limits	RPD	RPD Limit
#2 Diesel (C10-C24)	5.00	3.92		mg/L		78	70 - 130	5	30
Motor Oil (>C24-C36)	5.00	4.39		mg/L		88	70 - 130	5	30

Surrogate	*LCSD % Recovery*	*LCSD Qualifier*	*Limits*
o-Terphenyl	*89*		*50 - 150*

Method: 6020 - Metals (ICP/MS)

Lab Sample ID: MB 580-73409/1-A
Client Sample ID: MB 580-73409/1-A
Matrix: Water
Prep Type: Total Recoverable
Analysis Batch: 73534
Prep Batch: 73409

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	ND	^	2.0		ug/L		10/12/10 09:55	10/12/10 18:50	5

Lab Sample ID: LCS 580-73409/2-A
Client Sample ID: LCS 580-73409/2-A
Matrix: Water
Prep Type: Total Recoverable
Analysis Batch: 73534
Prep Batch: 73409

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	% Rec	% Rec. Limits
Lead	1000	985	^	ug/L		99	80 - 120

Lab Sample ID: LCSD 580-73409/3-A
Client Sample ID: LCSD 580-73409/3-A
Matrix: Water
Prep Type: Total Recoverable
Analysis Batch: 73534
Prep Batch: 73409

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	% Rec	% Rec. Limits	RPD	RPD Limit
Lead	1000	995	^	ug/L		99	80 - 120	1	20

Lab Sample ID: 580-22003-1 MS
Client Sample ID: MW-6R (10-01-10)
Matrix: Water
Prep Type: Total Recoverable
Analysis Batch: 73534
Prep Batch: 73409

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	% Rec	% Rec. Limits
Lead	ND	^	1000	1020	^	ug/L		102	80 - 120

Lab Sample ID: 580-22003-1 MSD
Client Sample ID: MW-6R (10-01-10)
Matrix: Water
Prep Type: Total Recoverable
Analysis Batch: 73534
Prep Batch: 73409

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	% Rec	% Rec. Limits	RPD	RPD Limit
Lead	ND	^	1000	1040	^	ug/L		104	80 - 120	2	20

Lab Sample ID: 580-22003-1 DU
Client Sample ID: MW-6R (10-01-10)
Matrix: Water
Prep Type: Total Recoverable
Analysis Batch: 73534
Prep Batch: 73409

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Lead	ND	^	ND	^	ug/L		3	20

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: BP OLY

TestAmerica Job ID: 580-22003-1

Client Sample ID: MW-6R (10-01-10)

Lab Sample ID: 580-22003-1
Matrix: Water

Date Collected: 10/01/10 13:55
Date Received: 10/01/10 15:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared Or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	73321	10/11/10 14:14	JMB	TestAmerica Seattle
Total/NA	Analysis	NWTPH-Gx		1	73471	10/13/10 02:57	JMB	TestAmerica Seattle
Total/NA	Prep	3520C			73124	10/06/10 15:47	DB	TestAmerica Seattle
Total/NA	Analysis	8270C SIM		1	73260	10/08/10 17:51	BT	TestAmerica Seattle
Total/NA	Prep	3520C			73267	10/08/10 14:14	SP	TestAmerica Seattle
Total/NA	Analysis	NWTPH-Dx		1	73312	10/11/10 14:58	EK	TestAmerica Seattle
Dissolved	Prep	3005A			73409	10/12/10 09:55	SP	TestAmerica Seattle
Dissolved	Analysis	6020		5	73534	10/12/10 20:55	FCW	TestAmerica Seattle
Total Recoverable	Prep	3005A			73409	10/12/10 09:55	SP	TestAmerica Seattle
Total Recoverable	Analysis	6020		5	73534	10/12/10 19:03	FCW	TestAmerica Seattle

Client Sample ID: MW-7 (10-01-10)

Lab Sample ID: 580-22003-2
Matrix: Water

Date Collected: 10/01/10 08:25
Date Received: 10/01/10 15:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared Or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	73321	10/11/10 15:31	JMB	TestAmerica Seattle
Total/NA	Analysis	NWTPH-Gx		1	73471	10/13/10 03:23	JMB	TestAmerica Seattle
Total/NA	Prep	3520C			73124	10/06/10 15:47	DB	TestAmerica Seattle
Total/NA	Analysis	8270C SIM		1	73260	10/08/10 18:11	BT	TestAmerica Seattle
Total/NA	Prep	3520C			73267	10/08/10 14:14	SP	TestAmerica Seattle
Total/NA	Analysis	NWTPH-Dx		1	73312	10/11/10 15:18	EK	TestAmerica Seattle
Dissolved	Prep	3005A			73409	10/12/10 09:55	SP	TestAmerica Seattle
Dissolved	Analysis	6020		5	73534	10/12/10 21:02	FCW	TestAmerica Seattle
Total Recoverable	Prep	3005A			73409	10/12/10 09:55	SP	TestAmerica Seattle
Total Recoverable	Analysis	6020		5	73534	10/12/10 20:02	FCW	TestAmerica Seattle

Client Sample ID: MW-8 (10-01-10)

Lab Sample ID: 580-22003-3
Matrix: Water

Date Collected: 10/01/10 09:20
Date Received: 10/01/10 15:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared Or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	73321	10/11/10 16:47	JMB	TestAmerica Seattle
Total/NA	Analysis	NWTPH-Gx		1	73471	10/13/10 05:30	JMB	TestAmerica Seattle
Total/NA	Prep	3520C			73124	10/06/10 15:47	DB	TestAmerica Seattle
Total/NA	Analysis	8270C SIM		1	73260	10/08/10 18:30	BT	TestAmerica Seattle
Total/NA	Prep	3520C			73267	10/08/10 14:14	SP	TestAmerica Seattle
Total/NA	Analysis	NWTPH-Dx		1	73312	10/11/10 15:38	EK	TestAmerica Seattle
Dissolved	Prep	3005A			73409	10/12/10 09:55	SP	TestAmerica Seattle
Dissolved	Analysis	6020		5	73534	10/12/10 21:21	FCW	TestAmerica Seattle
Total Recoverable	Prep	3005A			73409	10/12/10 09:55	SP	TestAmerica Seattle
Total Recoverable	Analysis	6020		5	73534	10/12/10 20:09	FCW	TestAmerica Seattle

Client Sample ID: MW-9 (10-01-10) Lab Sample ID: 580-22003-4
Date Collected: 10/01/10 10:15 Matrix: Water
Date Received: 10/01/10 15:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared Or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	73321	10/11/10 17:13	JMB	TestAmerica Seattle
Total/NA	Analysis	NWTPH-Gx		1	73471	10/13/10 05:55	JMB	TestAmerica Seattle
Total/NA	Prep	3520C			73124	10/06/10 15:47	DB	TestAmerica Seattle
Total/NA	Analysis	8270C SIM		1	73260	10/08/10 18:50	BT	TestAmerica Seattle
Total/NA	Prep	3520C			73267	10/08/10 14:14	SP	TestAmerica Seattle
Total/NA	Analysis	NWTPH-Dx		1	73312	10/11/10 15:57	EK	TestAmerica Seattle
Dissolved	Prep	3005A			73409	10/12/10 09:55	SP	TestAmerica Seattle
Dissolved	Analysis	6020		5	73534	10/12/10 21:28	FCW	TestAmerica Seattle
Total Recoverable	Prep	3005A			73409	10/12/10 09:55	SP	TestAmerica Seattle
Total Recoverable	Analysis	6020		5	73534	10/12/10 20:15	FCW	TestAmerica Seattle

Client Sample ID: MW-10 (10-01-10) Lab Sample ID: 580-22003-5
Date Collected: 10/01/10 11:10 Matrix: Water
Date Received: 10/01/10 15:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared Or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	73321	10/11/10 17:38	JMB	TestAmerica Seattle
Total/NA	Analysis	NWTPH-Gx		1	73471	10/13/10 06:20	JMB	TestAmerica Seattle
Total/NA	Prep	3520C			73124	10/06/10 15:47	DB	TestAmerica Seattle
Total/NA	Analysis	8270C SIM		1	73260	10/08/10 19:09	BT	TestAmerica Seattle
Total/NA	Prep	3520C			73267	10/08/10 14:14	SP	TestAmerica Seattle
Total/NA	Analysis	NWTPH-Dx		1	73312	10/11/10 16:17	EK	TestAmerica Seattle
Dissolved	Prep	3005A			73409	10/12/10 09:55	SP	TestAmerica Seattle
Dissolved	Analysis	6020		5	73534	10/12/10 21:35	FCW	TestAmerica Seattle
Total Recoverable	Prep	3005A			73409	10/12/10 09:55	SP	TestAmerica Seattle
Total Recoverable	Analysis	6020		5	73534	10/12/10 20:22	FCW	TestAmerica Seattle

Client Sample ID: MW-11 (10-01-10) Lab Sample ID: 580-22003-6
Date Collected: 10/01/10 12:00 Matrix: Water
Date Received: 10/01/10 15:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared Or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	73321	10/11/10 18:04	JMB	TestAmerica Seattle
Total/NA	Analysis	NWTPH-Gx		1	73471	10/13/10 06:46	JMB	TestAmerica Seattle
Total/NA	Prep	3520C			73124	10/06/10 15:47	DB	TestAmerica Seattle
Total/NA	Analysis	8270C SIM		1	73260	10/08/10 19:29	BT	TestAmerica Seattle
Total/NA	Prep	3520C			73267	10/08/10 14:14	SP	TestAmerica Seattle
Total/NA	Analysis	NWTPH-Dx		1	73312	10/11/10 16:37	EK	TestAmerica Seattle
Dissolved	Prep	3005A			73409	10/12/10 09:58	SP	TestAmerica Seattle
Dissolved	Analysis	6020		5	73534	10/12/10 21:41	FCW	TestAmerica Seattle
Total Recoverable	Prep	3005A			73409	10/12/10 09:55	SP	TestAmerica Seattle
Total Recoverable	Analysis	6020		5	73534	10/12/10 20:29	FCW	TestAmerica Seattle

Client Sample ID: MW-12 (10-01-10)

Lab Sample ID: 580-22003-7

Date Collected: 10/01/10 12:50

Matrix: Water

Date Received: 10/01/10 15:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared Or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	73321	10/11/10 18:29	JMB	TestAmerica Seattle
Total/NA	Analysis	NWTPH-Gx		1	73471	10/13/10 07:11	JMB	TestAmerica Seattle
Total/NA	Prep	3520C			73124	10/06/10 15:47	DB	TestAmerica Seattle
Total/NA	Analysis	8270C SIM		1	73260	10/08/10 19:48	BT	TestAmerica Seattle
Total/NA	Prep	3520C			73267	10/08/10 14:14	SP	TestAmerica Seattle
Total/NA	Analysis	NWTPH-Dx		1	73312	10/11/10 16:57	EK	TestAmerica Seattle
Dissolved	Prep	3005A			73409	10/12/10 09:58	SP	TestAmerica Seattle
Dissolved	Analysis	6020		5	73534	10/12/10 21:48	FCW	TestAmerica Seattle
Total Recoverable	Prep	3005A			73409	10/12/10 09:55	SP	TestAmerica Seattle
Total Recoverable	Analysis	6020		5	73534	10/12/10 20:35	FCW	TestAmerica Seattle

Client Sample ID: DUP-1 (10-01-10)

Lab Sample ID: 580-22003-8

Date Collected: 10/01/10 00:00

Matrix: Water

Date Received: 10/01/10 15:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared Or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	73321	10/11/10 18:55	JMB	TestAmerica Seattle
Total/NA	Analysis	NWTPH-Gx		1	73471	10/13/10 07:37	JMB	TestAmerica Seattle
Total/NA	Prep	3520C			73124	10/06/10 15:47	DB	TestAmerica Seattle
Total/NA	Analysis	8270C SIM		1	73260	10/08/10 20:08	BT	TestAmerica Seattle
Total/NA	Prep	3520C			73267	10/08/10 14:14	SP	TestAmerica Seattle
Total/NA	Analysis	NWTPH-Dx		1	73312	10/11/10 17:17	EK	TestAmerica Seattle
Dissolved	Prep	3005A			73409	10/12/10 09:58	SP	TestAmerica Seattle
Dissolved	Analysis	6020		5	73534	10/12/10 21:54	FCW	TestAmerica Seattle
Total Recoverable	Prep	3005A			73409	10/12/10 09:55	SP	TestAmerica Seattle
Total Recoverable	Analysis	6020		5	73534	10/12/10 20:42	FCW	TestAmerica Seattle

Client Sample ID: Preservative Blank

Lab Sample ID: 580-22003-10

Date Collected: 10/05/10 00:00

Matrix: Water

Date Received: 10/05/10 15:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared Or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			73267	10/08/10 14:14	SP	TestAmerica Seattle
Total/NA	Analysis	NWTPH-Dx		1	73312	10/11/10 17:37	EK	TestAmerica Seattle
Total Recoverable	Prep	3005A			73409	10/12/10 09:55	SP	TestAmerica Seattle
Total Recoverable	Analysis	6020		5	73534	10/12/10 20:48	FCW	TestAmerica Seattle

Laboratory	Authority	Program	EPA Region	Certification ID	Expiration Date
TestAmerica Seattle		USDA		P330-08-00099	05/22/11
TestAmerica Seattle	Alaska	Alaska UST	10	UST-022	03/04/11
TestAmerica Seattle	California	NELAC Secondary AB	9	1115CA	01/31/11
TestAmerica Seattle	Florida	NELAC Secondary AB	4	E871074	06/30/11
TestAmerica Seattle	L-A-B	DoD ELAP	0	L2236	01/19/13
TestAmerica Seattle	L-A-B	ISO/IEC 17025	0	L2236	01/19/13
TestAmerica Seattle	Montana	State Program	8		04/30/20
TestAmerica Seattle	Oregon	NELAC Primary AB	10	WA100007	11/06/10
TestAmerica Seattle	Washington	State Program	10	C553	02/17/11

Accreditation may not be offered or required for all methods and analytes reported in this package. Please contact your project manager for the laboratory's current list of certified methods and analytes.

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: BP OLY

TestAmerica Job ID: 580-22003-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-22003-1	MW-6R (10-01-10)	Water	10/01/10 13:55	10/01/10 15:10
580-22003-2	MW-7 (10-01-10)	Water	10/01/10 08:25	10/01/10 15:10
580-22003-3	MW-8 (10-01-10)	Water	10/01/10 09:20	10/01/10 15:10
580-22003-4	MW-9 (10-01-10)	Water	10/01/10 10:15	10/01/10 15:10
580-22003-5	MW-10 (10-01-10)	Water	10/01/10 11:10	10/01/10 15:10
580-22003-6	MW-11 (10-01-10)	Water	10/01/10 12:00	10/01/10 15:10
580-22003-7	MW-12 (10-01-10)	Water	10/01/10 12:50	10/01/10 15:10
580-22003-8	DUP-1 (10-01-10)	Water	10/01/10 00:00	10/01/10 15:10
580-22003-10	Preservative Blank	Water	10/05/10 00:00	10/05/10 15:10

Seattle/Tacoma
5755 8th Street East

Tacoma, WA 98424
phone 253.922.2310 fax 253.922.5047

10/001-SL1

Chain of Custody Record

22003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Client Contact	Project Manager: Alexander Lopez III	Site Contact: Blaine Tech	Date: 10/1/10	COC No:
ARCADIS	Tel/Fax: 503.220.8201 x 1122	Lab Contact: Curtis Armstrong	Carrier: Blaine Tech	1 of 1 COCs
111 SW Columbia Street, Suite 725	Analysis Turnaround Time			Job No.
Portland, OR 97201	Calendar (C) or Work Days (W) ______			
Phone: 503.220.8201 x 1122	TAT if different from Below ______			
Fax: 503.220.8209	[X] 2 weeks			SDG No.
Project Name: BP OLY	[ ] 1 week			
Site: 1117 W. Bay Dr, Olympia, Washington	[ ] 2 days			
Arcadis Project # GP09BPNA.WA60.N0000	[ ] 1 day			

	Sample Identification	Sample Date	Sample Time	Sample Type	Matrix	# of Cont.	Filtered Sample	TPH-G by NWTPH-Gx	TPH-D by NWTPH-Dx w/ silica gel clean	BTEX by 8260B	PAHs by 8270mod	Dissolved Metals	Total Metals by 6000/7000 series	Sample Specific Notes:
1	MW-6R (10-01-10)	10/1/10	1355	Grab	W	11		X	X	X	X	X	X	1,2,4
2	MW-7 (10-01-10)		0825	Grab	W	11		X	X	X	X	X	X	1,2,4
3	MW-8 (10-01-10)		0920	Grab	W	11		X	X	X	X	X	X	1,2,4
4	MW-9 (10-01-10)		1015	Grab	W	11		X	X	X	X	X	X	1,2,4
5	MW-10 (10-01-10)		1110	Grab	W	11		X	X	X	X	X	X	1,2,4
6	MW-11 (10-01-10)		1200	Grab	W	11		X	X	X	X	X	X	1,2,4
7	MW-12 (10-01-10)		1250	Grab	W	11		X	X	X	X	X	X	1,2,4
8	Dup -1 (10-01-10)		—	Grab	W	11		X	X	X	X	X	X	1,2,4
9	TB-1 (10-01-10)		0730		W	2				X				Hold

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other ______

Possible Hazard Identification

[ ] *Non-Hazard* [ ] *Flammable* [ ] *Skin Irritant* [ ] *Poison B* [ ] *Unknown*

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

[ ] *Return To Client* [X] *Disposal By Lab* [ ] *Archive For* ______ *Months*

Special Instructions/QC Requirements & Comments:

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	BTS	10/1/10	Khasl	TA	10/1/10 1510

Arcadis / Blaine tech

) Lab______ Temp 10.2 TB______
ooler Dsc Lg B/G Wet/Packs
acking None

) Lab______ Temp 9.7 TB______
ooler Dsc Lg B/G Wet/Packs
acking None

) Lab______ Temp 11.1 TB______
ooler Dsc Lg B/W Wet/Packs
acking None
w/o cs

Login Sample Receipt Check List

Client: ARCADIS U.S., Inc.

Job Number: 580-22003-1

Login Number: 22003

List Source: TestAmerica Seattle

Creator: Presley, Kim

List Number: 1

Question	T / F/ NA	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	no name
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	

ARCADIS

Appendix **F**

Groundwater Monitoring and Field Data Sheets

WELL GAUGING DATA

Project # 101001-SL1 Date 10/1/10 Client Shell

Site 1117 W. Bay, Olympia

Well ID	Time	Well Size (in.)	Sheen / Odor	Depth to Immiscible Liquid (ft.)	Thickness of Immiscible Liquid (ft.)	Volume of Immiscibles Removed (ml)	Depth to water (ft.)	Depth to well bottom (ft.)	Survey Point: TOB or TOC	Notes
MW-6R	0750	2				[illegible]	2.42	12.49		
MW-7	0734	2					4.80	13.10		
MW-8	0737	2					3.93	13.20		
MW-9	0740	2					3.21	13.25		
MW-10	0742	2					3.56	13.20		
MW-11	0745	2					2.75	13.14		
MW-12	0747	2					2.63	12.70		

BP LOW FLOW WELL MONITORING DATA SHEET

Project #: 101001-SL1	Station # BPOLY
Sampler: SL	Start Date: 10/01/10
Well I.D.: MW-6R	Well Diameter: 2 3 4 6 8 ___
Total Well Depth: 12.49	Depth to Water Pre: 2.42 Post: 2.45
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: PVC Grade	Flow Cell Type: **YSI 556 MPS / YSI 550A**

Purge Method: 2" Grundfos Pump ~~Peristaltic~~ Pump Bladder Pump
Sampling Method: Dedicated Tubing ~~New~~ Tubing Other___
Flow Rate: 100 ml/m
Pump Depth: 8'

Time	Temp. (°C or °F)	pH	Cond. (mS or µS)	Turbidity (NTUs)	D.O. (mg/L)	ORP (mV)	Water Removed (gals. or ml)	DTW
1343	13.52	7.17	148	15	1.73	194.8	300	2.45
1346	12.84	7.02	145	10	1.64	197.4	600	2.45
1349	12.92	6.96	149	6	1.53	159.9	900	2.45
1352	12.97	6.94	145	5	1.49	158.7	1200	2.45
1355	12.98	6.94	145	4	1.47	158.9	1500	2.45

[Ferrous Iron]Fe = [Nitrate]NH3 = Sulfide =

Did well dewater? Yes No

Amount actually evacuated: 1.5 l

Sampling Time: 1355

Sampling Date: 10/1/10

Sample I.D.: MW-6R(10-01-10)

Laboratory: TEST AMERICA

Analyzed for: See COC

Equipment Blank I.D.: @ Time

Duplicate I.D.:

BP LOW FLOW WELL MONITORING DATA SHEET

Project #: 101001-SL1	Station # BPOLY
Sampler: SL	Start Date: 10/01/10
Well I.D.: MW-7	Well Diameter: 2 3 4 6 8 ___
Total Well Depth: 13.10	Depth to Water Pre: 4.80 Post: 5.72
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: PVC Grade	Flow Cell Type: **YSI 556 MPS / YSI 550A**

Purge Method: 2" Grundfos Pump ~~Peristaltic~~ Pump Bladder Pump

Sampling Method: Dedicated Tubing ~~New~~ Tubing Other____

Flow Rate: 100 ml/m Pump Depth: 9'

Time	Temp. (°C or °F)	pH	Cond. (mS or µS)	Turbidity (NTUs)	D.O. (mg/L)	ORP (mV)	Water Removed (gals. or ml)	DTW
0808	13.46	5.99	1801	42	3.92	227.7	300	5.00
0811	13.40	5.94	1806	30	3.24	221.9	600	5.04
0814	13.35	5.93	1802	18	2.80	217.3	1200	5.08
0817	13.38	5.93	1799	11	1.98	207.1	1500	5.12
0820	13.30	5.92	1796	10	1.90	204.3	1800	5.17
0823	13.32	5.92	1795	9	1.88	202.2	2100	5.22

[Ferrous Iron]Fe =	[Nitrate]NH3 =	Sulfide =

Did well dewater? Yes No

Amount actually evacuated: 2.1 l

Sampling Time: 0825

Sampling Date: 10/1/10

Sample I.D.: MW-7 (10-01-10)

Laboratory: TEST AMERICA

Analyzed for: See COC

Equipment Blank I.D.: @ Time

Duplicate I.D.:

BP LOW FLOW WELL MONITORING DATA SHEET

Project #: 101001-SLI	Station # BPOLY
Sampler: SL	Start Date: 10/01/10
Well I.D.: MW-8	Well Diameter: 2 3 4 6 8 ___
Total Well Depth: 19.20	Depth to Water Pre: 3.93 Post: 5.69
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: PVC Grade	Flow Cell Type: **YSI 556 MPS / YSI 550A**

Purge Method: 2" Grundfos Pump ~~Peristaltic Pump~~ Bladder Pump

Sampling Method: Dedicated Tubing ~~New~~ Tubing Other___

Flow Rate: 100 ml/m Pump Depth: 9'

Time	Temp. (°C or °F)	pH	Cond. (mS or uS)	Turbidity (NTUs)	D.O. (mg/L)	ORP (mV)	Water Removed (gals. or ml)	DTW
0904	12.97	6.08	2786	26	2.19	169.8	300	4.02
0907	12.97	6.05	2759	18	1.40	170.8	600	4.13
0910	13.03	6.03	2724	12	1.38	170.1	900	4.21
0913	13.05	6.03	2713	12	1.33	169.7	1200	4.31
0916	13.07	6.02	2710	11	1.31	169.5	1500	4.40

[Ferrous Iron]Fe =	[Nitrate]NH3 =	Sulfide =

Did well dewater? Yes No

Amount actually evacuated: 3.0 L

Sampling Time: 0920

Sampling Date: 10/1/10

Sample I.D.: MW-8 (10-01-10)

Laboratory: TEST AMERICA

Analyzed for: See COC

Equipment Blank I.D.: @ Time

Duplicate I.D.:

BP LOW FLOW WELL MONITORING DATA SHEET

Project #: 101001-SL1	Station # BPOLY
Sampler: SL	Start Date: 10/01/10
Well I.D.: MW-9	Well Diameter: 2 3 4 6 8 ___
Total Well Depth: 13.25	Depth to Water Pre: 3.21 Post: 4.96
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: PVC Grade	Flow Cell Type: **YSI 556 MPS / YSI 550A**

Purge Method: 2" Grundfos Pump ~~Peristaltic~~ Pump Bladder Pump

Sampling Method: Dedicated Tubing ~~New~~ Tubing Other______

Flow Rate: 100 ml/m Pump Depth: 8'

Time	Temp. (°C or °F)	pH	Cond. (mS or µS)	Turbidity (NTUs)	D.O. (mg/L)	ORP (mV)	Water Removed (gals. or ml)	DTW
0959	12.49	6.35	472	8	2.08	163.4	300	3.31
1002	12.51	5.94	316	6	0.93	172.8	600	3.41
1005	12.40	5.76	253	5	0.62	176.0	900	3.52
1008	12.39	5.65	226	5	0.57	179.3	1200	3.62
1011	12.43	5.59	220	4	0.57	180.5	1500	3.71
1014	12.45	5.57	220	3	0.97	182.3	1800	3.82

[Ferrous Iron]Fe =	[Nitrate]NH3 =	Sulfide =

Did well dewater? Yes No

Amount actually evacuated: 1.8 l

Sampling Time: 1015

Sampling Date: 10/1/10

Sample I.D.: MW-9 (10-01-10)

Laboratory: TEST AMERICA

Analyzed for: See COC

Equipment Blank I.D.: @ Time

Duplicate I.D.:

BP LOW FLOW WELL MONITORING DATA SHEET

Project #: 101001-SLI	Station # BPOLY
Sampler: SL	Start Date: 10/01/10
Well I.D.: MW-10	Well Diameter: 2 3 4 6 8 ___
Total Well Depth: 13.20	Depth to Water Pre: 3.56 Post: 3.91
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: PVC Grade	Flow Cell Type: **YSI 556 MPS / YSI 550A**

Purge Method: 2" Grundfos Pump ~~Peristaltic~~ Pump Bladder Pump

Sampling Method: Dedicated Tubing ~~New~~ Tubing Other___

Flow Rate: 100 ml/m Pump Depth: 9'

Time	Temp. (°C or °F)	pH	Cond. (mS or µS)	Turbidity (NTUs)	D.O. (mg/L)	ORP (mV)	Water Removed (gals. or ml)	DTW
1053	13.29	6.62	252	33	2.74	165.4	300	3.70
1056	12.98	6.68	214	25	0.94	145.6	600	3.84
1059	13.06	6.69	196	14	0.98	140.7	900	3.91
1102	13.20	6.66	188	8	0.98	140.4	1200	3.91
1105	13.26	6.64	185	7	1.00	139.6	1500	3.91
1108	13.28	6.63	185	8	1.02	139.4	1800	3.91

[Ferrous Iron]Fe =	[Nitrate]NH3 =	Sulfide =

Did well dewater? Yes No — Amount actually evacuated: 1.8L

Sampling Time: 1110 — Sampling Date: 10/1/10

Sample I.D.: MW-10 (10-01-10) — Laboratory: TEST AMERICA

Analyzed for: See COC

Equipment Blank I.D.: @ Time — Duplicate I.D.:

BP LOW FLOW WELL MONITORING DATA SHEET

Project #: 101001-SLI	Station # BPOLY
Sampler: SL	Start Date: 10/01/10
Well I.D.: MW-11	Well Diameter: 2 3 4 6 8 ___
Total Well Depth: 13.14	Depth to Water Pre: 2.75 Post: 2.85
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: PVC Grade	Flow Cell Type: **YSI 556 MPS / YSI 550A**

Purge Method: 2" Grundfos Pump Peristaltic Pump Bladder Pump

Sampling Method: Dedicated Tubing New Tubing Other______

Flow Rate: 100 ml/m

Pump Depth:______

Time	Temp. (°C or °F)	pH	Cond. (mS or µS)	Turbidity (NTUs)	D.O. (mg/L)	ORP (mV)	Water Removed (gals. or ml)	DTW
1144	14.92	6.83	187	31	2.88	145.2	300	2.81
1147	13.92	6.66	182	21	1.67	149.6	600	2.85
1150	13.96	6.61	179	9	1.56	149.8	900	2.85
1153	13.89	6.53	176	9	1.54	149.8	1200	2.85
1156	13.90	6.49	175	8	1.53	150.1	1500	2.85
1159	13.93	6.48	175	7	1.52	150.4	1800	2.85

[Ferrous Iron]Fe = [Nitrate]NH3 = Sulfide =

Did well dewater? Yes No

Amount actually evacuated: 1.8 l

Sampling Time: 1200

Sampling Date: 10/1/10

Sample I.D.: MW-11 (10-01-10)

Laboratory: TEST AMERICA

Analyzed for: See COC

Equipment Blank I.D.: @ Time

Duplicate I.D.:

BP LOW FLOW WELL MONITORING DATA SHEET

Project #: 101001-SL1	Station # BPOLY
Sampler: SL	Start Date: 10/01/10
Well I.D.: MW-12	Well Diameter: 2 3 4 6 8 ___
Total Well Depth: 12.70	Depth to Water Pre: 2.67 Post: 2.70
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: PVC Grade	Flow Cell Type: **YSI 556 MPS / YSI 550A**

Purge Method: 2" Grundfos Pump ~~Peristaltic~~ Pump Bladder Pump

Sampling Method: Dedicated Tubing ~~New~~ Tubing Other___

Flow Rate: 100 ml/M Pump Depth: 8'

Time	Temp. (°C or °F)	pH	Cond. (mS or µS)	Turbidity (NTUs)	D.O. (mg/L)	ORP (mV)	Water Removed (gals. or ml)	DTW
1236	14.41	6.91	180	11	2.63	150.2	300	2.70
1239	13.98	6.77	177	9	2.26	156.1	600	2.70
1242	13.99	6.66	174	7	1.82	153.2	900	2.70
1249	14.07	6.64	174	6	1.80	153.3	1200	2.70
1248	14.08	6.64	174	5	1.81	153.2	1500	2.70

[Ferrous Iron]Fe = [Nitrate]NH3 = Sulfide =

Did well dewater? Yes No Amount actually evacuated: 1.5L

Sampling Time: 1250 Sampling Date: 10/1/10

Sample I.D.: MW-12(10-01-10) Laboratory: TEST AMERICA

Analyzed for: See COC

Equipment Blank I.D.: @ Time Duplicate I.D.: DUP-1(@10-01-10)

[illegible]

ARCADIS

Groundwater Monitoring Well Gauging Form

g@high = 5:30
gts@low = 12:15

Site ID: WA-BP OLY

Project #: GP09BPNA.WA60.N0000

Site Address: 1117 West Bay Dr., Olympia, WA

Date: 6.2.2011

High Tide

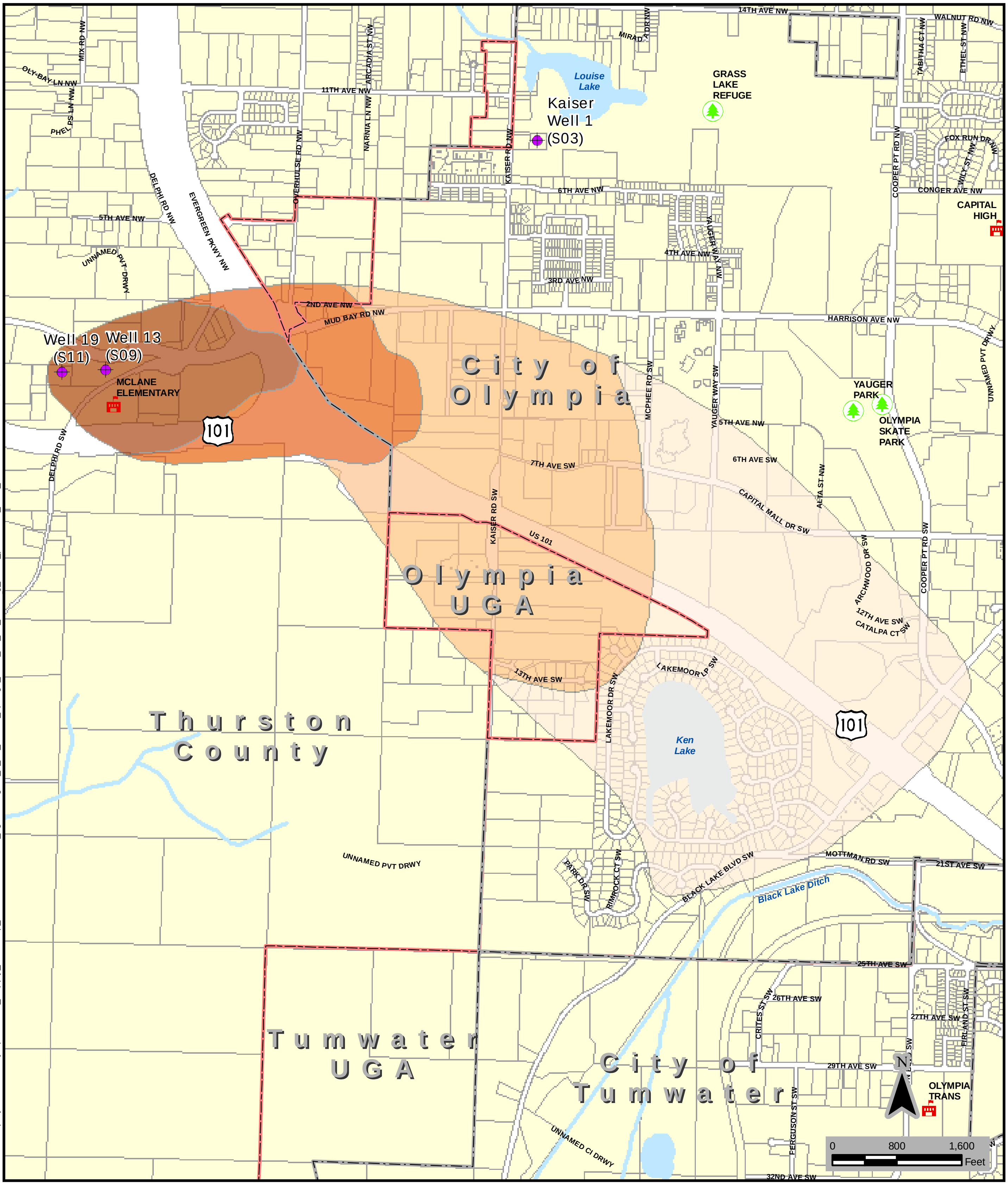
Well ID	Time	Sheen/ Odor	LNAPL Depth	LNAPL Thinkness	DTW	TD	Notes
MW-6	0520	N	Ø	Ø	4.10	NM	Stick up 2" PID = 0.0
MW-6R	0525	N	Ø	Ø	2.01		3 of 3 good PID = 0.0
MW-7	0530	N	Ø	Ø	4.80		3 of 3 good PID = 0.0
MW-8	0533	N	Ø	Ø	3.61		3 of 3 good PID = 0.0
MW-9	0537	N	Ø	Ø	3.97		3 of 3 good PID = 0.0
MW-10	0541	N	Ø	Ø	3.19		3 of 3 good PID = 0.0
MW-11	0544	N	Ø	Ø	1.96		3 of 3 good PID = 0.0
MW-12	0545	N	Ø	Ø	1.89		3 of 3 good PID = 0.0
MW-6	1215	N	Ø	Ø	4.16		SAME AS ABOVE
MW-6R	1218	N	Ø	Ø	2.08		
MW-7	1224	N	Ø	Ø	4.90		
MW-8	1230	N	Ø	Ø	3.64		
MW-9	1234	N	Ø	Ø	3.69		
MW-10	1239	N	Ø	Ø	3.02		
MW-11	1242	N	Ø	Ø	2.12		
MW-12	1245	N	Ø	Ø	2.01		

ARCADIS

Appendix **G**

Drinking Water Protection Area Maps

D:\GISDATA\projects\wash\Olympia\Water_Supply_Plan\map_docs\mxd\Wellhead_figures\Figure_8_10_allison_springs_wells_13_19_drinking_water_protection_area_2008.mxd - 5/21/2008 @ 7:45:29 AM



Legend

- Olympia Production Well

Time-of-Travel Zone

- 0.5 Year
- 1 Year
- 5 Year
- 10 Year

- Park
- School
- City Limits
- Urban Growth Area
- Water Body
- Stream

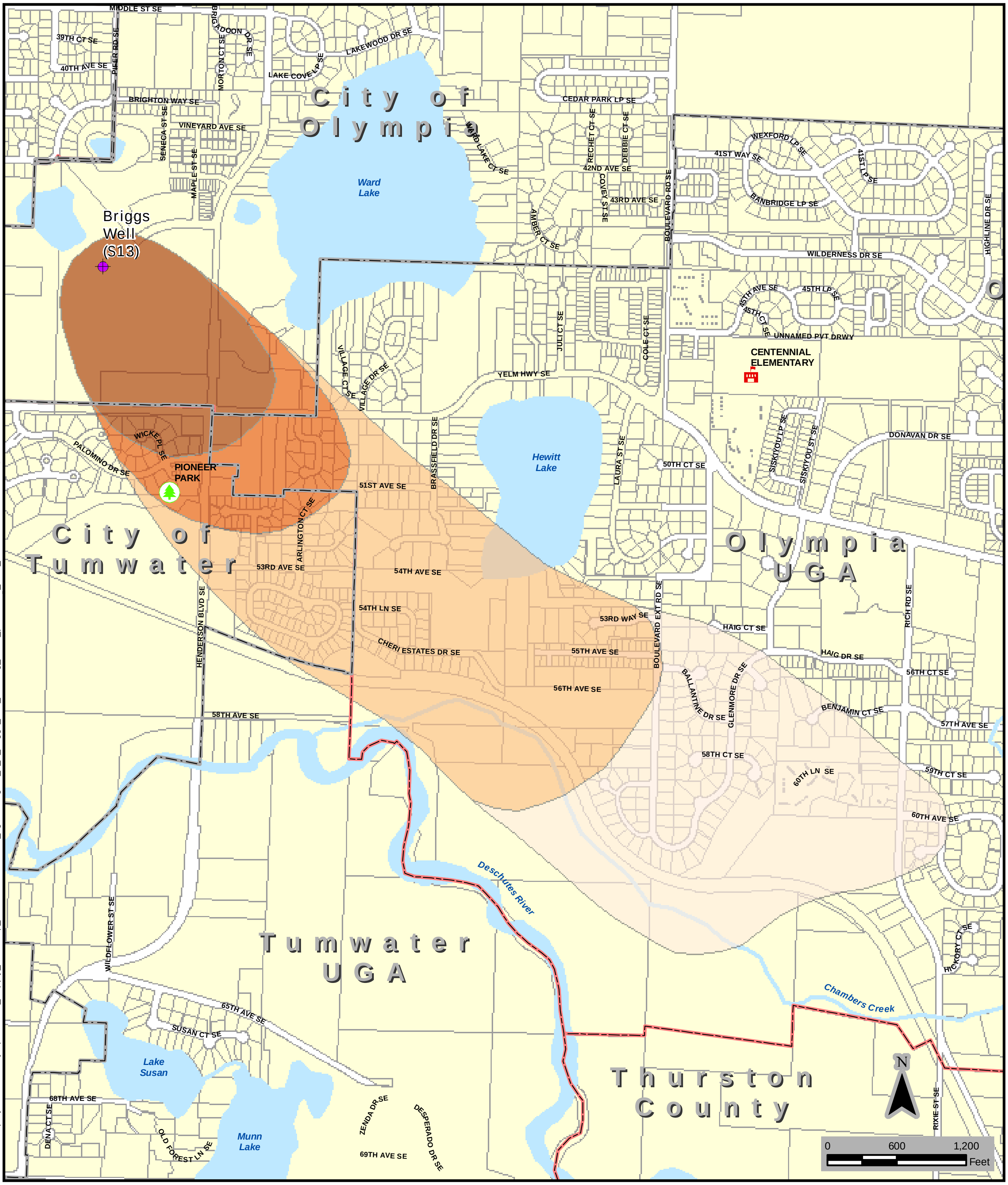
City of OLYMPIA

Golder Associates

FIGURE 8.10

Allison Springs Wells 13 and 19 Drinking Water Protection Area, 2008

2009 Water System Plan



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Legend

- Olympia Production Well

Time-of-Travel Zone

- 0.5 Year
- 1 Year
- 5 Year
- 10 Year

- Park
- School
- City Limits
- Urban Growth Area
- Water Body
- Stream

City of OLYMPIA

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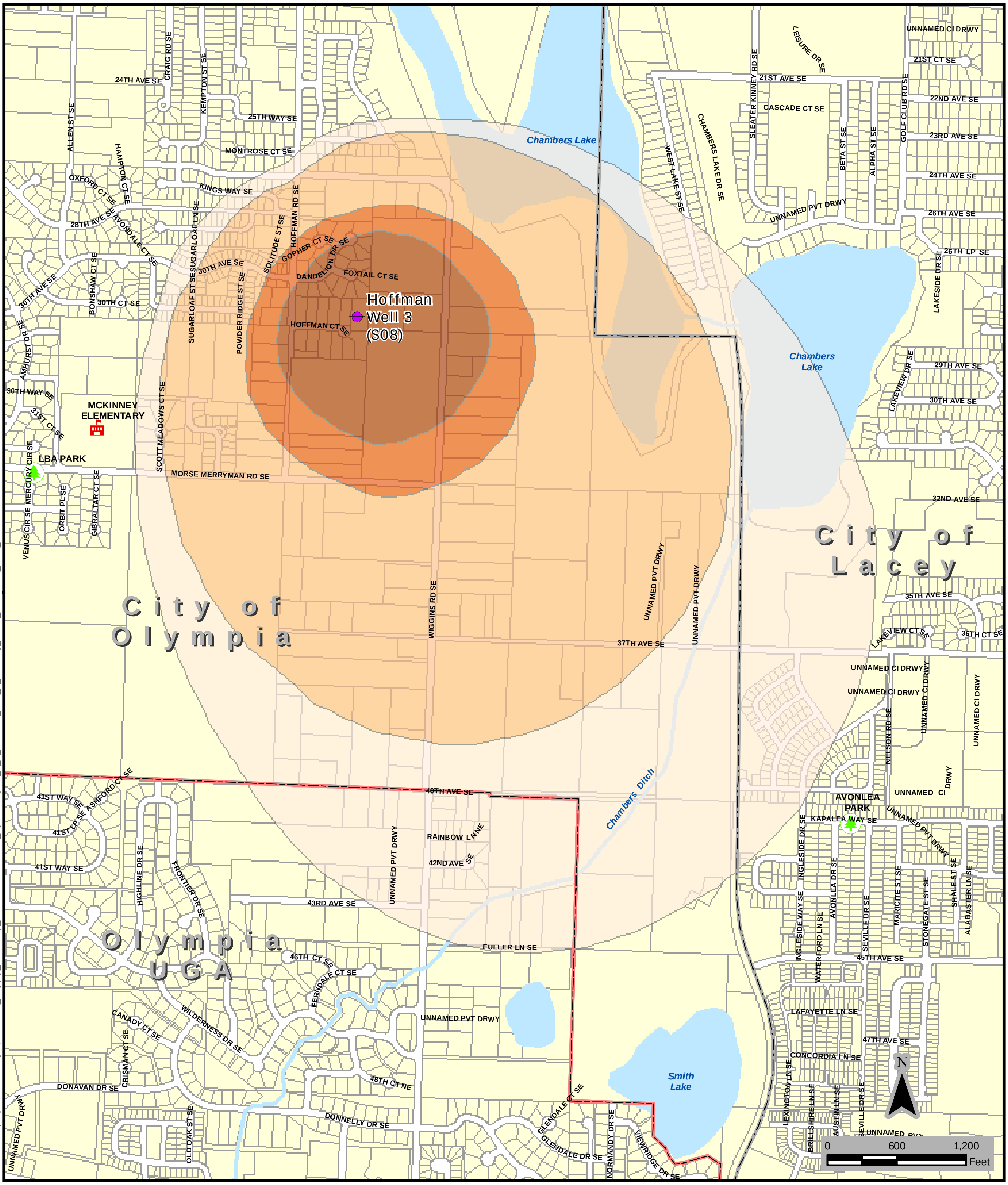
FIGURE 8.8

Briggs Well Drinking Water Protection Area, 2008

2009 Water System Plan



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Legend

- Olympia Production Well

Time-of-Travel Zone

- 0.5 Year
- 1 Year
- 5 Year
- 10 Year
- Park
- School
- City Limits
- Urban Growth Area
- Water Body
- Stream

City of OLYMPIA

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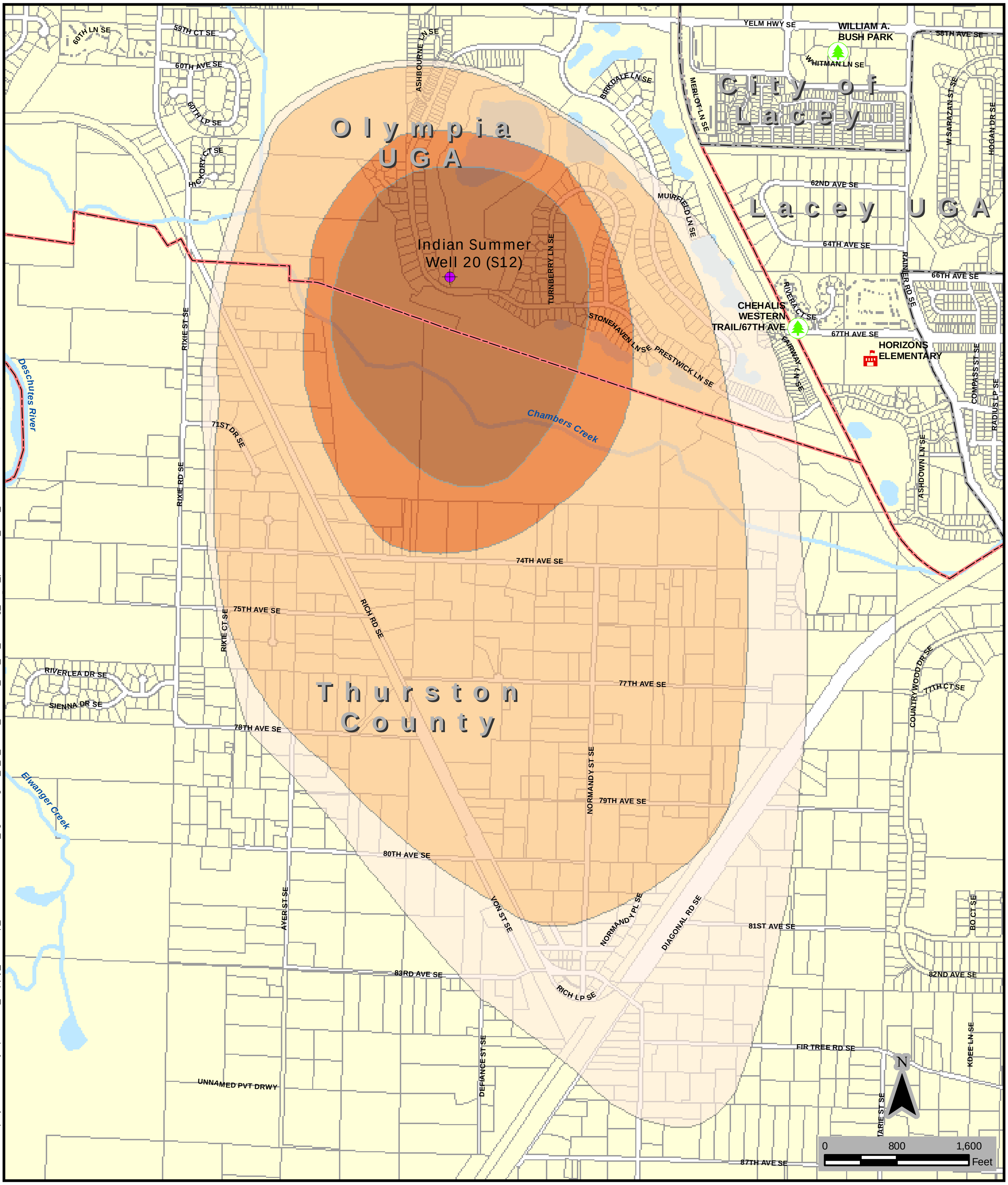
FIGURE 8.4

Hoffman Well 3 Drinking Water Protection Area, 2008

2009 Water System Plan



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Legend

- Olympia Production Well

Time-of-Travel Zone

- 0.5 Year
- 1 Year
- 5 Year
- 10 Year

- Park
- School
- City Limits
- Urban Growth Area
- Water Body
- Stream

City of OLYMPIA

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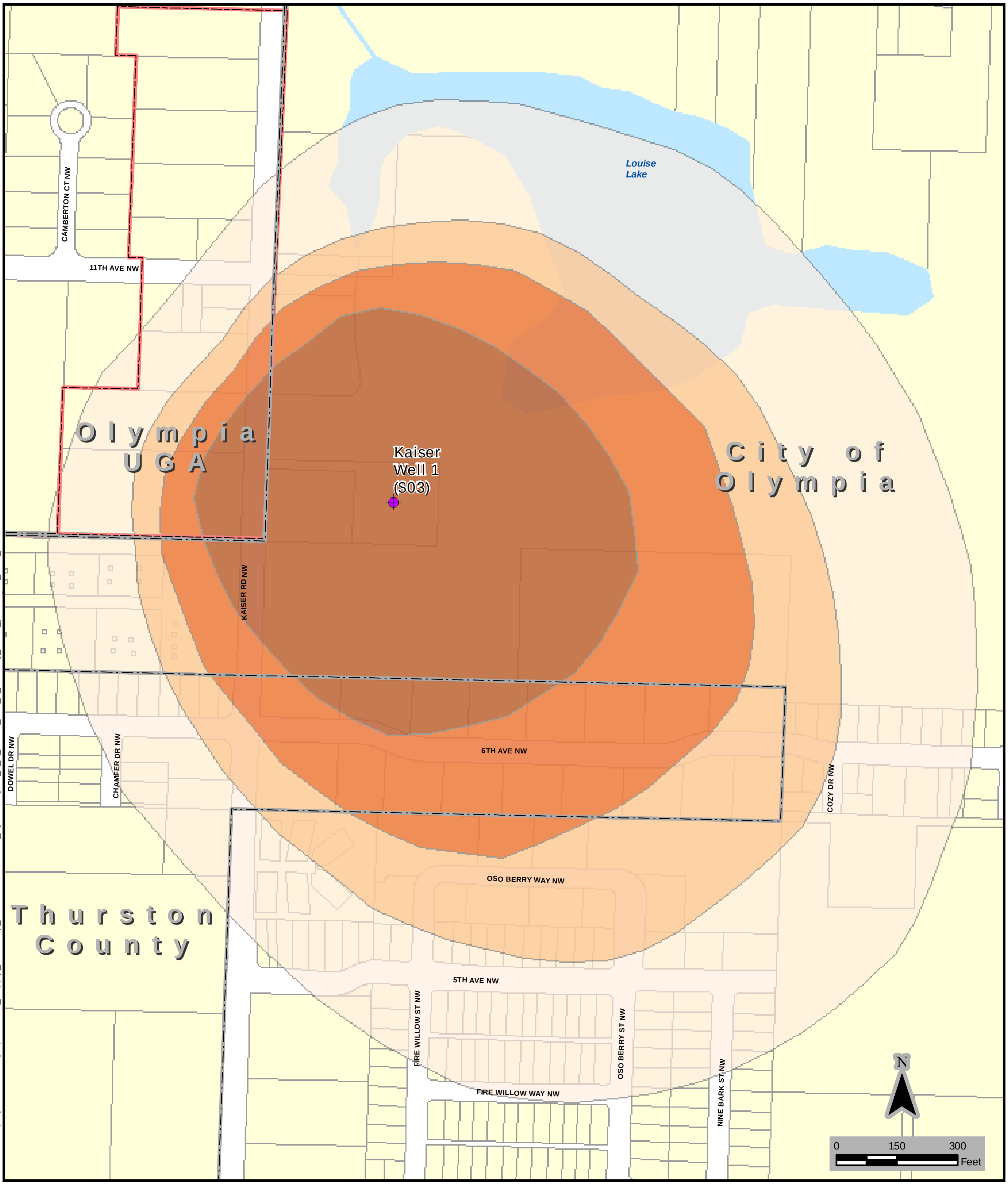
FIGURE 8.6

Indian Summer Well 20 Drinking Water Protection Area, 2008

2009 Water System Plan

D:\GISDATA\projects\wash\Olympia\Water_Supply_Plan\map_docs\mxd\Wellhead_figures\Figure_8_9_kaiser_well_1_drinking_water_protection_area_2008.mxd - 5/21/2008 @ 7:42:49 AM



Legend

Olympia Production Well

Time-of-Travel Zone

- 0.5 Year
- 1 Year
- 5 Year
- 10 Year

- Park
- School
- City Limits
- Urban Growth Area
- Water Body
- Stream

City of OLYMPIA

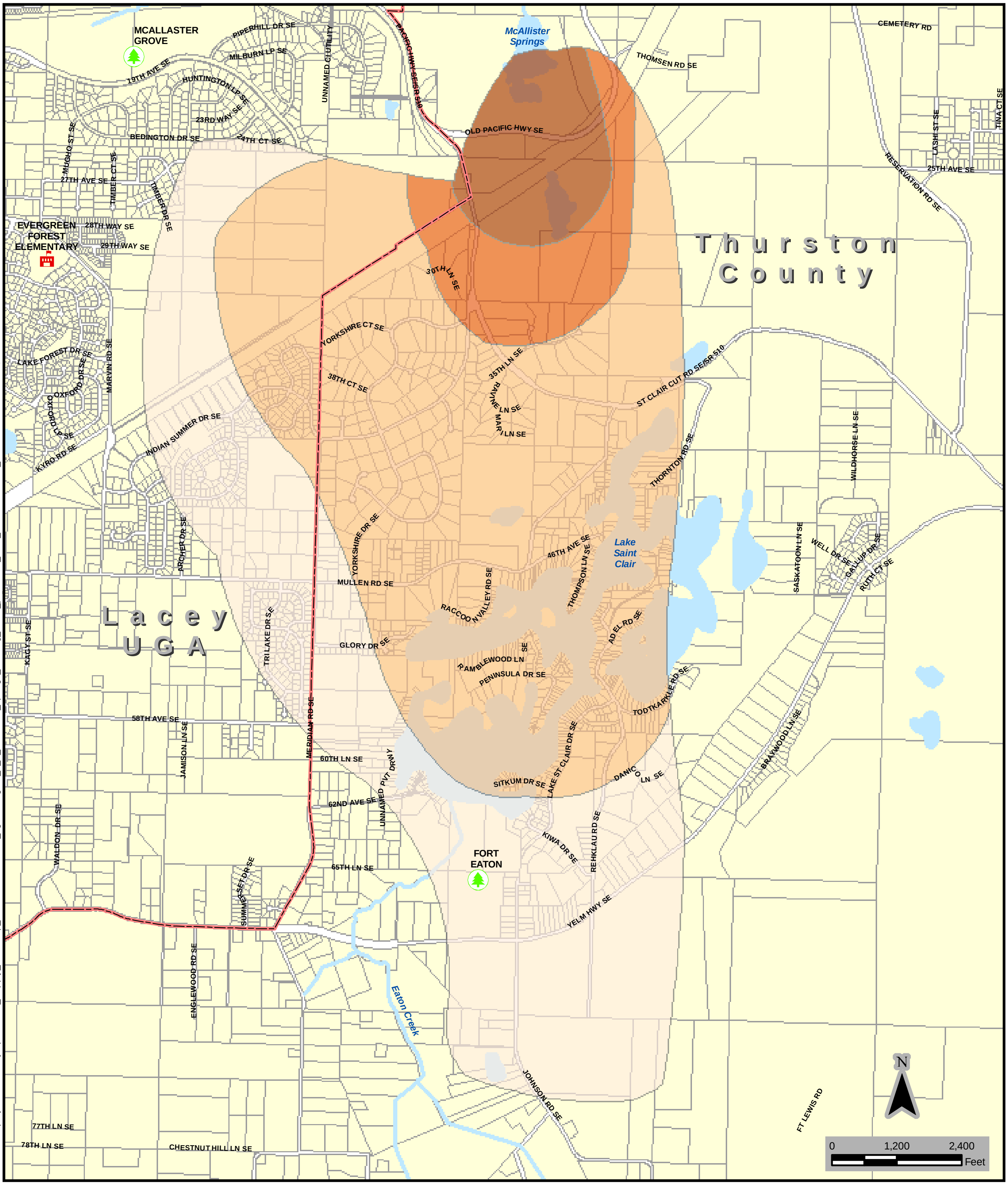
Golder Associates

FIGURE 8.9

Kaiser Well 1 Drinking Water Protection Area, 2008

2009 Water System Plan

D:\GISDATA\projects\wash\Olympia\Water_Supply_Plan\map_docs\mxd\Wellhead_figures\Figure_8_2_mcallister_springs_drinking_water_protection_area_without wellfield_2008.mxd - 5/21/2008 @ 7:35:38 AM



Legend

Time-of-Travel Zone

- 0.5 Year
- 1 Year
- 5 Year
- 10 Year

- Park
- School
- City Limits
- Urban Growth Area
- Water Body
- Stream

City of OLYMPIA

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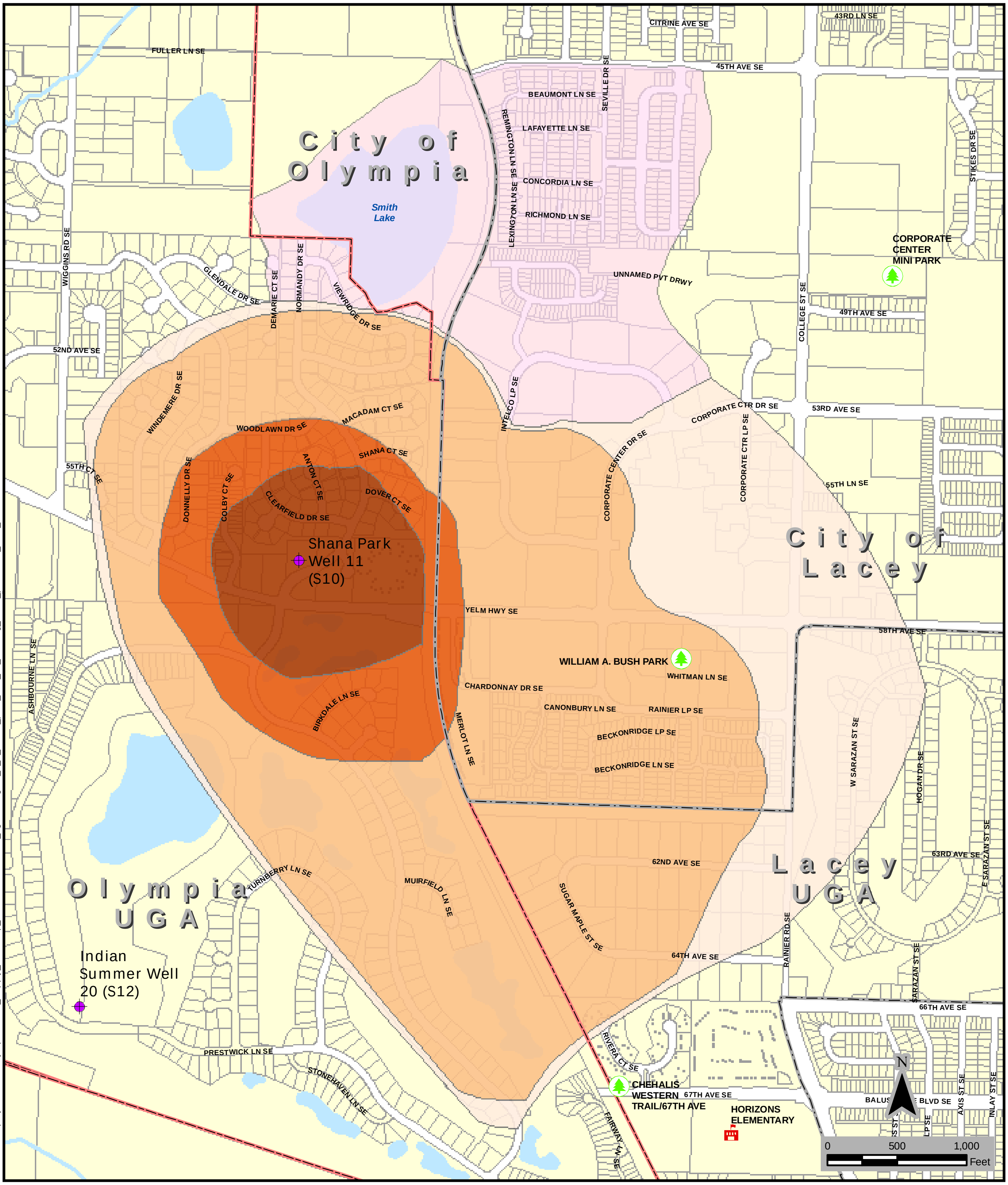
FIGURE 8.2

McAllister Springs Drinking Water Protection Area without Wellfield, 2008

2009 Water System Plan



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Legend

- Olympia Production Well

Time-of-Travel Zone

- 0.5 Year
- 1 Year
- 5 Year
- 10 Year
- Extended Capture Zone

- Park
- School
- City Limits
- Urban Growth Area
- Water Body
- Stream

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FIGURE 8.7

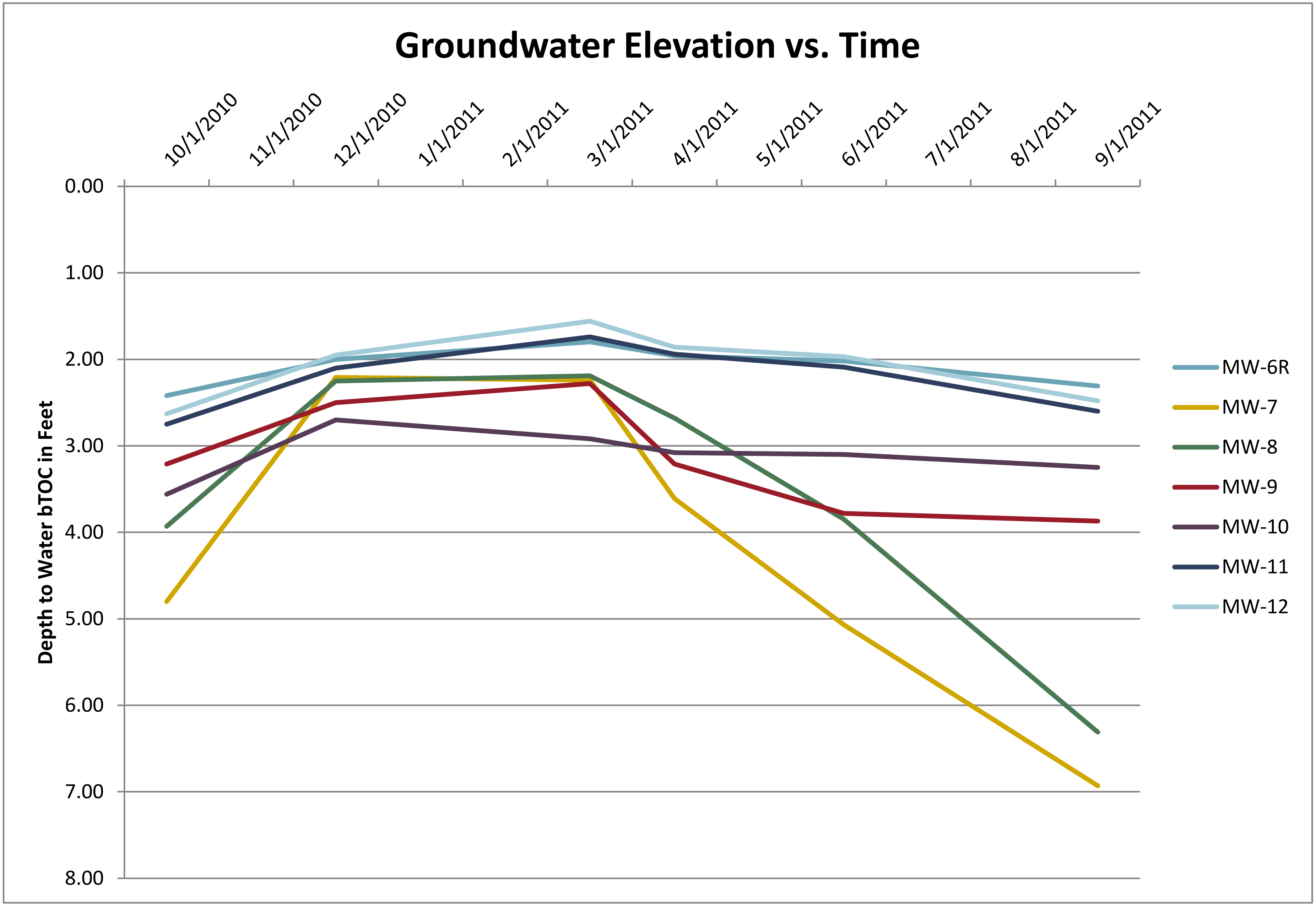
Shana Park Well 11 Drinking Water Protection Area, 2008

2009 Water System Plan

ARCADIS

Appendix **H**

Hydrograph



Groundwater Elevation vs. Time
10/1/2010
11/1/2010
12/1/2010
1/1/2011
2/1/2011
3/1/2011
4/1/2011
5/1/2011
6/1/2011
7/1/2011
8/1/2011
9/1/2011
0.00
1.00
2.00
3.00
4.00
5.00
6.00
7.00
8.00
Depth to Water bTOC in Feet
MW-6R
MW-7
MW-8
MW-9
MW-10
MW-11
MW-12