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Chevron Environmental Management Company

PROGRESS REPORT NO. 125
SECOND SEMI-ANNUAL 2018

Former Unocal Seattle

Marketing Terminal 0724

3001 Elliott Avenue

Seattle, Washington

April 5, 2019

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SECOND SEMI-ANNUAL 2018

Former Unocal Seattle Marketing Terminal 0724

Eric Krueger

AFS Environmental Scientist

Samuel Miles

AFS Project Manager

Rebecca K. Andresen, L.G.

Vice President

Prepared for:

Chevron Environmental Management Company

Prepared by:

Arcadis U.S., Inc.

1100 Olive Way

Suite 800

Seattle

Washington 98101

Tel 206 325 5254

Fax 206 325 8218

Our Ref.:

B0045363

Date:

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1 INTRODUCTION

On behalf of Chevron Environmental Management Company (Chevron), Arcadis U.S., Inc. (Arcadis) has prepared this report to document the second semi-annual 2018 groundwater sampling results for the former Seattle Marketing Terminal (Unocal 0724) located at 3001 Elliott Avenue in Seattle, Washington. The site and surrounding area are shown in **Figure 1**. This report summarizes the results of the groundwater gauging and sampling events conducted on September 27 and December 13 and 14, 2018 by Arcadis.

2 BACKGROUND

2.1 Site Description

The site was operated by the Union Oil Company of California (Unocal) as a bulk fuel distribution facility from the early 1900s to approximately 1975. Leaded and unleaded gasoline, diesel, lube oil, motor oils and petroleum-based solvents (non-chlorinated) were stored at the site. In the 1980s, the above-ground site structures were demolished. The site is defined in Order on Consent DE88-N223 and is divided into four contiguous areas: Upper Yard, Elliott Avenue, Lower Yard and the Offsite Area. The Upper Yard consists of the approximate area between Elliott Avenue and Western Avenue to the east and west, and Bay Street and Broad Street to the north and south. The Elliott Avenue area includes the length of Elliott Avenue between Bay Street and Broad Street. The Lower Yard consists of the area between Elliott Avenue and the Burlington Northern Santa Fe (BNSF) railroad tracks to the east and west, and Bay Street and Broad Street to the north and south. The Offsite Area generally comprises the BNSF railroad tracks right-of-way and Alaskan Way between Bay Street and Broad Street. A site map is included as **Figure 2.**

2.2 Site History

Chevron, on behalf of Unocal, is conducting cleanup of the site as required by Order on Consent DE88-N223 and Amendments 1 through 5. The initial Order on Consent was signed by Unocal and the Washington State Department of Ecology (Ecology) in December 1988. In July 1995, Amendment No. 4 was signed and contains cleanup targets and remedial action levels (RALs) for groundwater in the Upper Yard, Elliott Avenue, Lower Yard, and Offsite Area. Cleanup activities conducted by Unocal at the site included: an excavation with onsite treatment and offsite disposal of approximately 50,000 tons of soil from the Upper Yard; light non-aqueous phase liquid (LNAPL) recovery; and groundwater remediation (pump and treat) and excavation and disposal of approximately 45,000 tons of soil from Elliott Avenue and the Offsite Area.

In addition, Unocal excavated approximately 60,000 tons of soil exceeding the total petroleum hydrocarbon (TPH) RAL and removed and treated petroleum-containing groundwater (GeoEngineers, 1998). Petroleum-containing soils were typically excavated to depths of 15 to 20 feet below ground surface. The Lower Yard excavation was backfilled with clean fill material and moderately impacted petroleum-containing soils from the Upper and Lower Yards. The upper 95 percent confidence level of the mean for TPH concentrations remaining in these impacted Lower Yard soils used for backfill was below the RAL of 7,500 milligrams per kilogram (mg/kg) (GeoEngineers, 1998). Several feet of imported rock were placed at the base of the

excavation. According to Unocal, the average TPH concentration in these backfill soils was approximately 1,000 mg/kg (SAM, 1999).

The Upper Yard and Lower Yard properties of the site were sold by Unocal to the Trust for Public Land for the Seattle Art Museum (SAM) in 1999. In 2004, SAM began construction for redevelopment of the property, including the Offsite Area (which is owned by the City of Seattle Parks and Recreation), as the Olympic Sculpture Park (OSP). SAM entered a Pre-Purchaser Agreement with Ecology prior to their purchase of the property. As part of the agreement, SAM submitted remediation design reports to Ecology for the OSP. As provided in a January 17, 2008, letter, Ecology indicated that the terms of the Pre-Purchaser Agreement were satisfied. A Stipulation and Order of Dismissal (No. 99-2-50226-4SEA) was issued on October 31, 2008.

In conjunction with the OSP construction in the Offsite Area, Unocal conducted a “hot spot” excavation from July to October of 2005. The goal of this remedial action was to remove a source area of petroleum hydrocarbons and LNAPL in soil. Approximately 4,435 tons of petroleum-impacted soils were removed during the “hot spot” excavation (GeoEngineers, January 2006). Following the soil removal, the excavation was backfilled and the surface was restored with asphalt pavement.

On October 4, 2009, Arcadis submitted the *Work Plan for LNAPL Mobility Assessment, Natural Attenuation Monitoring and Surfactant Application Pilot Testing* to Ecology (October 2009 Work Plan). The October 2009 Work Plan was prepared in response to a letter from Ecology to Chevron dated June 8, 2009, requesting that Chevron assess the monitoring well network, address options for active remediation in the Offsite Area, conduct several short-term multiphase extraction (MPE) events on monitoring well MW-204 and on wells where LNAPL is observed in the Elliott Avenue Area and the Offsite Area and to further evaluate unfiltered/filtered samples of carcinogenic polycyclic aromatic hydrocarbons (cPAHs). This work plan outlined proposed activities to evaluate the monitoring well network, evaluate remedial alternatives for the site, and discussed the potential risk of cPAH concentrations remaining in groundwater in the Offsite Area. Specific areas addressed included LNAPL located in the Elliott Avenue Area, LNAPL along the railroad tracks and dissolved-phase concentrations in the Offsite Area.

Ecology approved the October 2009 Work Plan, with specific comments, on November 16, 2009. Following meetings with stakeholders and Ecology, Arcadis submitted the *Revised Work Plan for LNAPL Mobility Assessment, Natural Attenuation Monitoring and Surfactant Application Pilot Testing* (January 2010 Revised Work Plan) to Ecology on January 19, 2010.

On December 8, 2009, Ecology submitted a letter to Chevron approving the cancellation of fourth quarter 2009 groundwater compliance monitoring. In addition, Ecology recommended conducting semi-annual groundwater compliance monitoring for 2010 and quarterly monitoring for visual inspection, measurement and removal (if applicable) at monitoring wells MW-30 and MW-61A-R and recovery wells RW-1 through RW-3 and RW-21. Monitoring well MW-61A-R is a replacement for well MW-61A, which was originally an Upper Yard monitoring well. However, MW-61A-R is located in the Elliott Avenue right-of-way (ROW) and is currently referred to as an Elliott Avenue Area monitoring well.

On March 19, 2010, Ecology approved the January 2010 Revised Work Plan with additional specific comments. Following additional meetings, Arcadis submitted the *Addendum to the Revised Work Plan for LNAPL Mobility Assessment, Natural Attenuation Monitoring and Surfactant Application Pilot Testing* (May 2010 Addendum to the Revised Work Plan) on May 3, 2010, to address the additional stakeholder and

Ecology comments on the January 2010 Revised Work Plan. On May 18, 2010, Ecology approved the May 2010 Addendum to the Revised Work Plan via electronic mail. Field work to implement the May 2010 Addendum to the Revised Work Plan began in the summer of 2010.

Arcadis submitted the *2010 Summary Report and Risk Evaluation* on February 1, 2011 with the following recommendations and responses from Ecology:

- Continue quarterly gauging and semi-annual groundwater monitoring of wells MW-30, MW-61A-R, RW-3 and RW-21. Ecology concurred; both gauging and groundwater monitoring are ongoing for monitoring wells MW-30 and MW-61A-R. Recovery wells RW-3 and RW-21 were decommissioned with Ecology approval in June 2014 (discussed below).

- Continue semi-annual groundwater monitoring of wells MW-200 through MW-207. Ecology concurred: semi-annual groundwater monitoring is ongoing.

- Remove dissolved lead from the list of site constituents of concern. Dissolved lead has not been detected at the site since November 2007 and monitoring wells in the Offsite Area have at least 12 consecutive monitoring events without a dissolved-lead concentration exceedance. The few concentrations that were detected remained more than two orders of magnitude below the site RAL. Ecology concurred: effective second semi-annual 2011 monitoring event, lead is no longer a constituent of concern.

- Abandon piezometers PZ-61A-R, PZ-203, and PZ-204 in place. Ecology recommended maintaining and gauging piezometers through quarterly gauging during next two semi-annual monitoring events, then to re-evaluate. Piezometers PZ-61A-R, PZ-203, and PZ-204 were decommissioned in June 2014 with the approval of Ecology (discussed below).

- Abandon Trench D extraction wells RW-1, RW-2, RW-5 through RW-13 and RW-15 in place. Ecology recommended maintaining and quarterly gauging of Trench D extraction wells through the next two semi-annual monitoring events, then to re-evaluate. Quarterly gauging of extraction wells RW-1, RW-2, RW-5 through RW-13 and RW-15 for two additional semi-annual monitoring events was fulfilled. The Trench D extraction wells were decommissioned in June 2014, as discussed below.

- The LNAPL occasionally observed in wells RW-3, RW-21 or MW-30 is not mobile. Arcadis does not recommend further remedial operations on these wells unless quarterly gauging activities indicates a change in the volume or type of LNAPL present in the wells compared to historical observations. Ecology concurred and recommended continuing quarterly gauging through two semi-annual monitoring events and then to re-evaluate. Quarterly gauging of RW-3, RW-21 and MW-30 for two semi-annual monitoring events was fulfilled. Recovery wells RW-3 and RW-21 were decommissioned in June 2014 with the approval of Ecology (discussed below).

- Add monitoring well MW-205 to the quarterly gauging program. Ecology concurred: MW-205 was gauged quarterly as part of the quarterly gauging program ending in 2014.

- If LNAPL is observed and is recoverable, submit a sample for chemical testing and possible mobility parameter analysis. Ecology concurred. Recoverable thicknesses of LNAPL were observed in Trench D wells PZ-4.5, PZ-6, PZ-10.5, PZ-11.5, and PZ-13 in February 2014. Samples of the LNAPL were submitted for chemical analysis and in some cases, mobility parameter analysis. The results of these analyses were submitted in the Trench D Recovery System Decommissioning Summary and Recommendation for Replacement Well Installation" (Arcadis July, 2014).

In December 2012, Chevron submitted a revised Draft Amendment to the Order to Ecology. The proposed Amendment, which was prepared with the input of the City of Seattle and the SAM, recommended abandonment of the Trench D recovery wells and piezometers, installation of up to five replacement wells along the Trench D area, and additional groundwater monitoring. At the request of Ecology, Arcadis submitted the "Work Plan for Decommissioning Trench D Recovery System and Three Piezometers Installed in 2010" (Arcadis, May 2013). This work plan describes a scope of work to decommission remaining wells and equipment associated with Trench D, as well as the piezometers installed as part of the 2010 site assessment activities. This work plan was approved by Ecology in email correspondence dated July 29, 2013.

The decommissioning work was conducted in two phases. Phase I was conducted from February 21 to 25, 2014 and included the following activities:

- Prepared the site to allow access for equipment and vehicles.
- Removed the remediation system compound and equipment.
- Attempted to locate missing piezometers and recovery wells.
- Gauged recovery wells and piezometers.
- Received variance approval for well abandonment.

Separate LNAPL sampling events were completed between the two phases of decommissioning work on February 26 and May 5, 2014.

Phase II was conducted from June 9 to 13, 2014 and included the following activities:

- Gauged recovery wells and piezometers.
- Vacuum extraction of fluids from each recovery well and piezometer located along Trench D.
- Decommissioned recovery wells, piezometers, 2-inch lateral remediation system piping, and a 6-foot long by 4-foot wide recovery vault where the piping entered the former remediation system.
- Decommissioned of piezometers installed in 2010 (PZ-61A-R, PZ-203, and PZ-204).
- Disposed of waste materials generated by the above activities.

A report of the Trench D decommissioning activities, LNAPL summary and work plan for the installation of the replacement monitoring wells was submitted under separate cover "Trench D Recovery System Decommissioning Summary and Recommendation for Replacement Well Installation" (Arcadis July, 2014).

At the request of Ecology, Arcadis submitted a work plan for the installation of up to six additional monitoring wells in the Offsite Area. The work plan was approved by Ecology in correspondence dated May 29, 2015. The work plan was implemented in January 2016. A report documenting installation activities was submitted to Ecology on April 29, 2016.

3 GROUNDWATER COMPLIANCE MONITORING

3.1 Historical LNAPL Monitoring Program

During a comprehensive gauging event in September 2007, prior to well abandonment, LNAPL was observed in recovery well RW-21, located on the eastern side of the BNSF railroad tracks. Recovery well RW-21 was part of the Trench C remediation system and does not serve as a compliance well for the Lower Yard. Due to the presence of LNAPL, recovery well RW-21 was gauged on a bi-monthly basis between October 2007 and November 2009. Less than one-tenth of an inch of LNAPL was present in RW-21 in each of the gauging events prior to well redevelopment in December 2007. Due to the viscous nature of the LNAPL, the LNAPL thickness could not be accurately measured using an oil/water interface probe and a disposable bailer was used to confirm the presence of LNAPL. Observations of the interior casing of recovery well RW-21 indicated that a tar-like substance was present inside the well casing. Recovery well RW-21 was re-developed in January 2008 with a surge block and vacuum truck and in October 2008, the polyvinyl chloride (PVC) casing of recovery well RW-21 was cleaned with absorbent pads and re-developed using a vacuum truck.

Recovery wells RW-1 through RW-3 and RW-21 were added to a bi-monthly gauging program in 2007 as discussed with Ecology (November 2, 2007 phone conversation) to monitor for the presence of LNAPL from recovery well RW-21. Following Ecology's approval in November 2009, recovery wells RW-1 through RW-3 and RW-21 were reduced to quarterly gauging. Recovery wells RW-5 through RW-13 and RW-15 were also included in the gauging program during compliance monitoring events. However, recovery wells RW-12 and RW-15 could not be located between 2010 and Trench D abandonment activities in 2015 and are suspected to have been destroyed during maintenance activities along the BNSF ROW.

Field crews had been unable to locate five of the recovery wells, so a site visit was conducted on January 9th, 2013 with the intention of locating the missing wells. RW-6 was rediscovered, but RW-4, RW-12, RW-14 and RW-15 were not located during this visit. Accordingly, these recovery wells were not included in quarterly gauging events.

Recovery wells and associated piezometers in Trench D were decommissioned with the approval of Ecology in June 2014. During the Trench D decommissioning activities, a soil vacuum truck was used to try to locate RW-4 and RW-12, but they could not be found. The locations of RW-14 and RW-15 were surrounded by utilities so the soil vacuum locating activities could not be conducted in that area. The recovery wells and piezometers that were located along Trench D were decommissioned in the first half of 2014.

Quarterly gauging was conducted on September 27 and December 12, 2018. During both events, monitoring wells MW-30, MW-61A-R, MW-70R, and MW-200 through MW-207 were gauged to determine the presence of LNAPL. Monitoring wells MW-209 through MW-211 were not gauged due to access limitations; updated access negotiations are ongoing with BNSF. LNAPL was observed using a bailer in MW-61A-R during the September 2018 event. No LNAPL was observed in any of the remaining wells during both gauging events. During both 2018 events, gauging activities were conducted at low tide to ensure that groundwater levels were within the monitoring well screen intervals. However, during the December 2018 event, Arcadis field crews encountered a submerged screen at monitoring well MW-206. Monitoring well history is summarized in **Table 1** and gauging is summarized in **Table 2**.

3.2 Second Semi-Annual 2018 Groundwater Monitoring

3.2.1 Third Quarter 2018 Groundwater Monitoring

On September 27, 2018, Arcadis conducted a groundwater gauging and sampling event at the site. During the gauging event, monitoring wells MW-30, MW-61A-R, MW-70R, MW-200 through MW-207 were gauged with an oil/water interface probe to determine depth to water and LNAPL thickness. LNAPL was observed only in monitoring well MW-61-A-R. Gauging is summarized in **Table 2**. MW-209 through MW-211 were not gauged or sampled during this event due to an expired access agreement with BNSF. Arcadis and Chevron are currently working with BNSF to renew the access agreement.

Monitoring well MW-70R was purged and sampled with a peristaltic pump in general accordance with the procedures outlined in *Low-Flow Groundwater Purging and Sampling Procedures for Monitoring Wells* (Arcadis, 2009). This standard operating procedure (SOP) is included in **Appendix A.** Note that at the request of site stakeholders, tubing placement deviated from specifications in the SOP; tubing was placed within 6-inches of the groundwater surface in each monitoring well. Groundwater levels were conducted from each well prior to purging to assure the tubing was placed correctly. New, disposable Teflon-lined polyethylene tubing was used for sampling. Water quality parameters including temperature, pH, electrical conductivity, dissolved oxygen and oxidation/reduction potential were measured approximately every three minutes using an In-Situ® Aqua Troll 600 low-flow groundwater sampling system and were recorded on the field data sheets included in **Appendix B**. Monitoring wells MW-209 through MW-211 were not sampled during the September 2018 event due to access issues along the BNSF right of way.

Samples were collected in clean, laboratory-supplied containers with appropriate preservatives and were stored in iced coolers. Samples were then shipped via overnight delivery, under chain-of-custody procedures, to Eurofins Lancaster Laboratories in Lancaster, Pennsylvania. Groundwater samples from the March 2018 event were analyzed for the following:

- Total petroleum hydrocarbons as gasoline (TPH-G) by Northwest Method NWTPH-Gx extended range;
- Total petroleum hydrocarbons as diesel and heavy oil (TPH-D and TPH-O) by Northwest Method NWTPH-Dx extended range with silica gel cleanup;

- Benzene, toluene, ethylbenzene, and total xylenes (BTEX) by United States Environmental Protection Agency (USEPA) Method 8021B; and

- Benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, and indeno(1,2,3-c,d)pyrene collectively referred to as carcinogenic polycyclic aromatic hydrocarbons (cPAHs) by USEPA Method 8270C SIM.

3.2.2 Fourth Quarter 2018 Groundwater Monitoring

On December 12, 13 and 14, 2018 Arcadis conducted a groundwater gauging and sampling event at the site. During the gauging event, monitoring wells MW-30, MW-61A-R, MW-70R, and MW-200 through MW-207 were gauged with an oil/water interface probe to determine depth to water and LNAPL thickness. No LNAPL was observed during this event. As described above, MW-209 through MW-211 were not gauged within the BNSF right of way. Gauging is summarized in **Table 2.**

Monitoring wells MW-70R, and MW-200 through MW-207 were purged and sampled with a peristaltic pump in general accordance with the procedures outlined in *Low-Flow Groundwater Purging and Sampling Procedures for Monitoring Wells* (Arcadis, 2009). This standard operating procedure (SOP) is included in **Appendix A.** Note that at the request of site stakeholders, tubing placement deviated from specifications in the SOP; tubing was placed within 6-inches of the groundwater surface in each monitoring well. Groundwater levels were conducted from each well prior to purging to assure the tubing was placed correctly. New, disposable Teflon-lined polyethylene tubing was used for sampling. Water quality parameters including temperature, pH, electrical conductivity, dissolved oxygen and oxidation/reduction potential were measured approximately every three minutes using an In-Situ® Aqua Troll 600 low-flow groundwater sampling system and were recorded on the field data sheets included in **Appendix B**. Monitoring wells MW-209 through MW-211 were not sampled during the December 2018 event due to access issues along the BNSF right of way.

Samples were collected in clean, laboratory-supplied containers with appropriate preservatives and were stored in iced coolers. Samples were then shipped via overnight delivery, under chain-of-custody procedures, to Eurofins Lancaster Laboratories in Lancaster, Pennsylvania. Groundwater samples from the June 2018 event were analyzed for the following:

- TPH-G by Northwest Method NWTPH-Gx extended range;

- TPH-D and TPH-O by Northwest Method NWTPH-Dx extended range with silica gel cleanup;

- BTEX by United States Environmental Protection Agency (USEPA) Method 8021B; and

- Benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, and indeno(1,2,3-c,d)pyrene collectively referred to as carcinogenic polycyclic aromatic hydrocarbons (cPAHs) by USEPA Method 8270C SIM.

3.2.3 Groundwater Monitoring Results

Depths to groundwater measured during the third quarter 2018 groundwater monitoring event ranged from 9.41 feet below top of casing (btoc) in monitoring well MW-200 to 22.88 feet btoc in monitoring well MW-205. Groundwater elevations ranged from 3.16 feet above mean sea level in monitoring well MW-206 to 7.31 feet above mean sea level in monitoring well MW-61A-R. Depths to groundwater measured during the fourth quarter 2018 groundwater monitoring event ranged from 8.15 feet btoc in monitoring well MW-200 to 21.38 feet btoc in monitoring well MW-205. Groundwater elevations ranged from 2.98 feet above mean sea level in monitoring well MW-30 to 8.79 feet above mean sea level in monitoring well MW-61A-R. These measurements indicate groundwater is generally flowing in a southwesterly direction, towards Elliott Bay, and is consistent with historical data. Groundwater gauging was conducted at low tide during both 2018 events and water levels were within screened intervals for all wells, with the exception of MW-206 during the December 2018 event. Current groundwater elevations are included in **Table 2** and historical groundwater elevations are presented in **Appendix C**. Groundwater elevations and contours from the third quarter 2018 sampling event are shown on **Figure 3a** and groundwater elevations and contours from the fourth quarter 2018 sampling event are shown on **Figure 3b**.

During the third quarter 2018 event, groundwater analytical results indicate that no exceedances of the applicable BTEX, TPH-G, TPH-D, TPH-O or cPAH RALs were detected in the sample collected from monitoring well MW-70R. MW-209 through MW-211 were not sampled during the third quarter 2018 event due to access issues along the BNSF right of way.

During the fourth quarter 2018 event, groundwater analytical results indicate that no exceedances of the applicable BTEX, TPH-G, TPH-D, TPH-O or cPAH RALs were detected in the samples collected from monitoring wells MW-30, MW-61A-R, MW-70R, and MW-200 through MW-207. MW-209 through MW-211 were not sampled during the fourth quarter 2018 event due to access issues along the BNSF right of way.

Historical trend graphs for MW-30, MW-70R, MW-200 through MW-207, and MW-209 through MW-211 are provided in **Appendix D**. Analytical results for TPH-G, TPH-D, TPH-O, and BTEX, are summarized in **Table 3** and on **Figure 4**; results for cPAHs are summarized in **Table 3** and on **Figure 5**. Historical analytical results are presented in **Appendix C**.

As of the December 2018 event, four monitoring wells (MW-202, MW-203, MW-205, and MW-206) have met a minimum of fifteen consecutive sampling events in compliance with the RALs established for the site. Monitoring well MW-70R has meet eleven consecutive sampling events in compliance with the RALs established for the site. A summary of groundwater compliance as of the December 2018 event is included in **Table 4.**

3.2.4 Laboratory Data Verification Results

A trip blank sample for BTEX and GRO analysis was submitted with the groundwater samples for the third quarter 2018 and fourth quarter 2018 sampling events. Analyte concentrations did not exceed their respective method detection limits (MDLs) in the trip blanks.

A duplicate sample was collected during the third and fourth quarter 2018 sampling events and were submitted to the laboratory for quality assurance purposes. During the third quarter and fourth quarter 2018 sampling events, the duplicate sample was collected from monitoring well MW-70R and MW-202, respectively. The duplicate samples were submitted for the same analyses as the parent sample. The duplicate analytical results were comparable to the parent samples collected from MW-70R and MW-202.

All coolers were received in good condition within temperature requirements. The laboratory report and chains of custody are provided in **Appendix E**.

4 REMEDIAL ACTIVITIES

4.1 Upper Yard and Elliott Avenue LNAPL Removal

Monitoring well MW-61A-R was re-developed on September 3, 2008 using a disposable bailer and a vacuum truck to remove sediment and LNAPL which may have accumulated in the well and/or sand pack. Approximately ten well volumes of groundwater and residual LNAPL were removed. The re-development water and recovered LNAPL were collected in the vacuum truck and transported to an approved facility for recycling. The amount of LNAPL recovered was not quantified. Mobile multi-phase extraction (MPE) was initiated in August 2009 in monitoring wells MW-30 and MW-61A-R. Observations made during MPE operations indicate that short term MPE does not influence the groundwater table and subsurface vapor flow. MPE was determined to be an ineffective method to address the remaining LNAPL and dissolved-phase impacts at the site due to the minimal remaining hydrocarbon impacts at the site and associated low MPE mass removal rate.

To assess persistent measurable LNAPL observed during groundwater monitoring, a surfactant-enhanced LNAPL recovery pilot test was performed on monitoring well MW-61A-R in July 2010. Approximately 200 gallons of surfactant were injected into MW-61-A-R. The surfactant solution was allowed to remain in the formation for approximately 24 hours and then approximately 900 gallons of fluids were extracted. Monitoring was completed weekly for the first month after extraction. After weekly monitoring was completed, monthly monitoring was initiated and quarterly monitoring is ongoing. A complete summary of the surfactant-enhanced LNAPL recovery pilot test was submitted in the *2010 Summary Report and Risk Evaluation* on February 1, 2011.

Monitoring wells MW-61A-R and MW-30 were gauged during the September 2018 and December 2018 gauging and sampling events with an oil/water interface probe to determine if LNAPL was present. LNAPL was detected using a bailer in monitoring well MW-61A-R during the September 2018 event.

4.2 Lower Yard LNAPL Recovery

LNAPL was observed in recovery well RW-21 during the September 2013 groundwater monitoring event (visually observed on oil/water interface probe, a measurable thickness was not present). This recovery well, as well as the downgradient Trench D recovery wells (RW-1 through RW-3), were included in the quarterly gauging program. Manual LNAPL recovery from RW-21 had been unsuccessful due to the highly-viscous nature of the LNAPL. LNAPL has not been observed in recovery wells RW-1 and RW-2 since the gauging program was implemented and has not been observed in RW-3 since the first semi-annual

groundwater monitoring event of 2013. Wells RW-1, RW-2 and RW-21 were decommissioned in 2014 during the Trench D decommissioning activities.

4.3 Offsite Area Remediation System

A groundwater extraction system was installed in the offsite area in 1989. The system included 24 extraction wells located along the BNSF right-of-way. In November and December 2006, the underground piping was severely damaged during the construction of the OSP, rendering the system inoperable.

From 1989 to November 2006, approximately 29,244,966 gallons of water and 4,809 gallons of LNAPL were recovered and treated by the groundwater extraction system. The extraction system last recovered LNAPL in fourth quarter 2004; no LNAPL was recovered during the last two years of operation. The associated Trench D recovery wells were gauged semi-annually until they were decommissioned in June 2014. The oil water separator was rehabilitated in May 2010 for use in disposal of purge water generated from routine groundwater sampling events and for well redevelopment and hydraulic conductivity testing approved by Ecology. The oil water separator was decommissioned during the June 2014 Trench D decommissioning activities and the King County Major Discharge Authorization Number 529-04 was discontinued.

Throughout the third and fourth quarter of 2011, monitoring well MW-205 was gauged on a bi-weekly (every other week) basis. During these events, no LNAPL or sheen was observed. Gauging was reduced to quarterly as of the first semi-annual 2012 reporting period at this location and continued on a quarterly basis through 2013. No LNAPL was observed in MW-205 during the September or December 2018 gauging and groundwater monitoring activities.

5 CONCLUSIONS

Gauging and groundwater monitoring was conducted on September 27, 2018 and December 12, 2018. During the third quarter sampling event, there were no exceedances of BTEX, TPH-G, TPH-D, or TPH-O RALs in the sample collected from monitoring well MW-70R. During the fourth quarter sampling event, there were no exceedances of BTEX, TPH-G, TPH-D, or TPH-O RALs in the samples collected from monitoring wells MW-30, MW-61A-R, MW-70R, MW-200 through MW-207. Analytical results are summarized in **Table 3**, **Figure 4**, and **Figure 5**. Historical analytical results are presented in **Appendix C**. LNAPL was observed in monitoring well MW-61A-R during the September 2018 gauging event.

As of the December 2018 event, four monitoring wells (MW-202, MW-203, MW-205, and MW-206,) have met a minimum of fifteen consecutive sampling events in compliance with the RALs established for the site. Monitoring wells MW-202, MW-203, MW-206, and MW-207 have met twenty-nine consecutive sampling events in compliance with the petroleum hydrocarbon constituent RALs. MW-70R has met eleven consecutive sampling events in compliance with the RALs established for the site. A summary of groundwater compliance as of the December 2018 event is included in **Table 4**.

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TABLES

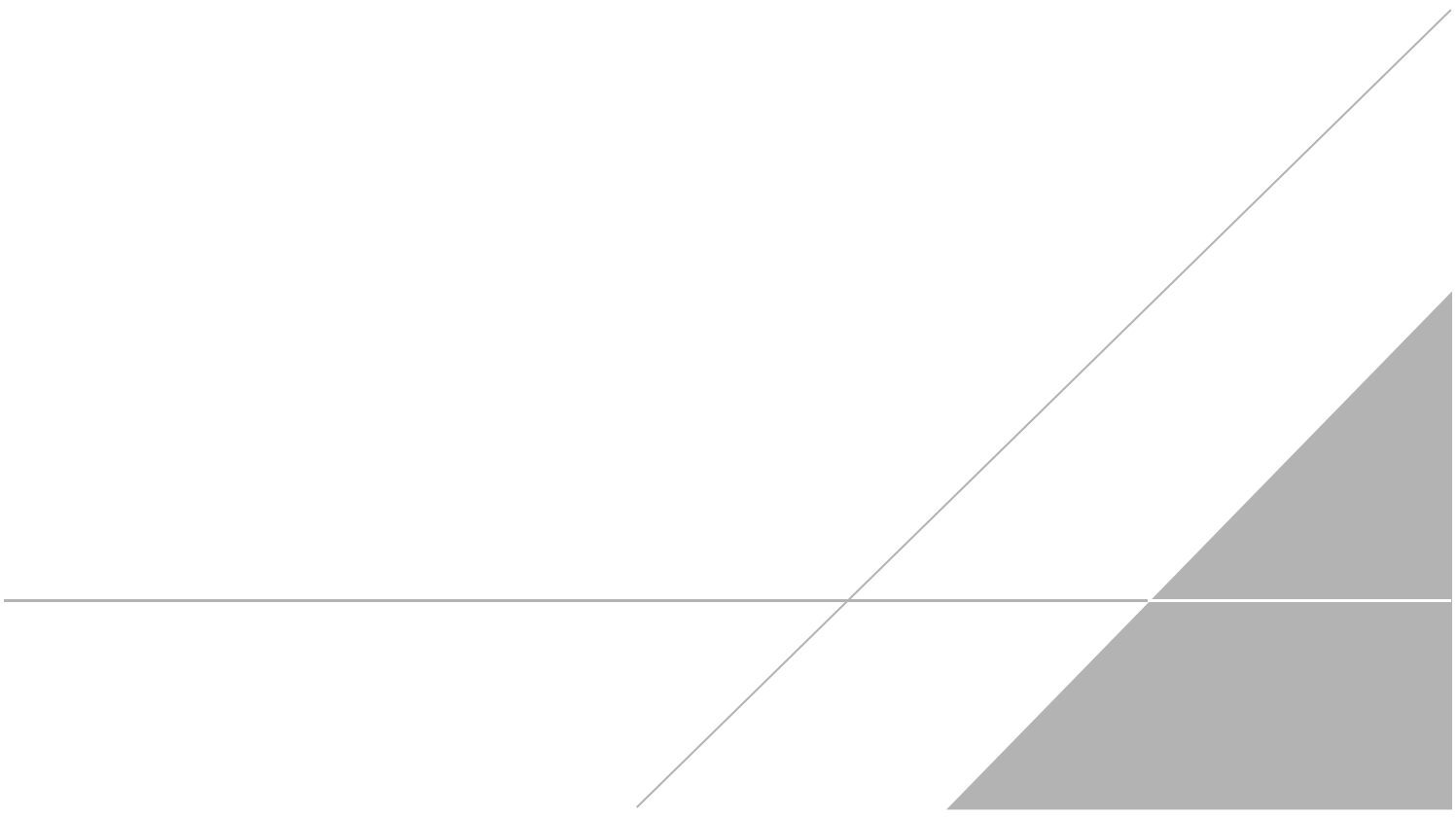


Table 1

Monitoring Well History
Former Unocal Seattle Marketing Terminal
3001 Elliott Avenue
Seattle, Washington

Well ID	Installation Date	Compliance Parameters	Compliance/Removal Date
Upper Yard			
MW-37	06/1990	**LNAPL-TPH - BTEX (MW-61A-R)**	12/1995
MW-38	06/1990		1992
MW-39	06/1990		1992
MW-40	06/1990		1992
MW-58	09/1995		01/2004
MW-61	1995		1997
MW-61A	01/1998		01/2004
MW-61A-R	**03/2006**		**LNAPL**
MW-62	1995		1997
MW-62A	01/1998		01/2004
MW-63	1995		1997
MW-63A	01/1998		01/2004
MW-64	1995		01/2004
Elliott Avenue			
MW-30	**1989**	**LNAPL - TPH - BTEX (MW-30)**	**LNAPL**
MW-31	1989		12/2003
MW-32	1989		04/1991
MW-59	03/1998		*no data*
MW-65	03/1998		ABANDONED 12/07
MW-66	03/1998		ABANDONED 12/07
MW-69	*no data*		*no data*
Lower Yard			
MW-1	*no data*	**No wells in Lower Yard currently sampled for compliance parameters**	1998
MW-2	*no data*		1998
MW-18	*no data*		1998
MW-22	*no data*		1998
MW-23	*no data*		1998
MW-33	*no data*		1998
MW-34	*no data*		1998
MW-35	*no data*		1998
MW-49	*no data*		1998
MW-50	*no data*		1998
MW-51	*no data*		1998
MW-53	*no data*		1998
MW-54	*no data*		1998
MW-55	*no data*		1998
MW-56	*no data*		1998

Table 1

Monitoring Well History
Former Unocal Seattle Marketing Terminal
3001 Elliott Avenue
Seattle, Washington

Well ID	Installation Date	Compliance Parameters	Compliance/Removal Date
Lower Yard (continued)			
MW-57	*no data*	**No wells in Lower Yard currently sampled for compliance parameters**	1998
MW-60	*no data*		1998
MW-81	09/1998		06/2002
MW-82	09/1998		06/2002
MW-83	09/1998		06/2002
MW-84	09/1998		06/2002
MW-85	09/1998		06/2002
MW-86	09/1998		06/2002
Offsite Area			
MW-8	01/1989	**LNAPL - TPH - BTEX - PAHs (MW-70R)**	10/2005
MW-9	*no data*		07/2005
MW-10	01/1989		10/2005
MW-20	01/1989		10/2005
MW-25	01/1989		10/2005
MW-26	01/1989		10/2005
MW-27	01/1989		damaged 2006
MW-27R	12/2006		ABANDONED 12/07
MW-34	10/1989		*no data*
MW-35	10/1989		*no data*
MW-36	10/1989		07/2005
MW-41	10/1990		12/2002
MW-42	10/1990		12/1991
MW-43	10/1990		12/1991
MW-44	*no data*		*no data*
MW-52	06/1998		10/2005
MW-67	03/1998		10/2005
MW-68	03/1998		07/2005
MW-69	03/1998		*no data*
MW-70	03/1998		10/2005
MW-70R	**09/2016**		**sampled**
MW-71	03/1998		10/2005
MW-72	03/1998		07/2005
MW-76	03/1998		10/2005

Table 1

Monitoring Well History
Former Unocal Seattle Marketing Terminal
3001 Elliott Avenue
Seattle, Washington

Well ID	Installation Date	Compliance Parameters	Compliance/Removal Date
Offsite Area- Amendment No. 4 Point of Compliance monitoring wells			
MW-200	**10/2006**	**LNAPL - TPH - BTEX - PAHs (MW-200 to MW-207,** MW-209 to MW-11**)**	**sampled**
MW-201	**10/2006**		**sampled**
MW-202	**10/2006**		**sampled**
MW-203	**10/2006**		**sampled**
MW-204	**10/2006**		**sampled**
MW-205	**10/2006**		**sampled**
MW-206	**10/2006**		**sampled**
MW-207	**10/2006**		**sampled**
MW-209	09/2016		not sampled in 3Q18 or 4Q18
MW-210	09/2016		not sampled in 3Q18 or 4Q18
MW-211	09/2016		not sampled in 3Q18 or 4Q18

Notes:
LNAPL = Light non-aqueous phase liquid
TPH = Total petroleum hydrocarbons
BTEX = Benzene, Toluene, Ethylbenzene and Xylenes (Total)
PAHs = Polycyclic Aromatic Hydrocarbons
Items in bold represent compliance wells sampled in the most recent sampling event.

Table 2
Summary of Groundwater Elevation Data

Former Unocal Seattle Marketing Terminal
3001 Elliott Avenue
Seattle, Washington

Well Number[1] (Well Casing Elevation)	Date Measured	Time Measured (hr:min)	Depth to Groundwater[2] (feet)	Depth to LNAPL[3] (feet)	LNAPL Thickness[3] (feet)	Groundwater Elevation[4] (feet)	Top of Well Screen Elevation[5] (feet)
MW-30	09/27/18	12:49	14.01	--	--	6.84	15.85
	12/12/18	15:28	12.87	--	--	7.98	15.85
MW-61A-R	09/27/18	12:36	15.21	15.10	0.11	7.23	--
	12/12/18	15:23	13.65	--	--	8.79	--
MW-200	09/27/18	11:27	9.41	--	--	4.95	9.36
	12/12/18	14:50	8.15	--	--	6.21	9.36
MW-201	09/27/18	11:36	10.00	--	--	4.86	9.86
	12/12/18	14:55	8.77	--	--	6.09	9.86
MW-202	09/27/18	12:05	10.00	--	--	4.58	6.78
	12/12/18	14:57	8.54	--	--	6.04	6.78
MW-203	09/27/18	11:43	12.79	--	--	4.76	7.05
	12/12/18	14:39	11.37	--	--	6.18	7.05
MW-204	09/27/18	11:51	18.99	--	--	4.94	6.58
	12/12/18	14:17	17.46	--	--	6.47	6.58
MW-205	09/27/18	12:00	22.88	--	--	5.01	9.89
	12/12/18	14:15	21.38	--	--	6.51	9.89
MW-206	09/27/18	12:20	11.99	--	--	3.16	4.15
	12/12/18	15:06	9.79	--	--	5.36	4.15
MW-207	09/27/18	12:13	11.70	--	--	3.70	5.90
	12/12/18	15:08	9.79	--	--	5.61	5.90
MW-209	09/27/18	--	NG	--	--	--	--
	12/12/18	--	NG	--	--	--	--
MW-210	09/27/18	--	NG	--	--	--	--
	12/12/18	--	NG	--	--	--	--
MW-211	09/27/18	--	NG	--	--	--	--
	12/12/18	--	NG	--	--	--	--
MW-70R	09/27/18	12:16	11.66	--	--	3.95	11.61
	12/12/18	15:15	9.88	--	--	5.73	11.61

Notes:
[1]Well casing elevations listed in feet above mean sea level. Approximate monitoring well locations are shown in Figure 2.
[2]Below top of casing.
[3]Light non-aqueous phase liquid
[4]Elevation referenced to city of Seattle datum.
[5]Top of well screen elevation data from historic records.
[6] LNAPL indicated in field notes, unable to collect measurement
Bolded data are for the current reporting period.
"--" = not measured or not obtainable
NG = Not Gauged during third or fourth quarter 2018 due to access issues.

Table 3
Summary of Groundwater Analytical Data

Former Unocal Seattle Marketing Terminal
3001 Elliott Avenue
Seattle, Washington

Location	Sample Date	Benzo(a)anthracene (µg/L)	Benzo(a)pyrene (µg/L)	Benzo(b)fluoranthene (µg/L)	Benzo(k)fluoranthene (µg/L)	Chrysene (µg/L)	Dibenz(a,h)anthracene (µg/L)	Indeno(1,2,3-cd)Pyrene (µg/L)	Naphthalene (µg/L)	Gasoline (C7-C12 Petroleum Hydrocarbons) (mg/L)	Diesel (C12-C24 DRO w/Si Gel) (mg/L)	Heavy Oil (C24-C40 w/Si Gel) (mg/L)	Benzene (µg/L)	Ethylbenzene (µg/L)	Toluene (µg/L)	Xylene (total) (µg/L)
Remedial Action Levels		0.03	0.03	0.03	0.03	0.03	0.03	0.03	NE	1	10	15	40	1,400	14,300	4,400
MW-30	12/14/2018	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	--	<0.019	<0.045	<0.100	<0.5	<0.5	<0.5	<1.5
MW-61A-R	12/14/2018	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	--	**0.680**	**0.190**	<0.100	<0.5	**0.8**	<0.5	<1.5
MW-70-R	9/27/2018	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	--	<0.019	<0.030	<0.070	<0.5	<0.5	<0.5	<1.5
DUP	9/27/2018	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	--	<0.019	<0.031	<0.072	<0.5	<0.5	<0.5	<1.5
MW-70-R	12/13/2018	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	--	<0.019	<0.045	<0.100	<0.5	<0.5	<0.5	<1.5
MW-200	12/13/2018	**0.01**	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	--	**0.230**	**0.130**	**0.130**	<0.5	**0.6**	<0.5	<1.5
MW-201	12/13/2018	**0.02**	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	--	**0.220**	**0.054**	<0.100	<0.5	<0.5	<0.5	<1.5
MW-202	12/13/2018	**0.01**	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	--	<0.019	<0.046	<0.100	<0.5	<0.5	<0.5	<1.5
DUP	12/13/2018	**0.01**	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	--	<0.019	<0.046	<0.100	<0.5	<0.5	<0.5	<1.5
MW-203	12/13/2018	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	--	**0.032**	**0.054**	<0.100	<0.5	<0.5	<0.5	<1.5
MW-204	12/13/2018	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	--	**0.830**	**0.075**	<0.100	<0.5	**1.1**	**0.9**	**2.0**
MW-205	12/13/2018	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	--	<0.019	<0.045	<0.100	<0.5	<0.5	<0.5	<1.5
MW-206	12/13/2018	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	--	<0.019	**0.050**	<0.100	<0.5	<0.5	<0.5	<1.5
MW-207	12/13/2018	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	--	<0.019	<0.046	<0.100	<0.5	<0.5	<0.5	<1.5
MW-209 [1]	9/27/2018	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/13/2018	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-210 [1]	9/27/2018	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/13/2018	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-211 [1]	9/27/2018	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/13/2018	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Notes:
Shaded concentrations are greater than corresponding Remedial Action Levels
-- = Not analyzed
<0.50 = Not detected at or above the remedial action level
Bold = Value exceeds laboratory reporting limits
µg/L = Micrograms per liter
mg/L = Miligrams per liter
DUP = duplicate
NE = Not Established
[1] = Well not sampled during third or fourth quarter 2018 due to access issues

Table 4
Summary of Groundwater Compliance as of Second Semi-Annual 2018

Former Unocal Seattle Marketing Terminal
3001 Elliott Avenue
Seattle, Washington

Monitoring Well	Petroleum Constituents and Sheen (BTEX, Gasoline-range, Diesel-range)		cPAHs		Lead	
	Current Sampling Interval	Consecutive Sampling Events in Compliance[1]	Current Sampling Interval	Consecutive Sampling Events in Compliance[1]	Current Sampling Interval	Consecutive Sampling Events in Compliance[1]
Upper Yard						
MW-61A-R	semi-annually	1	none	N/A	none	N/A
Elliott Avenue						
MW-30	semi-annually	1	none	0 [11]	none	N/A
Offsite Area- Amendment No. 4 Point of Compliance monitoring wells						
MW-70R	quarterly	11	quarterly	11	none	N/A
MW-200	semi-annually	18 [7]	semi-annually[2]	2 [4,5,8]	none	13
MW-201	semi-annually	17 [7]	semi-annually[2]	5	none	13
MW-202	semi-annually	29	semi-annually[2]	25 [3, 4, 10]	none	13
MW-203	semi-annually	29	semi-annually[2]	29 [4,8]	none	13
MW-204	semi-annually	1	semi-annually[2]	29 [4,8,10]	none	13
MW-205	semi-annually	15	semi-annually [2]	15 [4,8]	none	13
MW-206	semi-annually	29	semi-annually [2]	29 [4,6,8]	none	13
MW-207	semi-annually	29	semi-annually [2]	5	none	13
MW-209 [12]	quarterly	0	quarterly	6	none	N/A
MW-210 [12]	quarterly	0	quarterly	0	none	N/A
MW-211 [12]	quarterly	6	quarterly	6	none	N/A

Notes:

[1] "Consecutive events" are number of consecutive sampling events prior to and including the current reporting period that are in compliance with the groundwater remediation action levels. Events prior to 3/97 are not counted. Refer to progress reports for results.

[2]Quarterly sampling beginning June 2007. Semi-annual sampling beginning 2010.

[3]Field-Filtered sample below RAL.

[4]Field-Filtered and Un-Filtered samples below RAL

[5]9/3/08 laboratory reporting limit above RAL

[6]Confirmation samples indicate erroneous 9/4/08 field-filtered data

[7]Sheen noted on groundwater during well redevelopment in August 2010

[8]First Semi-Annual 2011 laboratory reporting limit above RAL

[9]First Semi-Annual 2012 laboratory reporting limit above RAL

[10]Second Semi-Annual 2012 laboratory reporting limit above RAL

[11]MW-30 analyzed for cPAHs only during the First Semi-Annual 2013 sampling event

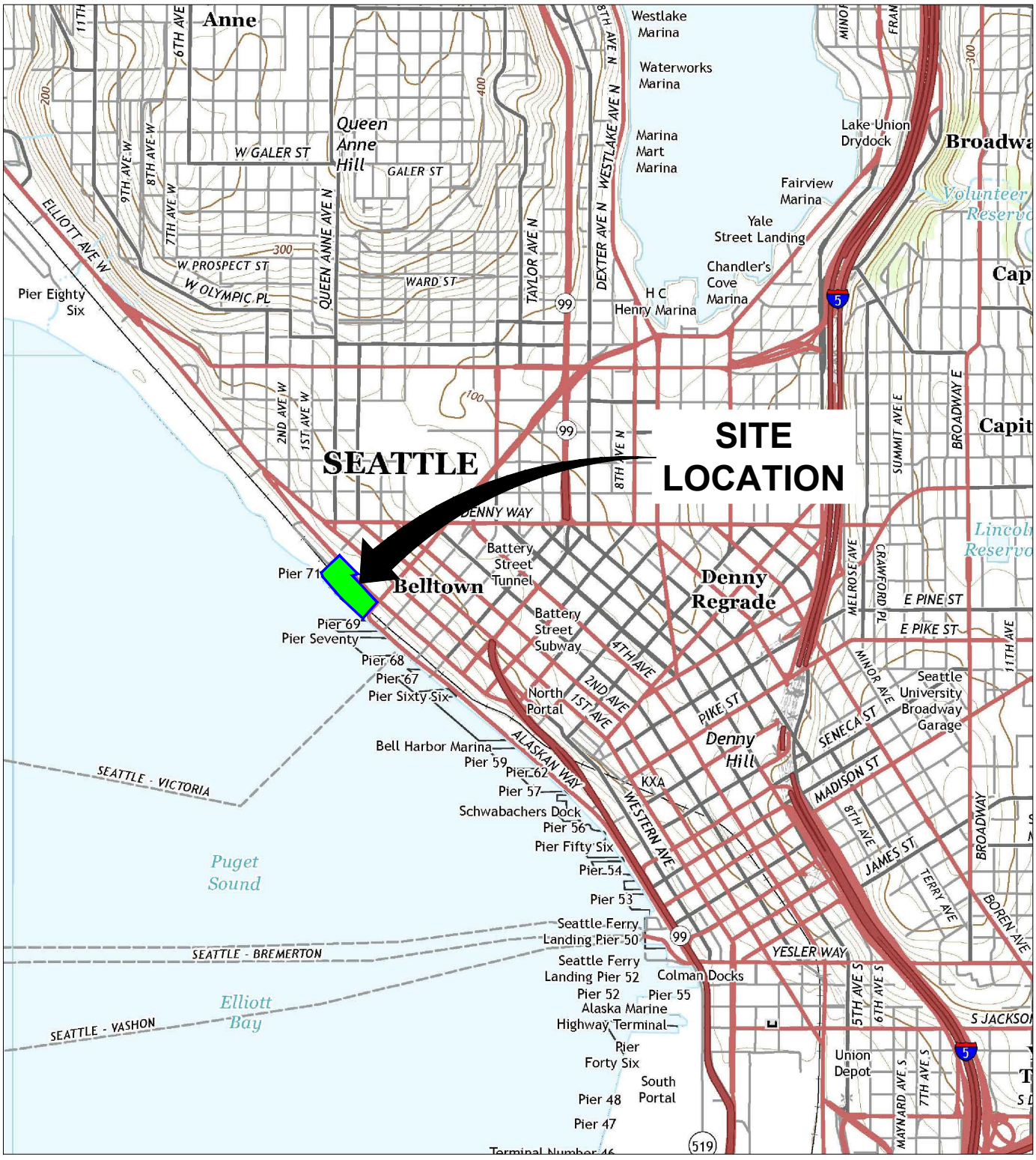
[12] Monitoring well not sampled during third quarter or fourth quarter 2018 due to access issues

BTEX = benzene, toluene, ethylbenzene, xylenes

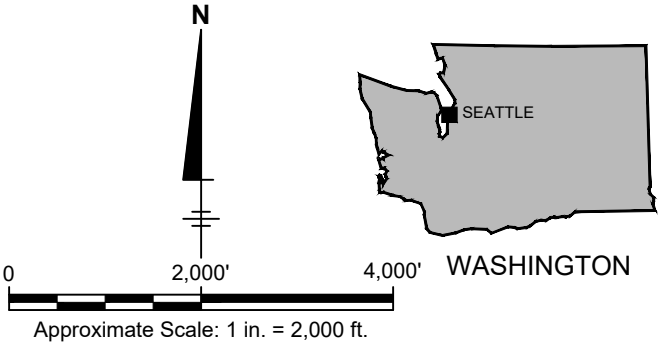
cPAHs = carcinogenic polycyclic aromatic hydrocarbons

N/A = not applicable

FIGURES



REFERENCE: BASE MAP USGS 7.5. MIN. TOPO. QUAD., SEATTLE SOUTH AND SEATTLE NORTH, WASHINGTON, 2014.



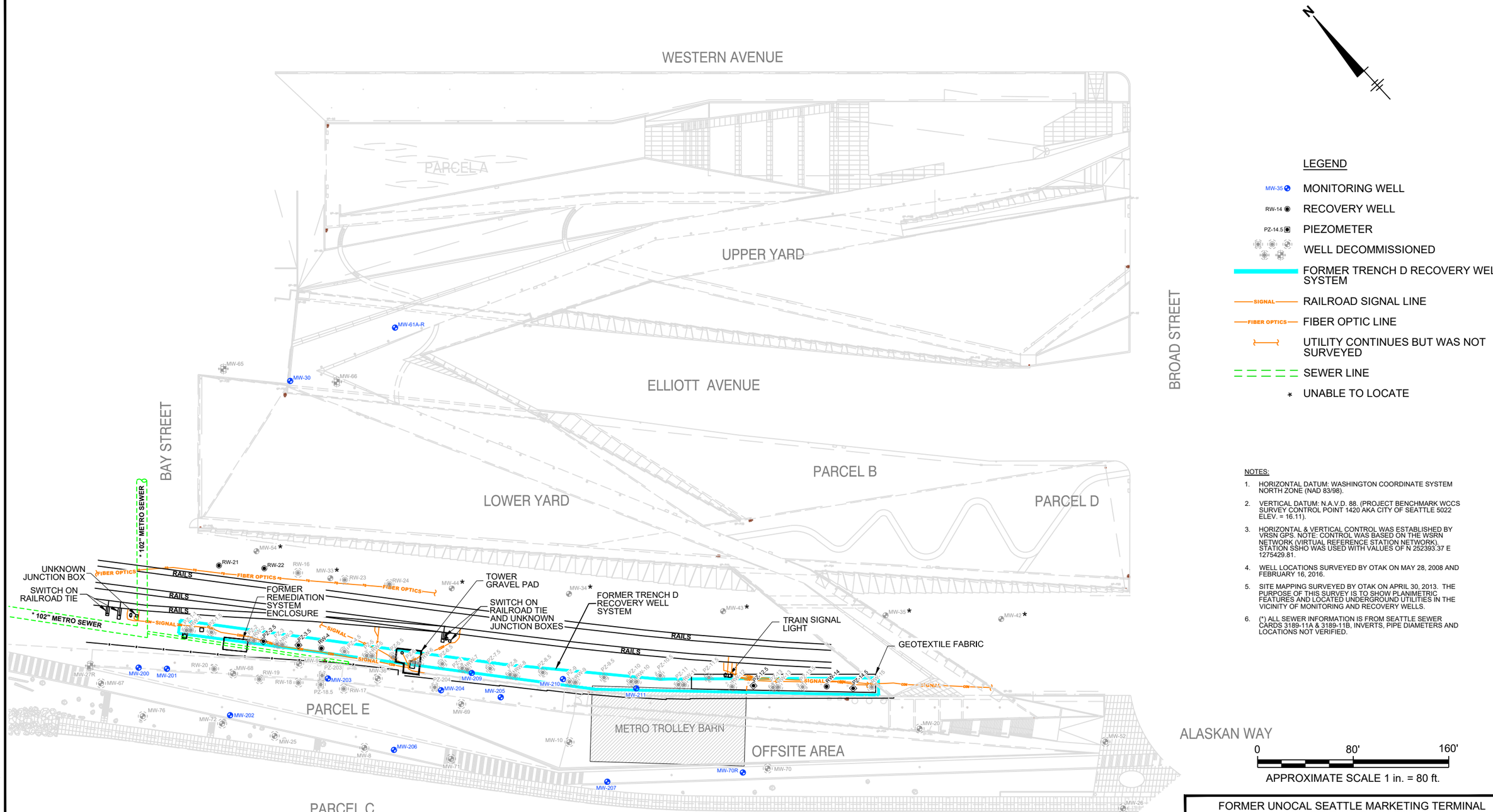
FORMER UNOCAL SEATTLE MARKETING TERMINAL
SEATTLE, WASHINGTON

GROUNDWATER MONITORING REPORT
SECOND SEMI-ANNUAL 2018

SITE LOCATION MAP

ARCADIS Design & Consultancy for natural and built assets

FIGURE
1



LEGEND

- MW-35 MONITORING WELL
- RW-14 RECOVERY WELL
- PZ-14.5 PIEZOMETER
- WELL DECOMMISSIONED
- FORMER TRENCH D RECOVERY WELL SYSTEM
- SIGNAL RAILROAD SIGNAL LINE
- FIBER OPTICS FIBER OPTIC LINE
- UTILITY CONTINUES BUT WAS NOT SURVEYED
- SEWER LINE
- * UNABLE TO LOCATE

NOTES:

1. HORIZONTAL DATUM: WASHINGTON COORDINATE SYSTEM NORTH ZONE (NAD 83/98).
2. VERTICAL DATUM: N.A.V.D. 88. (PROJECT BENCHMARK WCCS SURVEY CONTROL POINT 1420 AKA CITY OF SEATTLE 5022 ELEV. = 16.11).
3. HORIZONTAL & VERTICAL CONTROL WAS ESTABLISHED BY VRSN GPS. NOTE: CONTROL WAS BASED ON THE WSRN NETWORK (VIRTUAL REFERENCE STATION NETWORK). STATION SSHO WAS USED WITH VALUES OF N 252393.37 E 1275429.81.
4. WELL LOCATIONS SURVEYED BY OTAK ON MAY 28, 2008 AND FEBRUARY 16, 2016.
5. SITE MAPPING SURVEYED BY OTAK ON APRIL 30, 2013. THE PURPOSE OF THIS SURVEY IS TO SHOW PLANIMETRIC FEATURES AND LOCATED UNDERGROUND UTILITIES IN THE VICINITY OF MONITORING AND RECOVERY WELLS.
6. (*) ALL SEWER INFORMATION IS FROM SEATTLE SEWER CARDS 3189-11A & 3189-11B, INVERTS, PIPE DIAMETERS AND LOCATIONS NOT VERIFIED.

0 80' 160'

APPROXIMATE SCALE 1 in. = 80 ft.

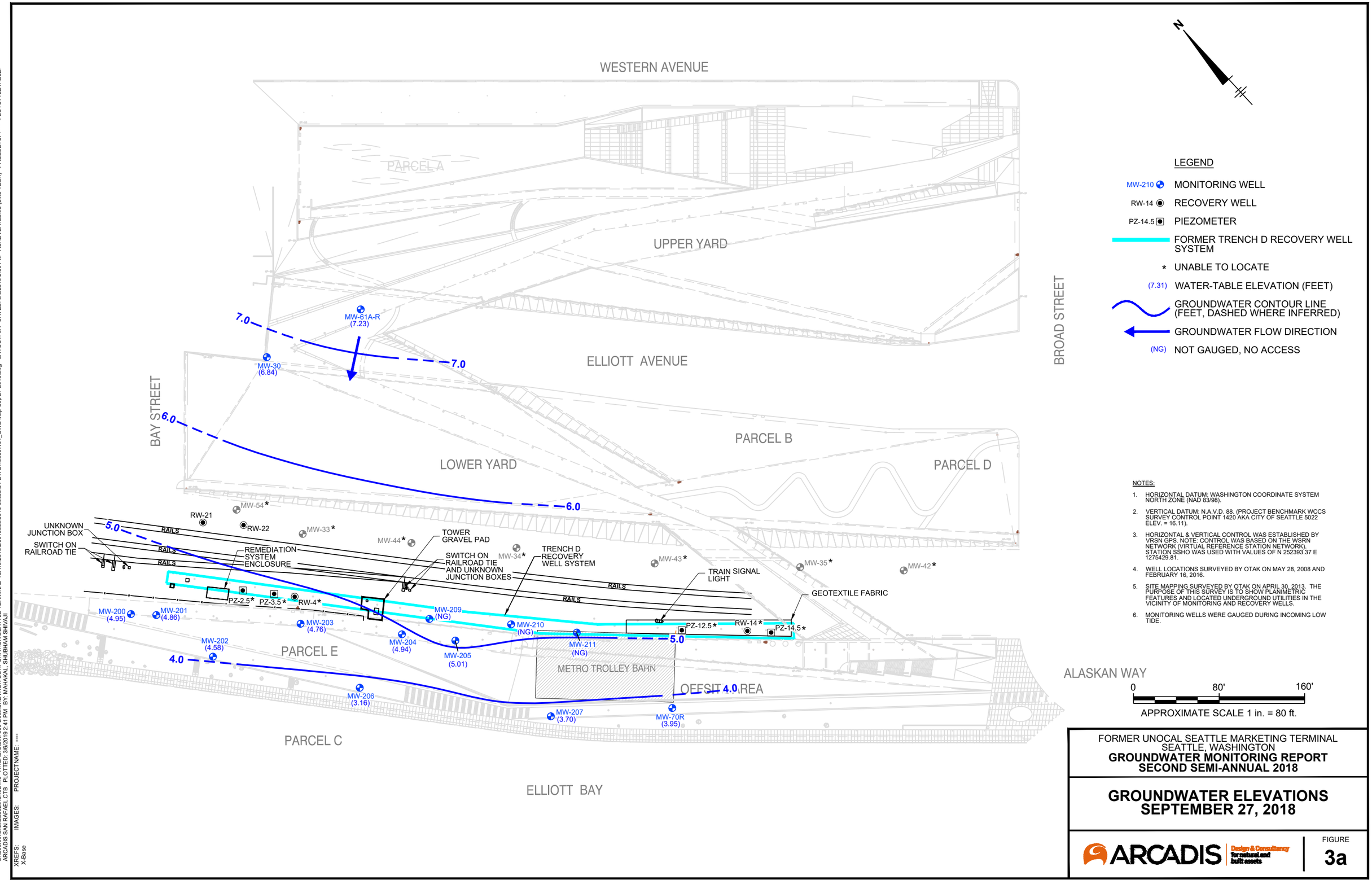
FORMER UNOCAL SEATTLE MARKETING TERMINAL
SEATTLE, WASHINGTON
GROUNDWATER MONITORING REPORT
SECOND SEMI-ANNUAL 2018

SITE MAP

ARCADIS Design & Consultancy for natural and built assets

FIGURE 2

CITY: SAN RAFAEL, CA DIV/GROUP: ENVCAD DB: J. HARRIS LD: E. MURESAN
C:\Users\mahakal\3326\OneDrive - ARCADIS\BIM 360 Docs\CHEVRON CORPORATION\SEATTLE TERMINAL-1SA18\2018\B0045363.0010 0000301-DWG\45363801_Site Plan.dwg LAYOUT: 2 SAVED: 3/6/2019 2:22 PM ACADVER: 22.0S (LMS TECH) PAGESETUP: --- PLOTSTYLETABLE: ARCADIS SAN
RAFAEL.CTB PLOTTED: 3/6/2019 2:43 PM BY: MAHAKAL, SHUBHAM SHIVAJI



NOTES:

1. HORIZONTAL DATUM: WASHINGTON COORDINATE SYSTEM NORTH ZONE (NAD 83/98).
2. VERTICAL DATUM: N.A.V.D. 88. (PROJECT BENCHMARK WCCS SURVEY CONTROL POINT 1420 AKA CITY OF SEATTLE 5022 ELEV. = 16.11).
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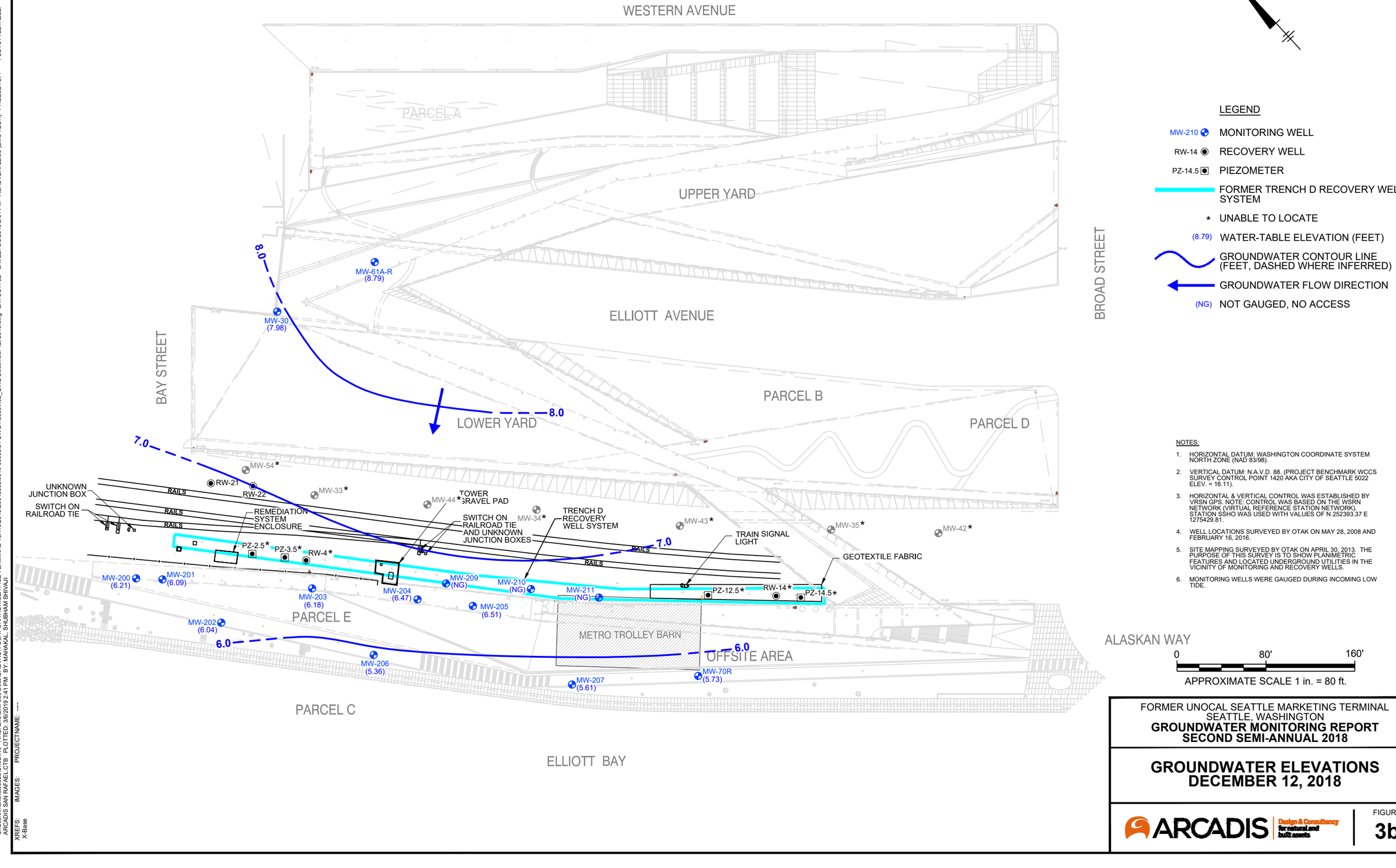
5. SITE MAPPING SURVEYED BY OTAK ON APRIL 30, 2013. THE PURPOSE OF THIS SURVEY IS TO SHOW PLANIMETRIC FEATURES AND LOCATED UNDERGROUND UTILITIES IN THE VICINITY OF MONITORING AND RECOVERY WELLS.
6. MONITORING WELLS WERE GAUGED DURING INCOMING LOW TIDE.

FORMER UNOCAL SEATTLE MARKETING TERMINAL
SEATTLE, WASHINGTON
GROUNDWATER MONITORING REPORT
SECOND SEMI-ANNUAL 2018

GROUNDWATER ELEVATIONS SEPTEMBER 27, 2018

ARCADIS Design & Consultancy for natural and built assets

FIGURE **3a**



N

LEGEND

- MW-210 — MONITORING WELL
- RW-14 — RECOVERY WELL
- PZ-14.5 — PIEZOMETER
- FORMER TRENCH D RECOVERY WELL SYSTEM
- * — UNABLE TO LOCATE
- (8.79) — WATER-TABLE ELEVATION (FEET)
- GROUNDWATER CONTOUR LINE (FEET, DASHED WHERE INFERRED)
- GROUNDWATER FLOW DIRECTION
- (NG) — NOT GAUGED, NO ACCESS

NOTES:

1. HORIZONTAL DATUM: WASHINGTON COORDINATE SYSTEM NORTH ZONE (NAD 83/98).
2. VERTICAL DATUM: N.A.V.D. 88. (PROJECT BENCHMARK WCCS SURVEY CONTROL POINT 1420 AKA CITY OF SEATTLE 5022 ELEV. = 16.11).
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6. MONITORING WELLS WERE GAUGED DURING INCOMING LOW TIDE.

0 80' 160'

APPROXIMATE SCALE 1 in. = 80 ft.

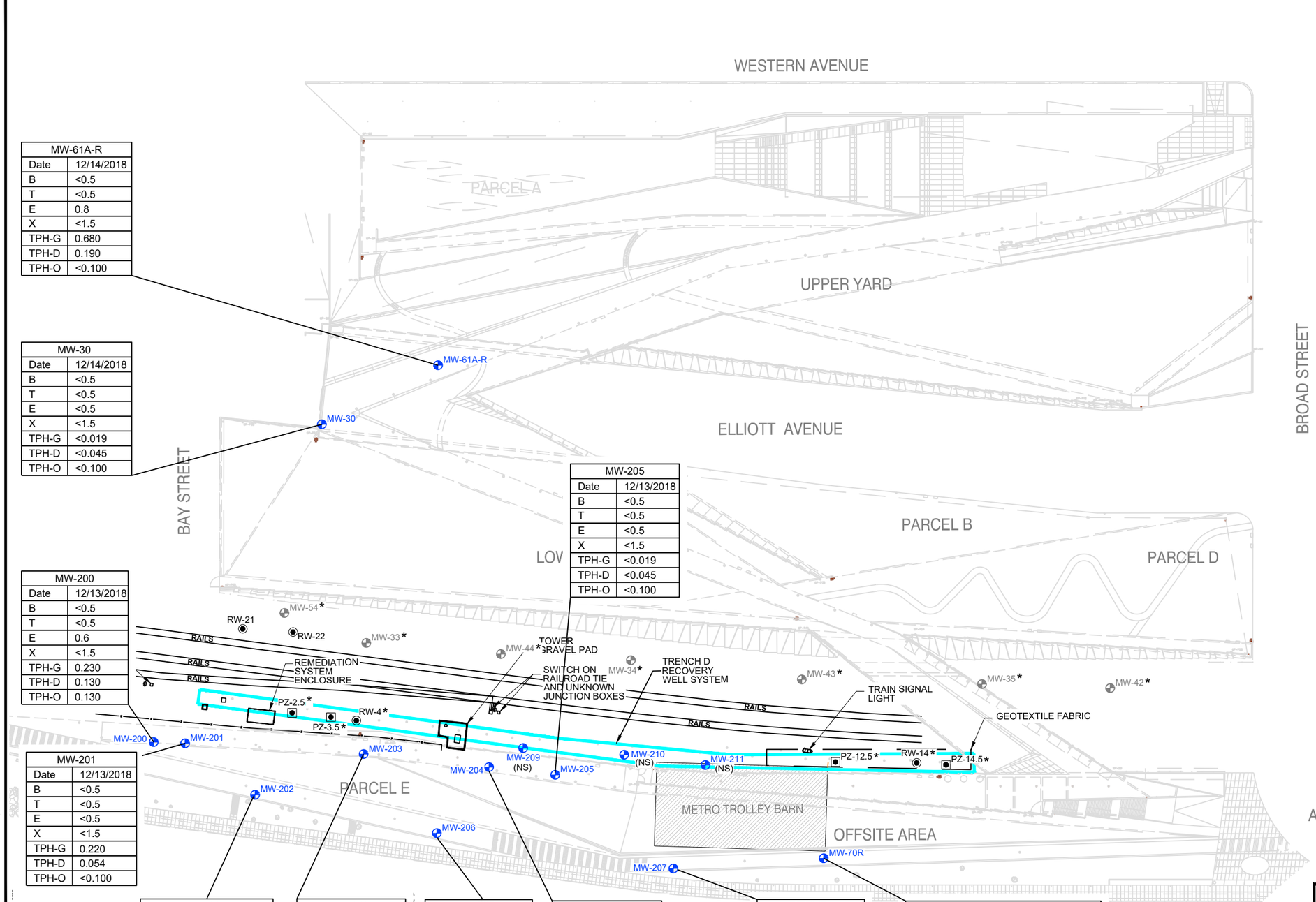
FORMER UNOCAL SEATTLE MARKETING TERMINAL
SEATTLE, WASHINGTON

GROUNDWATER MONITORING REPORT
SECOND SEMI-ANNUAL 2018

GROUNDWATER ELEVATIONS DECEMBER 12, 2018

ARCADIS Design & Consultancy for natural and built assets

FIGURE
3b



MW-61A-R	
Date	12/14/2018
B	<0.5
T	<0.5
E	0.8
X	<1.5
TPH-G	0.680
TPH-D	0.190
TPH-O	<0.100

MW-30	
Date	12/14/2018
B	<0.5
T	<0.5
E	<0.5
X	<1.5
TPH-G	<0.019
TPH-D	<0.045
TPH-O	<0.100

MW-205	
Date	12/13/2018
B	<0.5
T	<0.5
E	<0.5
X	<1.5
TPH-G	<0.019
TPH-D	<0.045
TPH-O	<0.100

MW-200	
Date	12/13/2018
B	<0.5
T	<0.5
E	0.6
X	<1.5
TPH-G	0.230
TPH-D	0.130
TPH-O	0.130

MW-201	
Date	12/13/2018
B	<0.5
T	<0.5
E	<0.5
X	<1.5
TPH-G	0.220
TPH-D	0.054
TPH-O	<0.100

MW-202	
Date	12/13/2018
B	<0.5/[<0.5]
T	<0.5/[<0.5]
E	<0.5/[<0.5]
X	<1.5/[<1.5]
TPH-G	<0.019/[<0.019]
TPH-D	<0.046/[<0.046]
TPH-O	<0.100/[<0.100]

MW-203	
Date	12/13/2018
B	<0.5
T	<0.5
E	<0.5
X	<1.5
TPH-G	0.032
TPH-D	0.054
TPH-O	<0.100

MW-206	
Date	12/13/2018
B	<0.5
T	<0.5
E	<0.5
X	<1.5
TPH-G	<0.019
TPH-D	0.050
TPH-O	<0.100

MW-204	
Date	12/13/2018
B	<0.5
T	0.9
E	1.1
X	2.0
TPH-G	0.830
TPH-D	0.075
TPH-O	<0.100

MW-207	
Date	12/13/2018
B	<0.5
T	<0.5
E	<0.5
X	<1.5
TPH-G	<0.019
TPH-D	<0.046
TPH-O	<0.100

MW-70-R		
Date	9/27/2018	12/13/2018
B	<0.5/[<0.5]	<0.5
T	<0.5/[<0.5]	<0.5
E	<0.5/[<0.5]	<0.5
X	<1.5/[<1.5]	<1.5
TPH-G	<0.019/[<19]	<0.019
TPH-D	<0.030/[<0.031]	<0.045
TPH-O	<0.070/[<0.072]	<0.100

N

LEGEND

- MW-210 — MONITORING WELL
- RW-14 — RECOVERY WELL
- PZ-14.5 — PIEZOMETER
- FORMER TRENCH D RECOVERY WELL SYSTEM
- * UNABLE TO LOCATE
- (NS) NOT SAMPLED, NO ACCESS

SAMPLE LOCATION	
DATE	SAMPLE DATE
B	BENZENE
T	TOLUENE
E	ETHYLBENZENE
X	TOTAL XYLENES
TPH-G	TPH GASOLINE
TPH-D	TPH DIESEL
TPH-O	TPH HEAVY OIL

BTEX RESULTS REPORTED IN MICROGRAMS PER LITER (µg/L). TPH-G, TPH-D, AND TPH-O RESULTS REPORTED IN MILLIGRAMS PER LITER (mg/L).

TPH = TOTAL PETROLEUM HYDROCARBON

<1.5 / [<1.5] = DUPLICATE SAMPLE

NOTES:

1. HORIZONTAL DATUM: WASHINGTON COORDINATE SYSTEM NORTH ZONE (NAD 83/98).
2. VERTICAL DATUM: N.A.V.D. 88. (PROJECT BENCHMARK WCCS SURVEY CONTROL POINT 1420 AKA CITY OF SEATTLE 5022 ELEV. = 16.11).
3. HORIZONTAL & VERTICAL CONTROL WAS ESTABLISHED BY VRSN GPS. NOTE: CONTROL WAS BASED ON THE WSRN NETWORK (VIRTUAL REFERENCE STATION NETWORK). STATION SSHO WAS USED WITH VALUES OF N 252393.37 E 1275429.81.
4. WELL LOCATIONS SURVEYED BY OTAK ON MAY 28, 2008 AND FEBRUARY 16, 2016.
5. SITE MAPPING SURVEYED BY OTAK ON APRIL 30, 2013. THE PURPOSE OF THIS SURVEY IS TO SHOW PLANIMETRIC FEATURES AND LOCATED UNDERGROUND UTILITIES IN THE VICINITY OF MONITORING AND RECOVERY WELLS.

0 80' 160'

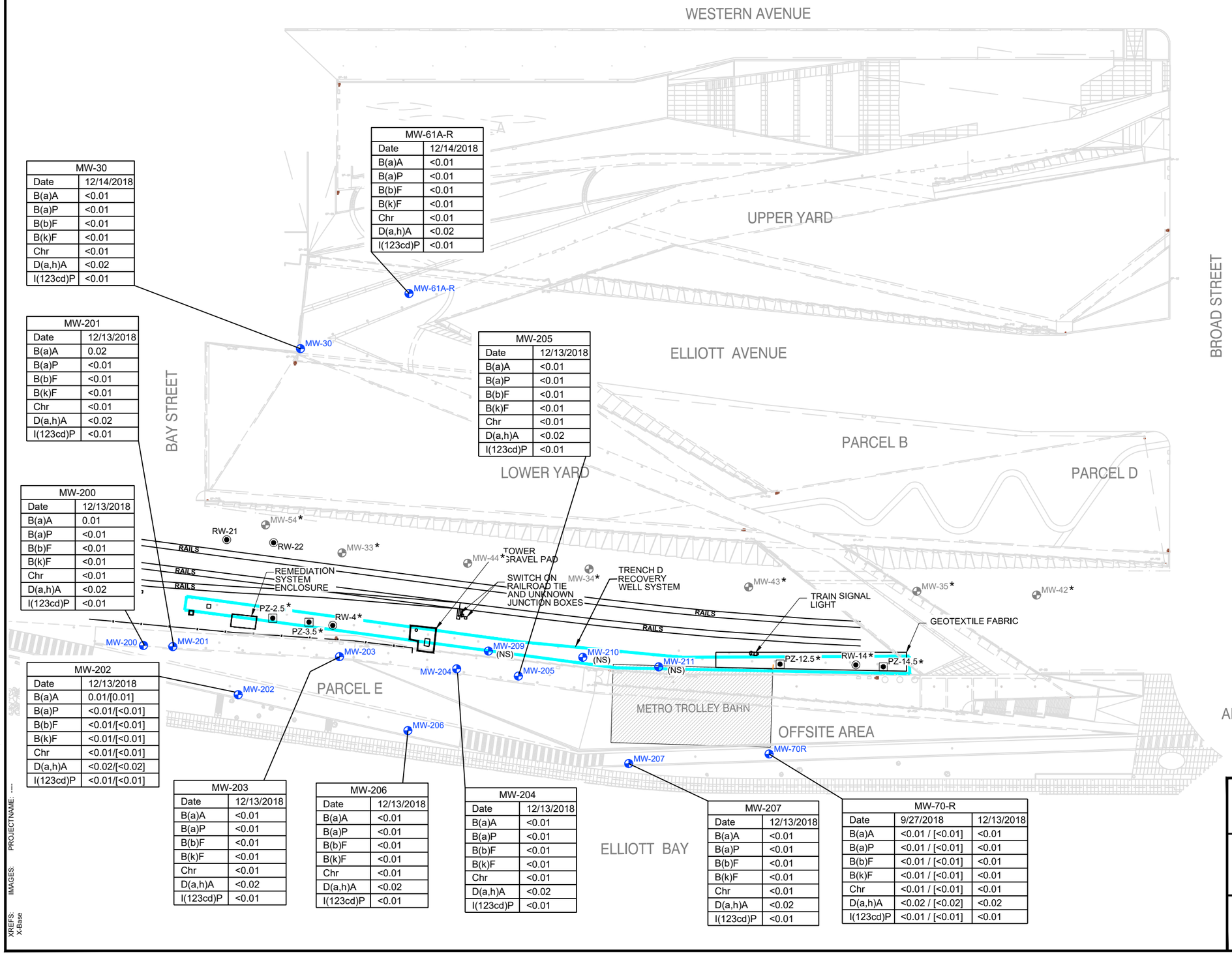
APPROXIMATE SCALE 1 in. = 80 ft.

FORMER UNOCAL SEATTLE MARKETING TERMINAL
SEATTLE, WASHINGTON
GROUNDWATER MONITORING REPORT
SECOND SEMI-ANNUAL 2018

GROUNDWATER ANALYTICAL SUMMARY MAP SEPTEMBER 27, 2018 AND DECEMBER 13 AND 14, 2018

ARCADIS Design & Consultancy for natural and built assets

FIGURE 4



MW-30	
Date	12/14/2018
B(a)A	<0.01
B(a)P	<0.01
B(b)F	<0.01
B(k)F	<0.01
Chr	<0.01
D(a,h)A	<0.02
I(123cd)P	<0.01

MW-61A-R	
Date	12/14/2018
B(a)A	<0.01
B(a)P	<0.01
B(b)F	<0.01
B(k)F	<0.01
Chr	<0.01
D(a,h)A	<0.02
I(123cd)P	<0.01

MW-201	
Date	12/13/2018
B(a)A	0.02
B(a)P	<0.01
B(b)F	<0.01
B(k)F	<0.01
Chr	<0.01
D(a,h)A	<0.02
I(123cd)P	<0.01

MW-205	
Date	12/13/2018
B(a)A	<0.01
B(a)P	<0.01
B(b)F	<0.01
B(k)F	<0.01
Chr	<0.01
D(a,h)A	<0.02
I(123cd)P	<0.01

MW-200	
Date	12/13/2018
B(a)A	0.01
B(a)P	<0.01
B(b)F	<0.01
B(k)F	<0.01
Chr	<0.01
D(a,h)A	<0.02
I(123cd)P	<0.01

MW-202	
Date	12/13/2018
B(a)A	0.01/[0.01]
B(a)P	<0.01/[<0.01]
B(b)F	<0.01/[<0.01]
B(k)F	<0.01/[<0.01]
Chr	<0.01/[<0.01]
D(a,h)A	<0.02/[<0.02]
I(123cd)P	<0.01/[<0.01]

MW-203	
Date	12/13/2018
B(a)A	<0.01
B(a)P	<0.01
B(b)F	<0.01
B(k)F	<0.01
Chr	<0.01
D(a,h)A	<0.02
I(123cd)P	<0.01

MW-206	
Date	12/13/2018
B(a)A	<0.01
B(a)P	<0.01
B(b)F	<0.01
B(k)F	<0.01
Chr	<0.01
D(a,h)A	<0.02
I(123cd)P	<0.01

MW-204	
Date	12/13/2018
B(a)A	<0.01
B(a)P	<0.01
B(b)F	<0.01
B(k)F	<0.01
Chr	<0.01
D(a,h)A	<0.02
I(123cd)P	<0.01

MW-207	
Date	12/13/2018
B(a)A	<0.01
B(a)P	<0.01
B(b)F	<0.01
B(k)F	<0.01
Chr	<0.01
D(a,h)A	<0.02
I(123cd)P	<0.01

MW-70-R		
Date	9/27/2018	12/13/2018
B(a)A	<0.01 / [<0.01]	<0.01
B(a)P	<0.01 / [<0.01]	<0.01
B(b)F	<0.01 / [<0.01]	<0.01
B(k)F	<0.01 / [<0.01]	<0.01
Chr	<0.01 / [<0.01]	<0.01
D(a,h)A	<0.02 / [<0.02]	<0.02
I(123cd)P	<0.01 / [<0.01]	<0.01

LEGEND

- MW-210 — MONITORING WELL
- RW-14 — RECOVERY WELL
- PZ-14.5 — PIEZOMETER
- FORMER TRENCH D RECOVERY WELL SYSTEM
- * UNABLE TO LOCATE
- (NS) NOT SAMPLED, NO ACCESS

SAMPLE LOCATION	
DATE	SAMPLE DATE
B(a)A	Benzo(a)anthracene
B(a)P	Benzo(a)pyrene
B(b)F	Benzo(b)fluoranthene
B(k)F	Benzo(k)fluoranthene
Chr	Chrysene
D(a,h)A	Dibenzo(a,h)anthracene
I(123cd)P	Indeno(1,2,3-cd)pyrene

RESULTS REPORTED IN MICROGRAMS PER LITER (µg/L)

<0.01 / [<0.01] = DUPLICATE SAMPLE

cPAH = CARCINOGENIC POLYNUCLEAR AROMATIC HYDROCARBONS

NOTES:

1. HORIZONTAL DATUM: WASHINGTON COORDINATE SYSTEM NORTH ZONE (NAD 83/98).
2. VERTICAL DATUM: N.A.V.D. 88. (PROJECT BENCHMARK WCCS SURVEY CONTROL POINT 1420 AKA CITY OF SEATTLE 5022 ELEV. = 16.11).
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0 80' 160'

APPROXIMATE SCALE 1 in. = 80 ft.

FORMER UNOCAL SEATTLE MARKETING TERMINAL
SEATTLE, WASHINGTON

GROUNDWATER MONITORING REPORT
SECOND SEMI-ANNUAL 2018

GROUNDWATER cPAH DATA SEPTEMBER 27, 2018 AND DECEMBER 13 AND 14, 2018

ARCADIS Design & Consultancy for natural and built assets

FIGURE 5

CITY: SAN RAFAEL, CA DIV/GROUP: ENVCAD DB: J. HARRIS
C:\Users\mahakal\3526\OneDrive - ARCADIS\BIM 360 Docs\CHEVRON CORPORATION\SEATTLE TERMINAL-15A18201\B0045363.0010 00003\01-DWG\45363C02_GWE cPAH data.dwg LAYOUT: 5 SAVED: 3/6/2019 2:38 PM ACADVER: 22.0S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ARCADIS
SAN RAFAEL C1TB PLOTTED: 3/6/2019 2:42 PM BY: MAHAKAL, SHUBHAM SHIVAJI
XREFS: PROJECTNAME: ----
IMAGES:
X-Base

APPENDIX A

Standard Operating Procedure

ARCADIS

Appendix A

Standard Operating Procedure

ARCADIS
Infrastructure, environment, facilities

Imagine the result

Low-Flow Groundwater Purging and Sampling Procedures for Monitoring Wells

Rev. #: 3

Rev Date: March 9, 2009

Approval Signatures

Prepared by:  Date: 3/9/2009

Reviewed by:  Date: 3/9/2009

(Technical Expert)

I. Scope and Application

Groundwater samples will be collected from monitoring wells to evaluate groundwater quality. The protocol presented in this standard operating procedure (SOP) describes the procedures to be used to purge monitoring wells and collect groundwater samples. This protocol has been developed in accordance with the United States Environmental Protection Agency (USEPA) Region I Low Stress (Low Flow) Purging and Sampling Procedures for the Collection of Groundwater Samples from Monitoring Wells (USEPA SOP No. GW0001; July 30, 1996). Both filtered and unfiltered groundwater samples may be collected using this low-flow sampling method. Filtered samples will be obtained using a 0.45-micron disposable filter. No wells will be sampled until well development has been performed in accordance with the procedures presented in the SOP titled Monitoring Well Development, unless that well has been sampled or developed within the prior 1-year time period. Groundwater samples will not be collected within 1 week following well development.

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. ARCADIS personnel providing assistance to groundwater sample collection and associated activities should have a minimum of 6 months of related experience or an advanced degree in environmental sciences, engineering, hydrogeology, or geology.

The supervisor of the groundwater sampling team will have at least 1 year of previous supervised groundwater sampling experience.

Prior to mobilizing to the field, the groundwater sampling team should review and be thoroughly familiar with relevant site-specific documents including but not limited to the site work plan, field sampling plan, QAPP, HASP, and historical information. Additionally, the groundwater sampling team should review and be thoroughly familiar with documentation provided by equipment manufacturers for all equipment that will be used in the field prior to mobilization.

III. Equipment List

Specific to this activity, the following materials (or equivalent) will be available:

- Health and safety equipment (as required in the site Health and Safety Plan [HASP]).

- Site Plan, well construction records, prior groundwater sampling records (if available).
- Sampling pump, which may consist of one or more of the following:
  - submersible pump (e.g., Grundfos Redi-Flo 2);
  - peristaltic pump (e.g., ISCO Model 150); and/or
  - bladder pump (e.g., Marschalk System 1, QED Well Wizard, etc.).
- Appropriate controller and power source for pump:
  - Submersible and peristaltic pumps require electric power from either a generator or a deep cell battery.
  - Submersible pumps such as Grundfos require a pump controller to run the pump
  - Bladder pumps require a pump controller and a gas source (e.g., air compressor or compressed N_2 or CO_2 gas cylinders).
- Teflon® tubing or Teflon®-lined polyethylene tubing of an appropriate size for the pump being used. For peristaltic pumps, dedicated Tygon® tubing (or other type as specified by the manufacturer) will also be used through the pump apparatus.
- Water-level probe (e.g., Solinist Model 101).
- Water-quality (temperature/pH/specific conductivity/ORP/turbidity/dissolved oxygen) meter and flow-through measurement cell. Several brands may be used, including:
  - YSI 6-Series Multi-Parameter Instrument;
  - Hydrolab Series 3 or Series 4a Multiprobe and Display; and/or
  - Horiba U-10 or U-22 Water Quality Monitoring System.
- Supplemental turbidity meter (e.g., Horiba U-10, Hach 2100P, LaMotte 2020). Turbidity measurements collected with multi-parameter meters have been shown to sometimes be unreliable due to fouling of the optic lens of the

turbidity meter within the flow-through cell. A supplemental turbidity meter will be used to verify turbidity data during purging if such fouling is suspected. Note that industry improvements may eliminate the need for these supplemental measurements in the future.

- Appropriate water sample containers (supplied by the laboratory).
- Appropriate blanks (trip blank supplied by the laboratory).
- 0.45-micron disposable filters (if field filtering is required).
- Large glass mixing container (if sampling with a bailer).
- Teflon® stirring rod (if sampling with a bailer).
- Cleaning equipment.
- Groundwater sampling log (attached) or bound field logbook.

Note that in the future, the client may acquire different makes/models of some of this equipment if the listed makes/models are no longer available, or as a result of general upgrades or additional equipment acquisitions. In the event that the client uses a different make/model of the equipment listed, the client will use an equivalent type of equipment (e.g., pumps, flow-through analytical cells) and note the specific make/model of the equipment used during a sampling event on the groundwater sampling log. In addition, should the client desire to change to a markedly different sampling methodology (e.g., discrete interval samplers, passive diffusion bags, or a yet to be developed technique), the client will submit a proposed SOP for the new methodology for USEPA approval prior to implementing such a change.

The maintenance requirements for the above equipment generally involve decontamination or periodic cleaning, battery charging, and proper storage, as specified by the manufacturer. For operational difficulties, the equipment will be serviced by a qualified technician.

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.

Do not use permanent marker or felt-tip pens for labels on sample container or sample coolers – use indelible ink. The permanent markers could introduce volatile constituents into the samples.

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

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 impacted based on previous analytical data. If no analytical data are available, samples are collected in order of upgradient, then furthest downgradient to source area locations.

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

V. Health and Safety Considerations

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.

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

Use caution when removing well caps as well may be under pressure, cap can dislodge forcefully and cause injury.

Use caution when opening protective casing on stickup wells as wasps frequently nest inside the tops of the covers. Also watch for fire ant mounds near well pads when sampling in the south or western U.S.

VI. Procedure

Groundwater will be purged from the wells using an appropriate pump. Peristaltic pumps will initially be used to purge and sample all wells when applicable. If the depth to water is below the sampling range of a peristaltic pump (approximately 25 feet), submersible pumps or bladder pumps will be used provided the well is constructed with a casing diameter greater than or equal to 2 inches (the minimum well diameter capable of accommodating such pumps). Bladder pumps are preferred over peristaltic and submersible pumps if sampling of VOCs is required to prevent volatilization. For

smaller diameter wells where the depth to water is below the sampling range of a peristaltic pump, alternative sampling methods (i.e., bailing or small diameter bladder pumps) will be used to purge and sample the groundwater. Purge water will be collected and containerized.

1. Calibrate field instruments according to manufacturer procedures for calibration.

2. Measure initial depth to groundwater prior to placement of pumps.

3. Prepare and install pump in well: For submersible and non-dedicated bladder pumps, decontaminate pump according to site decontamination procedures. Non-dedicated bladder pumps will require a new Teflon® bladder and attachment of an air line, sample discharge line, and safety cable prior to placement in the well. Attach the air line tubing to the air port on the top of the bladder pump. Attach the sample discharge tubing to the water port on the top of the bladder pump. Care should be taken not to reverse the air and discharge tubing lines during bladder pump set-up as this could result in bladder failure or rupture. Attach and secure a safety cable to the eyebolt on the top of bladder pump (if present, depending on pump model used). Slowly lower pump, safety cable, tubing, and electrical lines into the well to a depth corresponding to the approximate center of the saturated screen section of the well. Take care to avoid twisting and tangling of safety cable, tubing, and electrical lines while lowering pump into well; twisted and tangled lines could result in the pump becoming stuck in the well casing. Also, make sure to keep tubing and lines from touching the ground or other surfaces while introducing them into the well as this could lead to well contamination. If a peristaltic pump is being used, slowly lower the sampling tubing into the well to a depth corresponding to the approximate center of the saturated screen section of the well. The pump intake or sampling tube must be kept at least 2 feet above the bottom of the well to prevent mobilization of any sediment present in the bottom of the well.

4. Connect the pump to other equipment. If using a bladder pump, the discharge water line should be connected to the bottom inlet port on the flow-through cell connected to the water quality meter. Connect the air line to the pump controller output port. The pump controller should then be connected to a supply line from an air compressor or compressed gas cylinder using an appropriate regulator and air hose. Take care to tighten the regulator connector onto the gas cylinder (if used) to prevent leaks. Teflon tape may be used on the threads of the cylinder to provide a tighter seal. Once the air compressor or gas cylinder is connected to the pump controller, turn on the compressor or open the valve on the cylinder to begin the gas flow. Turn on the pump controller if an on/off switch

is present and verify that all batteries are charged and fully operating before beginning to pump.

5. Measure the water level again with the pump in the well before starting the pump. Start pumping the well at 200 to 500 milliliters (mL) per minute (or at lower site-specific rate if specified). The pump rate should be adjusted to cause little or no water level drawdown in the well (less than 0.3 feet below the initial static depth to water measurement) and the water level should stabilize. The water level should be monitored every 3 to 5 minutes (or as appropriate, lower flow rates may require longer time between readings) during pumping if the well diameter is of sufficient size to allow such monitoring. Care should be taken not to break pump suction or cause entrainment of air in the sample. Record pumping rate adjustments and depths to water. If necessary, pumping rates should be reduced to the minimum capabilities of the pump to avoid pumping the well dry and/or to stabilize indicator parameters. A steady flow rate should be maintained to the extent practicable. Groundwater sampling records from previous sampling events (if available) should be reviewed prior to mobilization to estimate the optimum pumping rate and anticipated drawdown for the well in order to more efficiently reach a stabilized pumping condition.

   If the recharge rate of the well is very low, alternative purging techniques should be used, which will vary based on the well construction and screen position. For wells screened across the water table, the well should be pumped dry and sampling should commence as soon as the volume in the well has recovered sufficiently to permit collection of samples. For wells screened entirely below the water table, the well should be pumped until a stabilized level (which may be below the maximum displacement goal of 0.3 feet) can be maintained and monitoring for stabilization of field indicator parameters can commence. If a lower stabilization level cannot be maintained, the well should be pumped until the drawdown is at a level slightly higher than the bentonite seal above the well screen. Sampling should commence after one well volume has been removed and the well has recovered sufficiently to permit collection of samples.

   During purging, monitor the field indicator parameters (e.g., turbidity, temperature, specific conductance, pH, etc.) every 3 to 5 minutes (or as appropriate). Field indicator parameters will be measured using a flow-through analytical cell or a clean container such as a glass beaker. Record field indicator parameters on the groundwater sampling log. The well is considered stabilized and ready for sample collection when turbidity values remain within 10% (or within 1 NTU if the turbidity reading is less than 10 NTU), the specific conductance and temperature values remain within 3%, and pH remains within 0.1 units for three consecutive readings collected at 3- to 5-minute intervals (or

other appropriate interval, alternate stabilization goals may exist in different geographic regions, consult the site-specific Work Plan for stabilization criteria). If the field indicator parameters do not stabilize within 1 hour of the start of purging, but the groundwater turbidity is below the goal of 50 NTU and the values for all other parameters are within 10%, the well can be sampled. If the parameters have stabilized but the turbidity is not in the range of the 50 NTU goal, the pump flow rate should be decreased to a minimum rate of 100 mL/min to reduce turbidity levels as low as possible. If dissolved oxygen values are not within acceptable range for the temperature of groundwater (Attachment 1), then check for and remove air bubbles on probe or in tubing. If the dissolved oxygen value is 0.00 or less, then the meter should be serviced and re-calibrated.

During extreme weather conditions, stabilization of field indicator parameters may be difficult to obtain. Modifications to the sampling procedures to alleviate these conditions (e.g., measuring the water temperature in the well adjacent to the pump intake) will be documented in the field notes. If other field conditions exist that preclude stabilization of certain parameters, an explanation of why the parameters did not stabilize will also be documented in the field logbook.

6. Complete the sample label and cover the label with clear packing tape to secure the label onto the container.

7. After the indicator parameters have stabilized, collect groundwater samples by diverting flow out of the unfiltered discharge tubing into the appropriate labeled sample container. If a flow-through analytical cell is being used to measure field parameters, the flow-through cell should be disconnected after stabilization of the field indicator parameters and prior to groundwater sample collection. Under no circumstances should analytical samples be collected from the discharge of the flow-through cell. When the container is full, tightly screw on the cap. Samples should be collected in the following order: VOCs, TOC, SVOCs, metals and cyanide, and others (or other order as defined in the site-specific Work Plan).

8. If sampling for total and filtered metals and/or PCBs, a filtered and unfiltered sample will be collected. Install an in-line, disposable 0.45-micron particle filter on the discharge tubing after the appropriate unfiltered groundwater sample has been collected. Continue to run the pump until an initial volume of “flush” water has been run through the filter in accordance with the manufacturer’s directions (generally 100 to 300 mL). Collect filtered groundwater sample by diverting flow out of the filter into the appropriately labeled sample container. When the container is full, tightly screw on the cap.

9. Secure with packing material and store at 4°C in an insulated transport container provided by the laboratory.

10. Record on the groundwater sampling log or bound field logbook the time sampling procedures were completed, any pertinent observations of the sample (e.g., physical appearance, and the presence or lack of odors or sheens), and the values of the stabilized field indicator parameters as measured during the final reading during purging (Attachment 2 – Example Sampling Log).

11. Turn off the pump and air compressor or close the gas cylinder valve if using a bladder pump set-up. Slowly remove the pump, tubing, lines, and safety cable from the well. Do not allow the tubing or lines to touch the ground or any other surfaces which could contaminate them. .

12. If tubing is to be dedicated to a well, it should be folded to a length that will allow the well to be capped and also facilitate retrieval of the tubing during later sampling events. A length of rope or string should be used to tie the tubing to the well cap. Alternatively, if tubing and safety line are to be saved and reused for sampling the well at a later date they may be coiled neatly and placed in a clean plastic bag that is clearly labeled with the well ID. Make sure the bag is tightly sealed before placing it in storage.

13. Secure the well and properly dispose of personal protective equipment (PPE) and disposable equipment.

14. Complete the procedures for packaging, shipping, and handling with associated chain-of-custody.

15. Complete decontamination procedures for flow-through analytical cell and submersible or bladder pump, as appropriate.

16. At the end of the day, perform calibration check of field instruments.

If it is not technically feasible to use the low-flow sampling method, purging and sampling of monitoring wells may be conducted using the bailer method as outlined below:

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

2. Place plastic sheeting around the well.

3. Clean sampling equipment.

4. Open the well cover while standing upwind of the well. Remove well cap and place on the plastic sheeting. 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 log. 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 breathing zone reading is less than 5 PID units, proceed. If the PID reading in the breathing zone 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 appropriate respiratory protection in accordance with the requirements of the HASP. Record all PID readings. For wells that are part of the regular weekly monitoring program and prior PID measurements have not resulted in a breathing zone reading above 5 PID units, PID measurements will be taken monthly.

5. Measure the depth to water and determine depth of well by examining drilling log data or by direct measurement. Calculate the volume of water in the well (in gallons) by using the length of the water column (in feet), multiplying by 0.163 for a 2-inch well or by 0.653 for a 4-inch well. For other well diameters, use the formula:

   Volume (in gallons) = • TIMES well radius (in feet) squared TIMES length of water column (in feet) TIMES 7.481 (gallons per cubic foot)

6. Measure a length of rope or twine at least 10 feet greater than the total depth of the well. Secure one end of the rope to the well casing and secure the other end to the bailer. Test the knots and make sure the rope will not loosen. Check bailers so that all parts are intact and will not be lost in the well.

7. Lower bailer into well and remove one well volume of water. Contain all water in appropriate containers.

8. Monitor the field indicator parameters (e.g., turbidity, temperature, specific conductance, and pH). Measure field indicator parameters using a clean container such as a glass beaker or sampling cups provided with the instrument. Record field indicator parameters on the groundwater sampling log.

9. Repeat Steps 7 and 8 until three or four well volumes have been removed. Examine the field indicator parameter data to determine if the parameters have stabilized. The well is considered stabilized and ready for sample collection when turbidity values remain within 10% (or within 1 NTU if the turbidity reading is less than 10 NTU), the specific conductance and temperature values remain

within 3%, and pH remains within ±0.1 units for three consecutive readings collected once per well volume removed.

10. If the field indicator parameters have not stabilized, remove a maximum of five well volumes prior to sample collection. Alternatively, five well volumes may be removed without measuring the field indicator parameters.

11. If the recharge rate of the well is very low, wells screened across the water table may be bailed dry and sampling should commence as soon as the volume in the well has recovered sufficiently to permit collection of samples. For wells screened entirely below the water table, the well should only be bailed down to a level slightly higher than the bentonite seal above the well screen. The well should not be bailed completely dry, to maintain the integrity of the seal. Sampling should commence as soon as the well volume has recovered sufficiently to permit sample collection.

12. Following purging, allow water level in well to recharge to a sufficient level to permit sample collection.

13. Complete the sample label and cover the label with clear packing tape to secure the label onto the container.

14. Slowly lower the bailer into the screened portion of the well and carefully retrieve a filled bailer from the well causing minimal disturbance to the water and any sediment in the well.

15. The sample collection order (as appropriate) will be as follows:

    a. VOCs;

    b TOC;

    c. SVOCs;

    d. metals and cyanide; and

    e. others.

16. When sampling for volatiles, collect water samples directly from the bailer into 40-mL vials with Teflon®-lined septa.

17. For other analytical samples, remove the cap from the large glass mixing container and slowly empty the bailer into the large glass mixing container. 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.

18. Continue collecting samples until the mixing container contains a sufficient volume for all laboratory samples.

19. Mix the entire sample volume with the Teflon® stirring rod and transfer the appropriate volume into the laboratory jar(s). Secure the sample jar cap(s) tightly.

20. 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 using a peristaltic pump prior to preservation. Install new medical-grade silicone tubing in the pump head. Place new Teflon® tubing into the sample mixing container and attach to the intake side of pump tubing. Attach (clamp) a new 0.45-micron filter (note the filter flow direction). Turn the pump on and dispense the filtered liquid directly into the laboratory sample bottles.

21. Secure with packing material and store at 4°C in an insulated transport container provided by the laboratory.

22. After sample containers have been filled, remove one additional volume of groundwater. Measure the pH, temperature, turbidity, and conductivity. Record on the groundwater sampling log or bound field logbook the time sampling procedures were completed, any pertinent observations of the sample (e.g., physical appearance, and the presence or lack of odors or sheens), and the values of the field indicator parameters.

23. Remove bailer from well, secure well, and properly dispose of PPE and disposable equipment.

24. If a bailer is to be dedicated to a well, it should be secured inside the well above the water table, if possible. Dedicated bailers should be tied to the well cap so that inadvertent loss of the bailer will not occur when the well is opened.

25. Complete the procedures for packaging, shipping, and handling with associated chain-of-custody.

VII. Waste Management

Materials generated during groundwater sampling activities, including disposable equipment, will be placed in appropriate containers. Containerized waste will be disposed of by the client consistent with the procedures identified in the HASP.

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.

IX. Quality Assurance

In addition to the quality control samples to be collected in accordance with this SOP, the following quality control procedures should be observed in the field:

- Collect samples from monitoring wells in order of increasing concentration, to the extent known based on review of historical site information if available.
- Equipment blanks should include the pump and tubing (if using disposable tubing) or the pump only (if using tubing dedicated to each well).
- Collect equipment blanks after wells with higher concentrations (if known) have been sampled.
- Operate all monitoring instrumentation in accordance with manufacturer's instructions and calibration procedures. Calibrate instruments at the beginning of each day and verify the calibration at the end of each day. Record all calibration activities in the field notebook.
- Clean all groundwater sampling equipment prior to use in the first well and after each subsequent well using procedures for equipment decontamination.

X. References

United States Environmental Protection Agency (USEPA). 1986. RCRA Groundwater Monitoring Technical Enforcement Guidance Document (September 1986).

USEPA Region II. 1998. *Ground Water Sampling Procedure Low Stress (Low Flow) Purging and Sampling*.

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.

Attachment 1

Groundwater Sampling Log

ARCADIS
Infrastructure, environment, facilities

Low-Flow Groundwater Sampling Log

Project _____

Project Number _____ **Site Location** _____ **Well ID** _____

Date _____ **Sampled By** _____

Sampling Time _____ **Recorded By** _____

Weather _____ **Coded Replicate No.** _____

Instrument Identification

Water Quality Meter(s) _____ **Serial #** _____

Casing Material _____ **Purge Method** _____

Casing Diameter _____ **Screen Interval (ft bmp)** **Top** _____ **Bottom** _____

Sounded Depth (ft bmp) _____ **Pump Intake Depth (ft bmp)** _____ _____

Depth to Water (ft bmp) _____ **Purge Time** **Start** _____ **Finish** _____

Field Parameter Measurements During Purging

Time	Minutes Elasped	Flow Rate (mL/min)	Volume Purged	Temp (°C)	pH (s.u.)	Conductivity (umhos or mS/cm) 1)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)

Collected Sample Condition **Color**_____ **Odor**_____ **Appearance**_____

Parameter	Container	No.	Preservative

PID Reading _____

Comments _____

_____

_____

_____

1) Circle one unit type

Attachment 2

Oxygen Solubility in Fresh Water

Temperature (degrees C)	**Dissolved Oxygen** (mg/L)
0	14.6
1	14.19
2	13.81
3	13.44
4	13.09
5	12.75
6	12.43
7	12.12
8	11.83
9	11.55
10	11.27
11	11.01
12	10.76
13	10.52
14	10.29
15	10.07
16	9.85
17	9.65
18	9.45
19	9.26
20	9.07
21	8.9
22	8.72
23	8.56
24	8.4
25	8.24
26	8.09
27	7.95
28	7.81
29	7.67
30	7.54
31	7.41
32	7.28
33	7.16
34	7.05
35	6.93

Reference: Vesilind, P.A., *Introduction to Environmental Engineering*, PWS Publishing Company, Boston, 468 pages (1996).

APPENDIX B

Field Data Sheets

Low-Flow Test Report:

Test Date / Time: 9/27/2018 3:04:48 PM
Project: Seattle Terminal 3Q
Operator Name: Jl

Location Name: MW-70R **Well Diameter: 2 in** **Casing Type: Pvc** **Screen Length: 12 ft** **Top of Screen: 4 ft** **Total Depth: 16 ft** **Initial Depth to Water: 13.4 ft**	**Pump Type: Geotecg geo pump series 2** **Tubing Type: Polyethlylene 0.170" x 1/4"** **Pump Intake From TOC: 12.8 ft** **Estimated Total Volume Pumped: 2250 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 150 ml/min** **Final Draw Down: 0.08 ft**	**Instrument Used: Aqua TROLL 600 Vented** **Serial Number: 469079**

Test Notes:

Weather Conditions:
Sunny

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 15 %		
9/27/2018 3:04 PM	00:00	6.90 pH	66.18 °F	25,022 µS/cm	6.87 mg/L	256.8 mV	13.40 ft	150.00 ml/min
9/27/2018 3:07 PM	03:00	6.92 pH	64.45 °F	25,533 µS/cm	3.48 mg/L	198.7 mV	13.40 ft	150.00 ml/min
9/27/2018 3:10 PM	06:00	6.94 pH	64.01 °F	25,595 µS/cm	3.21 mg/L	162.6 mV	13.40 ft	150.00 ml/min
9/27/2018 3:13 PM	09:00	6.94 pH	63.82 °F	25,498 µS/cm	3.12 mg/L	137.6 mV	13.40 ft	150.00 ml/min
9/27/2018 3:16 PM	12:00	6.94 pH	63.77 °F	25,458 µS/cm	3.12 mg/L	129.1 mV	13.40 ft	150.00 ml/min
9/27/2018 3:19 PM	15:00	6.94 pH	63.73 °F	25,403 µS/cm	3.11 mg/L	120.1 mV	13.40 ft	150.00 ml/min

Samples

Sample ID:	Description:
MW-70R	Sample time-1430 Fdtw-12.47

Low-Flow Test Report:

Test Date / Time: 12/14/2018 10:11:46 AM
Project: 4Q18 Seattle Terminal
Operator Name: EK

Location Name: MW-30 **Well Diameter: 4 in** **Casing Type: PVC** **Screen Length: 25 ft** **Top of Screen: 5 ft** **Total Depth: 30 ft** **Initial Depth to Water: 12.5 ft**	**Pump Type: Geotech geopump series 2** **Tubing Type: Polyethylene 0.170" x 1/4"** **Pump Intake From TOC: 13 ft** **Estimated Total Volume Pumped: 9000 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 200 ml/min** **Final Draw Down: 0.02 ft**	**Instrument Used: Aqua TROLL 600 Vented** **Serial Number: 469050**

Test Notes:

Weather Conditions:
50 and overcast

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
12/14/2018 10:11 AM	00:00	6.76 pH	54.66 °F	1,101.7 µS/cm	0.94 mg/L	2,737.5 NTU	81.9 mV	12.50 ft	200.00 ml/min
12/14/2018 10:14 AM	03:00	6.79 pH	54.71 °F	1,083.0 µS/cm	0.41 mg/L	1,888.5 NTU	65.5 mV	12.50 ft	200.00 ml/min
12/14/2018 10:17 AM	06:00	6.79 pH	54.82 °F	1,077.1 µS/cm	0.30 mg/L	2,546.0 NTU	52.4 mV	12.50 ft	200.00 ml/min
12/14/2018 10:20 AM	09:00	6.80 pH	55.23 °F	1,073.3 µS/cm	0.33 mg/L	1,069.3 NTU	41.7 mV	12.50 ft	200.00 ml/min
12/14/2018 10:23 AM	12:00	6.81 pH	55.06 °F	1,064.9 µS/cm	0.22 mg/L	4,221.9 NTU	30.6 mV	12.50 ft	200.00 ml/min
12/14/2018 10:26 AM	15:00	6.82 pH	55.01 °F	1,059.7 µS/cm	0.34 mg/L	2,083.6 NTU	26.2 mV	12.50 ft	200.00 ml/min
12/14/2018 10:29 AM	18:00	6.83 pH	55.10 °F	1,049.0 µS/cm	0.18 mg/L	707.26 NTU	18.4 mV	12.50 ft	200.00 ml/min
12/14/2018 10:32 AM	21:00	6.83 pH	55.14 °F	1,043.7 µS/cm	0.20 mg/L	619.04 NTU	19.6 mV	12.50 ft	200.00 ml/min
12/14/2018 10:35 AM	24:00	6.83 pH	55.04 °F	1,047.6 µS/cm	0.18 mg/L	582.96 NTU	24.5 mV	12.50 ft	200.00 ml/min
12/14/2018 10:38 AM	27:00	6.84 pH	55.04 °F	1,046.7 µS/cm	0.17 mg/L	327.80 NTU	23.8 mV	12.50 ft	200.00 ml/min
12/14/2018 10:41 AM	30:00	6.85 pH	55.14 °F	1,032.9 µS/cm	0.18 mg/L	339.24 NTU	13.4 mV	12.50 ft	200.00 ml/min
12/14/2018 10:44 AM	33:00	6.85 pH	54.79 °F	1,028.1 µS/cm	0.18 mg/L	443.96 NTU	4.0 mV	12.50 ft	200.00 ml/min

12/14/2018 10:47 AM	36:00	6.86 pH	55.25 °F	1,023.5 µS/cm	0.17 mg/L	274.50 NTU	-6.4 mV	12.50 ft	200.00 ml/min
12/14/2018 10:50 AM	39:00	6.86 pH	55.29 °F	1,026.4 µS/cm	0.16 mg/L	795.05 NTU	-4.8 mV	12.50 ft	200.00 ml/min
12/14/2018 10:53 AM	42:00	6.87 pH	55.25 °F	1,019.5 µS/cm	0.15 mg/L	362.73 NTU	-5.9 mV	12.50 ft	200.00 ml/min
12/14/2018 10:56 AM	45:00	6.87 pH	55.14 °F	1,022.0 µS/cm	0.28 mg/L	188.72 NTU	-8.9 mV	12.50 ft	200.00 ml/min

Samples

Sample ID:	Description:
MW-30	Sample time 1000 Final DTW 12.70 ft btoc

Low-Flow Test Report:

Test Date / Time: 12/14/2018 9:57:44 AM
Project: 4Q18 Seattle Terminal
Operator Name: KF

Location Name: MW-61A-R **Well Diameter: 2 in** **Casing Type: PVC** **Screen Length: 20 ft** **Top of Screen: 5 ft** **Total Depth: 25 ft** **Initial Depth to Water: 13.42 ft**	**Pump Type: Geotech geopump Series 2** **Tubing Type: Polyethylene 0.170" x 1/4"** **Pump Intake From TOC: 13.92 ft** **Estimated Total Volume Pumped: 4050 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 150 ml/min** **Final Draw Down: 0.08 ft**	**Instrument Used: Aqua TROLL 600 Vented** **Serial Number: 469079**

Test Notes:

Weather Conditions:
Overcast

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
12/14/2018 9:57 AM	00:00	7.71 pH	53.84 °F	721.79 µS/cm	4.82 mg/L	154.10 NTU	-124.1 mV	13.42 ft	150.00 ml/min
12/14/2018 10:00 AM	03:00	7.70 pH	54.77 °F	659.30 µS/cm	1.27 mg/L	114.82 NTU	-201.3 mV	13.42 ft	150.00 ml/min
12/14/2018 10:03 AM	06:00	7.68 pH	54.89 °F	660.29 µS/cm	0.69 mg/L	454.20 NTU	-224.1 mV	13.42 ft	150.00 ml/min
12/14/2018 10:06 AM	09:00	7.66 pH	55.26 °F	651.80 µS/cm	0.67 mg/L	421.20 NTU	-235.5 mV	13.42 ft	150.00 ml/min
12/14/2018 10:09 AM	12:00	7.64 pH	55.41 °F	627.03 µS/cm	0.50 mg/L	110.92 NTU	-244.0 mV	13.42 ft	150.00 ml/min
12/14/2018 10:12 AM	15:00	7.62 pH	55.51 °F	619.17 µS/cm	0.40 mg/L	106.58 NTU	-249.8 mV	13.42 ft	150.00 ml/min
12/14/2018 10:15 AM	18:00	7.61 pH	55.60 °F	619.94 µS/cm	0.33 mg/L	105.55 NTU	-254.1 mV	13.42 ft	150.00 ml/min
12/14/2018 10:18 AM	21:00	7.60 pH	55.72 °F	617.85 µS/cm	0.29 mg/L	105.54 NTU	-258.0 mV	13.42 ft	150.00 ml/min
12/14/2018 10:21 AM	24:00	7.59 pH	55.79 °F	619.76 µS/cm	0.25 mg/L	104.73 NTU	-261.5 mV	13.42 ft	150.00 ml/min
12/14/2018 10:24 AM	27:00	7.58 pH	55.74 °F	619.09 µS/cm	0.29 mg/L	106.65 NTU	-264.4 mV	13.42 ft	150.00 ml/min

Samples

Sample ID:	Description:
MW-61A-R	Sample Time: 930 Final DTW: 13.50

Low-Flow Test Report:

Test Date / Time: 12/13/2018 2:22:29 PM
Project: 4Q18 Seattle Terminal
Operator Name: EK

Location Name: MW-70R **Well Diameter: 2 in** **Casing Type: PVC** **Screen Length: 12 ft** **Top of Screen: 4 ft** **Total Depth: 16 ft** **Initial Depth to Water: 8.8 ft**	**Pump Type: Geotech geopump series 2** **Tubing Type: Polyethylene 0.170" x 1/4"** **Pump Intake From TOC: 9.4 ft** **Estimated Total Volume Pumped: 9000 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 200 ml/min** **Final Draw Down: 0.04 ft**	**Instrument Used: Aqua TROLL 600 Vented** **Serial Number: 469050**

Test Notes:

Weather Conditions:
45 and rain

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
12/13/2018 2:22 PM	00:00	7.06 pH	55.61 °F	27,070 µS/cm	0.32 mg/L	0.00 NTU	26.3 mV	8.80 ft	200.00 ml/min
12/13/2018 2:25 PM	03:00	7.08 pH	55.62 °F	26,815 µS/cm	0.50 mg/L	0.00 NTU	21.4 mV	8.80 ft	200.00 ml/min
12/13/2018 2:28 PM	06:00	7.09 pH	55.31 °F	26,840 µS/cm	0.49 mg/L	0.00 NTU	14.7 mV	8.80 ft	200.00 ml/min
12/13/2018 2:31 PM	09:00	7.10 pH	56.33 °F	26,654 µS/cm	0.45 mg/L	0.00 NTU	14.6 mV	8.80 ft	200.00 ml/min
12/13/2018 2:34 PM	12:00	7.10 pH	56.48 °F	26,492 µS/cm	0.36 mg/L	0.00 NTU	15.5 mV	8.80 ft	200.00 ml/min
12/13/2018 2:37 PM	15:00	7.11 pH	56.38 °F	26,348 µS/cm	0.29 mg/L	0.00 NTU	11.8 mV	8.80 ft	200.00 ml/min
12/13/2018 2:40 PM	18:00	7.11 pH	56.42 °F	26,220 µS/cm	0.29 mg/L	0.00 NTU	9.7 mV	8.80 ft	200.00 ml/min
12/13/2018 2:43 PM	21:00	7.12 pH	56.38 °F	26,174 µS/cm	0.29 mg/L	0.00 NTU	8.9 mV	8.80 ft	200.00 ml/min
12/13/2018 2:46 PM	24:00	7.12 pH	56.25 °F	26,019 µS/cm	0.38 mg/L	0.00 NTU	10.0 mV	8.80 ft	200.00 ml/min
12/13/2018 2:49 PM	27:00	7.13 pH	56.31 °F	25,981 µS/cm	0.38 mg/L	0.00 NTU	12.5 mV	8.80 ft	200.00 ml/min
12/13/2018 2:52 PM	30:00	7.13 pH	56.49 °F	25,930 µS/cm	0.32 mg/L	0.00 NTU	13.8 mV	8.80 ft	200.00 ml/min
12/13/2018 2:55 PM	33:00	7.13 pH	56.61 °F	25,905 µS/cm	0.30 mg/L	0.00 NTU	13.2 mV	8.80 ft	200.00 ml/min

12/13/2018 2:58 PM	36:00	7.13 pH	56.63 °F	25,848 µS/cm	0.28 mg/L	0.00 NTU	12.8 mV	8.80 ft	200.00 ml/min
12/13/2018 3:01 PM	39:00	7.13 pH	56.68 °F	25,859 µS/cm	0.24 mg/L	0.00 NTU	12.4 mV	8.80 ft	200.00 ml/min
12/13/2018 3:04 PM	42:00	7.13 pH	56.76 °F	25,968 µS/cm	0.21 mg/L	0.00 NTU	11.9 mV	8.80 ft	200.00 ml/min
12/13/2018 3:07 PM	45:00	7.13 pH	56.83 °F	25,913 µS/cm	0.23 mg/L	0.00 NTU	12.1 mV	8.80 ft	200.00 ml/min

Samples

Sample ID:	Description:
MW-70R	Sample time 1405 Final DTW 9.20 ft btoc

Low-Flow Test Report:

Test Date / Time: 12/13/2018 12:51:18 PM
Project: 4Q18 Seattle Terminal
Operator Name: EK

Location Name: MW-200 **Well Diameter: 2 in** **Casing Type: PVC** **Screen Length: 18.9 ft** **Top of Screen: 5 ft** **Total Depth: 23.9 ft** **Initial Depth to Water: 8.5 ft**	**Pump Type: Geotech geopump series 2** **Tubing Type: Polyethylene 0.170" x 1/4"** **Pump Intake From TOC: 9 ft** **Estimated Total Volume Pumped: 4200 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 200 ml/min** **Final Draw Down: 0 ft**	**Instrument Used: Aqua TROLL 600 Vented** **Serial Number: 469050**

Test Notes:

Weather Conditions:
45 and rain

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
12/13/2018 12:51 PM	00:00	7.11 pH	56.82 °F	4,383.7 µS/cm	0.23 mg/L	0.00 NTU	-119.9 mV	8.50 ft	200.00 ml/min
12/13/2018 12:54 PM	03:00	7.12 pH	57.08 °F	4,359.4 µS/cm	0.15 mg/L	0.00 NTU	-143.7 mV	8.50 ft	200.00 ml/min
12/13/2018 12:57 PM	06:00	7.12 pH	57.42 °F	4,334.9 µS/cm	0.10 mg/L	0.00 NTU	-153.6 mV	8.50 ft	200.00 ml/min
12/13/2018 1:00 PM	09:00	7.13 pH	57.75 °F	4,307.5 µS/cm	0.07 mg/L	0.00 NTU	-161.8 mV	8.50 ft	200.00 ml/min
12/13/2018 1:03 PM	12:00	7.13 pH	57.90 °F	4,281.0 µS/cm	0.05 mg/L	0.00 NTU	-166.7 mV	8.50 ft	200.00 ml/min
12/13/2018 1:06 PM	15:00	7.13 pH	57.93 °F	4,273.7 µS/cm	0.05 mg/L	0.00 NTU	-170.0 mV	8.50 ft	200.00 ml/min
12/13/2018 1:09 PM	18:00	7.13 pH	58.05 °F	4,260.0 µS/cm	0.05 mg/L	0.00 NTU	-173.3 mV	8.50 ft	200.00 ml/min
12/13/2018 1:12 PM	21:00	7.14 pH	58.06 °F	4,251.8 µS/cm	0.04 mg/L	0.00 NTU	-176.2 mV	8.50 ft	200.00 ml/min

Samples

Sample ID:	Description:

MW-200	Sample time 1215 Final DTW 8.50 ft btoc

Low-Flow Test Report:

Test Date / Time: 12/13/2018 11:47:40 AM
Project: 4Q18 Seattle Terminal
Operator Name: KF

Location Name: MW-201 **Well Diameter: 2 in** **Casing Type: PVC** **Screen Length: 14.8 ft** **Top of Screen: 5 ft** **Total Depth: 19.8 ft** **Initial Depth to Water: 9.42 ft**	**Pump Type: Geotech geopump Series 2** **Tubing Type: Polyethylene 0.170" x 1/4"** **Pump Intake From TOC: 10.02 ft** **Estimated Total Volume Pumped: 5400 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 150 ml/min** **Final Draw Down: -0.14 ft**	**Instrument Used: Aqua TROLL 600 Vented** **Serial Number: 469079**

Test Notes:

Weather Conditions:
Overcast
Rain

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
12/13/2018 11:47 AM	00:00	6.88 pH	51.71 °F	4.36 µS/cm	4.34 mg/L	189.57 NTU	1.2 mV	9.42 ft	150.00 ml/min
12/13/2018 11:50 AM	03:00	6.78 pH	54.17 °F	848.35 µS/cm	0.80 mg/L	125.45 NTU	-43.4 mV	9.42 ft	150.00 ml/min
12/13/2018 11:53 AM	06:00	6.77 pH	56.93 °F	1,087.3 µS/cm	0.31 mg/L	111.20 NTU	-56.9 mV	9.42 ft	150.00 ml/min
12/13/2018 11:56 AM	09:00	6.76 pH	57.89 °F	1,099.0 µS/cm	0.19 mg/L	100.23 NTU	-68.3 mV	9.42 ft	150.00 ml/min
12/13/2018 11:59 AM	12:00	6.76 pH	57.83 °F	1,016.8 µS/cm	0.45 mg/L	152.56 NTU	-75.7 mV	9.42 ft	150.00 ml/min
12/13/2018 12:02 PM	15:00	6.76 pH	57.36 °F	1,074.8 µS/cm	0.75 mg/L	189.23 NTU	-73.6 mV	9.42 ft	150.00 ml/min
12/13/2018 12:05 PM	18:00	6.76 pH	57.75 °F	1,108.9 µS/cm	0.35 mg/L	129.51 NTU	-75.0 mV	9.42 ft	150.00 ml/min
12/13/2018 12:08 PM	21:00	6.76 pH	57.94 °F	1,111.1 µS/cm	0.21 mg/L	115.27 NTU	-80.9 mV	9.42 ft	150.00 ml/min
12/13/2018 12:11 PM	24:00	6.76 pH	58.10 °F	1,118.5 µS/cm	0.16 mg/L	201.73 NTU	-86.0 mV	9.42 ft	150.00 ml/min
12/13/2018 12:14 PM	27:00	6.76 pH	58.39 °F	1,121.5 µS/cm	0.15 mg/L	163.01 NTU	-89.9 mV	9.42 ft	150.00 ml/min
12/13/2018 12:17 PM	30:00	6.76 pH	58.63 °F	1,121.1 µS/cm	0.13 mg/L	151.21 NTU	-93.1 mV	9.42 ft	150.00 ml/min
12/13/2018 12:20 PM	33:00	6.76 pH	58.63 °F	1,119.0 µS/cm	0.13 mg/L	151.70 NTU	-96.2 mV	9.42 ft	150.00 ml/min

12/13/2018 12:23 PM	36:00	6.76 pH	58.66 °F	1,116.0 µS/cm	0.13 mg/L	144.68 NTU	-97.8 mV	9.42 ft	150.00 ml/min

Samples

Sample ID:	Description:
MW-201	Sample Time: 1125 Final DTW: 9.28

Low-Flow Test Report:

Test Date / Time: 12/13/2018 1:40:26 PM
Project: 4Q18 Seattle Terminal
Operator Name: KF

Location Name: MW-202 **Well Diameter: 2 in** **Casing Type: PVC** **Screen Length: 19.55 m** **Top of Screen: 7.8 ft** **Total Depth: 27.35 ft** **Initial Depth to Water: 8.11 ft**	**Pump Type: Geotech geopump Series 2** **Tubing Type: Polyethylene 0.170" x 1/4"** **Pump Intake From TOC: 8.61 ft** **Estimated Total Volume Pumped: 2250 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 150 ml/min** **Final Draw Down: 0 ft**	**Instrument Used: Aqua TROLL 600 Vented** **Serial Number: 469079**

Test Notes:

Weather Conditions:
Overcast
Rain

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
12/13/2018 1:40 PM	00:00	6.78 pH	53.12 °F	27,932 µS/cm	5.23 mg/L	160.48 NTU	-55.3 mV	8.11 ft	150.00 ml/min
12/13/2018 1:43 PM	03:00	6.92 pH	54.28 °F	28,411 µS/cm	0.92 mg/L	134.61 NTU	-135.3 mV	8.11 ft	150.00 ml/min
12/13/2018 1:46 PM	06:00	6.95 pH	54.55 °F	28,613 µS/cm	0.45 mg/L	123.91 NTU	-152.8 mV	8.11 ft	150.00 ml/min
12/13/2018 1:49 PM	09:00	6.97 pH	54.73 °F	28,738 µS/cm	0.28 mg/L	120.80 NTU	-169.7 mV	8.11 ft	150.00 ml/min
12/13/2018 1:52 PM	12:00	6.98 pH	54.79 °F	28,772 µS/cm	0.27 mg/L	120.23 NTU	-180.2 mV	8.11 ft	150.00 ml/min
12/13/2018 1:55 PM	15:00	6.99 pH	54.87 °F	28,788 µS/cm	0.28 mg/L	120.64 NTU	-187.9 mV	8.11 ft	150.00 ml/min

Samples

Sample ID:	Description:
MW-202	Sample Time: 1300 Final DTW: 8.11 DUP-1

Low-Flow Test Report:

Test Date / Time: 12/13/2018 11:31:22 AM
Project: 4Q18 Seattle Terminal
Operator Name: EK

Location Name: MW-203 **Well Diameter: 2 in** **Casing Type: PVC** **Screen Length: 15 ft** **Top of Screen: 10.5 ft Total Depth: 25.5 ft** **Initial Depth to Water: 11.70 ft**	**Pump Type: Geotech geopump series 2** **Tubing Type: Polyethylene 0.170" x 1/4"** **Pump Intake From TOC: 12.30 ft** **Estimated Total Volume Pumped: 4800 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 200 ml/min** **Final Draw Down: 0 ft**	**Instrument Used: Aqua TROLL 600 Vented** **Serial Number: 469050**

Test Notes:

Weather Conditions:
45 and rain

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
12/13/2018 11:31 AM	00:00	7.17 pH	53.69 °F	2,425.5 µS/cm	7.50 mg/L	52,657 NTU	-79.9 mV	11.70 ft	200.00 ml/min
12/13/2018 11:34 AM	03:00	7.43 pH	56.34 °F	2,346.0 µS/cm	0.63 mg/L	7,980.4 NTU	-167.0 mV	11.70 ft	200.00 ml/min
12/13/2018 11:37 AM	06:00	7.46 pH	55.57 °F	2,323.8 µS/cm	0.67 mg/L	7,627.0 NTU	-181.9 mV	11.70 ft	200.00 ml/min
12/13/2018 11:40 AM	09:00	7.48 pH	54.22 °F	2,368.6 µS/cm	0.75 mg/L	0.00 NTU	-188.9 mV	11.70 ft	200.00 ml/min
12/13/2018 11:43 AM	12:00	7.46 pH	57.62 °F	2,459.8 µS/cm	0.16 mg/L	0.00 NTU	-202.0 mV	11.70 ft	200.00 ml/min
12/13/2018 11:46 AM	15:00	7.46 pH	58.22 °F	2,434.0 µS/cm	0.10 mg/L	0.00 NTU	-208.6 mV	11.70 ft	200.00 ml/min
12/13/2018 11:49 AM	18:00	7.45 pH	58.48 °F	2,473.4 µS/cm	0.08 mg/L	0.00 NTU	-212.9 mV	11.70 ft	200.00 ml/min
12/13/2018 11:52 AM	21:00	7.45 pH	58.63 °F	2,541.4 µS/cm	0.08 mg/L	0.00 NTU	-218.1 mV	11.70 ft	200.00 ml/min
12/13/2018 11:55 AM	24:00	7.46 pH	58.82 °F	2,613.6 µS/cm	0.08 mg/L	0.00 NTU	-222.1 mV	11.70 ft	200.00 ml/min

Samples

Sample ID:	Description:

MW-203	Sample time 1100 Final DTW 11.70 ft btoc

Low-Flow Test Report:

Test Date / Time: 12/13/2018 10:31:34 AM
Project: 4Q18 Seattle Terminal
Operator Name: EK

Location Name: MW-204 **Well Diameter: 2 in** **Casing Type: PVC** **Screen Length: 13.05 ft** **Top of Screen: 17.35 ft** **Total Depth: 30.9 ft** **Initial Depth to Water: 18.20 ft**	**Pump Type: Geotech geopump series 2** **Tubing Type: Polyethylene 0.170" x 1/4"** **Pump Intake From TOC: 18.90 ft** **Estimated Total Volume Pumped: 4800 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 200 ml/min Final Draw Down: 0 ft**	**Instrument Used: Aqua TROLL 600 Vented** **Serial Number: 469050**

Test Notes:

Weather Conditions:
45 and rain

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
12/13/2018 10:31 AM	00:00	6.92 pH	57.24 °F	511.02 µS/cm	0.18 mg/L	3,096.1 NTU	-104.1 mV	18.20 ft	200.00 ml/min
12/13/2018 10:34 AM	03:00	6.92 pH	57.32 °F	513.62 µS/cm	0.12 mg/L	571.10 NTU	-121.1 mV	18.20 ft	200.00 ml/min
12/13/2018 10:37 AM	06:00	6.93 pH	57.47 °F	513.63 µS/cm	0.10 mg/L	0.00 NTU	-128.5 mV	18.20 ft	200.00 ml/min
12/13/2018 10:40 AM	09:00	6.93 pH	57.48 °F	515.17 µS/cm	0.09 mg/L	0.00 NTU	-134.2 mV	18.20 ft	200.00 ml/min
12/13/2018 10:43 AM	12:00	6.93 pH	57.51 °F	513.96 µS/cm	0.07 mg/L	0.00 NTU	-137.7 mV	18.20 ft	200.00 ml/min
12/13/2018 10:46 AM	15:00	6.93 pH	57.37 °F	515.40 µS/cm	0.10 mg/L	0.00 NTU	-140.3 mV	18.20 ft	200.00 ml/min
12/13/2018 10:49 AM	18:00	6.94 pH	57.21 °F	514.40 µS/cm	0.09 mg/L	0.00 NTU	-142.7 mV	18.20 ft	200.00 ml/min
12/13/2018 10:52 AM	21:00	6.94 pH	57.16 °F	515.41 µS/cm	0.09 mg/L	0.00 NTU	-144.0 mV	18.20 ft	200.00 ml/min
12/13/2018 10:55 AM	24:00	6.94 pH	57.05 °F	516.01 µS/cm	0.08 mg/L	0.00 NTU	-145.0 mV	18.20 ft	200.00 ml/min

Samples

Sample ID:	Description:

MW-204	Sample time 1000 Final DTW 18.20 ft btoc

Low-Flow Test Report:

Test Date / Time: 12/13/2018 10:39:04 AM
Project: 4Q18 Seattle Terminal
Operator Name: KF

Location Name: MW-205 **Well Diameter: 2 in** **Casing Type: PVC** **Screen Length: 20.5 ft** **Top of Screen: 18 ft** **Total Depth: 38.5 ft** **Initial Depth to Water: 21.96 ft**	**Pump Type: Geotech geopump Series 2** **Tubing Type: Polyethylene 0.170" x 1/4"** **Pump Intake From TOC: 22.46 ft** **Estimated Total Volume Pumped: 3600 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 150 ml/min** **Final Draw Down: -0.05 ft**	**Instrument Used: Aqua TROLL 600 Vented** **Serial Number: 469079**

Test Notes:

Weather Conditions:
Overcast
Rain

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
12/13/2018 10:39 AM	00:00	6.57 pH	55.27 °F	723.17 µS/cm	2.65 mg/L	161.77 NTU	84.0 mV	21.96 ft	150.00 ml/min
12/13/2018 10:42 AM	03:00	6.91 pH	56.82 °F	652.98 µS/cm	0.38 mg/L	45.88 NTU	-30.7 mV	21.96 ft	150.00 ml/min
12/13/2018 10:45 AM	06:00	6.98 pH	57.15 °F	659.34 µS/cm	0.34 mg/L	37.94 NTU	-56.9 mV	21.96 ft	150.00 ml/min
12/13/2018 10:48 AM	09:00	7.02 pH	56.75 °F	657.81 µS/cm	0.31 mg/L	46.22 NTU	-68.3 mV	21.96 ft	150.00 ml/min
12/13/2018 10:51 AM	12:00	7.07 pH	56.65 °F	660.89 µS/cm	0.27 mg/L	52.76 NTU	-74.5 mV	21.96 ft	150.00 ml/min
12/13/2018 10:54 AM	15:00	7.10 pH	56.42 °F	666.20 µS/cm	0.25 mg/L	56.31 NTU	-79.2 mV	21.96 ft	150.00 ml/min
12/13/2018 10:57 AM	18:00	7.12 pH	56.36 °F	675.07 µS/cm	0.23 mg/L	68.13 NTU	-83.5 mV	21.96 ft	150.00 ml/min
12/13/2018 11:00 AM	21:00	7.15 pH	56.31 °F	733.73 µS/cm	0.21 mg/L	63.03 NTU	-88.4 mV	21.96 ft	150.00 ml/min
12/13/2018 11:03 AM	24:00	7.15 pH	56.38 °F	737.71 µS/cm	0.20 mg/L	55.44 NTU	-92.1 mV	21.96 ft	150.00 ml/min

Samples

Sample ID:	Description:

MW-205	Sample Time: 1005 Final DTW: 21.91

Low-Flow Test Report:

Test Date / Time: 12/13/2018 4:51:30 PM
Project: 4Q18 Seattle Terminal
Operator Name: KF and EK

Location Name: MW-206 **Well Diameter: 2 in** **Casing Type: PVC** **Screen Length: 14.8 m** **Top of Screen: 11 ft** **Total Depth: 25.8 ft** **Initial Depth to Water: 11.65 ft**	**Pump Type: Geotech geopump Series 2** **Tubing Type: Polyethylene 0.170" x 1/4"** **Pump Intake From TOC: 12.15 ft** **Estimated Total Volume Pumped: 900 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 150 ml/min** **Final Draw Down: 1.06 ft**	**Instrument Used: Aqua TROLL 600 Vented** **Serial Number: 469079**

Test Notes:

Weather Conditions:
Overcast
Rain

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
12/13/2018 4:51 PM	00:00	6.92 pH	52.24 °F	38,168 µS/cm	0.79 mg/L	229.15 NTU	81.0 mV	11.65 ft	150.00 ml/min
12/13/2018 4:54 PM	03:00	6.92 pH	52.24 °F	38,110 µS/cm	0.85 mg/L	232.48 NTU	75.7 mV	11.65 ft	150.00 ml/min
12/13/2018 4:57 PM	06:00	6.92 pH	52.20 °F	37,980 µS/cm	0.88 mg/L	232.55 NTU	71.9 mV	11.65 ft	150.00 ml/min

Samples

Sample ID:	Description:
MW-206	Sample Time: 1600 Finally DTW: 11.71

Low-Flow Test Report:

Test Date / Time: 12/13/2018 3:15:27 PM
Project: 4Q18 Seattle Terminal
Operator Name: KF

Location Name: MW-207 **Well Diameter: 2 in** **Casing Type: PVC** **Screen Length: 13.77 ft** **Top of Screen: 9.5 ft** **Total Depth: 23.27 ft Initial Depth to Water: 9.60 ft**	**Pump Type: Geotech geopump Series 2** **Tubing Type: Polyethylene 0.170" x 1/4"** **Pump Intake From TOC: 10.20 ft** **Estimated Total Volume Pumped: 1065 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 150 ml/min** **Final Draw Down: 0 ft**	**Instrument Used: Aqua TROLL 600 Vented** **Serial Number: 469079**

Test Notes:

Weather Conditions:
Overcast
Rain

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
12/13/2018 3:15 PM	00:00	6.83 pH	54.22 °F	34,598 µS/cm	0.94 mg/L	223.30 NTU	24.0 mV	9.60 ft	150.00 ml/min
12/13/2018 3:18 PM	03:00	6.83 pH	54.07 °F	33,048 µS/cm	1.23 mg/L	331.54 NTU	23.8 mV	9.60 ft	150.00 ml/min
12/13/2018 3:19 PM	04:06	6.83 pH	54.20 °F	33,087 µS/cm	1.36 mg/L	284.03 NTU	24.2 mV	9.60 ft	150.00 ml/min
12/13/2018 3:22 PM	07:06	6.82 pH	54.30 °F	33,342 µS/cm	1.42 mg/L	337.25 NTU	26.0 mV	9.60 ft	150.00 ml/min

Samples

Sample ID:	Description:
MW-207	Sample Time: 1420 Final DTW: 9.60

9/27/18 Seattle Terminal 3Q18 GW Sampling

John Light
Jackie Engle
63° Sunny

1030 – Arcadis onsite. H+S tailgate. Review JSAs Drum, Manifest / GW sampling / Cooler packing. On PPE

1110 – Begin gauging round / measuring wells in Path

	Time	Well	DTW	DTP	TD	Time	Screen
		MW-200	9.41	∅	0.0	11:27	5–23.9
		MW-201	10.00	∅	0.0	11:36	5–19.8
		MW-202	10.00	∅	0.0	12:05	7.8–27.35
△		MW-203	12.73	∅	0.0	11:43	10.5–25.5
△		MW-204	18.99	∅	0.0	11:51	17.35–30.9
△		MW-205	22.88	∅	0.0	12:00	8–38.5
		MW-206	11.99	∅	0.0	12:20	~~4.5–23.27~~ 11–25.8
		MW-207	11.70	∅	0.0	12:13	~~3–18~~ 9.5–23.27
		MW-70R	11.66	∅	0.0	12:16	~~3–18~~ 4–16
		MW-61AR	15.21	15.10	64.2	12:36	
		MW-30	14.01	∅	0.0	12:49	5–30

13:15 – Begin set up for sampling MW-70R.
14:06 – Begin sampling at 14:06. / 14:55 : demob/decon
15:15 – ANA offsite. 14:30: sample MW-70R DUP-01 collected
Sample to be shipped by next day air via Fedex.

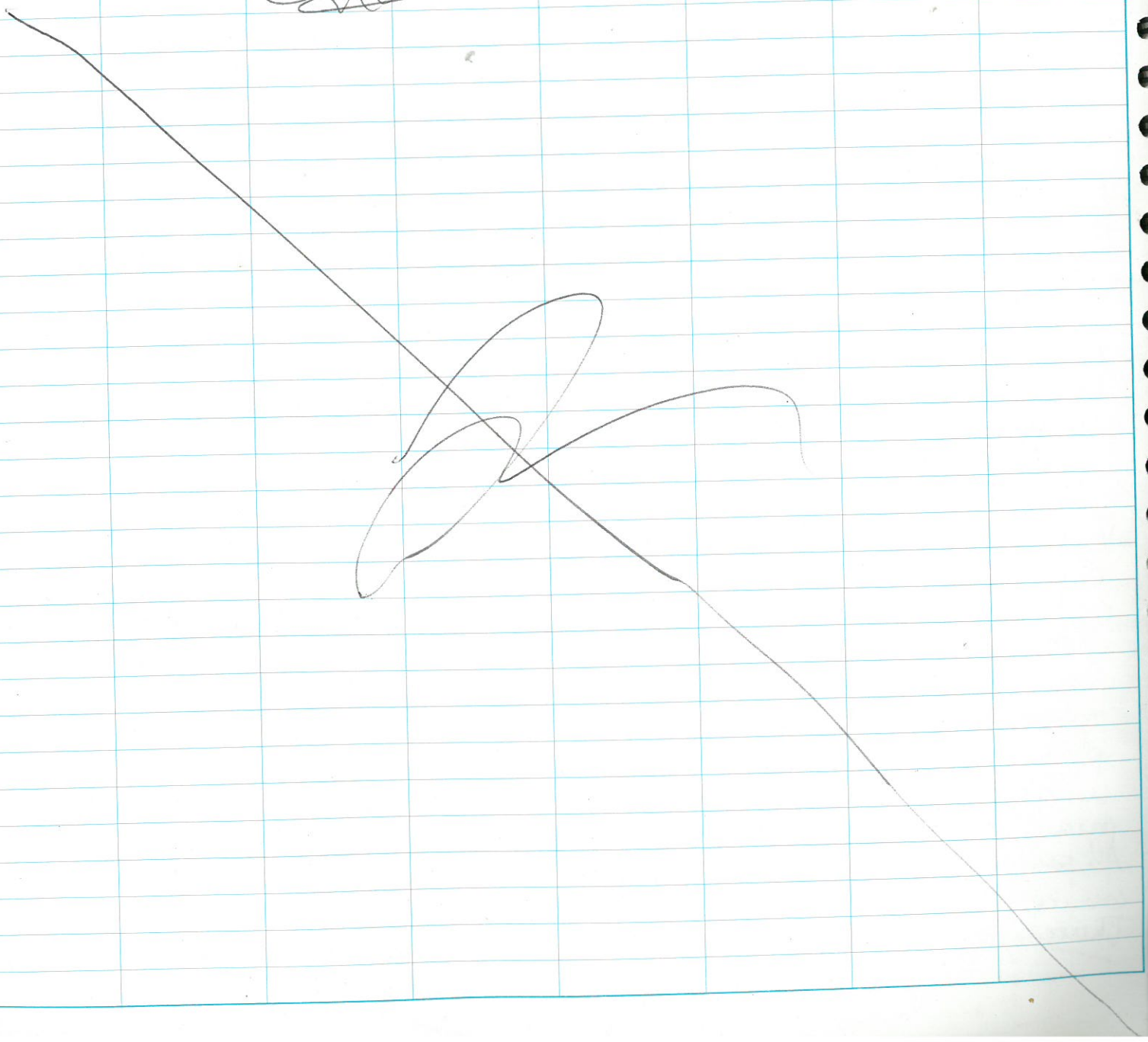
Methodology:

GW samples were collected using low flow techniques with dedicated tubing, a geopump peristaltic pump, and an Aquatroll 600 multimeter. All wells were gauged using a 100 foot oil/water interface probe. All wells were gauged and sampled when water levels were within screened intervals. The polyethane tubing was placed in the well such that the intake depth was six inches below the water level. The well was purged at a rate of 200 ml/min, until parameters stabilized or for 45 minutes if parameters didn't stabilize. All samples were collected in laboratory labs bottleware and immediately stored on ice. Cooler was packed with fresh ice and sent to Lancaster Labs on Thursday Sept 27th via priority overnight.

Seattle terminal 3Q18 GWM continue

Samples were collected from MW-70R. LNAPL was detected in MW-61 AR using a bailer.
MW-70R ~~xxxx~~ samples ~~were~~ analysed for NWTPH-Gx, NWTPH-Dx with SGC, BTEX and cPAHs.

Drum Inventory:
During sampling activities, 2 gallons of purge water was produced and stored in one 30 gallons drum. On Friday 28th of September, the drum was delievered to Emerald services in Seattle for proper disposal.



12/12/18 4Q18 Seattle Terminal GWM

E. Krueger
K. Franz

1230 - ANA onsite. Don PPE. conduct H&S tailgate meeting. Review HASP, JSAs and SOW.

weather: 50°F, overcast

1300 - Prep & calibrate equipment for gauging round. (PID CAL Report: Zero CAL -> 0.0 ppm Isobutylene CAL -> 100 ppm)

1406 - Begin gauging round

	Well ID	PID ppm	DTW ft. btoc	DTP ft. btoc	TIME	NOTES
	MW-30	1.1	12.87	—	1528	4", sock
	MW-61AR	172.3	13.65	—	1523	2", sock
	MW-70R	0.0	9.88	—	1515	water
	MW-200	0.0	8.15	—	1450	water, buried
	MW-201	0.0	8.77	—	1455	buried
	MW-202	0.0	8.54	—	1457	
	MW-203	0.0	11.37	—	1439	water, buried
	MW-204	0.0	17.46	—	1417	water, buried
	MW-205	0.0	21.38	—	1415	water, buried
Δ	MW-206	0.0	9.79	—	1506	
	MW-207	0.0	9.79	—	1508	water

• MW-61A-R confirmed w/ bailer -> NO LNAPL

Δ - Submerged screen - gauged right at low tide (1306)

1540 - End gauging round. Pack up equipment

1615 - ANA offsite

12/12/18

12/13/18 4Q18 Seattle Terminal GWM

E. Krueger
R. Franz

0800 - ANA onsite. DON PPE. conduct H&S tailgate meeting. Review HASP, JSAs & SOW

weather: 45, rain

0815 - Prep for sampling round

0915 - Begin sampling round

1000 - Sample MW-204

1005 - sample MW-205

1100 - Sample MW-203

1125 - Sample MW-201

1215 - Sample MW-200

1300 - Sample MW-202 (DUP-1 collected)

1405 - Sample MW-70R

1420 - Sample MW-207

1600 - Sample MW-206. Initial DTW reading (9.60 ft btoc) indicated a submerged screen. call S. Miles to discuss. Decision was made to purge well until the screen was no longer submerged, and then begin sampling. DTW measurements were taken every 3 minutes to ensure well didnt recharge. Purged 2 gallons out of well before it was set up to be LFP Sampled. Low tide was at 1606. ~~which~~

1645 - ANA begins packing up equipment

1730 - ANA offsite

12/13/18

12/14/18 4Q18 Seattle Terminal GWM

E. Krueger
K. Franz

Weather: 45°, Rain

0730 - ANA onsite. Don PPE. Conduct H&S tailgate meeting. Review HASP, JSA & SOW

0800 - Prep for sampling round

0845 - Begin sampling round

0930 - Sample MW-61A-R

1000 - Sample MW-30

1100 - ANA offsite

1245 - Two, 30-Gallon drums dropped off at Emerald services in Kent

1345 - coolers dropped off at FedEx and shipped out priority overnight to Lancaster Labs.

Methodology: GW samples were collected using LFP techniques w/ dedicated tubing, a geopump peristaltic pump and an AquaTroll 600 multimeter. All wells were gauged using an oil/water interface probe, prior to sampling. All wells were gauged and sampled when water levels were within screened intervals. The polyethene tubing was placed in each well such that the intake depth was six inches below water level. All samples were immediately stored on ice after collection. All wells were analyzed for GRO, DRO/ito & BTEX & cPAHs.

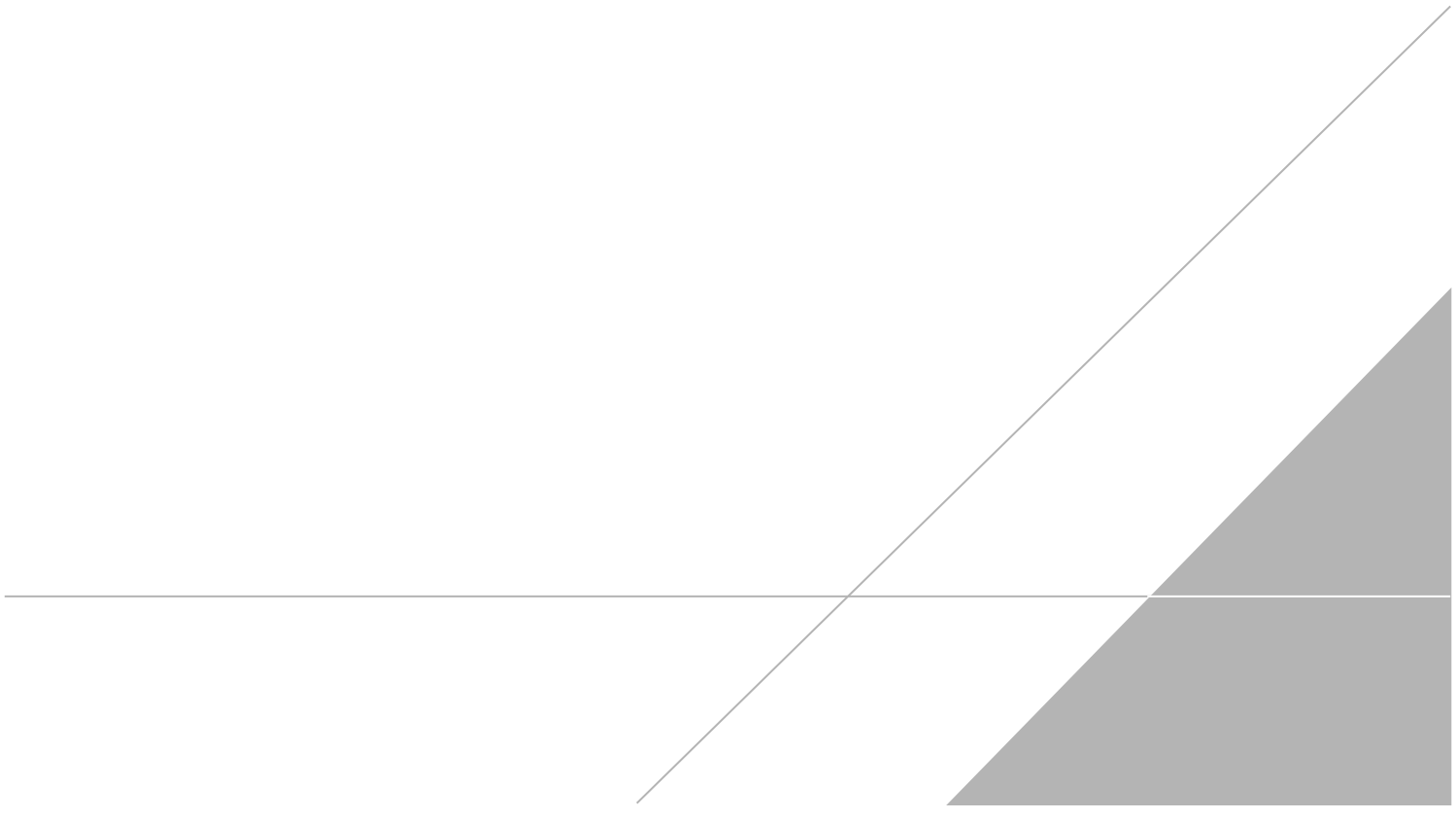
Drum Inventory: During sampling, ~ 60 gallons of purge water was produced and stored in two 30-gallon steel new drums. On 12/14/18, both drums were taken to Emerald services in Kent for proper disposal.

12/14/18

Rite in the Rain

APPENDIX C

Historical Groundwater Analytical Results



Appendix C
Summary of Historical Groundwater Elevation Data

Former Unocal Seattle Marketing Terminal
3001 Elliott Avenue
Seattle, Washington

Well Number[1] (Well Casing Elevation)	Date Measured	Time Measured (hr:min)	Depth to Groundwater[2] (feet)	Depth to LNAPL[3] (feet)	LNAPL Thickness[3] (feet)	Groundwater Elevation[4] (feet)	Top of Well Screen Elevation[5] (feet)
MW-27	12/11/02	13:20	9.38	NR	NR	-3.20	--
(6.18)	03/20/03	10:31	11.09	NR	NR	-4.91	--
	07/03/03	9:02	12.10	NR	NR	-5.92	--
	09/18/03	11:27	10.58	NR	NR	-4.40	--
	12/02/03	10:56	9.50	NR	NR	-3.32	--
	03/09/04	10:37	11.83	NR	NR	-5.65	--
	06/03/04	10:09	12.32	NR	NR	-6.14	--
	09/03/04	10:35	10.63	NR	NR	-4.45	--
	12/06/04	10:30	9.41	NR	NR	-3.23	--
	03/04/05	10:33	9.05	NR	NR	-2.87	--
	06/03/05	--	13.05	NR	NR	-6.87	--
	09/01/05	8:00	10.29	NR	NR	-4.11	--
	12/01/05	9:45	9.28	NR	NR	-3.10	--
	03/02/06	9:00	9.29	NR	NR	-3.11	--
	06/06/06	Well Damaged During Construction Activities					
MW-27R[6]	03/07/07	9:35	8.25	--	--	-3.88	--
(4.37)	09/26/07	7:59	9.19	--	--	-4.82	--
	11/26/07	14:55	7.56	--	--	-3.19	--
	12/03/07	Well Abandoned					
MW-30	12/11/02	14:10	15.23	NR	NR	-3.94	--
(11.29)	03/20/03	13:00	12.59	NR	NR	-1.30	--
	07/03/03	11:18	14.30	NR	NR	-3.01	--
	09/18/03	10:36	14.70	NR	NR	-3.41	--
	12/02/03	11:23	12.20	NR	NR	-0.91	--
	03/09/04	10:58	13.81	NR	NR	-2.52	--
	06/03/04	11:44	14.60	NR	NR	-3.31	--
	09/03/04	13:42	9.85	NR	NR	1.44	--
	12/06/04	9:37	15.27	NR	NR	-3.98	--
	03/04/05	14:08	14.33	NR	NR	-3.04	--
	06/03/05	--	14.47	NR	NR	-3.18	--
	09/01/05	10:05	15.05	NR	NR	-3.76	--
	12/01/05	11:23	11.98	NR	NR	-0.69	--
	03/02/06	11:28	14.53	NR	NR	-3.24	--
	06/06/06	8:20	14.16	NR	NR	-2.87	--
	09/15/06	--	14.10	NR	NR	-2.81	--
	03/07/07	8:55	13.74	Sheen	--	-2.45	--
	06/07/07	8:43	13.87	--	--	-2.58	--
	07/10/07	9:45	14.21	--	--	-2.92	--
	07/25/07	11:35	13.94	--	--	-2.65	--
	08/22/07	9:35	14.15	--	--	-2.86	--
	09/06/07	9:50	14.25	--	--	-2.96	--
	09/26/07	9:30	14.52	--	--	-3.23	--
	10/11/07	7:55	14.22	--	--	-2.93	--
	11/01/07	9:50	14.29	--	--	-3.00	--
	11/16/07	15:25	13.85	--	--	-2.56	--
	11/26/07	13:40	13.90	--	--	-2.61	--
	12/19/07	9:30	12.59	--	--	-1.30	--
	01/03/08	8:30	12.60	--	--	-1.31	--
	01/17/08	8:48	12.53	--	--	-1.24	--
	01/30/08	9:30	13.10	Sheen	--	-1.81	--
	02/12/08	9:28	13.39	Sheen	--	-2.10	--
	03/03/08	9:31	13.80	--	--	-2.51	--
	03/17/08	9:29	13.99	--	--	-2.70	--
	04/01/08	9:13	13.78	--	--	-2.49	--
	04/14/08	9:14	13.97	--	--	-2.68	--
	04/28/08	9:56	14.18	--	--	-2.89	--
(20.85)[8]	05/13/08	9:24	14.46	--	--	6.39	--
	05/27/08	13:40	14.33	--	--	6.52	--
	06/10/08	10:25	14.08	--	--	6.77	--
	06/24/08	9:46	14.35	--	--	6.50	--
	07/07/08	9:50	14.13	--	--	6.72	--
	07/22/08	9:29	14.19	Sheen	--	6.66	--
	08/12/08	9:58	14.05	--	--	6.80	--
	09/03/08	--	14.03	--	--	6.82	--
	09/26/08	--	14.16	--	--	6.69	--
	10/17/08	9:15	14.35	--	--	6.50	--
	10/29/08	8:43	14.49	--	--	6.36	--
	11/12/08	10:46	13.03	--	--	7.82	--
	12/03/08	12:46	13.75	--	--	7.10	--
	01/06/09	9:36	12.68	--	--	8.17	--
	01/20/09	12:46	12.98	--	--	7.87	--
	02/03/09	9:39	13.79	--	--	7.06	--
	02/17/09	11:15	13.75	--	--	7.10	--
	03/12/09	12:09	13.79	--	--	7.06	--
	03/25/09	8:46	13.70	--	--	7.15	--
	04/08/09	10:16	13.30	--	--	7.55	--
	04/30/09	10:09	12.98	--	--	7.87	--
	05/12/09	10:10	12.72	12.70	0.02	8.13	--
	05/26/09	14:27	13.20	--	--	7.65	--
	06/09/09	9:41	13.91	--	--	6.94	--
	06/25/09	9:43	13.49	--	--	7.36	--
	07/07/09	9:35	13.75	Sheen	--	7.10	--
	07/13/09	8:09	14.23	--	--	6.62	--
	08/05/09	6:45	13.96	Sheen	--	6.89	--
	08/06/09	9:26	13.99	--	--	6.86	--

Appendix C
Summary of Historical Groundwater Elevation Data

Former Unocal Seattle Marketing Terminal
3001 Elliott Avenue
Seattle, Washington

Well Number[1] (Well Casing Elevation)	Date Measured	Time Measured (hr:min)	Depth to Groundwater[2] (feet)	Depth to LNAPL[3] (feet)	LNAPL Thickness[3] (feet)	Groundwater Elevation[4] (feet)	Top of Well Screen Elevation[5] (feet)
MW-30 (continued)	08/20/09	8:41	14.18	--	--	6.67	--
(20.85)[8]	09/10/09	10:11	14.15	--	--	6.70	--
	09/23/09	9:33	14.07	Sheen	--	6.78	--
	10/08/09	9:49	14.21	--	--	6.64	--
	10/19/09	9:20	14.13	--	--	6.72	--
	11/12/09	9:33	12.43	--	--	8.42	--
	03/24/10	9:48	12.98	Sheen	--	7.87	--
	04/13/10	10:31	12.98	Sheen	--	7.87	--
	05/26/10	9:15	13.36	Sheen	--	7.49	--
	07/28/10	14:40	14.11	--	--	6.74	--
	08/05/10	11:49	14.10	--	--	6.75	--
	08/13/10	10:10	13.90	--	--	6.95	--
	08/18/10	8:36	13.92	--	--	6.93	--
	09/21/10	10:29	13.30	--	--	7.55	--
	10/11/10	11:01	13.40	--	--	7.45	--
	11/19/10	14:54	12.41	--	--	8.44	--
	03/04/11	9:44	12.54	Sheen	--	8.31	--
	04/25/11	10:50	12.80	Sheen	--	8.05	--
	09/21/11	9:32	13.55	--	--	7.30	--
	11/21/11	11:00	13.74	--	--	7.11	--
	02/20/12	8:59	13.16	--	--	7.69	--
	04/17/12	11:55	12.90	Sheen	--	7.95	--
	10/10/12	12:10	14.41	--	--	6.44	--
	12/24/12	11:40	13.00	--	--	7.85	--
	01/08/13	14:20	11.88	--	--	8.97	--
	04/30/13	10:55	13.34	--	--	7.51	--
	09/19/13	9:54	13.74	--	--	7.11	--
	11/22/13	9:15	14.61	--	--	6.24	--
	06/23/14	10:27	14.04	--	--	6.81	--
	09/10/14	9:10	14.82	--	--	6.03	--
	12/15/14	13:27	11.38	--	--	9.47	--
	06/17/15	11:25	13.90	--	--	6.95	--
	12/09/15	10:39	10.00	--	--	10.85	--
	02/16/16	9:20	10.89	--	--	9.96	--
	06/13/16	8:40	13.79	LNAPL	--	7.06	--
	09/22/16	13:13	14.35	--	--	6.50	--
	01/12/17	12:44	--	LNAPL	--	--	--
	03/27/17	13:13	10.71	LNAPL	--	10.14	15.85
	06/16/17	9:46	13.39	13.38	--	7.46	15.85
	11/07/17	13:18	13.97	--	--	6.88	15.85
	03/26/18	8:46	13.48	--	--	7.37	15.85
	06/19/18	16:05	13.90	--	--	6.95	15.85
	09/27/18	**12:49**	**14.01**	**--**	**--**	**6.84**	**15.85**
	12/12/18	**15:28**	**12.87**	**--**	**--**	**7.98**	**15.85**
MW-34	12/11/02	13:45	9.45	NR	NR	-4.12	--
(5.33)	03/20/03	11:43	6.99	NR	NR	-1.66	--
	07/03/03	8:29	9.02	NR	NR	-3.69	--
	09/18/03	9:55	9.57	NR	NR	-4.24	--
	12/02/03	11:45	7.00	NR	NR	-1.67	--
	03/09/04	12:15	8.42	NR	NR	-3.09	--
	06/03/04	11:25	8.95	NR	NR	-3.62	--
	09/03/04	13:53	8.63	NR	NR	-3.30	--
	12/06/04	9:45	9.48	NR	NR	-4.15	--
	03/04/05	13:55	8.87	NR	NR	-3.54	--
	06/03/05	--	9.08	NR	NR	-3.75	--
	09/01/05	9:08	9.38	NR	NR	-4.05	--
	12/01/05	10:49	6.72	NR	NR	-1.39	--
	03/02/06	10:50	9.25	NR	NR	-3.92	--
	06/06/06	9:20	8.82	NR	NR	-3.49	--
	09/15/06	--	8.66	NR	NR	-3.33	--
	03/07/07	--	--	NR	NR	--	--
	02/13/08	Well Possibly Removed During Previous Excavation Activities					
MW-35	12/11/02	13:35	9.29	NR	NR	-4.18	--
(5.11)	03/20/03	11:42	7.65	NR	NR	-2.54	--
	07/03/03	--	--	NR	NR	--	--
	09/18/03	--	--	NR	NR	--	--
	12/02/03	--	--	NR	NR	--	--
	03/09/04	--	--	NR	NR	--	--
	06/03/04	--	--	NR	NR	--	--
	09/03/04	--	--	NR	NR	--	--
	12/06/04	--	--	NR	NR	--	--
	03/04/05	--	--	NR	NR	--	--
	06/03/05	--	--	NR	NR	--	--
	09/01/05	--	--	NR	NR	--	--
	12/01/05	--	--	NR	NR	--	--
	03/02/06	--	--	NR	NR	--	--
	06/06/06	--	--	NR	NR	--	--
	09/15/06	--	--	NR	NR	--	--
	03/07/07	--	--	NR	NR	--	--
	02/13/08	Well Possibly Removed During Previous Excavation Activities					
MW-42	12/11/02	13:30	9.38	NR	NR	-4.18	--
(5.20)	03/20/03	11:50	7.86	NR	NR	-2.66	--
	07/03/03	8:11	9.44	NR	NR	-4.24	--
	09/18/03	10:21	10.92	NR	NR	-5.72	--
	12/02/03	11:36	9.14	NR	NR	-3.94	--

Appendix C
Summary of Historical Groundwater Elevation Data

Former Unocal Seattle Marketing Terminal
3001 Elliott Avenue
Seattle, Washington

Well Number[1] (Well Casing Elevation)	Date Measured	Time Measured (hr:min)	Depth to Groundwater[2] (feet)	Depth to LNAPL[3] (feet)	LNAPL Thickness[3] (feet)	Groundwater Elevation[4] (feet)	Top of Well Screen Elevation[5] (feet)
MW-42 Continued	03/09/04	10:09	8.58	NR	NR	-3.38	--
	06/03/04	11:10	9.19	NR	NR	-3.99	--
	09/03/04	14:01	9.02	NR	NR	-3.82	--
	12/06/04	9:48	9.43	NR	NR	-4.23	--
	03/04/05	13:56	8.99	NR	NR	-3.79	--
	06/03/05	--	9.24	NR	NR	-4.04	--
(5.20)	09/01/05	9:00	9.55	NR	NR	-4.35	--
	12/01/05	10:54	8.91	NR	NR	-3.71	--
	03/02/06	10:45	9.25	NR	NR	-4.05	--
	06/06/06	9:28	8.93	NR	NR	-3.73	--
	09/15/06	--	8.87	NR	NR	-3.67	--
	03/07/07	--	--	NR	NR	--	--
	02/13/08	Well Possibly Removed During Previous Excavation Activities					
MW-43	12/11/02	13:40	9.06	NR	NR	-4.12	--
(4.94)	03/20/03	11:30	7.10	NR	NR	-2.16	--
	07/03/03	8:15	8.86	NR	NR	-3.92	--
	09/18/03	--	--	NR	NR	--	--
	12/02/03	--	--	NR	NR	--	--
	03/09/04	--	--	NR	NR	--	--
	06/03/04	--	--	NR	NR	--	--
	09/03/04	--	--	NR	NR	--	--
	12/06/04	--	--	NR	NR	--	--
	03/04/05	--	--	NR	NR	--	--
	06/03/05	--	--	NR	NR	--	--
	09/01/05	--	--	NR	NR	--	--
	12/01/05	--	--	NR	NR	--	--
	03/02/06	--	--	NR	NR	--	--
	06/06/06	--	--	NR	NR	--	--
	09/15/06	--	--	NR	NR	--	--
	03/07/07	--	--	NR	NR	--	--
	02/13/08	Well Possibly Removed During Previous Excavation Activities					
MW-44	12/11/02	--	--	NR	NR	--	--
(5.46)	03/20/03	--	--	NR	NR	--	--
	07/03/03	--	--	NR	NR	--	--
	09/18/03	--	--	NR	NR	--	--
	12/02/03	--	--	NR	NR	--	--
	03/09/04	--	--	NR	NR	--	--
	06/03/04	--	--	NR	NR	--	--
	09/03/04	--	--	NR	NR	--	--
	12/06/04	--	--	NR	NR	--	--
	03/04/05	--	--	NR	NR	--	--
	06/03/05	--	--	NR	NR	--	--
	09/01/05	--	--	NR	NR	--	--
	12/01/05	--	--	NR	NR	--	--
	03/02/06	--	--	NR	NR	--	--
	06/06/06	--	--	NR	NR	--	--
	09/15/06	--	--	NR	NR	--	--
	03/07/07	--	--	NR	NR	--	--
MW-61A-R[6]	03/02/06	--	15.15[6]	NR	NR	-1.81	1.91
(13.35)	06/06/06	8:00	14.96	NR	NR	-1.61	--
	09/15/06	--	14.26	NR	NR	-0.91	--
	03/07/07	8:44	14.04	--	NR	-0.69	--
	06/07/07	9:15	14.36	--	NR	-1.01	--
	07/10/07	9:50	14.84	--	NR	-1.49	--
	07/25/07	11:40	14.55	--	NR	-1.20	--
	08/22/07	9:40	14.72	--	NR	-1.37	--
	09/06/07	9:55	14.90	--	NR	-1.55	--
	09/26/07	9:16	15.09	--	NR	-1.74	--
	10/11/07	8:00	14.82	--	NR	-1.47	--
	11/01/07	9:55	14.81	--	NR	-1.46	--
	11/16/07	15:30	14.59	--	NR	-1.24	--
	11/26/07	13:48	14.40	--	NR	-1.05	--
	12/19/07	9:35	13.83	--	NR	-0.48	--
	01/03/08	8:41	12.93	--	NR	0.42	--
	01/17/08	9:00	12.76	--	NR	0.59	--
	02/12/08	9:24	13.65	--	NR	-0.30	--
	03/03/08	9:24	14.14	--	NR	-0.79	--
	03/17/08	9:23	14.49	--	NR	-1.14	--
	04/01/08	9:10	14.22	14.21	0.01	-0.87	--
	04/14/08	9:06	14.41	14.39	0.02	-1.06	--
	04/28/08	9:36	14.70	14.64	0.06	-1.35	--
(22.44)[8]	05/13/08	9:29	14.88	--	--	7.56	11.00
	05/27/08	13:53	14.93	Sheen	--	7.51	--
	06/10/08	10:20	14.73	--	--	7.71	--
	06/24/08	9:41	14.92	--	--	7.52	--
	07/07/08	9:56	14.70	--	--	7.74	--
	07/22/08	9:34	14.72	14.70	0.02	7.72	--
	08/12/08	9:50	14.75	14.68	0.07	7.69	--
	09/03/08	--	15.58	15.56	0.02	6.86	--
	09/26/08	--	14.89	14.79	0.10	7.55	--
	10/17/08	9:03	15.12	14.92	0.20	7.32	--
	10/29/08	8:50	15.21	15.00	0.21	7.23	--
	11/12/08	10:51	13.95	13.81	0.14	8.49	--
	12/03/08	12:52	14.25	14.19	0.06	8.19	--
	01/06/09	9:40	13.12	12.99	0.13	9.32	--

Appendix C
Summary of Historical Groundwater Elevation Data

Former Unocal Seattle Marketing Terminal
3001 Elliott Avenue
Seattle, Washington

Well Number[1] (Well Casing Elevation)	Date Measured	Time Measured (hr:min)	Depth to Groundwater[2] (feet)	Depth to LNAPL[3] (feet)	LNAPL Thickness[3] (feet)	Groundwater Elevation[4] (feet)	Top of Well Screen Elevation[5] (feet)
MW-61A-R (continued)	01/20/09	12:50	13.06	13.01	0.05	9.38	--
	02/03/09	9:43	14.40	13.88	0.52	8.04	--
	02/17/09	11:20	14.30	13.80	0.50	8.14	--
	03/12/09	12:16	14.20	14.05	0.15	8.24	--
	03/25/09	8:50	14.01	13.91	0.10	8.43	--
	04/08/09	10:21	13.81	13.71	0.10	8.63	--
(22.44)[8]	04/30/09	10:12	14.14	13.95	0.19	8.30	--
	05/12/09	10:51	13.66	13.64	0.02	8.78	--
	05/26/09	14:15	13.74	--	--	8.70	--
	06/09/09	9:46	13.40	--	--	9.04	--
	06/25/09	9:47	14.14	13.94	0.20	8.30	--
	07/07/09	9:40	14.18	14.15	0.03	8.26	--
	07/13/09	8:14	14.88	14.87	0.01	7.56	--
	08/05/09	6:45	14.68	14.39	0.29	7.76	--
	08/06/09	9:29	14.64	14.62	0.02	7.80	--
	08/20/09	8:51	14.85	14.84	0.01	7.59	--
	09/10/09	10:15	14.84	14.78	0.06	7.60	--
	09/23/09	9:37	14.89	14.81	0.08	7.55	--
	10/08/09	9:39	15.01	14.94	0.07	7.43	--
	10/19/09	9:05	14.98	14.91	0.07	7.46	--
	11/12/09	9:36	12.85	12.80	0.05	9.59	--
	03/24/10	9:54	13.20	12.95	0.25	9.24	--
	04/13/10	10:37	13.06	12.95	0.11	9.38	--
	05/26/10	9:06	13.91	13.76	0.15	8.53	--
	07/28/10	14:56	14.78	--	--	7.66	--
	08/05/10	11:28	14.79	--	--	7.65	--
	08/13/10	9:38	13.62	--	--	8.82	--
	08/13/10	10:37	13.61	--	--	8.83	--
	08/13/10	10:42	13.61	--	--	8.83	--
	08/13/10	15:42	13.64	--	--	8.80	--
	08/18/10	8:55	14.70	--	--	7.74	--
	09/21/10	10:42	15.35	--	--	7.09	--
	10/11/10	11:20	14.35	14.31	0.04	8.09	--
	11/19/10	15:25	13.30	13.19	0.11	9.14	--
	03/04/11	10:04	12.80	12.63	0.17	9.64	--
	04/25/11	11:20	12.70	Sheen[10]	--	9.74	--
	09/21/11	9:45	14.65	14.10	0.55	7.79	--
	11/21/11	11:05	14.82	14.26	0.56	7.62	--
	02/20/12	9:15	13.55	13.15	0.40	8.89	--
	04/17/12	12:10	13.18	12.79	0.39	9.26	--
	10/10/12	12:25	14.80	14.39	0.41	7.64	--
	12/24/12	11:28	12.61	12.20	0.41	9.83	--
	01/08/13	14:30	11.84	11.74	0.10	10.60	--
	04/30/13	11:10	13.59	13.35	0.24	8.85	--
	09/19/13	9:48	14.45	14.40	0.05	7.99	--
	11/22/13	9:25	15.28	15.22	0.06	7.16	--
	06/23/14	10:36	14.60	--	--	7.84	--
	06/24/14	--	14.80	14.61	0.19	7.64	--
	09/10/14	9:30	14.92	--	--	7.52	--
	12/15/14	13:35	11.71	--	--	10.73	--
	12/16/14	15:25	11.90	11.81	0.01	10.54	--
	06/17/15	11:15	14.79	14.78	0.01	7.65	--
	12/09/15	10:45	10.99	10.98	0.01	11.45	--
	02/16/16	9:15	11.08	--	--	11.36	--
	06/13/16	8:30	14.40	--	--	8.04	--
	09/22/16	13:21	15.00	--	--	7.44	--
	01/12/17	13:09	12.26	--	--	10.18	--
	03/27/17	13:22	10.62	--	--	11.82	--
	06/16/17	9:41	14.73	13.84	0.89	7.71	--
	11/07/17	13:21	14.93	14.84	0.09	7.51	--
	03/26/18	8:41	13.68	--	--	8.76	--
	06/19/18	15:55	14.45	--	--	7.99	--
	09/27/18	**12:36**	**15.21**	**15.10**	**0.11**	**7.31**	**--**
	12/12/18	**15:23**	**13.65**	**--**	**--**	**8.79**	**--**
PZ-7.5	04/30/13	9:45	7.18	--	--	UK	--
	09/15/13	8:46	7.19	--	--	UK	--
	11/22/13	9:27	8.03	--	--	UK	--
	06/11/14	Well Decommissioned					
PZ-9.5	04/30/13	9:53	9.00	--	--	UK	--
	09/15/13	8:52	9.86	--	--	UK	--
	11/22/13	9:37	9.86	--	--	UK	--
	06/10/14	Well Decommissioned					
PZ-61A-R[11]	09/21/10	10:36	14.05	--	--	UK	--
	09/28/09	8:50	14.04	--	--	UK	--
	10/11/10	11:12	14.18	--	--	UK	--
	03/04/11	9:55	12.46	--	--	UK	--
	04/25/11	11:30	13.05	0.27	12.78	UK	--
	09/21/11	9:40	14.18	14.17	0.01	UK	--
	11/21/11	11:10	14.34	--	--	UK	--
	02/20/12	9:10	13.28	13.18	0.10	UK	--
	04/17/12	12:05	12.84	--	--	UK	--
	10/10/12	12:30	14.89	--	--	UK	--
	12/24/12	11:31	12.66	--	--	UK	--
	01/08/13	14:31	11.73	--	--	UK	--
	04/30/13	11:05	13.38	--	--	UK	--

Appendix C
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3001 Elliott Avenue
Seattle, Washington

Well Number[1] (Well Casing Elevation)	Date Measured	Time Measured (hr:min)	Depth to Groundwater[2] (feet)	Depth to LNAPL[3] (feet)	LNAPL Thickness[3] (feet)	Groundwater Elevation[4] (feet)	Top of Well Screen Elevation[5] (feet)
PZ-61A-R (continued)	09/19/13	9:51	14.10	--	--	UK	--
	11/22/13	9:30	15.01	--	--	UK	--
	06/12/14			Well Decommissioned			
PZ-203[11]	09/21/10	11:24	13.29	--	--	UK	--
	04/25/11	13:50	11.80	--	--	UK	--
	09/21/11	10:29	13.67	--	--	UK	--
	11/21/11	10:24	12.60	--	--	UK	--
	02/20/12			UNABLE TO LOCATE			
	04/17/12	12:25	13.00	--	--	UK	--
	10/10/12			UNABLE TO LOCATE			
	12/24/12	10:39	14.52	--	--	UK	--
	01/08/13	15:25	10.13	--	--	UK	--
	04/30/13	10:26	11.53	--	--	UK	--
	09/19/13	9:27	12.30	--	--	UK	--
	11/22/13	10:10	12.03	--	--	UK	--
	06/12/14			Well Decommissioned			
PZ-204[11]	09/21/10	11:32	19.02	--	--	UK	--
	04/25/11	14:05	17.67	--	--	UK	--
	09/21/11	10:18	19.34	--	--	UK	--
	11/21/11	10:30	18.71	--	--	UK	--
	02/20/12			UNABLE TO LOCATE			
	04/17/12	11:35	18.23	--	--	UK	--
	10/10/12			UNABLE TO LOCATE			
	12/24/12	10:21	16.65	--	--	UK	--
	01/08/13	15:15	16.82	--	--	UK	--
	04/30/13	10:34	17.75	--	--	UK	--
	09/19/13	9:21	18.40	--	--	UK	--
	11/22/13	9:55	18.80	--	--	UK	--
	06/12/14			Well Decommissioned			
MW-65	12/11/02	14:03	14.69	NR	NR	-3.86	--
(10.83)	03/20/03	10:44	10.09	NR	NR	0.74	--
	07/03/03	11:12	13.85	NR	NR	-3.02	--
	09/18/03	10:40	14.15	NR	NR	-3.32	--
	12/02/03	11:14	12.38	NR	NR	-1.55	--
	03/09/04	10:50	13.63	NR	NR	-2.80	--
	06/03/04	11:42	14.24	NR	NR	-3.41	--
	09/03/04	14:08	13.77	NR	NR	-2.94	--
	12/06/04	9:32	14.59	NR	NR	-3.76	--
	03/04/05	14:04	14.06	NR	NR	-3.23	--
	06/03/05	--	14.14	NR	NR	-3.31	--
	09/01/05	9:55	14.67	NR	NR	-3.84	--
	12/01/05	11:19	12.05	NR	NR	-1.22	--
	03/02/06	11:12	14.28	NR	NR	-3.45	--
	06/06/06	8:26	13.83	NR	NR	-3.00	--
	09/15/06	--	13.90	NR	NR	-3.07	--
	03/07/07	8:51	13.63	--	--	-2.80	--
	06/07/07	8:30	13.69	--	--	-2.86	--
	09/26/07	9:27	14.29	--	--	-3.46	--
	11/26/07	10:00	13.62	--	--	-2.79	--
	12/03/07			Well Decommissioned			
MW-66	12/11/02	14:15	15.36	NR	NR	-3.74	--
(11.62)	03/20/03	13:04	12.21	NR	NR	-0.59	--
	07/03/03	11:22	14.73	NR	NR	-3.11	--
	09/18/03	10:34	15.25	NR	NR	-3.63	--
	12/02/03	11:27	11.99	NR	NR	-0.37	--
	03/09/04	11:02	13.67	NR	NR	-2.05	--
	06/03/04	11:45	14.78	NR	NR	-3.16	--
	09/03/04	14:12	14.16	NR	NR	-2.54	--
	12/06/04	9:39	15.22	NR	NR	-3.60	--
	03/04/05	14:01	14.54	NR	NR	-2.92	--
	06/03/05	--	14.69	NR	NR	-3.07	--
	09/01/05	10:10	15.31	NR	NR	-3.69	--
	12/01/05	11:26	11.78	NR	NR	-0.16	--
	03/02/06	11:20	14.77	NR	NR	-3.15	--
	06/06/06	8:15	14.35	NR	NR	-2.73	--
	09/15/06	--	14.39	NR	NR	-2.77	--
	03/07/07	9:00	14.11	--	--	-2.49	--
	09/26/07	9:36	14.97	--	--	-3.35	--
	11/26/07	13:42	14.23	--	--	-2.61	--
	12/03/07			Well Decommissioned			
MW-200[6]	03/07/07	9:45	8.88	--	--	-4.10	-0.22
(4.78)	06/07/07	15:53	9.26	--	--	-4.48	--
	07/06/07	10:00	9.76	--	--	-4.98	--
	09/26/07	8:08	9.43	--	--	-4.65	--
	11/26/07	14:48	8.54	--	--	-3.76	--
	02/13/08	11:15	8.57	--	--	-3.79	--
(14.36)[8]	05/13/08	10:16	10.02	--	--	4.34	9.36
	09/03/08	--	9.56	--	--	4.80	--
	12/03/08	12:10	9.11	--	--	5.25	--
	02/17/09	10:43	8.28	--	--	6.08	--
	05/12/09	12:02	8.95	--	--	5.41	--
	05/26/09	13:54	9.40	--	--	4.96	--
	09/10/09	10:39	9.74	--	--	4.62	--
	04/13/10	11:21	9.23	--	--	5.13	--
	06/16/10	10:05	9.10	--	--	5.26	--

Appendix C
Summary of Historical Groundwater Elevation Data

Former Unocal Seattle Marketing Terminal
3001 Elliott Avenue
Seattle, Washington

Well Number[1] (Well Casing Elevation)	Date Measured	Time Measured (hr:min)	Depth to Groundwater[2] (feet)	Depth to LNAPL[3] (feet)	LNAPL Thickness[3] (feet)	Groundwater Elevation[4] (feet)	Top of Well Screen Elevation[5] (feet)
MW-200 (continued)	08/12/10	9:45	8.92	Sheen	--	5.44	--
	09/14/10	1:48	9.31	--	--	5.05	--
	09/14/10	1:53	9.31	--	--	5.05	--
	09/15/10	15:03	9.34	--	--	5.02	--
	09/15/10	15:05	9.33	--	--	5.03	--
	09/15/10	15:10	9.31	--	--	5.05	--
	09/15/10	15:15	9.29	--	--	5.07	--
	09/15/10	15:20	9.28	--	--	5.08	--
	09/15/10	15:25	9.26	--	--	5.10	--
	09/15/10	15:35	9.38	--	--	4.98	--
	09/15/10	15:39	9.49	--	--	4.87	--
(14.36)[8]	09/15/10	15:45	9.58	--	--	4.78	--
	09/15/10	15:50	9.66	--	--	4.70	--
	09/15/10	15:55	9.70	--	--	4.66	--
	09/15/10	16:00	9.74	--	--	4.62	--
	09/15/10	16:05	9.76	--	--	4.60	--
	09/15/10	16:10	9.79	--	--	4.57	--
	09/15/10	16:16	9.82	--	--	4.54	--
	09/15/10	16:28	9.80	--	--	4.56	--
	09/15/10		9.69	--	--	4.67	--
	09/15/10	16:36	9.56	--	--	4.80	--
	09/15/10	16:40	9.50	--	--	4.86	--
	09/15/10	16:46	9.43	--	--	4.93	--
	09/15/10	16:55	9.35	--	--	5.01	--
	09/15/10	17:05	9.27	--	--	5.09	--
	09/15/10	17:20	9.21	--	--	5.15	--
	09/15/10	17:29	9.20	--	--	5.16	--
	09/21/10	11:14	9.50	--	--	4.86	--
	09/22/10	11:00	9.40	--	--	4.96	--
	04/26/11	10:45	9.30	--	--	5.06	--
	09/21/11	10:45	10.15	--	--	4.21	--
	11/21/11			Unable to Gauge due to rain fillup of well			
	02/20/12			UNABLE TO LOCATE			
	04/17/12	14:00	9.78	--	--	4.58	--
	10/10/12	11:35	10.35	--	--	4.01	--
	12/24/12	10:54	7.94	--	--	6.42	--
	01/08/13	15:40	7.83	--	--	6.53	--
	04/30/13	10:21	8.62	--	--	5.74	--
	09/19/13	9:33	9.40	--	--	4.96	--
	11/22/13	10:30	9.82	--	--	4.54	--
	06/23/14	9:52	9.61	--	--	4.75	--
	12/15/14	12:59	8.00	--	--	6.36	--
	06/17/15	10:25	8.51	--	--	5.85	--
	12/09/15	10:08	5.89	--	--	8.47	--
	01/15/16	16:47	8.16	--	--	6.20	--
	02/16/16	8:40	8.25	--	--	6.11	--
	06/13/16	9:10	9.75	--	--	4.61	--
	09/22/16	12:42	9.20	--	--	5.16	--
	01/12/17	11:15	8.06	--	--	6.30	--
	03/27/17	12:55	8.58	--	--	5.78	9.36
	06/16/17	8:44	8.90	--	--	5.46	9.36
	11/07/17	12:51	8.69	--	--	5.67	9.36
	03/26/18	8:20	8.68	--	--	5.68	9.36
	06/19/18	15:20	9.42	--	--	4.94	9.36
	09/27/18	**11:27**	**9.41**	**--**	**--**	**4.95**	**9.36**
	12/12/18	**14:50**	**8.15**	**--**	**--**	**6.21**	**9.36**
MW-201[6]	03/07/07	9:55	9.41	Sheen	--	-4.13	0.28
(5.28)	06/07/07	16:35	9.79	--	--	-4.51	--
	07/06/07	11:00	10.27	--	--	-4.99	--
	09/26/07	8:20	9.97	--	--	-4.69	--
	11/27/07	14:38	9.04	--	--	-3.76	--
	02/12/08	10:24	9.65	--	--	-4.37	--
(14.86)[8]	05/13/08	10:24	10.34	--	--	4.52	9.86
	09/03/08	--	10.08	--	--	4.78	--
	12/03/08	12:17	9.66	--	--	5.20	--
	02/17/09	10:37	8.82	--	--	6.04	--
	05/12/09	12:13	9.52	--	--	5.34	--
	05/26/09	13:50	9.90	--	--	4.96	--
	08/11/09	9:02	10.31	--	--	4.55	--
	08/28/09	14:50	10.21	--	--	4.65	--
	09/10/09	10:42	10.29	--	--	4.57	--
	04/13/10	11:17	9.75	--	--	5.11	--
	08/11/10	14:45	10.68	Sheen	--	4.18	--
	09/14/10	13:55	9.89	--	--	4.97	--
	09/14/10	14:00	9.89	--	--	4.97	--
	09/14/10	15:05	10.04	--	--	4.82	--
	09/14/10	15:07	10.02	--	--	4.84	--
	09/14/10	15:19	9.92	--	--	4.94	--
	09/14/10	15:26	9.89	--	--	4.97	--
	09/14/10	15:36	9.86	--	--	5.00	--
	09/17/10	18:14	9.59	--	--	5.27	--
	09/17/10	20:07	9.36	--	--	5.50	--
	09/21/10	11:18	10.06	--	--	4.80	--
	04/25/11	13:15	9.22	--	--	5.64	--
	09/21/11	10:40	10.81	--	--	4.05	--

Appendix C
Summary of Historical Groundwater Elevation Data

Former Unocal Seattle Marketing Terminal
3001 Elliott Avenue
Seattle, Washington

Well Number[1] (Well Casing Elevation)	Date Measured	Time Measured (hr:min)	Depth to Groundwater[2] (feet)	Depth to LNAPL[3] (feet)	LNAPL Thickness[3] (feet)	Groundwater Elevation[4] (feet)	Top of Well Screen Elevation[5] (feet)
MW-201 (continued)	11/21/11	10:15	10.17	--	--	4.69	--
	02/20/12	11:20	9.68	--	--	5.18	--
	04/17/12	11:20	10.11	--	--	4.75	--
	10/10/12	11:45	10.91	--	--	3.95	--
	12/24/12	10:47	8.35	--	--	6.51	--
	01/08/13	15:35	8.35	--	--	6.51	--
	04/30/13	10:23	9.14	--	--	5.72	--
	09/19/13	9:30	9.90	--	--	4.96	--
	11/22/13	10:20	10.27	--	--	4.59	--
	06/23/14	9:56	10.14	--	--	4.72	--
	12/15/14	12:51	8.60	--	--	6.26	--
	06/17/15	10:20	8.99	--	--	5.87	--
	12/09/15	10:14	6.59	--	--	8.27	--
	01/15/16	16:56	8.85	--	--	6.01	--
	02/16/16	8:35	8.91	--	--	5.95	--
	06/13/16	9:15	10.39	--	--	4.47	--
(14.86)[8]	09/22/16	12:45	9.86	--	--	5.00	--
	01/12/17	11:37	9.72	--	--	5.14	--
	03/27/17	12:52	9.25	--	--	5.61	9.86
	06/16/17	8:42	9.55	--	--	5.31	9.86
	11/07/17	12:46	9.32	--	--	5.54	9.86
	03/26/18	8:25	9.29	--	--	5.57	9.86
	06/19/18	15:27	10.06	--	--	4.80	9.86
	09/27/18	**11:36**	**10.00**	**--**	**--**	**4.86**	**9.86**
	12/12/18	**14:55**	**8.77**	**--**	**--**	**6.09**	**9.86**
MW-202[6]	03/07/07	9:25	8.79	--	--	-3.78	-2.74
(5.01)	06/07/07	14:53	9.52	--	--	-4.51	--
	07/06/07	10:05	10.16	--	--	-5.15	--
	09/26/07	7:48	9.59	--	--	-4.58	--
	11/26/07	15:16	8.43	--	--	-3.42	--
	02/12/08	10:26	8.59	--	--	-3.58	--
(14.58)[8]	05/13/08	10:06	10.20	--	--	4.38	6.83
	09/03/08	--	9.61	--	--	4.97	--
	12/03/08	11:55	8.86	--	--	5.72	--
	02/17/09	10:32	8.15	--	--	6.43	--
	05/12/09	11:58	9.77	--	--	4.81	--
	05/26/09	13:56	10.84	--	--	3.74	--
	08/11/09	9:25	9.96	--	--	4.62	--
	08/28/09	14:29	9.85	--	--	4.73	--
	09/10/09	10:58	9.90	--	--	4.68	--
	04/13/10	11:23	10.17	--	--	4.41	--
	06/16/10	9:58	8.95	--	--	5.63	--
	08/11/10	11:45	10.00	--	--	4.58	--
	08/16/10	14:40	8.46	--	--	6.12	--
	08/16/10	14:43	8.46	--	--	6.12	--
	08/16/10	14:45	9.01	--	--	5.57	--
	08/16/10	14:57	9.02	--	--	5.56	--
	08/16/10	14:48	9.06	--	--	5.52	--
	08/16/10	14:49	9.13	--	--	5.45	--
	08/16/10	14:50	9.14	--	--	5.44	--
	08/16/10	14:51	9.13	--	--	5.45	--
	08/16/10	14:56	9.19	--	--	5.39	--
	08/16/10	14:56	8.75	--	--	5.83	--
	08/16/10	14:57	8.60	--	--	5.98	--
	08/16/10	14:57	8.59	--	--	5.99	--
	08/16/10	14:58	8.53	--	--	6.05	--
	08/18/10	9:12	11.12	--	--	3.46	--
	09/17/10	14:32	18.86	--	--	-4.28	--
	09/17/10	16:18	9.18	--	--	5.40	--
	09/17/10	17:52	8.83	--	--	5.75	--
	09/21/10	11:10	10.55	--	--	4.03	--
	09/22/10	9:30	9.66	--	--	4.92	--
	04/25/11	14:40	9.32	--	--	5.26	--
	09/21/11	10:47	10.90	--	--	3.68	--
	11/21/11	9:56	10.03	--	--	4.55	--
	02/20/12	11:29	9.61	--	--	4.97	--
	04/17/12	11:00	10.30	--	--	4.28	--
	10/10/12	11:50	11.00	--	--	3.58	--
	12/24/12	11:00	7.85	--	--	6.73	--
	01/08/13	15:45	7.59	--	--	6.99	--
	04/30/13	10:18	8.75	--	--	5.83	--
	09/19/13	9:36	10.12	--	--	4.46	--
	11/22/13	10:40	7.00	--	--	7.58	--
	06/23/14	9:45	10.65	--	--	3.93	--
	12/15/14	13:06	7.41	--	--	7.17	--
	06/17/15	10:35	8.84	--	--	5.74	--
	12/09/15	10:00	6.61	--	--	7.97	--
	01/15/16	16:32	9.06	--	--	5.52	--
	02/16/16	8:45	8.37	--	--	6.21	--
	06/13/16	9:05	10.65	--	--	3.93	--
	09/22/16	12:38	9.21	--	--	5.37	--
	01/12/17	10:32	8.32	--	--	6.26	--
	03/27/17	12:56	9.44	--	--	5.14	6.78
	06/16/17	8:47	9.43	--	--	5.15	6.78
	11/07/17	12:55	9.00	--	--	5.58	6.78

Appendix C
Summary of Historical Groundwater Elevation Data

Former Unocal Seattle Marketing Terminal
3001 Elliott Avenue
Seattle, Washington

Well Number[1] (Well Casing Elevation)	Date Measured	Time Measured (hr:min)	Depth to Groundwater[2] (feet)	Depth to LNAPL[3] (feet)	LNAPL Thickness[3] (feet)	Groundwater Elevation[4] (feet)	Top of Well Screen Elevation[5] (feet)
MW-202[8] (continued)	03/26/18	8:15	8.95	--	--	5.63	6.78
	06/19/18	15:33	10.55	--	--	4.03	6.78
	09/27/18	**12:05**	**10.00**	**--**	**--**	**4.58**	**6.78**
	12/12/18	**14:57**	**8.54**	**--**	**--**	**6.04**	**6.78**
MW-203[6]	03/07/07	--	11.86	--	--	-3.88	-2.52
(7.98)	06/07/07	13:54	12.45	--	--	-4.47	--
	07/06/07	11:01	13.07	--	--	-5.09	--
	09/26/07	8:30	12.69	--	--	-4.71	--
	11/26/07	14:33	11.56	--	--	-3.58	--
	02/12/08	10:05	12.29	--	--	-4.31	--
	05/13/08	10:32	13.56	--	--	3.99	7.05
(17.55)[8]	09/03/08	--	13.40	--	--	4.15	--
	12/03/08	12:26	11.76	--	--	5.79	--
	02/17/09	10:47	11.00	--	--	6.55	--
	05/12/09	12:21	12.81	--	--	4.74	--
	05/26/09	13:45	13.51	--	--	4.04	--
	08/28/09	15:14	12.67	--	--	4.88	--
	09/10/09	10:45	12.99	--	--	4.56	--
	04/13/10	11:12	12.92	--	--	4.63	--
	07/21/10	16:30	12.59	--	--	4.96	--
	08/11/10	11:12	11.68	--	--	5.87	--
	08/11/10	11:28	11.89	--	--	5.66	--
	08/11/10	11:29	11.84	--	--	5.71	--
	08/13/10	16:15	13.10	--	--	4.45	--
	08/16/10	7:12	13.96	--	--	3.59	--
	08/16/10	7:13	13.96	--	--	3.59	--
(17.55)[8]	09/02/10	14:45	12.76	--	--	4.79	--
	09/02/10	14:55	12.71	--	--	4.84	--
	09/02/10	15:10	12.31	--	--	5.24	--
	09/02/10	15:33	12.56	--	--	4.99	--
	09/15/10	6:47	14.20	--	--	3.35	--
	09/16/10	15:55	12.02	--	--	5.53	--
	09/16/10	16:00	12.01	--	--	5.54	--
	09/16/10	16:11	11.95	--	--	5.60	--
	09/16/10	16:20	11.90	--	--	5.65	--
	09/21/10	11:28	13.54	--	--	4.01	--
	04/25/11	13:45	12.06	--	--	5.49	--
	09/21/11	14:26	12.68	--	--	4.87	--
	11/21/11	10:21	11.69	--	--	5.86	--
	02/20/12	11:14	12.25	--	--	5.30	--
	04/17/12	13:45	13.39	--	--	4.16	--
	10/10/12	11:20	14.18	--	--	3.37	--
	12/24/12	10:35	9.67	--	--	7.88	--
	01/08/13	15:30	10.34	--	--	7.21	--
	04/30/13	10:28	11.76	--	--	5.79	--
	09/19/13	9:39	12.81	--	--	4.74	--
	11/22/13	10:05	12.48	--	--	5.07	--
	06/23/14	10:04	13.68	--	--	3.87	--
	12/15/14	12:46	10.46	--	--	7.09	--
	06/17/15	10:15	11.94	--	--	5.61	--
	12/09/15	10:19	9.63	--	--	7.92	--
	01/15/16	16:16	11.89	--	--	5.66	--
	02/16/16	8:30	11.48	--	--	6.07	--
	06/13/16	9:20	13.62	--	--	3.93	--
	09/22/16	12:50	12.01	--	--	5.54	--
	01/12/17	11:50	11.40	--	--	6.15	--
	03/27/17	12:50	12.41	--	--	5.14	7.05
	06/16/17	8:38	12.31	--	--	5.24	7.05
	11/07/17	12:40	11.86	--	--	5.69	7.05
	03/26/18	8:30	11.89	--	--	5.66	7.05
	06/19/18	15:10	13.15	--	--	4.40	7.05
	09/27/18	**11:43**	**12.79**	**--**	**--**	**4.76**	**7.05**
	12/12/18	**14:39**	**11.37**	**--**	**--**	**6.18**	**7.05**
MW-204[6]	03/07/07	10:15	18.12	--	--	-3.74	-2.87
(14.38)	06/07/07	14:50	18.52	--	--	-4.14	--
	07/06/07	11:40	19.03	--	--	-4.65	--
	09/26/07	8:37	18.85	--	--	-4.47	--
	11/26/07	14:29	17.78	--	--	-3.40	--
	02/12/08	10:03	18.00	--	--	-3.62	--
(23.93)[8]	05/13/08	10:38	19.43	--	--	4.50	6.68
	09/03/08	--	18.76	--	--	5.17	--
	10/01/08	10:25	18.40	--	--	5.53	--
	10/17/08	9:29	18.72	--	--	5.21	--
	12/03/08	12:31	18.06	--	--	5.87	--
	02/17/09	10:54	17.42	--	--	6.51	--
	05/12/09	12:41	19.81	--	--	4.12	--
	05/26/09	13:41	19.20	--	--	4.73	--
	07/13/09	8:18	19.82	--	--	4.11	--
	08/04/09	--	18.88	--	--	5.05	--
	08/06/09	9:36	18.33	--	--	5.60	--
	08/20/09	9:02	18.21	--	--	5.72	--
	09/10/09	10:47	19.02	--	--	4.91	--
	04/13/10	10:59	18.71	--	--	5.22	--
	06/16/10	10:15	18.06	--	--	5.87	--
	08/11/10	16:16	18.65	--	--	5.28	--

Appendix C
Summary of Historical Groundwater Elevation Data

Former Unocal Seattle Marketing Terminal
3001 Elliott Avenue
Seattle, Washington

Well Number[1] (Well Casing Elevation)	Date Measured	Time Measured (hr:min)	Depth to Groundwater[2] (feet)	Depth to LNAPL[3] (feet)	LNAPL Thickness[3] (feet)	Groundwater Elevation[4] (feet)	Top of Well Screen Elevation[5] (feet)
MW-204 Continued	08/12/10	12:31	18.11	--	--	5.82	--
	08/12/10	12:34	18.12	--	--	5.81	--
	08/12/10	16:13	18.95	--	--	4.98	--
	08/12/10	16:15	18.94	--	--	4.99	--
	08/12/10	16:17	18.90	--	--	5.03	--
	08/13/10	16:25	18.79	--	--	5.14	--
	08/14/10	7:17	19.70	--	--	4.23	--
	08/14/10	7:18	19.70	--	--	4.23	--
	09/02/10	14:33	18.93	--	--	5.00	--
	09/02/10	14:35	18.93	--	--	5.00	--
	09/02/10	14:39	18.93	--	--	5.00	--
	09/02/10	15:37	18.73	--	--	5.20	--
	09/02/10	17:35	18.57	--	--	5.36	--
	09/14/10	11:58	18.91	--	--	5.02	--
	09/14/10	12:37	18.70	--	--	5.23	--
	09/14/10	12:46	18.65	--	--	5.28	--
	09/16/10	7:10	19.67	--	--	4.26	--
	09/16/10	7:12	19.67	--	--	4.26	--
	09/16/10	7:13	19.67	--	--	4.26	--
	09/16/10	7:14	19.68	--	--	4.25	--
	09/16/10	7:15	19.68	--	--	4.25	--
	09/16/10	7:17	19.69	--	--	4.24	--
	09/16/10	7:19	19.69	--	--	4.24	--
	09/16/10	7:21	19.70	--	--	4.23	--
	09/16/10	7:23	19.70	--	--	4.23	--
	09/16/10	7:25	19.71	--	--	4.22	--
	09/16/10	7:27	19.72	--	--	4.21	--
	09/16/10	7:29	19.72	--	--	4.21	--
	09/16/10	7:30	19.75	--	--	4.18	--
	09/17/10	14:30	18.93	--	--	5.00	--
	09/17/10	16:20	18.47	--	--	5.46	--
(23.93)[8]	09/17/10	19:57	18.26	--	--	5.67	--
	09/21/10	11:35	19.18	--	--	4.75	--
	04/25/11	14:15	18.07	--	--	5.86	--
	09/21/11	10:22	19.62	--	--	4.31	--
	11/21/11	10:30	18.71	--	--	5.22	--
	02/20/12	10:53	17.99	--	--	5.94	--
	04/17/12	13:25	19.03	--	--	4.90	--
	10/10/12	11:10	19.87	--	--	4.06	--
	12/24/12	10:16	16.73	--	--	7.20	--
	01/08/13	15:20	16.69	--	--	7.24	--
	04/30/13	10:40	17.97	--	--	5.96	--
	09/19/13	9:18	18.63	--	--	5.30	--
	11/22/13	9:50	18.95	--	--	4.98	--
	06/23/14	10:13	19.51	--	--	4.42	--
	12/15/14	12:37	16.71	--	--	7.22	--
	06/17/15	10:10	18.20	--	--	5.73	--
	12/09/15	10:24	15.49	--	--	8.44	--
	01/15/16	15:44	17.59	--	--	6.34	--
	02/16/16	8:20	17.31	--	--	6.62	--
	06/13/16	9:25	19.42	--	--	4.51	--
	09/22/16	12:53	18.41	--	--	5.52	--
	01/12/17	12:09	17.43	--	--	6.50	--
	03/27/17	12:45	17.99	--	--	5.94	6.58
	06/16/17	8:27	18.39	--	--	5.54	6.58
	11/07/17	12:04	17.98	--	--	5.95	6.58
	03/26/18	8:34	18.00	--	--	5.93	6.58
	06/19/18	15:06	19.00	--	--	4.93	6.58
	09/27/18	**11:51**	**18.99**	**--**	**--**	**4.94**	**6.58**
	12/12/18	**14:17**	**17.46**	**--**	**--**	**6.47**	**6.58**
MW-205[6]	03/07/07	10:30	22.20	Sheen	--	-3.77	0.43
(18.43)	06/07/07	15:45	22.45	--	--	-4.02	--
	07/06/07	11:47	22.93	--	--	-4.50	--
	09/26/07	8:46	22.83	--	--	-4.40	--
	11/26/07	14:23	21.76	--	--	-3.33	--
	02/12/08	10:01	21.78	--	--	-3.35	--
(27.89)[8]	05/13/08	10:43	23.38	--	--	4.51	9.89
	09/03/08	--	22.68	--	--	5.21	--
	12/03/08	12:36	22.01	--	--	5.88	--
	02/17/09	10:59	21.40	--	--	6.49	--
	05/12/09	12:47	22.73	--	--	5.16	--
	05/26/09	13:36	23.06	--	--	4.83	--
	08/04/09	--	22.84	--	--	5.05	--
	08/28/09	15:34	22.71	--	--	5.18	--
	09/10/09	10:46	23.01	--	--	4.88	--
	04/13/10	11:07	22.62	--	--	5.27	--
	08/13/10	8:45	22.31	--	--	5.58	--
	08/16/10	14:18	21.50	--	--	6.39	--
	08/16/10	12:22	21.75	--	--	6.14	--
	09/14/10	11:59	22.66	--	--	5.23	--
	09/16/10	9:24	24.00	--	--	3.89	--
	09/16/10	9:25	24.00	--	--	3.89	--
	09/16/10	9:28	24.00	--	--	3.89	--
	09/16/10	15:05	22.42	--	--	5.47	--
	09/17/10	13:43	23.12	--	--	4.77	--

Appendix C
Summary of Historical Groundwater Elevation Data

Former Unocal Seattle Marketing Terminal
3001 Elliott Avenue
Seattle, Washington

Well Number[1] (Well Casing Elevation)	Date Measured	Time Measured (hr:min)	Depth to Groundwater[2] (feet)	Depth to LNAPL[3] (feet)	LNAPL Thickness[3] (feet)	Groundwater Elevation[4] (feet)	Top of Well Screen Elevation[5] (feet)
MW-205 (continued)	09/17/10	13:48	23.11	--	--	4.78	--
	09/17/10	13:55	23.05	--	--	4.84	--
	09/17/10	14:00	23.05	--	--	4.84	--
	09/17/10	14:04	23.02	--	--	4.87	--
	09/17/10	14:09	23.03	--	--	4.86	--
	09/17/10	14:19	22.96	--	--	4.93	--
	09/17/10	14:26	22.92	--	--	4.97	--
	09/21/10	11:40	23.15	--	--	4.74	--
	09/28/10	8:15	23.05	Sheen[9]	--	4.84	--
	10/11/10	10:48	21.89	--	--	6.00	--
	11/19/10	16:51	22.81	--	--	5.08	--
	03/04/11	10:32	21.98	--	--	5.91	--
	04/25/11	14:20	22.04	--	--	5.85	--
	04/26/11	13:40	--	LNAPL	--	--	--
	05/12/11	7:49	22.68	--	--	5.21	--
	06/03/11	11:33	22.70	--	--	5.19	--
	06/09/11	14:48	22.66	Sheen	--	5.23	--
	09/21/11	10:13	23.60	--	--	4.29	--
	09/30/11	13:50	22.26	--	--	5.63	--
	10/06/11	14:35	22.31	--	--	5.58	--
	10/14/11	6:15	22.61	--	--	5.28	--
	10/21/11	6:30	22.40	--	--	5.49	--
	10/28/11	13:40	22.53	--	--	5.36	--
	11/04/11	13:05	22.42	--	--	5.47	--
	11/10/11	14:35	22.18	--	--	5.71	--
	11/21/11	10:43	22.76	--	--	5.13	--
	02/20/12	11:10	22.32	--	--	5.57	--
	04/17/12	11:45	23.03	--	--	4.86	--
	10/10/12	11:00	23.80	--	--	4.09	--
	12/24/12	10:10	20.73	--	--	7.16	--
	01/08/13	15:00	20.73	--	--	7.16	--
	04/30/13	10:45	21.91	--	--	5.98	--
	09/19/13	9:15	22.33	--	--	5.56	--
	11/22/13	9:40	22.69	--	--	5.20	--
	06/23/14	10:17	23.50	--	--	4.39	--
	12/15/14	12:30	20.78	--	--	7.11	--
(27.89)[8]	06/17/15	10:05	22.22	--	--	5.67	--
	12/09/15	10:27	19.51	--	--	8.38	--
	01/15/16	16:10	21.56	--	--	6.33	--
	02/16/16	8:10	21.28	--	--	6.61	--
	06/13/16	9:30	23.37	--	--	4.52	--
	09/22/16	12:58	22.31	--	--	5.58	--
	01/12/17	12:29	21.34	--	--	6.55	--
	03/27/17	12:40	19.89	--	--	8.00	9.89
	06/16/17	8:22	22.33	--	--	5.56	9.89
	11/07/17	11:59	21.89	--	--	6.00	9.89
	03/26/18	8:36	21.91	--	--	5.98	9.89
	06/19/18	15:02	22.80	--	--	5.09	9.89
	09/27/18	**12:00**	**22.88**	**--**	**--**	**5.01**	**9.89**
	12/12/18	**14:15**	**21.38**	**--**	**--**	**6.51**	**9.89**
MW-206[6]	03/07/07	9:15	9.15	--	--	-3.56	-5.41
(5.59)	06/07/07	13:26	10.24	--	--	-4.65	--
	07/06/07	9:22	10.84	--	--	-5.25	--
	09/26/07	7:35	10.21	--	--	-4.62	--
	11/26/07	15:08	8.47	--	--	-2.88	--
	02/12/08	10:28	8.69	--	--	-3.10	--
(15.15)[8]	05/13/08	9:59	11.80	--	--	3.35	4.15
	09/03/08	--	9.91	--	--	5.24	--
	10/01/08	9:30	9.21	--	--	5.94	--
	12/03/08	11:51	8.78	--	--	6.37	--
	02/17/09	10:29	8.28	--	--	6.87	--
	05/12/09	11:47	11.83	--	--	3.32	--
	05/26/09	13:59	13.30	--	--	1.85	--
	08/11/09	9:38	10.02	--	--	5.13	--
	08/28/09	14:07	9.78	--	--	5.37	--
	09/10/09	11:14	9.81	--	--	5.34	--
	04/13/10	11:27	12.60	--	--	2.55	--
	08/11/10	17:30	13.10	--	--	2.05	--
	08/16/10	11:52	9.70	--	--	5.45	--
	08/16/10	12:26	8.60	--	--	6.55	--
	08/18/10	9:07	13.10	--	--	2.05	--
	09/17/10	16:12	8.69	--	--	6.46	--
	09/17/10	17:55	10.03	--	--	5.12	--
	09/21/10	11:07	12.65	--	--	2.50	--
	09/22/10	9:20	11.09	--	--	4.06	--
	04/25/11	14:50	10.84	--	--	4.31	--
	09/21/11	10:52	11.00	--	--	4.15	--
	11/21/11	9:50	10.20	--	--	4.95	--
	02/20/12	11:32	11.31	--	--	3.84	--
	04/17/12	10:55	12.45	--	--	2.70	--
	10/10/12	12:00	10.65	--	--	4.50	--
	12/24/12	11:10	8.45	--	--	6.70	--
	01/08/13	15:48	8.47	--	--	6.68	--
	04/30/13	10:15	9.64	--	--	5.51	--
	09/19/13	9:42	12.46	--	--	2.69	--

Appendix C
Summary of Historical Groundwater Elevation Data

Former Unocal Seattle Marketing Terminal
3001 Elliott Avenue
Seattle, Washington

Well Number[1] (Well Casing Elevation)	Date Measured	Time Measured (hr:min)	Depth to Groundwater[2] (feet)	Depth to LNAPL[3] (feet)	LNAPL Thickness[3] (feet)	Groundwater Elevation[4] (feet)	Top of Well Screen Elevation[5] (feet)
MW-206[6] (continued)	11/22/13	10:50	9.22	--	--	5.93	--
	06/23/14	9:41	13.04	--	--	2.11	--
	12/15/14	13:13	7.09	--	--	8.06	--
	06/17/15	10:45	10.67	--	--	4.48	--
	12/09/15	9:54	7.86	--	--	7.29	--
	02/16/16	8:50	8.51	--	--	6.64	--
	06/13/16	9:00	12.46	--	--	2.69	--
	09/22/16	12:34	8.90	--	--	6.25	--
	01/12/17	10:24	9.45	--	--	5.70	--
	03/27/17	12:58	11.59	--	--	3.56	4.15
	06/16/17	8:50	11.59	--	--	3.56	4.15
	11/07/17	12:59	10.18	--	--	4.97	4.15
	03/26/18	8:08	10.00	--	--	5.15	4.15
	06/19/18	15:38	12.92	--	--	2.23	4.15
	09/27/18	**12:20**	**11.99**	**--**	**--**	**3.16**	**4.15**
	12/12/18	**15:06**	**9.79**	**--**	**--**	**5.36**	**4.15**
MW-207[6]	03/07/07	10:40	10.64	--	--	-4.82	-3.68
(5.82)	06/07/07	17:10	10.53	--	--	-4.71	--
	07/06/07	9:10	11.20	--	--	-5.38	--
	09/26/07	7:25	10.30	--	--	-4.48	--
	11/26/07	15:03	8.84	--	--	-3.02	--
	02/12/08	10:31	8.90	--	--	-3.08	--
(15.40)[8]	05/13/08	9:53	12.07	--	--	3.33	5.90
	09/03/08	--	10.14	--	--	5.26	--
	10/01/08	8:10	9.51	--	--	5.89	--
	12/03/08	11:46	9.05	--	--	6.35	--
	02/17/09	10:25	8.40	--	--	7.00	--
	05/12/09	11:43	11.70	--	--	3.70	--
	05/26/09	14:03	13.52	--	--	1.88	--
	08/11/09	9:46	10.41	--	--	4.99	--
	08/28/09	13:45	10.35	--	--	5.05	--
	09/10/09	11:25	10.20	--	--	5.20	--
	04/13/10	11:30	12.43	--	--	2.97	--
	06/16/10	9:54	9.70	--	--	5.70	--
	08/13/10	13:30	12.52	--	--	2.88	--
	08/16/10	11:22	10.35	--	--	5.05	--
	08/16/10	11:25	10.32	--	--	5.08	--
	08/16/10	11:28	10.32	--	--	5.08	--
	08/16/10	11:31	10.29	--	--	5.11	--
	08/16/10	11:33	10.26	--	--	5.14	--
	08/16/10	11:37	10.25	--	--	5.15	--
	08/16/10	11:50	9.70	--	--	5.70	--
	09/21/10	11:02	12.55	--	--	2.85	--
	04/25/11	14:55	10.83	--	--	4.57	--
	09/21/11	10:55	11.45	--	--	3.95	--
	11/21/11	9:45	10.08	--	--	5.32	--
(15.40)[8]	02/20/12	11:36	11.25	--	--	4.15	--
	04/17/12	10:45	12.30	--	--	3.10	--
	10/10/12	12:05	11.19	--	--	4.21	--
	12/24/12	11:15	8.73	--	--	6.67	--
	01/08/13	15:52	8.42	--	--	6.98	--
	04/30/13	10:10	9.59	--	--	5.81	--
	09/19/13	9:45	12.23	--	--	3.17	--
	11/22/13	11:00	8.98	--	--	6.42	--
	06/23/14	9:01	12.88	--	--	2.52	--
	12/15/14	13:18	7.45	--	--	7.95	--
	06/17/15	10:55	10.24	--	--	5.16	--
	12/09/15	9:45	7.82	--	--	7.58	--
	01/15/16	15:38	10.63	--	--	4.77	--
	02/16/16	8:55	8.94	--	--	6.46	--
	06/13/16	8:55	12.48	--	--	2.92	--
	09/22/16	12:27	9.36	--	--	6.04	--
	01/12/17	10:11	9.24	--	--	6.16	--
	03/27/17	13:00	11.49	--	--	3.91	5.90
	06/16/17	8:53	10.25	--	--	5.15	5.90
	11/07/17	13:04	10.21	--	--	5.19	5.90
	03/26/18	8:00	10.01	--	--	5.39	5.90
	06/19/18	15:42	13.06	--	--	2.34	5.90
	09/27/18	**12:13**	**11.70**	**--**	**--**	**3.70**	**5.90**
	12/12/18	**15:08**	**9.79**	**--**	**--**	**5.61**	**5.90**
MW-209	02/16/16	9:45	8.26	--	--	7.27	--
(15.53)	06/13/16	9:50	10.31	--	--	5.22	--
	09/22/16	12:12	10.21	--	--	5.32	--
	01/12/17	11:51	8.01	--	--	7.52	--
	03/27/17	12:35	8.46	--	--	7.07	12.53
	06/16/17	9:26	9.59	--	--	5.94	12.53
MW-210	02/16/16	9:50	7.52	--	--	7.61	--
(15.13)	06/13/16	9:45	9.59	--	--	5.54	--
	09/22/16	12:08	9.71	--	--	5.42	--
	01/12/17	11:56	8.31	--	--	6.82	--
	03/27/17	12:30	8.61	--	--	6.52	12.13
	06/16/17	9:24	8.94	--	--	6.19	12.13
MW-211	02/16/16	9:55	7.91	--	--	7.11	--
(15.02)	06/13/16	9:40	9.79	--	--	5.23	--
	09/22/16	12:05	9.77	--	--	5.25	--

Appendix C
Summary of Historical Groundwater Elevation Data

Former Unocal Seattle Marketing Terminal
3001 Elliott Avenue
Seattle, Washington

Well Number[1] (Well Casing Elevation)	Date Measured	Time Measured (hr:min)	Depth to Groundwater[2] (feet)	Depth to LNAPL[3] (feet)	LNAPL Thickness[3] (feet)	Groundwater Elevation[4] (feet)	Top of Well Screen Elevation[5] (feet)
Mw-211 (continued)	01/12/17	11:59	8.18	--	--	6.84	--
	03/27/17	12:25	8.04	--	--	6.98	12.02
	06/16/17	9:20	9.55	--	--	5.47	12.02
MW-70R	02/16/16	9:05	9.14	--	--	6.47	--
(15.61)	06/13/16	8:50	12.41	--	--	3.20	--
	09/22/16	12:30	9.69	--	--	5.92	--
	01/12/17	9:48	9.25	--	--	6.36	--
	03/27/17	13:05	11.41	--	--	4.20	11.61
	06/16/17	8:59	10.42	--	--	5.19	11.61
	11/07/17	13:09	10.32	--	--	5.29	11.61
	03/26/18	7:51	10.09	--	--	5.52	11.61
	06/19/18	15:45	12.64	--	--	2.97	11.61
	09/27/18	**12:16**	**11.66**	**--**	**--**	**3.95**	**11.61**
	12/12/18	**15:15**	**9.88**	**--**	**--**	**5.73**	**11.61**
RW-1	09/13/07	--	9.12	--	--	-4.47	--
(4.65)	11/01/07	10:45	9.60	--	--	-4.95	--
	11/26/07	11:57	8.43	--	--	-3.78	--
	12/07/07	11:55	7.00	--	--	-2.35	--
	12/19/07	9:25	7.75	--	--	-3.10	--
	01/03/08	9:05	7.78	--	--	-3.13	--
	01/30/07	8:34	8.22	--	--	-3.57	--
	02/12/08	9:00	8.55	--	--	-3.90	--
	03/03/08	8:58	8.88	--	--	-4.23	--
	03/17/08	8:52	8.80	--	--	-4.15	--
	04/01/08	8:49	8.79	--	--	-4.14	--
	04/14/08	8:51	8.85	--	--	-4.20	--
	04/28/08	9:01	8.90	--	--	-4.25	--
	05/13/08	9:10	9.25	--	--	-4.60	--
(14.20)[8]	05/27/08	10:25	9.05	--	--	5.15	--
	06/10/08	10:36	8.88	--	--	5.32	--
	06/24/08	9:15	8.98	--	--	5.22	--
	07/07/08	9:26	8.65	--	--	5.55	--
	07/22/08	9:15	8.88	--	--	5.32	--
	08/12/08	9:23	8.86	--	--	5.34	--
	09/03/08	--	9.13	--	--	5.07	--
	10/17/08	8:29	6.33	--	--	7.87	--
	10/29/08	8:17	9.23	--	--	4.97	--
	11/12/08	9:09	7.63	--	--	6.57	--
	12/03/08	11:25	9.82	--	--	4.38	--
	01/06/09	9:15	7.86	--	--	6.34	--
	01/20/09	12:20	8.34	--	--	5.86	--
	02/03/09	9:08	8.89	--	--	5.31	--
	02/17/09	9:06	8.41	--	--	5.79	--
	03/12/09	11:18	8.75	--	--	5.45	--
	03/25/09	9:05	8.62	--	--	5.58	--
	04/08/09	9:14	8.58	--	--	5.62	--
	04/30/09	9:20	8.55	--	--	5.65	--
	05/12/09	9:21	7.98	--	--	6.22	--
	05/26/09	13:19	8.24	--	--	5.96	--
	06/09/09	9:09	8.00	--	--	6.20	--
	06/25/09	9:19	8.08	--	--	6.12	--
	07/07/09	9:13	8.34	--	--	5.86	--
	09/10/09	9:52	8.98	--	--	5.22	--
	09/23/09	9:09	8.98	--	--	5.22	--
	10/08/09	9:24	9.01	--	--	5.19	--
	10/19/09	9:36	8.60	--	--	5.60	--
(14.20)[8]	11/12/09	9:10	7.75	--	--	6.45	--
	03/24/10	9:24	8.39	--	--	5.81	--
	04/13/10	10:15	8.29	--	--	5.91	--
	05/24/10	10:14	8.38	--	--	5.82	--
	09/21/10	9:59	8.00	--	--	6.20	--
	11/19/10	16:25	7.98	--	--	6.22	--
	03/04/11	9:12	7.96	--	--	6.24	--
	04/25/11	9:10	8.25	--	--	5.95	--
	09/21/11	8:30	8.94	--	--	5.26	--
	11/21/11	8:30	8.67	--	--	5.53	--
	02/20/12	9:55	8.41	--	--	5.79	--
	04/17/12	9:22	8.40	--	--	5.80	--
	10/10/12	9:40	9.41	--	--	4.79	--
	12/24/12	UNABLE TO ACCESS					
	01/08/13	13:40	7.54	--	--	6.66	--
	04/30/13	9:20	8.31	--	--	5.89	--
	09/15/13	8:25	6.30	--	--	7.90	--
	11/22/13	8:00	9.04	--	--	5.16	--
	02/25/14	12:00	7.80	--	--	6.40	--
	05/05/14	8:45	7.30	--	--	6.90	--
	06/12/14	Well Decommissioned					
RW-2	04/28/08	9:10	9.98	--	--	-5.51	--
(4.47)	05/13/08	9:08	8.29	--	--	-3.82	--
(14.3)[8]	05/27/08	10:23	9.12	--	--	5.18	--
	06/10/08	10:38	9.00	--	--	5.30	--
	06/24/08	9:19	9.12	--	--	5.18	--
	07/07/08	9:30	8.86	--	--	5.44	--
	07/22/08	9:19	9.03	--	--	5.27	--
	08/12/08	9:27	8.78	--	--	5.52	--

Appendix C
Summary of Historical Groundwater Elevation Data

Former Unocal Seattle Marketing Terminal
3001 Elliott Avenue
Seattle, Washington

Well Number[1] (Well Casing Elevation)	Date Measured	Time Measured (hr:min)	Depth to Groundwater[2] (feet)	Depth to LNAPL[3] (feet)	LNAPL Thickness[3] (feet)	Groundwater Elevation[4] (feet)	Top of Well Screen Elevation[5] (feet)
RW-2 (continued)	09/03/08	--	9.23	--	--	5.07	--
	10/17/08	8:35	6.34	--	--	7.96	--
	10/29/08	8:21	9.37	--	--	4.93	--
	11/12/08	9:13	6.32	--	--	7.98	--
	12/03/08	11:23	8.92	--	--	5.38	--
	01/06/09	9:18	6.84	--	--	7.46	--
	01/20/09	12:23	8.40	--	--	5.90	--
	02/03/09	9:13	9.08	--	--	5.22	--
	02/17/09	9:09	8.55	--	--	5.75	--
	03/12/09	11:21	8.91	--	--	5.39	--
	03/25/09	9:07	8.50	--	--	5.80	--
	04/08/09	9:18	8.68	--	--	5.62	--
	04/30/09	9:24	8.70	--	--	5.60	--
	05/12/09	9:15	8.15	--	--	6.15	--
	05/26/09	13:17	8.31	--	--	5.99	--
	06/09/09	9:13	8.21	--	--	6.09	--
	06/25/09	9:22	8.28	--	--	6.02	--
	07/07/09	9:17	8.49	--	--	5.81	--
	09/10/09	9:50	9.11	--	--	5.19	--
	09/23/09	9:12	9.10	--	--	5.20	--
	10/08/09	9:27	9.24	--	--	5.06	--
	10/19/09	9:40	8.72	--	--	5.58	--
	11/12/09	9:12	7.16	--	--	7.14	--
	03/24/10	9:28	8.42	--	--	5.88	--
	04/13/10	10:12	8.35	--	--	5.95	--
	05/24/10	10:16	8.46	--	--	5.84	--
	08/16/10	7:40	7.87	--	--	6.43	--
	08/16/10	7:42	7.87	--	--	6.43	--
	09/02/10	10:14	9.24	--	--	5.06	--
	09/02/10	10:42	9.25	--	--	5.05	--
	09/02/10	11:45	9.32	--	--	4.98	--
	09/02/10	11:46	9.32	--	--	4.98	--
	09/02/10	11:47	9.32	--	--	4.98	--
	09/02/10	11:48	9.32	--	--	4.98	--
	09/02/10	11:49	9.32	--	--	4.98	--
	09/02/10	11:55	9.33	--	--	4.97	--
	09/02/10	12:00	9.33	--	--	4.97	--
	09/02/10	12:05	9.33	--	--	4.97	--
	09/02/10	12:10	9.33	--	--	4.97	--
	09/02/10	12:15	9.34	--	--	4.96	--
	09/02/10	12:20	9.34	--	--	4.96	--
	09/02/10	12:25	9.34	--	--	4.96	--
	09/02/10	12:42	9.35	--	--	4.95	--
	09/02/10	13:00	9.36	--	--	4.94	--
	09/02/10	13:32	9.36	--	--	4.94	--
	09/03/10	9:12	9.52	--	--	4.78	--
	09/03/10	10:26	9.48	--	--	4.82	--
	09/03/10	10:54	9.55	--	--	4.75	--
	09/03/10	11:08	9.54	--	--	4.76	--
	09/21/10	9:57	8.10	--	--	6.20	--
	11/19/10	16:24	7.62	--	--	6.68	--
	03/04/11	9:16	7.80	--	--	6.50	--
	04/25/11	9:15	8.20	--	--	6.10	--
	09/21/11	8:33	8.39	--	--	5.91	--
	11/21/11	8:36	8.82	--	--	5.48	--
	02/20/12	9:57	8.53	--	--	5.77	--
(14.3)[8]	04/17/12	9:25	8.38	--	--	5.92	--
	10/10/12	9:50	9.26	--	--	5.04	--
	12/24/12	UNABLE TO ACCESS					
	01/08/13	13:42	7.40	--	--	6.90	--
	04/30/13	9:25	8.35	--	--	5.95	--
	09/15/13	8:28	8.32	--	--	5.98	--
	11/22/13	8:05	9.22	--	--	5.08	--
	02/25/14	11:52	7.54	--	--	6.76	
	05/05/14	08:55	7.00	--	--	7.30	
	06/12/14	Well Decommissioned					
RW-3	09/13/07	--	9.45	--	--	-4.75	--
(4.70)	11/01/07	10:52	10.00	--	--	-5.30	--
	11/26/07	12:00	8.60	--	--	-3.90	--
	12/07/07	11:50	7.10	--	--	-2.40	--
	12/19/07	9:20	7.63	--	--	-2.93	--
	01/03/08	9:07	7.49	--	--	-2.79	--
	01/30/08	8:38	8.44	--	--	-3.74	--
	02/12/08	9:30	8.84	--	--	-4.14	--
	03/03/08	9:02	9.11	--	--	-4.41	--
	03/17/08	8:58	8.91	--	--	-4.21	--
	04/01/08	8:43	9.01	--	--	-4.31	--
	04/14/08	8:44	9.16	--	--	-4.46	--
	04/28/08	9:16	9.10	--	--	-4.40	--
(14.3)[8]	05/13/08	9:03	9.53	--	--	4.77	--
	05/27/08	10:20	9.36	--	--	4.94	--
	06/10/08	10:41	9.34	Sheen	--	4.96	--
	06/24/08	9:23	9.34	--	--	4.96	--
	07/07/08	9:34	9.04	--	--	5.26	--
	07/22/08	9:22	9.21	--	--	5.09	--

Appendix C
Summary of Historical Groundwater Elevation Data

Former Unocal Seattle Marketing Terminal
3001 Elliott Avenue
Seattle, Washington

Well Number[1] (Well Casing Elevation)	Date Measured	Time Measured (hr:min)	Depth to Groundwater[2] (feet)	Depth to LNAPL[3] (feet)	LNAPL Thickness[3] (feet)	Groundwater Elevation[4] (feet)	Top of Well Screen Elevation[5] (feet)
RW-3 (continued)	08/12/08	9:30	9.21	--	--	5.09	--
	09/03/08	--	9.51	--	--	4.79	--
	10/17/08	8:39	9.60	--	--	4.70	--
	10/29/08	8:26	9.53	--	--	4.77	--
	11/12/08	9:17	7.10	--	--	7.20	--
	12/03/08	11:19	8.04	--	--	6.26	--
	01/06/09	9:21	7.69	--	--	6.61	--
	01/20/09	12:26	8.58	--	--	5.72	--
	02/03/09	9:17	9.22	Sheen	--	5.08	--
	02/17/09	9:11	8.69	--	--	5.61	--
	03/12/09	11:24	9.08	--	--	5.22	--
	03/25/09	9:09	8.91	8.90	0.01	5.39	--
	04/08/09	9:20	8.83	8.82	0.01	5.47	--
	04/30/09	9:25	8.90	Sheen	--	5.40	--
	05/12/09	9:26	8.45	Sheen	--	5.85	--
	05/26/09	14:38	9.09	--	--	5.21	--
	06/09/09	9:16	8.40	--	--	5.90	--
	06/25/09	9:23	8.35	--	--	5.95	--
	07/07/09	9:21	8.62	--	--	5.68	--
	08/20/09	8:26	8.60	Sheen	--	5.70	--
	08/28/09	16:00	9.76	--	--	4.54	--
	09/10/09	9:47	9.54	--	--	4.76	--
	09/23/09	9:16	9.41	Sheen	--	4.89	--
	10/08/09	9:30	9.46	--	--	4.84	--
	10/19/09	9:45	9.13	--	--	5.17	--
	11/12/09	9:15	8.36	--	--	5.94	--
	03/24/10	9:31	8.60	Sheen	--	5.70	--
	04/13/10	10:09	8.58	--	--	5.72	--
	05/24/10	10:18	8.82	--	--	5.48	--
	08/16/10	7:40	8.40	--	--	5.90	--
	08/16/10	7:50	8.36	--	--	5.94	--
	09/02/10	10:13	9.81	--	--	4.49	--
	09/02/10	10:40	9.79	--	--	4.51	--
	09/21/10	9:55	8.58	--	--	5.72	--
	11/19/10	16:32	7.73	--	--	6.57	--
	03/04/11	9:19	7.92	--	--	6.38	--
	04/25/11	9:30	8.43	--	--	5.87	--
	09/21/11	8:37	8.39	--	--	5.91	--
	11/21/11	8:43	9.00	--	--	5.30	--
	02/20/12	10:00	8.60	--	--	5.70	--
	04/17/12	9:30	8.58	--	--	5.72	--
	10/10/12	9:55	9.67	--	--	4.63	--
	12/24/12			UNABLE TO ACCESS			
	01/08/13	13:43	7.46	--	--	6.84	--
	04/30/13	9:28	8.49	LNAPL on probe	--	5.81	--
	09/15/13	8:31	8.65	--	--	5.65	--
	11/22/13	8:10	9.55	--	--	4.75	--
	02/25/14	11:15	7.67			6.63	
	05/05/14	8:04	7.50			6.80	
	06/12/14			Well Decommissioned			
RW-4				UNABLE TO LOCATE			
RW-5	09/13/07	--	8.6	--	--	5.30	--
(13.9)[8]	11/01/07	11:00	9.4	--	--	4.50	--
	11/26/07	12:05	7.89	--	--	6.01	--
	12/07/07	11:45	6.4	--	--	7.50	--
	12/19/07	9:15	2.2	--	--	11.70	--
(13.9)[8]	05/13/08	9:01	8.72	--	--	5.18	--
	09/03/08	--	8.74	--	--	5.16	--
	12/03/08	11:16	8.45	--	--	5.45	--
	02/17/09	9:14	7.77	Sheen	--	6.13	--
	05/12/09	9:12	7.48	--	--	6.42	--
	05/26/09	13:15	7.94	--	--	5.96	--
	09/10/09	9:44	8.95	--	--	4.95	--
	04/13/10	10:07	7.75	--	--	6.15	--
	09/21/10	9:52	7.82	--	--	6.08	--
	04/25/11			UNABLE TO LOCATE			
	09/21/11	8:48	8.52	--	--	5.38	--
	11/21/11	8:49	8.52	--	--	5.38	--
	02/20/12	10:02	7.85	--	--	6.05	--
	04/17/12	9:35	7.82	--	--	6.08	--
	10/10/12	10:02	9.00	--	--	4.90	
	12/24/12			UNABLE TO ACCESS			
	01/08/13	13:44	6.90	--	--	7.00	--
	04/30/13	9:35	7.75	--	--	6.15	--
	09/15/13	8:34	8.00	--	--	5.90	--
	11/22/13	8:15	9.20	--	--	4.70	--
	02/25/14	11:35	7.43	--	--	6.47	--
	05/05/14	09:27	7.23	--	--	6.67	--
	06/11/14			Well Decommissioned			
RW-6	05/13/08[7]	8:58	8.35	--	--	5.55	--
(13.9)[8]	09/03/08	--	8.14	--	--	5.76	--
	12/03/08	11:13	7.95	--	--	5.95	--
	02/17/09	9:17	7.80	--	--	6.10	--
	05/12/09	9:10	7.57	--	--	6.33	--
	05/26/09	13:12	7.65	--	--	6.25	--

Appendix C
Summary of Historical Groundwater Elevation Data

Former Unocal Seattle Marketing Terminal
3001 Elliott Avenue
Seattle, Washington

Well Number[1] (Well Casing Elevation)	Date Measured	Time Measured (hr:min)	Depth to Groundwater[2] (feet)	Depth to LNAPL[3] (feet)	LNAPL Thickness[3] (feet)	Groundwater Elevation[4] (feet)	Top of Well Screen Elevation[5] (feet)
RW-6 (continued)	09/10/09	9:43	7.90	--	--	6.00	--
	04/13/10	10:05	7.42	--	--	6.48	--
	09/21/10	9:50	6.74	--	--	7.16	--
	04/25/11			UNABLE TO LOCATE			
	09/21/11			UNABLE TO LOCATE			
	11/21/11			UNABLE TO LOCATE			
	02/20/12			UNABLE TO LOCATE			
	04/17/12			UNABLE TO LOCATE			
	10/10/12			UNABLE TO LOCATE			
	12/24/12			UNABLE TO ACCESS			
	01/08/13	13:45	6.87	--	--	7.03	--
	04/30/13	9:40	7.60	--	--	6.30	--
	09/15/13	8:40	7.73	--	--	6.17	--
	11/22/13	8:20	8.02	--	--	5.88	--
	02/25/14	11:25	6.98	--	--	6.92	--
	05/05/14	09:36	7.02	--	--	6.88	--
	06/11/14			Well Decommissioned			
RW-7	09/13/07	--	8.75	--	--	5.45	--
(14.2)[8]	11/01/07	11:20	9.3	--	--	4.90	--
	11/26/07	12:07	8.1	--	--	6.10	--
	12/07/07	11:40	6.45	--	--	7.75	--
	12/07/07	9:10	6.4	--	--	7.80	--
	05/13/08	8:43	8.80	--	--	5.40	--
	09/03/08	--	8.84	--	--	5.36	--
	12/03/08	11:11	8.60	--	--	5.60	--
	02/17/09	9:20	8.95	--	--	5.25	--
	05/12/09	9:08	7.41	--	--	6.79	--
	05/26/09	13:10	7.81	--	--	6.39	--
	08/04/09	--	8.18	--	--	6.02	--
	09/10/09	9:40	8.83	--	--	5.37	--
	04/13/10	10:03	7.78	--	--	6.42	--
	09/21/10	9:47	7.88	--	--	6.32	--
	04/25/11	9:40	7.62	--	--	6.58	--
	09/21/11	8:51	8.49	--	--	5.71	--
	11/21/11	8:56	4.62	--	--	9.58	--
	02/20/12	10:04	7.92	--	--	6.28	--
	04/17/12	9:40	7.87	--	--	6.33	--
	10/10/12	10:07	8.99	--	--	5.21	--
	12/24/12			UNABLE TO ACCESS			
	01/08/13	13:46	6.24	--	--	7.96	--
	04/30/13	9:43	7.92	--	--	6.28	--
	09/15/13	8:40	8.08	--	--	6.12	--
	11/22/13	8:25	8.95	--	--	5.25	--
	02/25/14	11:15	7.40	--	--	6.80	--
	05/05/14	09:46	7.40	--	--	6.80	--
	06/11/14			Well Decommissioned			
RW-8	09/13/07	--	8.75	--	--	5.15	--
(13.9)[8]	11/01/07	11:25	8.9	--	--	5.00	--
	11/26/07	12:09	7.9	--	--	6.00	--
	12/07/07	11:35	6.07	--	--	7.83	--
	12/19/07	9:05	7.18	--	--	6.72	--
	05/13/08	8:39	8.59	--	--	5.31	--
	09/03/08	--	8.53	--	--	5.37	--
	12/03/08	11:09	8.20	--	--	5.70	--
	02/17/09	9:24	7.70	--	--	6.20	--
	05/12/09	9:05	7.41	--	--	6.49	--
(13.9)[8]	05/26/09	13:07	7.59	--	--	6.31	--
	09/10/09	9:38	8.61	--	--	5.29	--
	04/13/10	10:00	7.39	--	--	6.51	--
	09/21/10	9:43	7.58	--	--	6.32	--
	04/25/11	9:45	7.21	--	--	6.69	--
	09/21/11	8:53	8.15	--	--	5.75	--
	11/21/11	9:03	8.24	--	--	5.66	--
	02/20/12	10:05	7.55	--	--	6.35	--
	04/17/12	9:45	7.56	--	--	6.34	--
	10/10/12	10:10	8.61	--	--	5.29	--
	12/24/12			UNABLE TO ACCESS			
	01/08/13	13:54	6.65	--	--	7.25	--
	04/30/13	9:48	7.52	--	--	6.38	--
	09/15/13	8:43	7.71	--	--	6.19	--
	11/22/13	8:30	8.55	--	--	5.35	--
	02/25/14	11:00	7.00	--	--	6.90	--
	05/05/14	10:04	7.11	--	--	6.79	--
	06/11/14			Well Decommissioned			
RW-9	09/13/07	--	8.45	--	--	5.65	--
(14.1)[8]	11/01/07	11:30	7.4	--	--	6.70	--
	11/26/07	12:11	7.44	--	--	6.66	--
	12/07/07	11:32	5.55	--	--	8.55	--
	12/19/07	9:00	6.15	--	--	7.95	--
	05/13/08	8:33	8.61	--	--	5.49	--
	09/03/08	--	7.38	--	--	6.72	--
	12/03/08	11:06	6.95	--	--	7.15	--
	02/17/09	9:27	6.80	--	--	7.30	--
	05/12/09	9:03	7.22	--	--	6.88	--
	05/26/09	13:04	10.06	--	--	4.04	--

Appendix C
Summary of Historical Groundwater Elevation Data

Former Unocal Seattle Marketing Terminal
3001 Elliott Avenue
Seattle, Washington

Well Number[1] (Well Casing Elevation)	Date Measured	Time Measured (hr:min)	Depth to Groundwater[2] (feet)	Depth to LNAPL[3] (feet)	LNAPL Thickness[3] (feet)	Groundwater Elevation[4] (feet)	Top of Well Screen Elevation[5] (feet)
RW-9 (continued)	09/10/09	9:34	7.47	--	--	6.63	--
	04/13/10	9:57	8.28	--	--	5.82	--
	09/21/10	9:40	8.47	--	--	5.63	--
	04/25/11	9:50	7.29	--	--	6.81	--
	09/21/11	8:54	8.20	--	--	5.90	--
	11/21/11	9:08	7.68	--	--	6.42	--
	02/20/12	10:07	7.78	--	--	6.32	--
	04/17/12	9:50	8.02	--	--	6.08	--
	10/10/12	10:15	8.35	--	--	5.75	--
	12/24/12	UNABLE TO ACCESS					
	01/08/13	13:55	5.55	--	--	8.55	--
	04/30/13	9:51	7.02	--	--	7.08	--
	09/15/13	8:49	8.88	--	--	5.22	--
	11/22/13	8:35	7.06	--	--	7.04	--
	02/25/14	10:50	6.28	--	--	7.82	--
	05/05/14	10:18	6.70	--	--	7.40	--
	06/10/14	Well Decommissioned					
RW-10	09/13/07	--	8.9	--	--	5.40	--
(14.3)[8]	11/01/07	11:40	8.7	--	--	5.60	--
	11/26/07	12:12	7.89	--	--	6.41	--
	12/07/07	11:29	6.26	--	--	8.04	--
	12/19/07	8:55	7.25	--	--	7.05	--
	05/13/08	8:31	8.86	--	--	5.44	--
	09/03/08	--	8.41	--	--	5.89	--
	12/03/08	11:03	7.87	--	--	6.43	--
	02/17/09	9:28	7.90	--	--	6.40	--
	05/12/09	9:01	7.47	--	--	6.83	--
	05/26/09	13:02	8.95	--	--	5.35	--
	09/10/09	9:32	8.58	--	--	5.72	--
	04/13/10	9:55	7.80	--	--	6.50	--
	09/21/10	9:38	8.12	--	--	6.18	--
	04/25/11	9:51	6.70	--	--	7.60	--
	09/21/11	8:56	8.76	--	--	5.54	--
	11/21/11	9:14	8.42	--	--	5.88	--
	02/20/12	10:10	7.75	--	--	6.55	--
	04/17/12	9:53	7.90	--	--	6.40	--
	10/10/12	10:18	9.09	--	--	5.21	--
	12/24/12	UNABLE TO ACCESS					
	01/08/13	13:59	6.32	--	--	7.98	
	04/30/13	9:51	7.46	--	--	6.84	--
	09/15/13	8:55	8.66	--	--	5.64	--
	11/22/13	8:40	8.22	--	--	6.08	--
	02/25/14	10:38	7.07	--	--	7.23	--
	05/05/14	10:33	7.22	--	--	7.08	--
	06/10/14	Well Decommissioned					
RW-11	12/07/07	11:14	6.5	--	--	7.60	--
(14.1)[8]	12/19/07	8:50	7.6	--	--	6.50	--
	05/13/08	8:28	8.86	--	--	5.24	--
	09/03/08	--	8.79	--	--	5.31	--
	12/03/08	11:01	8.26	--	--	5.84	--
	02/17/09	9:31	7.80	--	--	6.30	--
	05/12/09	8:59	7.64	--	--	6.46	--
	05/26/09	12:59	8.33	--	--	5.77	--
	09/10/09	9:29	8.61	--	--	5.49	--
	04/13/10	9:53	7.85	--	--	6.25	--
	09/21/10	9:35	7.98	--	--	6.12	--
(14.1)[8]	04/25/11	9:55	7.46	--	--	6.64	--
	09/21/11	8:57	8.77	--	--	5.33	--
	11/21/11	9:20	8.52	--	--	5.58	--
	02/20/12	10:11	7.92	--	--	6.18	--
	04/17/12	10:00	7.90	--	--	6.20	--
	10/10/12	10:21	9.12	--	--	4.98	--
	12/24/12	UNABLE TO ACCESS					
	01/08/13	14:00	6.74	--	--	7.36	--
	04/30/13	9:54	7.73	--	--	6.37	--
	09/15/13	8:58	8.50	--	--	5.60	--
	11/22/13	8:45	8.90	--	--	5.20	--
	02/25/14	10:30	7.40	--	--	6.70	--
	05/05/14	10:45	7.51	--	--	6.59	--
	06/10/14	Well Decommissioned					
RW-12	12/07/07	11:08	6.78	--	--	7.22	--
(14.0)[8]	12/19/07	8:40	7.88	--	--	6.12	--
	05/13/08	8:25	8.97	--	--	5.03	--
	09/03/08	--	9.02	--	--	4.98	--
	12/03/08	10:48	8.56	--	--	5.44	--
	02/17/09	9:33	7.85	--	--	6.15	--
	05/12/09	8:56	7.76	--	--	6.24	--
	05/26/09	12:55	8.37	--	--	5.63	--
	09/10/09	9:27	9.22	--	--	4.78	--
	04/13/10	9:50	7.93	--	--	6.07	--
	09/21/10	UNABLE TO LOCATE					
	04/25/11	UNABLE TO LOCATE					
	09/21/11	UNABLE TO LOCATE					
	11/21/11	UNABLE TO LOCATE					
	02/20/12	UNABLE TO LOCATE					

Appendix C
Summary of Historical Groundwater Elevation Data

Former Unocal Seattle Marketing Terminal
3001 Elliott Avenue
Seattle, Washington

Well Number[1] (Well Casing Elevation)	Date Measured	Time Measured (hr:min)	Depth to Groundwater[2] (feet)	Depth to LNAPL[3] (feet)	LNAPL Thickness[3] (feet)	Groundwater Elevation[4] (feet)	Top of Well Screen Elevation[5] (feet)
RW-12 (continued)	04/17/12	UNABLE TO LOCATE					
	10/10/12	UNABLE TO LOCATE					
	12/24/12	UNABLE TO ACCESS					
	01/08/13	UNABLE TO LOCATE					
	04/30/13	UNABLE TO LOCATE					
	09/15/13	UNABLE TO LOCATE					
	11/22/13	UNABLE TO LOCATE					
	06/09/14	UNABLE TO LOCATE DURING FINAL DECOMMISSIONING ACTIVITIES					
RW-13	12/07/07	11:05	6.83	--	--	7.27	--
(14.1)[8]	12/19/07	8:35	7.5	--	--	6.60	--
	05/13/08	8:22	9.01	--	--	5.09	--
	09/03/08	--	9.05	--	--	5.05	--
	12/03/08	10:45	8.64	--	--	5.46	--
	02/17/09	9:36	8.22	--	--	5.88	--
	05/12/09	8:53	7.85	--	--	6.25	--
	05/26/09	12:53	8.48	--	--	5.62	--
	09/10/09	9:22	8.89	--	--	5.21	--
	04/13/10	9:47	8.01	--	--	6.09	--
	09/21/10	9:30	8.15	--	--	5.95	--
	04/25/11	10:00	7.51	--	--	6.59	--
	09/21/11	9:00	8.99	--	--	5.11	--
	11/21/11	9:27	8.56	--	--	5.54	--
RW-13 Continued	02/20/12	10:13	8.24	--	--	5.86	--
	04/17/12	10:04	8.21	--	--	5.89	--
	10/10/12	10:25	9.47	--	--	4.63	--
	12/24/12	UNABLE TO ACCESS					
	01/08/13	14:02	7.07	--	--	7.03	--
	04/30/13	9:56	7.96	--	--	6.14	--
	09/15/13	9:01	8.68	--	--	5.42	--
	11/22/13	8:50	9.25	--	--	4.85	--
	02/25/14	10:00	8.16	--	--	5.94	--
	05/05/14	11:00	7.65	--	--	6.45	--
	06/10/14	Well Decommissioned					
RW-14		UNABLE TO LOCATE					
RW-15	09/13/07	--	8.83	--	--	5.07	--
(13.9)[8]	11/01/07	11:50	9	--	--	4.90	--
	11/26/07	12:18	8.4	--	--	5.50	--
	12/07/07	10:56	6.55	--	--	7.35	--
	12/19/07	8:25	6.31	--	--	7.59	--
	05/13/08	8:17	8.97	--	--	4.93	--
	09/03/08	--	8.52	--	--	5.38	--
	12/03/08	10:40	8.31	--	--	5.59	--
	02/17/09	9:44	8.24	--	--	5.66	--
	05/12/09	8:50	8.19	--	--	5.71	--
	05/26/09	12:48	8.25	--	--	5.65	--
	09/10/09	9:20	5.52	--	--	8.38	--
	04/13/10	9:45	7.88	--	--	6.02	--
	09/21/10	UNABLE TO LOCATE					
	04/25/11	UNABLE TO LOCATE					
	09/21/11	UNABLE TO LOCATE					
	11/21/11	UNABLE TO LOCATE					
	2/20/12	UNABLE TO LOCATE					
	04/17/12	UNABLE TO LOCATE					
	10/10/12	UNABLE TO LOCATE					
	12/24/12	UNABLE TO LOCATE					
	01/08/13	UNABLE TO LOCATE					
(13.9)[8]	04/30/13	UNABLE TO LOCATE					
	09/15/13	UNABLE TO LOCATE					
	11/22/13	UNABLE TO LOCATE					
	06/09/14	UNABLE TO LOCATE DURING FINAL DECOMMISSIONING ACTIVITIES					
RW-21	09/13/07	--	9.85	Sheen	--	5.45	--
(5.87)	11/01/07	10:35	9.90	7.90	2.00	7.00	--
	11/26/07	12:23	--	Sheen	--	--	--
	12/07/07	9:40	6.90	Sheen	--	8.40	--
	12/19/07	--	7.79	--	--	7.51	--
	01/03/07	9:25	7.88	--	--	7.42	--
	01/30/07	8:44	8.67	--	--	6.63	--
	02/12/08	9:11	8.80	--	--	6.50	--
	03/03/08	9:10	9.25	--	--	6.05	--
	03/17/08	9:07	9.21	--	--	6.09	--
	04/01/08	9:05	9.09	--	--	6.21	--
	04/14/08	8:55	9.32	--	--	5.98	--
	04/28/08	9:24	9.33	--	--	5.97	--
	05/13/08	UNABLE TO ACCESS					
(15.3)[8]	05/27/08	11:20	9.45	--	--	5.85	--
	06/10/08	10:45	9.21	--	--	6.09	--
	06/24/08	9:29	9.49	--	--	5.81	--
	07/07/08	9:39	9.19	--	--	6.11	--
	07/22/08	9:00	9.38	--	--	5.92	--
	08/12/08	9:36	9.35	--	--	5.95	--
	09/03/08	--	9.36	Sheen	--	5.94	--
	10/08/08	8:30	9.72	Sheen	--	5.58	--
	10/17/08	8:41	9.50	--	--	5.80	--
	10/29/08	8:31	9.58	--	--	5.72	--
	11/12/08	9:27	7.83	--	--	7.47	--

Appendix C
Summary of Historical Groundwater Elevation Data

Former Unocal Seattle Marketing Terminal
3001 Elliott Avenue
Seattle, Washington

Well Number[1] (Well Casing Elevation)	Date Measured	Time Measured (hr:min)	Depth to Groundwater[2] (feet)	Depth to LNAPL[3] (feet)	LNAPL Thickness[3] (feet)	Groundwater Elevation[4] (feet)	Top of Well Screen Elevation[5] (feet)
RW-21 Continued	12/03/08	10:10	9.22	9.20	0.02	6.10	--
	01/06/09	9:26	7.89	Sheen	--	7.41	--
	01/20/09	12:29	8.56	8.55	0.01	6.75	--
	02/03/09	9:24	9.20	Sheen	--	6.10	--
	02/17/09	9:50	9.05	Sheen	--	6.25	--
	03/12/09	11:31	9.16	Sheen	--	6.14	--
	03/25/09	9:24	9.01	Sheen	--	6.29	--
	04/08/09	9:57	8.91	8.90	0.01	6.40	--
	04/30/09	9:49	8.88	Sheen	--	6.42	--
	05/12/09	9:43	8.45	8.44	0.01	6.86	--
	05/26/09	14:48	8.82	--	--	6.48	--
	06/09/09	9:26	8.64	--	--	6.66	--
	06/25/09	9:29	8.68	--	--	6.62	--
	07/07/09	9:26	8.95	Sheen	--	6.35	--
	07/13/09	8:05	9.45	--	--	5.85	--
	08/05/09	6:45	8.96	Sheen	--	6.34	--
	08/06/09	9:18	9.06	--	--	6.24	--
	08/20/09	8:34	9.15	--	--	6.15	--
	09/10/09	9:57	9.28	--	--	6.02	--
	09/23/09	9:21	9.25	Sheen	--	6.05	--
	10/08/09	9:16	9.31	Sheen	--	5.99	--
	10/19/09	9:50	9.23	Sheen	--	6.07	--
	11/12/09	9:19	7.82	Sheen	--	7.48	--
	03/24/10	9:37	8.62	Sheen	--	6.68	--
	04/13/10	10:19	8.61	Sheen	--	6.69	--
	05/26/10	9:32	8.73	Sheen	--	6.57	--
	09/21/10	10:05	8.46	Sheen	--	6.84	--
	11/19/10	16:01	9.21	Sheen	--	6.09	--
	03/04/11	9:31	8.18	Sheen	--	7.12	--
	04/25/11	8:50	8.50	8.49	0.01	6.81	--
	09/21/11	9:18	9.20	LNAPL on probe	--	6.10	--
	11/21/11	9:34	9.03	--	--	6.27	--
	02/20/12	10:23	8.76	LNAPL on probe	--	6.54	--
	04/17/12	10:10	8.65	--	--	6.65	--
	10/10/12	9:20	9.70	LNAPL on probe	--	5.60	--
	12/24/12	UNABLE TO ACCESS					
	01/08/13	UNABLE TO ACCESS					
	04/30/13	10:00	8.74	Tar on probe	--	6.56	
	09/19/13	10:10	9.43	Tar on probe	--	5.87	--
	11/22/13	8:55	10.23	--	--	5.07	--
	06/12/14	Well Decommissioned					

Notes:

[1]Well casing elevations listed in feet above mean sea level. Approximate monitoring well locations are shown in Figure 2.

"--" = not measured or not obtainable

[2]Below top of casing.

[3]Light non-aqueous phase liquid

[4]Elevation referenced to city of Seattle datum.

[5]Top of well screen elevation data from historic records.

[6]TOC elevations for wells MW-200 to 207, MW-27R, and MW-61A-R were surveyed using an arbitrary datum point, 9.65 feet lower than the datum from the upper well survey.

[7]Depth to water was measured with pump in well.

[8]Survey by OTAK 5/27/08.

[9] Groundwater elevation recorded prior to pump testing at the site. Sheen observed on extracted groundwater during hydraulic conductivity testing on well MW-205.

[10] LNAPL indicated in field notes, measurement not taken

[11] TOC elevations for wells PZ-61A-R, PZ-203, and PZ-204 unknown.

NR = Not reported.

UK = TOC elevations unknown.

Bolded data are for the current reporting period.

Appendix C
Historical Summary of Groundwater Analytical Data
Total Petroleum Hydrocarbons

Former Unocal Seattle Marketing Terminal
3001 Elliott Avenue
Seattle, Washington

Monitoring Well[1]	Date Sampled	LNAPL[2]	BTEX (EPA Method 8020 or 8021B) (µg/L)				TPH (EPA Method 418.1) (mg/L)	NWTPH-Gx (mg/L)	NWTPH-D Extended[3] (mg/L)	
			B	T	E	X		Gasoline C_7 - C_{12}	Diesel C_{12} - C_{24}	Heavy Oil >C_{24}
Upper Yard RALs		*No visible sheen*	*40*	*14,300*	*1,400*	*4,400*	--	*1*	*10*	*15*
Upper Yard										
MW-37	06/01/90	--	<0.5	<0.5	<0.5	<0.5	<1	--	--	--
	10/16/90	--	<0.5	<0.5	<0.5	<0.5	<1	--	--	--
	01/17/91	--	<0.5	<0.5	<0.5	<0.5	--	<1	<1	--
	04/16/91	--	<0.5	<0.5	<0.5	<0.5	--	<1	<1	--
	09/15/95	ND	<0.50	<0.50	<0.50	<1.0	--	<1.0	<1.0	<0.75
	12/14/95	ND	<0.50	<0.50	<0.50	<1.0	--	<0.05	<0.27	<0.75
MW-38	06/01/90	--	<0.5	<0.5	<0.5	<0.5	<1	--	--	--
	10/16/90	--	<0.5	<0.5	<0.5	<0.5	<1	--	--	--
	01/17/91	--	<0.5	<0.5	<0.5	<0.5	--	<1	<1	--
	04/16/91	--	<0.5	<0.5	<0.5	<0.5	--	<1	<1	--
MW-39	01/17/91	--	<0.5	0.5	0.6	2.2	--	<1	<1	--
	04/16/91	--	<0.5	<0.5	<0.5	<0.5	--	<1	<1	--
MW-40	06/01/90	--	<0.5	<0.5	<0.5	<0.5	<1	--	--	--
	10/16/90	--	<0.5	1.0	0.6	<0.5	<1	--	--	--
	01/17/91	--	<0.5	<0.5	<0.5	<0.5	--	<1	<1	--
	04/16/91	--	<0.5	<0.5	<0.5	<0.5	--	<1	<1	--
MW-61A	03/13/98	ND	<0.500	<0.500	<0.500	<1.00	--	0.956	2.14	<0.750
	06/18/98	ND	<2.50	<2.50	<2.50	<5.00	--	1.01	3.49	<0.750
	09/03/98	ND	<0.500	<0.500	<0.500	<0.500	--	0.396	1.85	<0.750
	12/15/98	Sheen	<2.50	<2.50	2.82	12.8	--	10.2	146/73.0	<30.8/<15.8
Duplicate	12/15/98	Sheen	<2.50	<2.50	<2.50	5.81	--	2.93	32.3/14.6	<3.75/<0.750
	03/23/99	Sheen	<0.500	<0.500	2.56	13.8	--	4.34	39.7/32.7	<8.25/<3.75
Duplicate	03/23/99	Sheen	<2.50	<2.50	<2.50	<5.00	--	1.56	52.8/42.1	<8.25/<8.25
	07/01/99	ND	<0.500	<0.500	<0.900	<3.70	--	1.38[4]	4.43/2.08	<0.750/<0.750
Duplicate	07/01/99	ND	<1.00	<1.00	<1.40	<5.60	--	1.30[4]	4.45/3.08	<0.750/<0.750
	09/29/99	Sheen	<0.500	<5.00	<5.00	<1.00	--	2.16[5]	7.57/4.04	<0.750/<0.750
Duplicate	09/29/99	Sheen	<0.500	<0.500	<5.00	<10.0	--	2.80[5]	19.7/21.1	0.758/<1.57
	12/16/99	Sheen	<0.500	<5.00	<3.50	<17.00	--	7.61	33.4/30.1	<15.8/<8.25
Duplicate	01/04/00[6]	Sheen	<0.500	<5.00	<5.00	<4.15	--	1.40	12.1/8.29	<1.34/<1.34
	03/21/00	ND	<0.500	<0.500	<0.550	<1.85	--	0.831	13.1[7]	<0.750[7]
Duplicate	03/21/00	ND	<0.500	<0.500	<0.720	<3.40	--	1.05	6.36[7]	<0.750[7]
	06/22/00[8]	ND	0.779	<0.500	<0.500	2.32	--	1.00	4.23/3.38	<0.750/<0.750
Duplicate	06/22/00	ND	0.880	<0.500	0.591	2.46	--	0.836	5.99/4.13	<0.750/<0.750
	09/14/00	ND	<0.500	<0.500	<0.704	<3.11	--	1.36	2.49/1.50	<0.750/<0.750
Duplicate	09/14/00	ND	<0.500	<0.500	0.986	<3.21	--	1.00	5.00/3.13	<0.750/<0.750
	12/21/00	ND	<0.500	<1.24	<0.500	<3.87	--	1.18	4.62/2.48	<0.750/<0.750
Duplicate	12/21/00[9]	ND	<0.500	<0.500	<0.500	<1.00	--	0.721	5.64/3.81	<0.750/<0.750
	03/14/01	ND	<0.565	<0.500	<1.38	<4.31	--	0.962	2.55/1.28	<0.750/<0.750
Duplicate	03/14/01	ND	<0.500	<0.500	<0.500	<1.12	--	0.498	1.82/0.668	<0.750/<0.750
	06/21/01	ND	<0.500	0.855	<0.500	1.14	--	0.773	2.45/1.55	<0.750/<0.750
Duplicate	06/21/01	ND	<0.500	<0.500	<0.500	2.61	--	0.676	1.80/1.04	<0.750/<0.750
	09/25/01	Sheen	<0.500	<0.500	<0.500	2.62	--	0.839	14.3/11.3	<8.25/<0.750
Duplicate	09/25/01	Sheen	<0.500	0.923	0.592	4.22	--	0.918	5.12/4.47	<0.750/<0.750
	12/19/01	Sheen	0.825	<2.00	<1.00	<1.50	--	2.54	19.4/14.8[10]	<3.00/<3.00[10]
	03/26/02	Sheen	<0.500	<0.500	<0.500	1.24	--	0.414	1.38/0.615	<0.750/<0.750
Duplicate	03/26/02	Sheen	<0.500	<0.500	<0.500	1.85	--	0.592	1.99/0.847	<0.750/<0.750
Duplicate	06/19/03	Sheen	<0.500	<0.500	<0.500	<1.00	--	0.360	1.43	<0.750
	09/18/03	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.728	<0.750
	12/03/03	Sheen	<0.500	<0.500	<0.500	1.22	--	0.604	2.46	<0.750
Duplicate	12/03/03	Sheen	<0.500	<0.500	<0.500	1.30	--	0.701	2.35	<0.750
MW-61A-R	03/02/06	Sheen/LNAPL	--	--	--	<1.00	--	--	--	--
	06/06/06	Sheen	<2.50	<2.50	7.64	7.48	--	3.92	20.6	<3.75
	09/15/06	Sheen	396	79.7	26.4	243	--	17.2	200	<142
	03/07/07	ND	<0.5	<0.5	0.5	<1.5	--	0.18	0.29	<0.095
	06/08/07	ND	<0.500	<2.0[16]	1.500	1.7	--	0.400	0.600	<0.095
	09/26/07	ND	<0.5	<0.5	1.4	<1.5	--	0.430	0.770	0.120
	11/28/07	ND	<0.5	<0.5	0.9	<1.5	--	0.410	0.340	<0.100
Duplicate	11/28/07	ND	<0.5	<0.5	0.9	<1.5	--	0.400	0.670	0.370
	02/13/08	ND	<0.500	<0.500	0.980	1.14	--	0.455	0.308	<0.485
	05/14/08	ND	<0.500	<0.500	1.24	1.43	--	0.363	0.406	<0.472
	09/04/08	Sheen	<0.500	1.16	3.58	1.13	--	0.933	0.380	<0.490
	12/03/08	LNAPL	--	--	--	--	--	--	--	--
	02/18/09	Sheen	<0.500	<0.500	<0.500	1.32	--	0.490	0.830	<0.481
	09/10/09	LNAPL	--	--	--	--	--	--	--	--
	04/14/10	LNAPL	--	--	--	--	--	--	--	--
	09/23/10	ND	<0.50	<0.50	0.68	<2.0	--	0.76	1.5	<0.26
	04/25/11	LNAPL	--	--	--	--	--	--	--	--
	09/21/11	LNAPL	--	--	--	--	--	--	--	--
	04/18/12	LNAPL	--	--	--	--	--	--	--	--
	10/10/12	LNAPL	--	--	--	--	--	--	--	--
	04/30/13	LNAPL	--	--	--	--	--	--	--	--
	09/19/13	LNAPL	--	--	--	--	--	--	--	--
	06/24/14	LNAPL	--	--	--	--	--	--	--	--
	12/16/15	LNAPL	--	--	--	--	--	--	--	--
	06/17/15	LNAPL	--	--	--	--	--	--	--	--
	12/09/15	LNAPL	--	--	--	--	--	--	--	--
	06/15/16	ND	<0.5	<0.5	<0.5	<1.5	--	0.220	0.120	<0.067
	01/13/17	ND	<0.5	<0.5	0.5	2	--	1.000	0.490	<0.074
	06/16/17	LNAPL	--	--	--	--	--	--	--	--
	11/08/17	LNAPL	--	--	--	--	--	--	--	--
	06/20/18	LNAPL	--	--	--	--	--	--	--	--
	09/27/18	**LNAPL**	--	--	--	--	--	--	--	--
	12/14/18	**ND**	**<0.5**	**0.8**	**<0.5**	**<1.5**	--	**0.680**	**0.190**	**<0.100**
MW-62A	03/13/98	ND	<0.500	<0.500	<0.500	<1.00	--	0.288	<.0250	<.0750
	06/18/98	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	09/03/98	ND	<1.00	<0.500	0.901	2.79	--	0.134	<0.250	<0.750
	12/14/98	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	03/23/99	ND	10.8	<5.00	<5.00	<10.0	--	<0.500	0.371/<0.250	<0.750/<0.750
	07/01/99	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.311/<0.250	<0.750/<0.750
	09/29/99	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.709/<0.250	<0.750/<0.750
	12/16/99	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	03/21/00	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	06/22/00	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	09/14/00	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.376/<0.250	<0.750/<0.750
	12/21/00[9]	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	03/14/01	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	06/21/01	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	09/25/01	ND	<0.500	<0.500	<0.500	1.57	--	<0.0500	0.373/<0.250	<0.750/<0.250
	12/18/01	ND	<0.500	<2.00	<1.00	<1.50	--	<0.100	<0.250[10]	<0.750[10]
	03/26/02	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	06/19/02	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.320/<0.250	<0.750/<0.750
	12/13/02	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.863	<0.750
	12/03/03	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
MW-63A	03/13/98	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	06/18/98	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	09/03/98	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	12/14/98	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	03/23/99	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750

Appendix C
Historical Summary of Groundwater Analytical Data
Total Petroleum Hydrocarbons

Former Unocal Seattle Marketing Terminal
3001 Elliott Avenue
Seattle, Washington

Monitoring Well[1]	Date Sampled	LNAPL[2]	BTEX (EPA Method 8020 or 8021B) (µg/L)				TPH (EPA Method 418.1) (mg/L)	NWTPH-Gx (mg/L)	NWTPH-D Extended[3] (mg/L)	
			B	T	E	X		Gasoline C_7 - C_{12}	Diesel C_{12} - C_{24}	Heavy Oil >C_{24}
MW-63A (continued)	07/01/99	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.389/<0.250	<0.750/<0.750
	09/29/99	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.305/<0.539	<0.750/<1.62
	12/16/99	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.380/<0.250	<0.750/<0.750
	03/21/00	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	06/22/00	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.366/<0.462	<0.750/<1.39
	09/14/00	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.273/<0.250	<0.750/<0.750
	12/21/00	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.575/<0.250	<0.750/<0.750
	03/14/01	ND	<0.500	0.922	<0.500	1.92	--	<0.0500	<0.250	<0.750
	06/21/01	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	09/25/01	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	12/18/01	ND	<0.500	<2.00	<1.00	<1.50	--	<0.100	0.468/<0.250[10]	<0.750/<0.750[10]
	03/26/02	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.379/<0.250	<0.750/<0.750
	06/19/02	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.299/<0.250	<0.750/<0.750
	12/13/02	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.514	<0.750
	12/03/03	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
MW-64	06/18/98	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	09/03/98	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	12/14/98	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.325/<0.250	<0.750/<0.750
	03/23/99	ND	<0.500	<0.500	<0.500	2.42	--	<0.0500	0.354/<0.250	<0.750/<0.750
	07/01/99	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.319/<0.250	<0.750/<0.750
	09/29/99	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.448/<0.564	<0.750/<0.169
	01/04/00[6]	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250/<0.250	<0.750/<0.750
	03/21/00	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.255[7]	<0.750
	06/22/00[8]	ND	<0.500	1.39	0.654	5.39	--	0.0908	0.315/<0.487	<0.750/<1.46
	07/25/00	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	09/14/00	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	12/21/00	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.298/<0.250	<0.750/<0.750
	03/14/01	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	06/21/01	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	09/25/01	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.263/<0.250[11]	<0.750/<0.750[11]
	12/18/01	ND	<0.500	<2.00	<1.00	<1.50	--	<0.100	0.372/<0.250[10]	<0.750/<0.750[10]
	03/26/02	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	06/19/02	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.499/<0.250	<0.750/<0.750
	12/13/02	ND	<0.500	<0.500	<0.500	<1.00	--	0.0563	0.38	<0.750
	12/03/03	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.379	<0.750
Elliott Avenue RALs		*No visible sheen*	*40*	*14,300*	*1,400*	*4,400*	--	*1*	*10*	*15*
Elliott Avenue										
MW-30[12]	01/31/89	--	4.0	0.6	<0.5	<0.5	6	<5	--	--
	04/27/89	--	5.0	<0.5	0.6	<0.5	0.37	<5	--	--
	07/25/89	--	8.0	4.9	17.0	11.1	13	<5	--	--
	10/26/89	LNAPL	--	--	--	--	--	--	--	--
	01/16/90	LNAPL	--	--	--	--	--	--	--	--
	04/16/90	LNAPL	--	--	--	--	--	--	--	--
	07/25/90	LNAPL	--	--	--	--	--	--	--	--
	09/20/90		--	--	--	--	1	--	--	--
	10/16/90	--	<5.0	<5.0	<5.0	<5.0	10	--	--	--
	01/17/91	--	<0.5	<0.5	0.6	3.5	24	2	13	--
	04/16/91	--	<0.5	<0.5	<0.5	<0.5	--	<1	<1	--
	09/17/91	LNAPL	--	--	--	--	--	--	--	--
	12/10/91	LNAPL	--	--	--	--	--	--	--	--
	01/29/92	--	<0.5	<0.5	<0.5	<0.5	--	--	--	--
	03/13/98	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.341	<0.750
Duplicate	03/13/98	ND	<0.500	<0.500	<0.500	<1.00	--	0.0522	<0.250	<0.750
	06/29/98	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
Duplicate	06/29/98	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	09/04/98	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.575	<0.750
Duplicate	09/04/98	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.416	<0.750
	12/15/98	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.900/0.310	<0.750/<0.750
	03/24/99	Sheen	<0.500	<0.500	<0.500	<1.00	--	<0.0500	1.47/0.580	1.38/<0.750
	07/01/99	Sheen	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.526/<0.250	<0.750/<0.750
	09/29/99	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	1.12/<0.454	1.19/<1.36
	12/15/99	Sheen	<0.500	<0.500	<0.500	<1.00	--	0.0657	2.72/0.679	<1.43/<1.43
	03/22/00	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	1.68/0.753	1.35/<0.750
	06/21/00	Sheen	<0.500	<0.500	<0.500	<1.00	--	0.0545	0.345/<0.250	<0.750/<0.750
	09/14/00	--	--	--	--	--	--	--	--	--
	12/22/00	ND	<0.500	<0.500	<0.500	<1.00	--	0.0766	1.17/0.353	<0.750/<0.750
	03/15/01	ND	<0.500	<0.500	<0.500	<1.00	--	0.248	4.85/3.27	6.28/3.25
	06/22/01	Sheen	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.448/<0.250	<0.750/<0.750
	09/25/01	Sheen	<0.500	<0.500	<0.500	1.12	--	<0.0500	2.73/1.60	2.20/1.22
	12/18/01	Sheen	<0.500	<2.00	<1.00	<1.50	--	<0.100	1.09/<0.250[10]	<0.750/<0.750[10]
Duplicate	12/18/01	Sheen	<0.500	<2.00	<1.00	<1.50	--	0.107	1.05/<0.250[10]	<0.750/<0.750[10]
	03/27/02	Sheen	<0.500	<0.500	<0.500	<1.00	--	0.0793	1.62/0.536	0.936/<0.750
	06/20/02	Sheen	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.527/<0.250	<0.750/<0.750
	09/19/02	Sheen	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	12/13/02	Sheen	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.419	<0.750
	06/19/03	Sheen	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	09/18/03	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	12/03/03	Sheen	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	03/09/04	Sheen	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	06/03/04	Sheen	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.544	<0.750
Duplicate	06/03/04	Sheen	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.913	0.765
	09/03/04	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.451	<0.750
Duplicate	09/03/04	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	1.33	0.765
	12/06/04	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.381	<0.750
Duplicate	12/06/04	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.268	<0.750
	03/04/05	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.747	0.898
Duplicate	03/04/05	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.835	0.976
	06/03/05	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.278	<0.750
Duplicate	06/03/05	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	09/01/05	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.416	<0.750
Duplicate	09/01/05	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.366	<0.750
	12/01/05	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.359	<0.708
Duplicate	12/01/05	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.438	<0.714
	03/02/06	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.236	<0.708
Duplicate	03/02/06	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.236	<0.708
	06/06/06	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
Duplicate	06/06/06	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	09/15/06	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.708
Duplicate	09/15/06	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.708
	03/07/07	Sheen	<0.5	<0.5	<0.5	<1.5	--	<0.048	1.6	0.53
	06/08/07	ND	<0.500	<0.500	<0.500	<1.50	--	<0.050	0.800	<0.095
	09/26/07	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	0.300	<0.095
	11/28/07	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	0.340	0.120
	02/13/08	ND	<0.500	<0.500	<0.500	<1.00	--	<0.050	<0.278	<0.556
	05/14/08	ND	<0.500	<0.500	<0.500	<1.00	--	<0.050	<0.236	<0.472
	09/04/08	ND	<0.500	<0.500	<0.500	<1.00	--	<0.050	<0.243	<0.485
	12/05/08	ND	<0.500	<0.500	<0.500	<1.00	--	<0.050	<0.245	<0.490
	02/18/09	ND	<0.500	<0.500	<0.500	<1.00	--	<0.050	<0.248	<0.495
	05/12/09	LNAPL	--	--	--	--	--	--	--	--
	09/10/09	Sheen	<0.500	<0.500	<0.500	<1.00	--	<0.050	<0.250	<0.500
	04/14/10	Sheen	<0.50	<0.50	<0.50	<2.0	--	<0.050	<0.13	<0.27

Appendix C
Historical Summary of Groundwater Analytical Data
Total Petroleum Hydrocarbons

Former Unocal Seattle Marketing Terminal
3001 Elliott Avenue
Seattle, Washington

Monitoring Well[1]	Date Sampled	LNAPL[2]	BTEX (EPA Method 8020 or 8021B) (µg/L)				TPH (EPA Method 418.1) (mg/L)	NWTPH-Gx (mg/L)	NWTPH-D Extended[3] (mg/L)	
			B	T	E	X		Gasoline C_7 - C_{12}	Diesel C_{12} - C_{24}	Heavy Oil >C_{24}
MW-30 (continued)	09/23/10	ND	<0.50	<0.50	<0.50	<2.0	--	<0.050	<0.13	<0.25
	04/27/11	Sheen	<0.50	<0.50	<0.50	<1.0	--	0.052	--	--
	09/22/11	ND	<0.50	<0.50	<0.50	<1.0	--	<0.050	<0.12	<0.24
	09/22/11	ND	<0.50	<0.50	<0.50	<1.0	--	<0.050	0.17 [17]	<0.24
	04/18/12	Sheen	--	--	--	--	--	--	--	--
	10/12/12	ND	<0.50	<0.50	<0.50	<0.50	--	<0.025	0.19	<0.24
	04/26/13	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	<0.029	<0.069
	09/19/13	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	<0.029	<0.067
	06/24/14	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050 UJ	<0.029	<0.067
	12/16/14	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	<0.028	<0.066
	06/18/15	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	0.5	0.640
	12/07/15	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	0.120	0.310
	06/13/16	LNAPL	--	--	--	--	--	--	--	--
	01/12/17	LNAPL	--	--	--	--	--	--	--	--
	03/27/17	LNAPL	--	--	--	--	--	--	--	--
	06/16/17	LNAPL	--	--	--	--	--	--	--	--
	11/08/17	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	0.25	<0.100
	06/20/18	**LNAPL**	--	--	--	--	--	--	--	--
	12/14/18	**ND**	**<0.5**	**<0.5**	**<0.5**	**<1.5**	--	**<0.019**	**<0.045**	**<0.100**
MW-31	08/10/89	--	<0.5	1.4	2.1	5.9	4.1	--	--	--
	10/26/89	--	7.1	<0.5	1.0	3.3	5.5	--	--	--
	01/16/90	--	4.2	<0.5	<0.5	<0.5	2.2	--	--	--
	04/16/90	--	5.2	1.5	1.9	4.5	<1	--	--	--
	07/25/90	--	2.0	<0.5	2.2	1.8	6	--	--	--
	10/16/90	--	0.7	<0.5	<0.5	<0.5	<1	--	--	--
	01/17/90	--	1.6	0.6	1.6	4.4	--	2	<1	--
	04/16/91	--	1.8	0.6	1.9	4.5	--	<1	<1	--
	09/17/91	--	--	--	--	--	--	--	--	--
	12/10/91	--	--	--	--	--	--	--	--	--
	09/14/95	ND	<0.50	<0.50	<0.50	<0.50	--	<0.05	0.54	0.94
	12/15/95	ND	<0.50	<0.50	<0.50	<1.0	--	<0.05	0.36	0.78
	03/14/96	ND	<0.50	<0.50	<0.50	<1.0	--	<0.05	1.2	0.94
	09/11/96	ND	<0.500	<0.500	<0.500	<1.00	--	0.0519	0.864	2.16
	03/18/97	ND	<0.500	<0.500	<0.500	<1.00	--	<0.050	0.546	<0.750
	06/26/97	ND	<0.500	<0.500	<0.500	<1.00	--	<0.050	<0.250	<0.750
	06/29/98	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	12/15/98	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.320/<0.250	<0.750/<0.750
	07/01/99	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.269/<0.250	<0.750/<0.750
	12/16/99	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.723/<0.250	<0.750/<0.750
	06/22/00[8]	ND	<0.500	5.05	1.39	15.0	--	0.167	<0.250	<0.750
	12/22/00	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	06/22/01	ND	<0.500	<0.500	<0.500	<1.00	--	0.0576	<0.250	<0.750
	12/18/01	ND	<0.500	<2.00	<1.00	<1.50	--	<0.100	1.08/<0.250[10]	<0.750/<0.750[10]
	06/20/02	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.568/<0.250	<0.750/<0.750
	12/13/02	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.436	1.27
	12/03/03	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
MW-32	08/10/89	--	2.7	2.9	0.8	2.3	1.7	--	--	--
	10/26/89	--	<0.5	1.7	<0.5	0.7	2.1	--	--	--
	01/16/90	--	<0.5	<0.5	<0.5	<0.5	0.76	--	--	--
	04/16/90	--	<0.5	1.0	<0.5	<0.5	<1	--	--	--
	07/25/90	--	<0.5	<0.5	1.1	<0.5	1	--	--	--
	10/16/90	--	<0.5	<0.5	<0.5	<0.5	<1	--	--	--
	01/17/91	--	<0.5	<0.5	0.5	1.5	--	<1	<1	--
	04/16/91	--	<0.5	0.6	0.6	1.6	--	<1	<1	--
	09/17/91	--	--	--	--	--	--	--	--	--
	12/01/91	--	--	--	--	--	--	--	--	--
MW-58	09/15/95	ND	<0.50	<0.50	<0.50	<1.0	--	<1.0	<1.0	<0.75
	12/14/95	ND	<0.50	<0.50	<0.50	<1.0	--	<0.05	<0.25	<0.75
	03/14/96	ND	<0.50	<0.50	<0.50	<1.0	--	<0.05	<0.25	<0.75
	09/11/96	ND	<0.500	<0.500	<0.500	<1.00	--	<0.050	<0.250	0.979
	12/11/96	ND	--	--	--	--	--	--	--	--
	03/18/97	ND	<0.500	<0.500	<0.500	<1.00	--	<0.050	<0.372	<0.750
	06/25/97	ND	<0.500	<0.500	<0.500	<1.00	--	<0.050	<0.250	<0.750
	06/30/98	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	12/14/98	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	06/29/99	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	12/16/99	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	06/22/00	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	12/21/00	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	06/21/01	ND	<0.500	<0.500	<0.500	2.43	--	<0.0500	<0.250	<0.750
	12/18/01	ND	<0.500	<2.00	<1.00	<1.50	--	<0.100	<0.250[10]	<0.750[10]
	06/19/02	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	12/13/02	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	12/03/03	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
MW-65	03/13/98	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	06/29/98	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	09/04/98	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	12/15/98	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.482/<0.250	<0.750/<0.750
	03/24/99	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.975/<0.250	0.991/<0.750
	06/29/99	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.750/<0.250	<0.750/<0.750
	09/29/99	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.683/<0.250	<0.750/<0.750
	12/16/99	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.418/<0.250	<0.750/<0.750
	03/22/00	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.816/<0.250	<0.750/<0.750
	06/23/00	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.689/<0.250	<0.750/<0.750
	09/14/00	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.603/<0.250	<0.750/<0.750
	12/22/00	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.408/<0.250	<0.750/<0.750
	03/15/01	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.620/<0.250	<0.750/<0.750
	06/22/01	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.262/<0.250	<0.750/<0.750
	09/25/01	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.584/0.225	<0.750/<0.750
	12/18/01	ND	<0.500	<2.00	<1.00	<1.50	--	<0.100	0.675/<0.250[10]	0.779/<0.750[10]
	03/26/02	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.749/<0.250	<0.750/<0.750
	06/20/02	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.675/<0.250	<0.750/<0.750
	12/13/02	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	12/03/03	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	03/07/07	ND	<0.500	<0.500	<0.500	<1.00	--	<0.048	0.730	0.170
	06/08/07	ND	<0.500	<0.500	<0.500	<1.50	--	<0.050	0.530	0.250
	11/26/07	ND	<0.5	<0.5	0.7	<1.5	--	<0.050	0.470	0.190
MW-66	03/13/98	ND	<1.25	<1.25	<1.25	<5.00	--	1.20[5]	3.52	<0.750
	06/29/98	ND	<0.500	<0.500	<0.500	1.06	--	0.424	<0.250	<0.750
	09/04/98	ND	<0.500	<0.500	<0.500	<2.00	--	0.257	1.27	<0.750
	12/15/98	ND	<0.500	<0.500	0.508	2.62	--	0.0387	0.906/<0.250	<0.750/<0.750
	03/24/99	ND	<0.500	<0.500	<0.900	<3.00	--	1.05	8.44/5.11	<0.750/<0.750
	07/01/99	Sheen	<0.500	<0.500	<0.500	<1.70	--	0.310[4]	1.37/0.596	<0.750/<0.750
	09/29/99	ND	<0.500	<0.500	<0.500	<1.00	--	0.216[4]	2.32/1.10	<0.750/<0.750
	12/16/99	ND	<0.500	<0.500	<0.500	<1.00	--	0.332	0.659/<0.250	<0.750/<0.750
	03/22/00	ND	<0.500	<0.500	<0.500	<3.00	--	0.711	4.31/2.31	<0.750/<0.750
	06/23/00[8]	Trace	<0.500	<0.500	<0.500	<1.00	--	0.109	0.439/<0.250	<0.750/<0.750
	09/14/00	ND	<0.500	<0.500	<0.500	<2.16	--	0.416	1.601/1.43	<0.750/<0.750
	12/22/00	ND	<0.500	<0.500	<0.500	<2.35	--	0.475	1.87/0.819	<0.750/<0.750
	03/15/01	ND	<0.570	<0.922	<0.500	<3.91	--	1.16	7.03/5.43	1.01/<0.750
	06/22/01	Sheen	<0.500	<0.500	<0.500	<1.00	--	0.130	0.409/<0.250	<0.750/<0.750

Appendix C
Historical Summary of Groundwater Analytical Data
Total Petroleum Hydrocarbons

Former Unocal Seattle Marketing Terminal
3001 Elliott Avenue
Seattle, Washington

Monitoring Well[1]	Date Sampled	LNAPL[2]	BTEX (EPA Method 8020 or 8021B) (µg/L)				TPH (EPA Method 418.1) (mg/L)	NWTPH-Gx (mg/L)	NWTPH-D Extended[3] (mg/L)	
			B	T	E	X		Gasoline C_7 - C_{12}	Diesel C_{12} - C_{24}	Heavy Oil >C_{24}
MW-66 (continued)	09/25/01	Sheen	<0.500	<0.500	<0.500	1.06	--	0.142	4.06/3.14	0.811/<0.750
	12/18/01	Sheen	<0.500	<2.00	<1.00	<1.50	--	0.162	0.696/<0.250[10]	<0.750/<0.750[10]
	03/27/02	Sheen	<0.500	<0.500	<0.500	1.32	--	0.454	4.41/2.58	1.41/<0.750
	06/20/02	ND	<0.500	<0.500	<0.500	<1.00	--	0.052	0.650/<0.250	<0.750/<0.750
	09/19/02	Sheen	<0.500	<0.500	<0.500	<1.00	--	0.128	<0.250[11]	<0.750[11]
	12/13/02	Sheen	<0.500	<0.500	<0.500	<1.00	--	0.0845	0.688	<0.750
	03/21/03	Sheen	<0.500	<0.500	<0.500	<1.00	--	0.114	2.72	<0.750
	06/19/03	Sheen	<0.500	<0.500	<0.500	<1.00	--	0.189[5]	0.707	<0.750
	09/18/03	Sheen	<0.500	<0.500	<0.500	<1.00	--	0.171	3.73	<0.750
	12/03/03	Sheen	<0.500	<0.500	<0.500	<1.00	--	0.0509	1.45	<0.750
	03/09/04	Sheen	<0.500	<0.500	<0.500	<1.00	--	0.131	0.446	<0.750
	06/03/04	ND	<0.500	<0.500	<0.500	<1.00	--	0.121	0.504	<0.750
	09/03/04	ND	<0.500	<0.500	<0.500	1.25	--	0.330	1.03	<0.750
	12/06/04	ND	<0.500	<0.500	<0.500	<1.00	--	0.116	0.380	<0.750
	03/04/05	ND	<0.500	<0.500	<0.500	1.4	--	0.275	0.577	<0.750
	06/03/05	ND	<0.500	<0.500	<0.500	<1.00	--	0.149	0.860	<0.750
	09/01/05	ND	<0.500	<0.500	<0.500	<1.00	--	0.119	0.678	<0.750
	12/01/05	ND	<0.500	<0.500	<0.500	<1.00	--	0.115	0.885	<0.721
	03/02/06	ND	<0.500	<0.500	<0.500	<1.00	--	0.0651	0.381	<0.714
	06/06/06	ND	<0.500	<0.500	<0.500	<1.00	--	0.128	<0.250	<0.750
	09/15/06	ND	<0.500	<0.500	<0.500	<1.00	--	0.0778	0.370	<0.708
	03/07/07	--	--	--	--	--	--	--	--	--
Lower Yard RALs		*No visible sheen*	*40*	*14,300*	*1,400*	*4,400*	--	*1*	*10*	*15*
Lower Yard										
MW-81	10/06/98	Sheen	<0.700	<0.500	<0.500	<1.50	--	0.136[4]	27.6/14.8	26.5/10.0
	12/14/98	Sheen	<0.500	<0.500	<0.500	<1.00	--	0.273	3.62/0.563	1.18/<0.750
	03/23/99	Sheen	<0.500	0.646	<0.500	2.28	--	0.0632	3.90/2.17	3.14/1.50
	06/29/99	Sheen	<0.500	<0.500	<0.500	<1.60	--	0.418	5.22/3.12	4.62/2.55
	09/29/99	ND	<0.500	<0.500	<0.500	<1.00	--	0.566[4]	1.69/0.390	<0.750/<0.750
	12/15/99	Sheen	<0.500	<0.500	<0.500	1.15	--	0.0762	2.46/0.366	0.764/<0.750
	03/21/00	ND	<0.500	<0.500	<0.500	<1.00	--	0.0817	2.20/0.800	1.28/<0.750
	06/22/00[8]	ND	0.536	3.35	2.37	16.2	--	0.234	2.36/0.495	1.29/<0.750
	09/14/00	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	1.20/0.347	<0.750/<0.750
	12/21/00	ND	<0.500	<0.500	<0.500	<1.00	--	0.585	1.5/0.374	<0.750/<0.750
	03/15/01	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	1.16/0.324	<0.750/<0.750
	06/21/01	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	1.60/0.751	1.32/<0.750
	09/25/01	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	1.59/1.11	0.832/<0.750
	12/18/01	ND	<0.500	<2.00	<1.00	<1.50	--	<0.100	1.62/0.323[10]	<0.750/<0.750[10]
	03/27/02	ND	<0.500	<0.500	<0.500	<1.00	--	0.0598	1.31/0.324	<0.750/<0.750
	06/19/02	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	1.09/<0.250	<0.750/<0.750
MW-82	10/06/98	Sheen	<0.500	<0.500	<0.500	<3.50	--	0.311[4]	7.90/5.43	3.93/2.31
	12/14/98	ND	<0.500	<0.500	<0.500	<1.00	--	0.0793	0.787/<0.250	<0.750/<0.750
	03/23/99	Sheen	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.757/0.268	<0.750/<0.750
	06/29/99	ND	<0.500	<0.500	<0.500	<1.00	--	0.2750	3.92/2.51	2.19/1.29
	09/29/99	ND	<0.500	<0.500	<0.500	<1.00	--	0.0566	1.48/0.784	<0.750/<0.750
	12/15/99	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.561/<0.250	<0.750/<0.750
	03/21/00	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.797/0.349	<0.750/<0.750
	06/22/00[8]	ND	<0.500	1.72	1.48	13.6	--	0.2580	1.01/0.494	<0.750/<0.750
	09/14/00	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.907/0.522	<0.750/<0.750
	12/21/00	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.911/0.386	<0.750/<0.750
	03/15/01	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.839/0.451	<0.750/<0.750
	06/21/01	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	1.03/0.675	0.830/<0.750
	09/25/01	ND	<0.500	<0.500	<0.500	1.14	--	<0.0500	0.742/0.288	<0.750/<0.750
	12/18/01	ND	<0.500	<2.00	<1.00	<1.50	--	<0.100	0.278/<0.250[10]	<0.750/<0.750[10]
	03/27/02	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.517/<0.250	<0.750/<0.750
	06/19/02	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.513/<0.250	<0.750/<0.750
MW-83	10/06/98	ND	<0.500	<0.500	<0.500	<1.00	--	0.0923[4]	2.19/1.31	2.36/1.11
	12/14/98	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.634/<0.250	<0.750/<0.750
	03/23/99	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.413/<0.250	<0.750/<0.750
	06/29/99	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.729/0.417	0.957/<0.750
	09/29/99	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.390/<0.250[13]	<0.750/<0.750[13]
	12/15/99	ND	<0.500	<0.500	<0.500	1.07	--	<0.0500	0.271/<0.250	<0.750/<0.750
	03/21/00	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	06/22/00[8]	ND	<0.500	<0.500	<0.500	3.76	--	0.205	0.302/<0.250	<0.750/<0.750
	09/14/00	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	12/21/00	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.316/<0.250	<0.750/<0.750
	03/15/01	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	06/21/01	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.268/<0.250	<0.750/<0.750
	09/25/01	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	12/18/01	ND	<0.500	<2.00	<1.00	<1.50	--	<0.100	<0.250[10]	<0.750[10]
	03/27/02	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	06/19/02	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.299/<0.250	<0.750/<0.750
MW-84	10/06/98	ND	<2.00	<1.00	<1.50	<8.00	--	1.09[4]	3.52/1.70	1.03/<0.750
	12/14/98	ND	<0.500	<0.500	<0.500	2.33	--	0.241	1.01/0.351	<0.750/<0.750
	03/23/99	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	Note 14	Note 14
	04/01/99	ND	--	--	--	--	--	--	0.0259	<0.750
	06/29/99	ND	<0.500	<0.500	<0.500	<1.00	--	0.0833	2.17/1.12	1.61/<0.750
	09/29/99	ND	<0.500	<0.500	<0.500	<1.00	--	0.0517	0.941/0.338	<0.750/<0.750
	12/15/99	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.692/<0.250	<0.750/<0.750
	03/21/00	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.859/<0.750	<0.750/<0.750
	06/22/00	ND	<0.500	<0.500	<0.500	1.37	--	0.0551	1.39/0.649	0.808/<0.750
	09/14/00	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.485/<0.250	<0.750/<0.750
	12/21/00	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	1.09/0.419	<0.750/<0.750
	03/15/01	ND	0.584	<0.500	<0.500	<1.00	--	<0.0500	0.559/<0.250	<0.750/<0.750
	06/21/01	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.407/<0.250	<0.750/<0.750
	09/25/01	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.324/<0.250	<0.750/<0.750
	12/18/01	ND	<0.500	<2.00	<1.00	<1.50	--	<0.100	0.965/<0.250[10]	0.926/<0.750[10]
	03/27/02	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.883/<0.250	<0.750/<0.750
	06/19/02	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.792/<0.250	<0.750/<0.750
MW-85	10/06/98	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.434/<0.250	<0.750/<0.750
	12/14/98	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.451/<0.250	<0.750/<0.750
	03/23/99	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.404/<0.250	<0.750/<0.750
	06/29/99	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.412/<0.250	<0.750/<0.750
	09/29/99	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.365/<0.250	<0.750/<0.750
	12/16/99	ND	<0.500	0.628	<0.500	<1.00	--	<0.0500	0.350/<0.250	<0.750/<0.750
	03/21/00	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.350/<0.250	<0.750/<0.750
	06/22/00	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.376/<0.250	<0.750/<0.750
	09/14/00	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	12/21/00	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.360/<0.250	<0.750/<0.750
	03/15/01	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	06/21/01	ND	<0.500	<0.500	<0.500	1.57	--	<0.0500	<0.250	<0.750
	09/25/01	ND	<0.500	<0.500	<0.500	1.57	--	<0.0500	<0.250	<0.750
	12/19/01	ND	<0.500	<2.00	<1.00	<1.50	--	<0.100	0.600/<0.250[10]	<0.750/<0.750[10]
	03/27/02	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.271/<0.250	<0.750/<0.750
	06/20/02	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.702/<0.250	<0.750/<0.750
MW-86	10/06/98	Sheen	<0.800	<0.500	<0.500	<1.00	--	<0.0500	2.28/2.99	2.57/2.92
	12/15/98	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	1.65/<0.250	<0.750/<0.750
	03/23/99	Sheen	<0.500	<0.500	<0.500	2.54	--	<0.0500	1.39/<0.250	0.883/<0.750
	07/01/99	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.926/<0.250	<0.750/<0.750
	09/29/99	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.481/<0.250	<0.750/<0.750
	12/16/99	ND	<0.500	0.574	<0.500	<1.00	--	<0.0500	1.71/<0.250	<0.750/<0.750

Appendix C
Historical Summary of Groundwater Analytical Data
Total Petroleum Hydrocarbons

Former Unocal Seattle Marketing Terminal
3001 Elliott Avenue
Seattle, Washington

Monitoring Well[1]	Date Sampled	LNAPL[2]	BTEX (EPA Method 8020 or 8021B) (µg/L)				TPH (EPA Method 418.1) (mg/L)	NWTPH-Gx (mg/L)	NWTPH-D Extended[3] (mg/L)	
			B	T	E	X		Gasoline C_7 - C_{12}	Diesel C_{12} - C_{24}	Heavy Oil >C_{24}
MW-86 (continued)	03/21/00	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.901[7]	<0.750[7]
	06/22/00	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.535/<0.250	<0.750/<0.750
	09/14/00	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.617/<0.250	<0.750/<0.750
	12/21/00[9]	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.374/<0.250	<0.750/<0.750
	03/15/01	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.436/0.250	<0.750/<0.750
	06/21/01	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.606/0.310	<0.750/<0.750
	09/25/01	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	12/19/01	ND	<0.500	<2.00	<1.00	<1.50	--	<0.100	1.21/<0.250[10]	<0.750/<0.750[10]
	03/27/02	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.464/<0.250	<0.750/<0.750
	06/20/02	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.629/<0.250	<0.750/<0.750
Offsite Area RALs		*No visible sheen*	*40*	*14,300*	*1,400*	*4,400*	--	*1*	*10*	*15*
Offsite Area										
MW-8	01/31/89	--	0.6	<0.5	<0.5	<0.5	0.21	--	--	--
	04/27/89	--	<0.5	<0.5	<0.5	<0.5	1.1	--	--	--
	07/25/89	--	4.3	2.1	<0.5	<0.5	0.17	--	--	--
	10/26/89	--	<0.5	<0.5	<0.5	<0.5	0.94	--	--	--
	01/16/90	--	<0.5	<0.5	<0.5	<0.5	0.35	--	--	--
	04/16/90	--	2.8	<0.5	<0.5	<0.5	<1	--	--	--
	07/25/90	--	<0.5	<0.5	<0.5	<0.5	<1	--	--	--
	10/16/90	--	<0.5	<0.5	<0.5	<0.5	2	--	--	--
	01/17/91	--	<0.5	<0.5	<0.5	<0.5	<1	<1	<1	--
	04/16/91	--	<0.5	<0.5	<0.5	<0.5	--	<1	<1	--
	09/17/91	--	<0.5	<0.5	<0.5	<0.5	--	<1	<1	--
	12/10/91	--	<0.5	<0.5	<0.5	<0.5	--	<1	<1	--
	06/25/98	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	12/14/98	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.523/<0.250	<0.750/<0.750
	07/01/99	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	12/16/99	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.501/<0.403	<1.21/<1.21
	06/22/00	ND	<0.500	<0.500	<0.500	<1.00	--	0.0558	0.273/<0.249	<0.750/<0.737
	12/21/00	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.441/<0.245	<0.750/<0.750
	06/21/01	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	12/19/01	ND	<0.500	<2.00	<1.00	<1.50	--	<0.100	0.464/<0.250[10]	<0.750/<0.750[10]
	06/19/02	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.271/<0.250	<0.750/<0.750
	12/13/02	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.439	0.762
	12/02/03	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
MW-10	01/31/89	--	<0.5	<0.5	<0.5	<0.5	0.36	--	--	--
	04/27/89	--	<0.5	<0.5	<0.5	<0.5	2.2	--	--	--
	07/25/89	--	<0.5	<0.5	<0.5	<0.5	0.45	--	--	--
	10/26/89	--	<0.5	<0.5	<0.5	<0.5	3.4	--	--	--
	01/16/90	--	<0.5	<0.5	<0.5	<0.5	0.35	--	--	--
	04/16/90	--	<0.5	<0.5	<0.5	<0.5	<1	--	--	--
	07/25/90	--	<0.5	<0.5	<0.5	<0.5	6	--	--	--
	10/16/90	--	<0.5	<0.5	<0.5	<0.5	<1	--	--	--
	01/17/91	--	<0.5	<0.5	<0.5	<0.5	--	<1	<1	--
	04/16/91	--	<0.5	<0.5	<0.5	<0.5	--	<1	<1	--
	09/17/91	--	<0.5	<0.5	<0.5	<0.5	--	<1	<1	--
	12/10/91	--	<0.5	<0.5	<0.5	<0.5	--	<1	<1	--
	06/25/98	ND	<0.500	<0.500	<0.500	<1.00	--	0.0593	<0.250	<0.750
	12/14/98	ND	<0.500	<0.500	<0.500	1.28	--	0.0715	0.953/<0.250	<0.750/<0.750
	07/01/99	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.652/<0.250	<0.750/<0.750
	12/16/99	ND	<0.500	<0.500	<0.500	<1.00	--	0.076	0.706/<0.475	<1.43/<1.43
	06/22/00	ND	<0.500	<0.500	<0.500	<1.00	--	0.0846	<0.503[13]	<1.51[13]
	12/21/00	ND	<0.500	<0.500	<0.500	1.10	--	0.0657	0.555/<0.250	<0.750/<0.750
	06/21/01	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.301/<0.250	<0.750/<0.750
	12/19/01	ND	<0.500	<2.00	<1.00	<1.50	--	<0.100	0.551/<0.250[10]	<0.750/<0.750[10]
	06/19/02	ND	<0.500	<0.500	<0.500	1.43	--	0.0545	0.656/<0.250	<0.750/<0.750
	12/13/02	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	12/02/03	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
MW-20	01/31/89	--	<0.5	<0.5	<0.5	<0.5	1.1	--	--	--
	04/27/89	--	<0.5	<0.5	<0.5	<0.5	1.6	--	--	--
	07/25/89	--	1.0	<0.5	<0.5	<0.5	0.31	--	--	--
	10/26/89	--	0.7	<0.5	<0.5	<0.5	3.2	--	--	--
	01/16/90	--	<0.5	<0.5	<0.5	<0.5	1.4	--	--	--
	04/16/90	--	0.6	<0.5	<0.5	<0.5	<1	--	--	--
	07/25/90	--	<0.5	<0.5	<0.5	<0.5	<1	--	--	--
	10/16/90	--	<0.5	<0.5	<0.5	<0.5	<1	--	--	--
	01/17/91	--	<0.5	<0.5	<0.5	<0.5	--	<1	<1	--
	04/16/91	--	<0.5	<0.5	<0.5	<0.5	--	<1	<1	--
	09/17/91	--	<0.5	<0.5	<0.5	<0.5	--	<1	<1	--
	12/10/91	--	<0.5	<0.5	<0.5	<0.5	--	<1	<1	--
	06/25/98	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	12/15/98	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.287/<0.250	<0.750/<0.750
	07/01/99	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.291/<0.250	<0.750/<0.750
	12/16/99	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.452/<0.250	<0.750/<0.750
	06/22/00	ND	<0.500	<0.500	<0.500	1.67	--	<0.0500	<0.250	<0.750
	12/21/00	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.569/<0.250	<0.750/<0.750
	06/21/01	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.277/<0.250	<0.750/<0.750
	12/19/01	ND	<0.500	<2.00	<1.00	<1.50	--	<0.100	1.05/<0.250[10]	<0.750/<0.750[10]
	06/20/02	ND	6.60	<0.500	<0.500	3.30	--	<0.0500	0.627/<0.250	<0.750/<0.750
	12/13/02	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	12/02/03	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
MW-25	01/31/89	--	<0.5	4.7	<0.5	2.3	3.7	--	--	--
	04/27/89	--	7.2	1.2	1.6	<0.5	0.93	--	--	--
	07/25/89	--	1.4	0.8	<0.5	1.2	3.4	--	--	--
	10/26/89	--	<0.5	<0.5	<0.5	<0.5	7.8	--	--	--
	01/16/90	--	1.3	<0.5	<0.5	<0.5	4.9	--	--	--
	04/16/90	--	6.6	1.4	0.8	2.7	<1	--	--	--
	07/25/90	--	2.5	0.6	0.6	0.8	<1	--	--	--
	10/16/90	--	<0.5	<0.5	<0.5	0.8	<1	--	--	--
	01/17/91	--	1.0	0.7	<0.5	1.4	<1	<1	<1	--
	04/16/91	--	0.9	<0.5	<0.5	<0.5	--	<1	<1	--
	09/19/91	--	<0.5	<0.5	<0.5	0.6	--	<1	<1	--
	12/10/91	--	<0.5	<0.5	<0.5	<0.5	--	<1	<1	--
	03/13/98	ND	<0.500	<0.500	<0.500	<1.00	--	0.160	<0.250	<0.750
	06/24/98	ND	<0.500	1.68	<0.500	<1.00	--	0.689	<0.250	<0.750
	09/03/98	ND	<0.500	<0.500	<0.500	<1.00	--	0.0716	<0.250	<0.750
	12/14/98	ND	<0.500	<0.500	0.795	1.31	--	0.0697	1.26/<0.250	<0.750/<0.750
	03/24/99	ND	<0.600	<0.700	<1.00	<2.50	--	0.118	0.969/<0.250	<0.750/<0.750
	07/01/99	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.719/<0.250	<0.750/<0.750
	09/29/99	ND	<0.500	3.52	<0.500	<10.0	--	0.136	1.58/<0.476	<1.43/<1.43
	12/16/99	ND	<0.500	<0.500	0.632	1.81	--	0.166	1.31/<0.250	<0.750/<0.750
	03/22/00	ND	<0.500	1.94	<0.500	<1.00	--	0.148	1.36/<0.447	<1.34/<1.34
	06/22/00	ND	<0.500	<0.500	<0.500	<1.00	--	0.0876	0.674/<0.250	<0.750/<0.750
	09/15/00	ND	<0.500	<0.607	<0.500	<1.28	--	0.716	1.26/<0.250	<0.750/<0.750
	12/21/00	ND	<0.500	<0.500	<0.500	1.18	--	0.0991	1.25/<0.250	<0.750/<0.750
	03/15/01	ND	<0.500	<0.500	<0.500	1.75	--	0.0664	1.19/<0.250	<0.750/<0.750
	06/21/01	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.538/<0.250	<0.750/<0.750
	09/25/01	ND	<0.500	<0.500	<0.500	<1.00	--	0.0596	0.864/<0.250	<0.750/<0.750
	12/19/01	ND	<0.500	<2.00	<1.00	<1.50	--	0.175	2.22/<0.250[10]	0.852/<0.750[10]
	03/26/02	ND	<0.500	<0.500	<0.500	1.39	--	0.12	0.861/<0.250	<0.750/<0.750
	06/19/02	ND	<0.500	<0.500	<0.500	1.44	--	0.108	0.706/<0.250	<0.750/<0.750

Appendix C
Historical Summary of Groundwater Analytical Data
Total Petroleum Hydrocarbons

Former Unocal Seattle Marketing Terminal
3001 Elliott Avenue
Seattle, Washington

Monitoring Well[1]	Date Sampled	LNAPL[2]	BTEX (EPA Method 8020 or 8021B) (µg/L)				TPH (EPA Method 418.1) (mg/L)	NWTPH-Gx (mg/L)	NWTPH-D Extended[3] (mg/L)	
			B	T	E	X		Gasoline C_7 - C_{12}	Diesel C_{12} - C_{24}	Heavy Oil >C_{24}
MW-25 (continued)	12/13/02	ND	<0.500	<0.500	<0.500	<1.00	--	0.0578	<0.250	<0.750
	12/02/03	ND	<0.500	<0.500	<0.500	<1.00	--	0.110	<0.250	<0.750
MW-26	01/31/89	--	<0.5	<0.5	<0.5	<0.5	0.64	--	--	--
	04/27/89	--	<0.5	<0.5	<0.5	<0.5	0.08	--	--	--
	07/25/89	--	<0.5	<0.5	<0.5	<0.5	1.4	--	--	--
	10/26/89	--	<0.5	<0.5	<0.5	<0.5	0.94	--	--	--
	01/16/90	--	<0.5	<0.5	<0.5	<0.5	1.8	--	--	--
	04/16/90	--	<0.5	<0.5	<0.5	<0.5	<1	--	--	--
	07/25/90	--	<0.5	<0.5	<0.5	<0.5	2	--	--	--
	10/16/90	--	<0.5	<0.5	<0.5	<0.5	<1	--	--	--
	01/17/91	--	<0.5	<0.5	<0.5	<0.5	<1	<1	<1	--
	04/16/91	--	<0.5	<0.5	<0.5	<0.5	--	<1	<1	--
	09/19/91	--	<0.5	<0.5	<0.5	<0.5	--	<1	<1	--
	12/10/91	--	<0.5	<0.5	<0.5	<0.5	--	<1	<1	--
	06/30/98	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	12/15/98	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	07/01/99	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	12/16/99	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250/<0.250	<0.750/<0.750
	06/22/00	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	12/22/00	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	06/21/01	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	12/19/01	ND	<0.500	<2.00	<1.00	<1.50	--	<0.100	0.445/<0.250[10]	<0.750/<0.750[10]
	06/20/02	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	12/13/02	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	12/02/03	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
MW-27	01/31/89	--	<0.5	1.8	<0.5	<0.5	0.64	--	--	--
	04/27/89	--	<0.5	<0.5	<0.5	<0.5	0.23	--	--	--
	07/25/89	--	1.0	<0.5	<0.5	<0.5	0.68	--	--	--
	10/26/89	--	1.3	0.7	<0.5	0.7	1.1	--	--	--
	01/16/90	--	<0.5	<0.5	<0.5	<0.5	1.3	--	--	--
	04/16/90	--	<0.5	<0.5	<0.5	0.6	<1	--	--	--
	07/25/90	--	<0.5	<0.5	<0.5	<0.5	2	--	--	--
	10/16/90	--	<0.5	<0.5	<0.5	<0.5	<1	--	--	--
	01/17/91	--	0.6	<0.5	<0.5	<0.5	--	<1	<1	--
	04/16/91	--	<0.5	<0.5	<0.5	0.9	--	<1	<1	--
	09/19/91	--	<0.5	<0.5	<0.5	1.1	--	<1	<1	--
	12/10/91	--	<0.5	<0.5	<0.5	<0.5	--	<1	<1	--
	03/13/98	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	06/24/98	ND	<0.500	2.85	<0.500	<1.00	--	0.188	<0.250	<0.750
	09/03/98	ND	<0.800	<0.500	<0.500	<1.00	--	0.0961	0.316	<0.750
	12/14/98	ND	<4.00	<0.500	<0.500	1.33	--	0.119	0.485/<0.250	<0.750/<0.750
	03/24/99	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.394/<0.250	<0.750/<0.750
	07/01/99	ND	<0.500	<2.20	<0.500	<1.00	--	0.0823	0.394/<0.250	<0.750/<0.750
	09/29/99	ND	<0.500	1.87	<0.500	<1.00	--	<0.0500	0.830/<0.323	<0.750/<0.750
	12/16/99	ND	<0.500	<0.500	<0.500	1.29	--	0.0925	0.544[15]	<0.750[15]
	03/22/00	ND	<0.500	0.874	<0.500	<1.00	--	<0.0500	0.468/<0.250	<0.750/<0.750
	06/22/00	ND	0.692	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	09/15/00	ND	<0.605	<0.500	<0.500	<1.00	--	<0.0500	0.420/<0.250	<0.750/<0.750
	12/21/00	ND	1.89	<0.500	<0.500	<1.00	--	0.0727	0.308/<0.250	<0.750/<0.750
	03/15/01	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.537/<0.250	<0.750/<0.750
	06/21/01	Sheen	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.259/<0.250	<0.750/<0.750
	09/25/01	ND	0.571	<0.500	<0.500	<1.00	--	<0.0500	1.38/0.547	<0.750/<0.750
	12/19/01	Sheen	<0.500	<2.00	<1.00	<1.50	--	<0.100	<0.250[10]	<0.750[10]
	03/26/02	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.257/<0.250	<0.750/<0.750
	06/19/02	ND	<0.500	<0.500	<0.500	1.05	--	<0.0500	<0.250	<0.750
	09/19/02	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	12/13/02	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	03/21/03	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	06/19/03	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	09/18/03	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.672	<0.750
	12/03/03	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	03/09/04	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	06/03/04	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	09/03/04	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	12/06/04	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	03/04/05	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	06/03/05	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	09/01/05	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	12/01/05	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.236	<0.708
	03/02/06	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.236	<0.708
MW-27R	03/07/07	ND	<0.5	<0.5	<0.5	<1.5	--	<0.048	<0.076	<0.094
	09/26/07	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	<0.077	<0.096
	11/27/07	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	<0.080	<0.100
MW-34	10/26/89	--	1.7	3	<0.5	2.1	0.27	--	--	--
	01/16/90	--	<0.5	<0.5	<0.5	<0.5	0.08	--	--	--
	04/16/90	--	<0.5	<0.5	<0.5	<0.5	<1	--	--	--
	07/25/90	--	<0.5	<0.5	<0.5	<0.5	<1	--	--	--
	10/16/90	--	<0.5	<0.5	<0.5	<0.5	<1	--	--	--
	01/17/91	--	<0.5	<0.5	<0.5	<0.5	--	<1	<1	--
	04/16/91	--	<0.5	<0.5	<0.5	<0.5	--	<1	<1	--
	09/17/91	--	<0.5	<0.5	<0.5	<0.5	--	<1	<1	--
	12/01/91	--	<0.5	<0.5	<0.5	<0.5	--	<1	<1	--
MW-35	10/26/89	--	33	1.1	<0.5	1.4	<0.5	--	--	--
	01/16/90	--	<0.5	<0.5	<0.5	<0.5	<0.5	--	--	--
	04/16/90	--	<0.5	<0.5	<0.5	<0.5	<1	--	--	--
	07/25/90	--	<0.5	<0.5	<0.5	<0.5	<1	--	--	--
	10/16/90	--	<0.5	<0.5	<0.5	<0.5	<1	--	--	--
	01/17/91	--	<0.5	<0.5	<0.5	<0.5	--	<1	<1	--
	04/16/91	--	<0.5	<0.5	<0.5	<0.5	--	<1	<1	--
	09/17/91	--	<0.5	<0.5	<0.5	<0.5	--	<1	<1	--
	12/01/91	--	<0.5	<0.5	<0.5	<0.5	--	<1	<1	--
MW-36	10/26/89	--	330	1.9	2.5	8.0	2	--	--	--
	01/16/90	--	95	3.1	<0.5	9.4	0.39	--	--	--
	04/16/90	--	140	7.8	<0.5	<5.0	3.2	--	--	--
	07/25/90	--	<0.5	<0.5	3.4	17	4	--	--	--
	10/16/90	--	8.0	<0.5	<0.5	4.8	8	--	--	--
	01/17/91	--	1.2	5.6	12	58	6	11	20	--
	04/16/91	--	1.7	6.4	<0.5	4.9	--	<1	<1	--
	09/17/91	--	<0.5	<0.5	1.1	3.2	--	15	29	--
	12/01/91	--	<0.5	<0.5	2.5	6.5	--	<1	<1	--
	03/13/98	ND	<0.500	<0.500	<0.500	<1.00	--	0.609	12.5	2.69
	06/25/98	ND	<0.500	<0.500	<0.500	<2.50	--	0.345	<0.250	<0.750
	09/03/98	ND	<0.800	<0.500	<0.750	<4.00	--	0.499	7.42	1.43
	12/14/98	ND	1.24	0.699	0.707	4.12	--	0.536	1.43/<0.250	<0.750/<0.750
	03/24/99	ND	1.96	<1.10	<1.40	<3.50	--	0.999	27.1/18.1	5.86/3.39
	07/01/99	ND	<0.500	<0.500	<0.500	<2.00	--	0.257[4]	1.28/<0.250	<0.750/<0.750
	09/29/99	ND	<0.500	<0.500	<5.00	<10.0	--	0.562[4]	4.63/2.01	0.849/<0.0750
	12/16/99	ND	0.813	<1.50	<5.00	<2.00	--	0.344	0.867/<0.250	<0.750/<0.750
	03/22/00	ND	<0.500	0.792	<0.500	<3.00	--	0.584	6.42/4.30	1.58/<0.750
	06/22/00[8]	ND	5.80	70.0	33.2	240	--	2.17	0.850/<0.250	<0.750/<0.750
	09/15/00	Sheen	<0.500	<2.39	<0.704	<5.46	--	0.923	9.25/6.10	1.70/0.927

Appendix C
Historical Summary of Groundwater Analytical Data
Total Petroleum Hydrocarbons

Former Unocal Seattle Marketing Terminal
3001 Elliott Avenue
Seattle, Washington

Monitoring Well[1]	Date Sampled	LNAPL[2]	BTEX (EPA Method 8020 or 8021B) (µg/L)				TPH (EPA Method 418.1) (mg/L)	NWTPH-Gx (mg/L)	NWTPH-D Extended[3] (mg/L)	
			B	T	E	X		Gasoline C_7 - C_{12}	Diesel C_{12} - C_{24}	Heavy Oil >C_{24}
MW-36 (continued)	12/21/00	ND	0.636	<1.12	<0.500	<2.20	--	0.229	1.26/<0.250	<0.750/<0.750
	03/15/01	ND	2.00	<1.04	<0.500	<12.5	--	2.19	5.46/4.03	1.40/<0.750
	06/21/01	ND	<0.500	<0.500	<0.500	<1.00	--	0.207	0.643/<0.250	<0.750/<0.750
	09/25/01	Sheen	1.03	<0.500	<0.500	2.54	--	0.514	8.88/6.64	1.92/<0.750
	12/19/01	ND	1.49	<2.00	<1.00	<1.50	--	0.415	1.15/<0.250[10]	<0.750/<0.750[10]
	03/26/02	ND	1.01	<0.500	<0.500	1.9	--	0.38	1.47/0.794	<0.750/<0.750
	06/20/02	ND	0.618	<0.500	<0.500	<1.00	--	0.106	1.01/<0.250	<0.750/<0.750
	09/19/02	Sheen	0.914	<0.500	<0.500	1.85	--	0.307	1.39[13]	<0.750[6]
	12/13/02	Sheen	<0.500	<0.500	<0.500	1.07	--	0.186	15.5	<0.750
	03/21/03	Sheen	0.846	<0.500	<0.500	2.4	--	0.398	3.25	<0.750
	06/19/03[14]	Sheen	0.691	0.508	0.503	2.93	--	0.623[7]	6.09	1.27
	09/18/03	Sheen	<0.500	<0.500	<0.500	1.29	--	0.219	4.87	0.943
	12/02/03	Sheen	0.538	<0.500	<0.500	1.37	--	0.242	1.97	<0.750
MW-41	09/18/90	--	--	--	--	--	2	--	--	--
	10/16/90	--	<0.5	<0.5	<0.5	<0.5	<1	--	--	--
	01/17/91	--	<0.5	<0.5	1.2	3.9	<1	1	<1	--
	04/16/91	--	3.5	0.9	4.5	1.4	--	<1	<1	--
	09/17/91	--	<0.5	<0.5	<0.5	<0.5	--	<1	4	--
	12/10/91	--	<0.5	<0.5	<0.5	<0.5	--	<1	<1	--
	06/29/98	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	12/15/98	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	07/01/99	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	12/16/99	ND	<0.500	<0.500	<5.00	<1.00	--	<0.0500	<0.250	<0.750
	06/22/00[8]	ND	<0.500	6.55	3.97	35.8	--	0.433	<0.250	<0.750
	12/22/00	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	06/22/01	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	12/18/01	ND	<0.500	<2.00	<1.00	<1.50	--	<0.100	<0.250[10]	<0.750[10]
	06/20/02	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	12/13/02	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
MW-42	10/16/90	--	<0.5	<0.5	<0.5	<0.5	<1	--	--	--
	01/17/91	--	<0.5	<0.5	<0.5	<0.5	--	<1	<1	--
	04/16/91	--	<0.5	<0.5	<0.5	<0.5	--	<1	<1	--
	09/17/91	--	<0.5	<0.5	<0.5	<0.5	--	<1	<1	--
	12/10/91	--	<0.5	<0.5	<0.5	<0.5	--	<1	<1	--
MW-43	10/16/90	--	2.9	<0.5	17	5.3	<1	--	--	--
	01/17/91	--	<0.5	<0.5	<0.5	<0.5	--	<1	<1	--
	04/16/91	--	<0.5	<0.5	0.7	0.6	--	<1	<1	--
	09/17/91	--	<0.5	<0.5	<0.5	<0.5	--	3	9	--
	12/10/91	--	<0.5	<0.5	<0.5	<0.5	--	<1	<1	--
MW-52	06/25/98	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	12/15/98	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	07/01/99	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.522/<0.250	<0.750/<0.750
	12/16/99	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.250/<0.250	<0.750/<0.750
	06/22/00	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	12/21/00	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.257/<0.250	<0.750/<0.750
	06/22/01	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	12/19/01	ND	<0.500	<2.00	<1.00	<1.50	--	<0.100	0.325/<0.250[10]	<0.750/<0.750[10]
	06/20/02	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.289/<0.250	<0.750/<0.750
	12/13/02	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	12/02/03	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
MW-67	03/13/98	ND	<0.500	0.658	1.57	3.37	--	0.237	<0.250	<0.750
	06/24/98	ND	<0.500	1.44	<0.500	<1.00	--	0.0597	<0.250	<0.750
	09/03/98	ND	<1.00	<0.500	0.913	<1.00	--	0.0661	0.287	<0.750
	12/14/98	ND	<0.800	<2.00	2.44	4.87	--	0.432	0.813/0.328	<0.750/<0.750
	03/24/99	ND	4.84	<0.500	<0.500	<1.00	--	0.158	0.566/<0.250	<0.750/<0.750
	07/01/99	ND	<4.20	<1.00	2.68	4.66	--	0.341	0.833/0.275	<0.750/<0.750
	09/29/99	ND	0.554	1.88	0.884	1.55	--	0.239	0.544/<0.250	<0.750/<0.750
	12/16/99	ND	<8.20	<1.25	1.9	8.65	--	0.561	0.807/<0.250	<0.750/<0.750
	03/22/00	ND	<0.500	1.71	0.533	1.46	--	0.156	0.651/0.292	<0.750/<0.750
	06/22/00	ND	4.74	1.02	1.65	4.53	--	0.395	0.951/<0.250	<0.750/<0.750
	09/15/00	ND	<3.00	<0.500	<0.520	<1.81	--	0.157	0.607/<0.250	<0.750/<0.750
	12/21/00	ND	7.35	<1.38	<2.04	5.73	--	0.413	0.646/<0.250	<0.750/<0.750
	03/15/01	ND	<0.500	<0.500	<0.624	<1.77	--	0.165	0.524/<0.250	<0.750/<0.750
	06/21/01	ND	<0.500	1.21	2.47	2.61	--	0.403	0.479/<0.250	<0.750/<0.750
	09/25/01	ND	3.45	<0.500	1.46	2.10	--	0.230	0.585/0.295	<0.750/<0.750
	12/19/01	ND	13.2	<2.00	1.46	2.97	--	1.01	0.760/<0.250[10]	<0.750/<0.750[10]
	03/26/02	ND	3.01	<0.500	0.671	1.09	--	0.178	0.672/<0.250	0.839/<0.750
	06/19/02	ND	<0.500	<0.500	<0.500	1.21	--	<0.0500	<0.250	<0.750
	09/19/02	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250[13]	<0.750[13]
	12/13/02	ND	<0.500	<0.500	0.751	2.99	--	<0.0500	<0.250	<0.750
	03/21/03	ND	<0.500	<0.500	0.751	<1.00	--	<0.0500	0.352	1.44
	06/19/03	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	09/18/03	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	12/03/03	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
MW-70	06/25/98	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	12/15/98	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.488/<0.250	<0.750/<0.750
	07/01/99	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	12/16/99	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.392/<0.250	<0.750/<0.750
	06/22/00[8]	ND	<0.500	1.31	0.610	3.83	--	0.0632	<0.250[13]	<0.750[13]
	12/21/00	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	06/21/01	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	12/19/01	ND	<0.500	<2.00	<1.00	<1.50	--	<0.100	0.372/<0.250[10]	<0.750/<0.750[10]
	06/19/02	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	12/13/02	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	12/02/03	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	12/06/04	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
MW-70R	02/16/16	ND	<0.500	<0.500	<0.500	<1.50	--	<0.0500	<0.029	<0.067
Duplicate	02/16/16	ND	<0.500	<0.500	<0.500	<1.50	--	<0.0500	<0.029	<0.067
	06/14/16	ND	<0.500	<0.500	<0.500	<1.50	--	<0.0500	<0.028	<0.066
	09/22/16	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	<0.030	<0.070
	01/12/17	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	0.046	<0.070
Duplicate	01/12/17	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	0.046	<0.070
	03/27/17	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	<0.029	<0.067
	06/16/17	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	<0.029	<0.068
	11/08/17	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	<0.047	<0.100
	03/26/18	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	<0.029	<0.067
Duplicate	03/26/18	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	<0.029	<0.067
	06/20/18	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	<0.029	<0.067
Duplicate	06/20/18	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	<0.029	<0.066
	09/27/18	**ND**	**<0.5**	**<0.5**	**<0.5**	**<1.5**	**--**	**<0.019**	**<0.030**	**<0.070**
Duplicate	**09/27/18**	**ND**	**<0.5**	**<0.5**	**<0.5**	**<1.5**	**--**	**<0.019**	**<0.031**	**<0.072**
	12/13/18	**ND**	**<0.5**	**<0.5**	**<0.5**	**<1.5**	**--**	**<0.019**	**<0.045**	**<0.100**
MW-71	06/25/98	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	12/14/98	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	3.77/<0.250	<0.750/<0.750
	07/01/99	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	12/16/99	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.430[15]	<0.904[15]
	06/22/00[8]	ND	<0.500	0.980	0.522	3.08	--	0.0746	<0.250	<0.750
	12/21/00	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	06/21/01	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	12/19/01	ND	<0.500	<2.00	<1.00	<1.50	--	<0.100	0.514/<0.0.250[10]	<0.750/<0.750[10]
	06/19/02	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750

Appendix C
Historical Summary of Groundwater Analytical Data
Total Petroleum Hydrocarbons

Former Unocal Seattle Marketing Terminal
3001 Elliott Avenue
Seattle, Washington

Monitoring Well[1]	Date Sampled	LNAPL[2]	BTEX (EPA Method 8020 or 8021B) (µg/L)				TPH (EPA Method 418.1) (mg/L)	NWTPH-Gx (mg/L)	NWTPH-D Extended[3] (mg/L)	
			B	T	E	X		Gasoline C_7 - C_{12}	Diesel C_{12} - C_{24}	Heavy Oil >C_{24}
MW-71 (continued)	12/13/02	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	12/02/03	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
MW-72	03/13/98	ND	<11.0	<3.00	<3.00	<11.0	--	1.30	0.369	<0.750
	06/24/98	ND	<1.00	<1.00	<0.500	<2.00	--	0.699	0.286	<0.750
	09/03/98	ND	<9.38	<2.50	<2.50	<4.50	--	1.03	3.11	1.78
	12/14/98	Sheen	5.45	0.644	1.07	1.68	--	0.196	0.847/<0.250	<0.750/<0.750
	03/24/98	Sheen	4.69	<0.950	<0.950	<3.30	--	0.269	1.74/0.744	1.42/<0.750
	07/01/99	ND	<2.80	<0.900	<0.500	<2.26	--	0.248	1.05/<0.250	<0.750/<0.750
	09/29/99	Sheen	5.71	2.71	0.68	5.01	--	0.481	1.86/0.424[13]	1.01/<0.750[13]
	12/16/99	Sheen	<7.40	<1.40	<0.500	6.87	--	0.421	0.905/<0.475	<1.43/<1.43
	03/22/00	ND	2.88	5.40	0.846	6.42	--	0.596	1.40/0.462	<0.750/<0.750
	06/22/00	ND	5.98	1.11	0.599	2.38	--	0.344	1.11/<0.250	<0.750/<0.750
	09/15/00	ND	1.47	<1.20	<0.525	<5.42	--	0.547	1.35/0.427	<0.750/<0.750
	12/21/00	ND	5.71	<1.00	<0.500	4.46	--	0.422	0.698/<0.250	<0.750/<0.750
	03/15/01	ND	1.90	<1.06	<0.791	<3.29	--	0.454	1.47/<0.250	0.752/<0.750
	06/21/01	ND	1.08	1.29	<0.500	2.78	--	0.274	0.591/<0.250	<0.750/<0.750
	09/25/01	Sheen	7.98	0.679	1.07	3.24	--	0.695	3.37/1.35	1.90/0.942
	12/19/01	ND	12.2	<2.00	<1.00	3.21	--	0.835	1.59/0.261[10]	<0.750/<0.750[10]
	03/26/02	Sheen	6.4	0.753	<0.500	3.88	--	0.47	1.05/<0.250	<0.750/<0.750
	06/19/02	ND	10.3	0.722	1.48	4.60	--	0.697	3.19/<0.250	<0.750/<0.750
	09/19/02	Sheen	13.3	0.798	2.29	4.29	--	0.828	0.769[11]	<0.750[11]
	12/13/02	Sheen	8.35	0.747	2.27	6.10	--	0.594	4.15	2.94
	03/21/03	Sheen	3.2	<0.500	0.909	1.29	--	0.360	0.281	<0.750
	06/19/03	Sheen	8.28	0.509	1.79	3.82	--	0.476	1.61	1.25
	09/18/03	Sheen	4.54	<0.500	0.931	4.28	--	0.522	1.17	0.775
	12/02/03	Sheen	2.26	<0.500	<0.500	2.34	--	0.439	1.20	0.979
	03/09/04	Sheen	0.738	<0.500	<0.500	1.31	--	0.133	0.315	<0.750
	06/03/04	Sheen	0.656	<0.500	<0.500	<1.00	--	0.195	0.265	<0.750
	09/03/04	ND	1.41	<0.500	<0.500	1.72	--	0.294	0.275	<0.750
	12/06/04	ND	1.27	<0.500	<0.500	1.47	--	0.238	<0.250	<0.750
	03/04/05	ND	1.07	<0.500	<0.500	2.20	--	0.202	0.524	<0.750
	06/03/05	ND	1.10	<0.500	<0.500	<1.00	--	0.141	<0.250	<0.750
MW-73	03/12/98	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	06/29/98	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	09/03/98	ND	<0.500	<0.500	<0.500	1.30	--	<0.0500	<0.250	<0.750
	12/15/98	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.388/<0.250	<0.750/<0.750
	03/24/99	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.665/<0.250	<0.750/<0.750
	06/29/99	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.370/<0.250	<0.750/<0.750
	09/29/99	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.430/<0.250	<0.750/<0.750
	12/15/99	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.830/<0.250	<0.750/<0.750
	03/22/00	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.559/<0.250	<0.750/<0.750
	06/22/00	ND	<0.500	<0.500	<0.500	<1.00	--	0.0737	0.407/<0.250	<0.750/<0.750
	09/14/00	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.298/<0.250	<0.750/<0.750
	12/22/00	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	03/15/01	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	06/22/01	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	09/25/01	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	12/18/01	ND	<0.500	<2.00	<1.00	<1.50	--	<0.100	0.693/<0.250[10]	<0.750/<0.750[10]
	03/26/02	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.618/<0.250	<0.750/<0.750
	06/20/02	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.287/<0.250	<0.750/<0.750
MW-74	03/12/98	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	06/29/98	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	09/03/98	ND	<0.500	<0.500	<0.500	1.02	--	<0.0500	0.29	1.07
	12/15/98	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.517/<0.250	<0.750/<0.750
	03/24/99	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.600/<0.250	0.993/<0.750
	06/29/99	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.251/<0.250	<0.750/<0.750
	09/29/99	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.462/<0.250	<0.750/<0.750
	12/15/99	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.659/<0.250	<0.750/<0.750
	03/22/00	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.500/<0.250	0.923/<0.750
	06/22/00	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.234	<0.748
	09/14/00	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	12/22/00	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	03/15/01	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.273/<0.250	0.863/<0.750
	06/22/01	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.505/<0.250	<0.750/<0.750
	09/25/01	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	12/18/01	ND	<0.500	<2.00	<1.00	<1.50	--	<0.100	1.06/<0.250[10]	1.11/<0.750[10]
	03/26/02	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.430/<0.250	<0.750/<0.750
	06/20/02	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.305/<0.250	<0.750/<0.750
MW-75	03/12/98	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	06/29/98	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	09/03/98	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	12/15/98	ND	<0.500	<0.500	<0.500	1.33	--	<0.0500	<0.250	<0.750
	03/24/99	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	06/29/99	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	09/29/99	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250/<0.250	<0.750/<0.750
	12/15/99	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	03/22/00	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	06/22/00	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.239	<0.744
	09/14/00	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	12/22/00	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	03/15/01	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	06/22/01	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	09/25/01	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	12/18/01	ND	<0.500	<2.00	<1.00	<1.50	--	<0.100	<0.250[10]	<0.750[10]
	03/26/02	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	06/20/02	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
MW-76	06/24/98	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	09/03/98	ND	0.962	0.774	0.609	<1.00	--	0.0593	0.361	<0.750
	12/14/98	ND	<1.00	<0.500	1.29	<1.00	--	0.0779	0.789/<0.250	<0.750/<0.750
	03/24/98	ND	<1.00	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	07/01/99	ND	<1.20	<0.500	1.64	1.31	--	0.0998	0.786/<0.250	<0.750/<0.750
	09/29/99	ND	<0.500	0.538	0.583	<1.00	--	0.0577	0.632/<0.250	<0.750/<0.750
	12/16/99	ND	0.582	<0.500	0.631	<1.00	--	0.728	0.667/<0.250	<0.750/<0.750
	03/22/00	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.640/<0.250	<0.750/<0.750
	06/22/00	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.259/<0.250	<0.750/<0.750
	09/15/00	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.605/<0.250	<0.750/<0.750
	12/21/00	ND	<0.600	<0.500	0.628	<1.00	--	0.784	0.606/<0.250	<0.750/<0.750
	03/15/01	ND	0.506	1.35	<0.500	1.22	--	<0.0500	0.278/<0.250	<0.750/<0.750
	06/21/01	ND	<0.500	<0.500	0.808	<1.00	--	<0.0500	<0.250	<0.750
	09/25/01	ND	0.508	<0.500	0.774	<1.00	--	<0.0500	0.461/0.316	<0.750/<0.750
	12/19/01	ND	<0.500	<2.00	<1.00	<1.50	--	0.114	0.549/<0.250	<0.750/<0.750
	03/26/02	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	0.317/<0.250	<0.750/<0.750
	06/19/02	ND	<0.500	<0.500	<0.500	1.11	--	<0.0500	<0.250	<0.750
	12/13/02	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	12/03/03	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
	12/06/04	ND	<0.500	<0.500	<0.500	<1.00	--	<0.0500	<0.250	<0.750
MW-200	03/08/07	Sheen	2.80	0.5	3.7	4	--	0.39	0.46	<0.095
	06/07/07	ND	2.4	0.6	2.1	2.5	--	0.250	0.310	<0.095
	09/26/07	ND	1.6	<0.5	0.9	<1.5	--	0.230	0.270	<0.100
Duplicate	09/26/07	ND	1.7	<0.5	0.8	<1.5	--	0.230	0.310	0.120
	11/28/07	ND	2.0	<0.5	1.2	2.1	--	0.250	0.330	<0.100

Appendix C
Historical Summary of Groundwater Analytical Data
Total Petroleum Hydrocarbons

Former Unocal Seattle Marketing Terminal
3001 Elliott Avenue
Seattle, Washington

Monitoring Well[1]	Date Sampled	LNAPL[2]	BTEX (EPA Method 8020 or 8021B) (µg/L)				TPH (EPA Method 418.1) (mg/L)	NWTPH-Gx (mg/L)	NWTPH-D Extended[3] (mg/L)	
			B	T	E	X		Gasoline C_7 - C_{12}	Diesel C_{12} - C_{24}	Heavy Oil >C_{24}
MW-200 (continued)	02/13/08	ND	3.44	<0.500	1.19	1.79	--	0.497	<0.236	<0.472
	05/13/08	ND	2.70	<0.500	1.15	2.07	--	0.426	<0.240	<0.481
	09/03/08	ND	<0.500	0.883	1.46	<1.00	--	0.337	<0.236	<0.472
	12/04/08	ND	3.19	<0.500	0.975	2.01	--	0.427	<0.238	<0.476
	02/18/09	ND	2.54	<0.500	0.619	1.14	--	0.355	<0.250	<0.500
	05/13/09	ND	3.43	<0.500	1.12	1.91	--	0.513	<0.278	<0.556
	09/11/09	ND	<0.500	<0.500	0.52	<1.00	--	0.360	<0.248	<0.495
	04/14/10	ND	<0.50	<0.50	0.54	<2.0	--	0.35	0.31	<0.25
	09/22/10	ND	<0.50	<0.50	0.56	1.2	--	0.43	0.56	<0.25
	04/26/11	ND	6.2	<0.50	0.59	1.5	--	0.39	--	--
	04/28/11	ND	--	--	--	--	--	--	0.33	<0.24
	09/22/11	ND	6.7 [18]	<0.50 [18]	0.83 [18]	1.9 [18]	--	0.27	0.39 [17]	<0.24
Duplicate	09/22/11	ND	5.0	<0.50	0.65	1.4	--	0.24	0.37 [17]	<0.24
	04/18/12	ND	3.7	<0.50	0.73	1.4	--	0.20	0.27 [17]	<0.24
	10/11/12	ND	<0.50	0.75 [21]	<0.50	<0.50	--	0.39	0.30 [17,19,20]	<0.24
	04/25/13	ND	6.5	<0.5	1.1	2.1	--	0.35	0.120	<0.068
	09/19/13	ND	2.3	<0.5	<0.5	<1.5	--	0.11	0.160	<0.068
	06/24/14	ND	2.4	<0.5	<0.5	<1.5	--	0.120 J	0.083	<0.067
	12/16/14	ND	<6.0	<0.7	1.1	<2.4	--	0.460	0.130	<0.066
	06/18/15	ND	<3.0	<0.5	<0.5	<1.5	--	0.092	0.074	<0.066
	12/08/15	ND	<0.5	0.5	0.8	<1.5	--	0.460	0.092	<0.067
	06/14/16	ND	<0.5	<0.5	0.6	<1.5	--	0.290	0.150	<0.067
	01/13/17	ND	4.2	0.5	0.9	2.2	--	0.490	0.140	<0.067
	06/13/17	ND	2.0	<0.5	0.6	<1.5	--	0.340	0.080	<0.067
	11/08/17	ND	<4.0	<0.5	<0.5	<1.5	--	0.530	0.076	<0.110
	06/20/18	ND	<0.5	<0.5	<0.5	<1.5	--	0.370	0.110	<0.073
	12/13/18	**ND**	**<0.5**	**0.6**	**<0.5**	**<1.5**	**--**	**0.230**	**0.130**	**0.130**
MW-201	03/08/07	Sheen	0.50	<0.5	<0.5	<1.5	--	0.076	0.51	0.18
	06/07/07	ND	0.50	<0.5	<0.5	<1.5	--	0.08	0.53	0.17
Duplicate	06/07/07	ND	0.60	<0.5	<0.5	<1.5	--	0.069	0.39	0.13
	09/27/07	Sheen	<0.5	<0.5	<0.5	<1.5	--	0.076	0.810	0.470
	11/27/07	ND	0.6	<0.5	<0.5	<1.5	--	0.065	0.390	0.150
	02/12/08	ND	0.813	<0.500	<0.500	<1.00	--	0.111	<0.243	<0.485
	05/14/08	Sheen	0.616	<0.500	<0.500	<1.00	--	0.110	<0.236	<0.472
	09/05/08	ND	<0.500	0.517	<0.500	<1.00	--	0.153	<0.238	<0.476
	12/05/08	ND	2.24	0.511	<0.500	1.87	--	0.323	<0.248	<0.495
	02/17/09	ND	0.552	<0.500	<0.500	<1.00	--	0.0887	<0.263	<0.526
	05/13/09	ND	2.42	<0.500	<0.500	1.76	--	0.372	<0.250	<0.500
	09/11/09	ND	<0.500	<0.500	<0.500	1.4	--	0.43	<0.248	<0.495
	04/14/10	ND	<0.50	<0.50	<0.50	<2.0	--	0.15	0.17	<0.25
	09/22/10	ND	<0.50	<0.50	<0.50	1.1	--	0.27	0.47	<0.25
	04/26/11	ND	1.6	<0.50	<0.50	<1.0	--	0.18	--	--
	09/22/11	ND	3.6	<0.50	<0.50	1.4	--	0.22	0.33 [17]	<0.24
	04/18/12	ND	1.8	<0.50	<0.50	<1.0	--	0.14	0.29 [17]	<0.24
	10/11/12	ND	<0.50	0.61 [21]	<0.50	0.81	--	0.37	0.28 [17,19,20]	<0.24
	04/25/13	ND	1.7	0.9	<0.5	<1.5	--	0.14	0.049	<0.067
	09/19/13	ND	1.8	<0.5	<0.5	<1.5	--	0.13	0.075	<0.067
	06/23/14	ND	2.2	<0.5	<0.5	<1.5	--	0.210 J	0.068	<0.067
	12/16/14	ND	2.4	<0.7	0.6	2.3	--	0.450	0.063	<0.067
	06/18/15	ND	<2.0	<0.5	<0.5	<1.5	--	0.130	0.32	0.46
	12/08/15	ND	<0.5	<0.5	0.6	1.6	--	0.580	0.062	<0.066
Duplicate	12/08/15	ND	<0.5	<0.5	<0.5	<1.5	--	0.500	0.19	0.27
	06/14/16	ND	<0.5	<0.5	<0.5	<1.5	--	0.160	0.072	<0.068
	01/13/17	ND	2.6	<0.5	0.6	<1.5	--	0.400	0.062	<0.067
	06/13/17	ND	1.3	0.9	<0.5	<1.5	--	0.350	0.260	0.350
	11/08/17	ND	<3.0	0.5	<0.5	<1.5	--	0.370	0.053	<0.110
	06/20/18	ND	<0.5	<0.5	<0.5	<1.5	--	0.340	0.063	<0.067
	12/13/18	**ND**	**<0.5**	**<0.5**	**<0.5**	**<1.5**	**--**	**0.220**	**0.054**	**<0.100**
MW-202	03/08/07	ND	0.60	<0.5	<0.5	<1.5	--	0.16	0.18	<0.095
	06/07/07	ND	<0.5	<2.0 [16]	0.9	<1.5	--	0.072	0.150	<0.095
	09/27/07	ND	<0.5	<0.5	<0.5	<1.5	--	0.110	0.380	0.360
	11/26/07	ND	<0.5	<0.5	0.8	<1.5	--	0.100	0.290	0.120
	02/12/08	ND	<0.500	<0.500	0.751	<1.00	--	0.249	<0.240	<0.481
	05/13/08	ND	<0.500	<0.500	0.620	<1.00	--	0.188	<0.236	<0.472
	09/04/08	ND	<0.500	<0.500	1.55	<1.00	--	0.135	<0.238	<0.476
	12/04/08	ND	<0.500	<0.500	<0.500	1.34	--	0.132	<0.245	<0.490
	02/18/09	ND	<0.500	<0.500	0.583	<1.00	--	0.314	<0.245	<0.490
	05/13/09	ND	<0.500	<0.500	<0.500	<1.00	--	0.233	<0.243	<0.485
	09/11/09	ND	<0.500	<0.500	<0.500	<1.00	--	0.120	<0.245	<0.490
	04/14/10	ND	<0.50	<0.50	<0.50	<2.0	--	0.10	<0.12	<0.25
	09/22/10	ND	<0.50	<0.50	<0.50	<2.0	--	0.090	<0.12	<0.25
	04/27/11	ND	<0.50	<0.50	<0.50	<1.0	--	0.072	--	--
	04/28/11	ND	--	--	--	--	--	--	<0.12	<0.24
	09/21/11	ND	<0.50	<0.50	<0.50	<1.0	--	<0.050	0.18 [17]	<0.24
	04/18/12	ND	<0.50	<0.50	<0.50	<1.0	--	0.074	0.24 [17]	<0.24
	10/11/12	ND	<0.50	<0.50	<0.50	<0.50	--	0.100	0.19 [17,19,20]	<0.24
	04/25/13	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	<0.031	<0.073
	09/19/13	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	<0.030	<0.069
	06/23/14	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050 UJ	<0.029	<0.067
	12/16/14	ND	<0.5	<0.5	<0.5	<1.5	--	0.052	<0.028	<0.066
	06/18/15	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	<0.028	<0.066
	12/08/15	ND	<0.5	<0.5	<0.5	<1.5	--	0.064	<0.029	<0.068
	06/14/16	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	<0.029	<0.068
	01/13/17	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	<0.030	<0.070
	06/13/17	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	<0.028	<0.066
	11/08/17	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	<0.046	<0.100
	06/20/18	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	<0.031	<0.072
	12/13/18	**ND**	**<0.5**	**<0.5**	**<0.5**	**<1.5**	**--**	**<0.019**	**<0.046**	**<0.100**
Duplicate	**12/13/18**	**ND**	**<0.5**	**<0.5**	**<0.5**	**<1.5**	**--**	**<0.019**	**<0.045**	**<0.100**
MW-203	03/08/07	ND	<0.5	<0.5	<0.5	<1.5	--	<0.048	0.32	<0.095
	06/07/07	ND	<0.5	<0.5	<0.5	<1.5	--	<0.0500	0.150	<0.097
	09/28/07	ND	<0.5	<0.5	<0.5	<1.5	--	<0.500	0.400	0.270
	11/27/07	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	0.290	<0.100
	02/12/08	ND	<0.500	<0.500	<0.500	<1.00	--	<0.050	<0.240	<0.481
Duplicate	02/12/08	ND	<0.500	<0.500	<0.500	<1.00	--	<0.050	<0.236	<0.472
	05/14/08	ND	<0.500	<0.500	<0.500	<1.00	--	<0.050	<0.243	<0.485
Duplicate	05/14/08	ND	<0.500	<0.500	<0.500	<1.00	--	<0.050	--	--
	09/03/08	ND	<0.500	<0.500	<0.500	<1.00	--	<0.050	<0.236	<0.472
	12/04/08	ND	<0.500	<0.500	<0.500	<1.00	--	<0.050	<0.240	<0.481
	02/17/09	ND	<0.500	<0.500	<0.500	<1.00	--	<0.050	<0.236	<0.472
	05/13/09	ND	<0.500	<0.500	<0.500	<1.00	--	<0.050	<0.243	<0.485
	09/11/09	ND	<0.500	<0.500	<1.00	<1.00	--	0.082	<0.248	<0.495
	04/14/10	ND	<0.50	<0.50	<0.50	<2.0	--	<0.050	<0.12	<0.25
	09/22/10	ND	<0.50	<0.50	<0.50	<2.0	--	0.058	<0.12	<0.24
	04/27/11	ND	<0.50	<0.50	<0.50	<1.0	--	<0.050	--	--
	04/28/11	ND	--	--	--	--	--	--	<0.12	<0.24
	09/21/11	ND	<0.50	<0.50	<0.50	<1.0	--	<0.050	<0.12	<0.25
	04/18/12	ND	<0.50	<0.50	<0.50	<1.0	--	<0.050	0.14 [17]	<0.24
	10/11/12	ND	<0.50	<0.50	<0.50	<0.50	--	<0.025	0.22 [17,19,20]	<0.24
	04/25/13	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	<0.031	<0.072
	09/19/13	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	<0.029	<0.068

Appendix C
Historical Summary of Groundwater Analytical Data
Total Petroleum Hydrocarbons

Former Unocal Seattle Marketing Terminal
3001 Elliott Avenue
Seattle, Washington

Monitoring Well[1]	Date Sampled	LNAPL[2]	BTEX (EPA Method 8020 or 8021B) (µg/L)				TPH (EPA Method 418.1) (mg/L)	NWTPH-Gx (mg/L)	NWTPH-D Extended[3] (mg/L)	
			B	T	E	X		Gasoline C_7 - C_{12}	Diesel C_{12} - C_{24}	Heavy Oil >C_{24}
MW-203 (continued)	06/24/14	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050 UJ	<0.029	<0.067
Duplicate	06/24/14	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050 UJ	<0.029	<0.067
	12/16/14	ND	<0.5	<0.5	<0.5	<1.5	--	0.110	0.032	<0.067
	06/18/15	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	<0.029	<0.069
	12/07/15	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	<0.030	<0.069
	06/15/16	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	0.047	<0.067
Duplicate	06/15/16	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	0.035	<0.067
	01/13/17	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	<0.029	<0.069
	06/13/17	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	<0.029	<0.067
	11/08/17	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	<0.046	<0.100
	06/20/18	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	0.037	<0.068
	12/13/18	**ND**	**<0.5**	**<0.5**	**<0.5**	**<1.5**	**--**	**0.032**	**0.054**	**<0.100**
MW-204	03/08/07	Sheen	1.00	0.9	<0.5	<1.5	--	0.47	0.89	0.14
	06/07/07	ND	1.40	1.8	<0.5	2.6	--	0.670	1.400	0.170
	09/28/07	ND	0.70	0.9	<0.5	1.6	--	0.640	1.000	0.260
	11/27/07	ND	0.9	0.8	0.9	<5.0[16]	--	0.670	0.700	0.160
	02/12/08	ND	1.76	1.09	<0.500	2.12	--	0.713	<0.240	<0.481
	05/14/08	ND	1.32	1.71	<0.500	4.17	--	0.782	0.310	0.784
	09/03/08	ND	4.42	1.06	3.07	1.47	--	1.070	0.384	<0.476
	10/01/08	ND	--	--	--	--	--	0.796	--	--
	12/04/08	ND	1.45	1.20	1.05	4.22	--	0.869	0.291	<0.495
	02/17/09	ND	1.48	1.32	1.82	7.50	--	1.060	0.341	<0.500
Duplicate	02/17/09	ND	1.54	1.30	1.81	7.45	--	1.120	0.332	<0.556
	05/13/09	ND	1.93	1.55	1.86	4.79	--	1.190	0.593	<0.500
Duplicate	05/13/09	ND	1.82	1.58	1.88	7.70	--	1.230	0.553	<0.556
	09/11/09	ND	<0.500	1.10	<0.500	1.8	--	1.200	0.396	<0.495
Duplicate	09/11/09	ND	<0.500	1.10	<0.500	1.8	--	1.100	0.393	<0.495
	04/14/10	ND	1.1	2.1	<0.50	3.6	--	1.5	1.2	0.84
Duplicate	04/14/10	ND	1.1	2.1	<0.50	3.7	--	1.5	1.1	<0.25
	09/22/10	ND	<0.50	1.5	<0.50	3.2	--	1.3	1.5	<0.25
	04/26/11	ND	1.6	1.5	<0.50	3.9	--	0.71	--	--
Duplicate	04/26/11	ND	1.9	1.7	<0.50	5.0	--	1.0	--	--
	04/28/11	ND	--	--	--	--	--	--	0.69	<0.24
Duplicate	04/28/11	ND	--	--	--	--	--	--	0.58	<0.24
	09/22/11	ND	1.7	1.6	<0.50	6.1	--	0.92	0.88[17]	<0.25
Duplicate	09/22/11	ND	1.7	1.8	<0.50	6.5	--	0.92	0.65[17]	<0.24
MW-204-NEAR	09/22/11	ND	1.7	1.7	<0.50	6.3	--	0.94	0.91[17]	<0.25
	04/18/12	ND	1.6	1.7	<0.50	4.1	--	0.69	1.2[17]	0.64[17]
Duplicate	04/18/12	ND	2.0	1.7	<0.50	5.3	--	0.87	1.2[17]	1.4[17]
MW-204-NEAR	04/18/12	ND	2.0	1.8	<0.50	5.3	--	0.90	1.2[17]	1.6[17]
Duplicate	04/18/12	ND	2.0	1.8	<0.50	5.3	--	0.90	1.3[17]	2.8[17]
	10/12/12	ND	<0.50	1.3	<0.50	2.3	--	0.95	0.6[17,19,20]	<0.24
Duplicate	10/12/12	ND	<0.50	1.2	<0.50	2.3	--	0.62	0.62[17,19,20]	<0.24
MW-204-NEAR	10/12/12	ND	<0.50	1.3	<0.50	2.4	--	0.71	0.51[17,19,20]	<0.24
	04/26/13	ND	0.7	2.2	1.6	4.6	--	0.89	0.24	<0.067
Duplicate	04/26/13	ND	0.7	2.2	1.7	4.9	--	0.88	0.32	0.077
	09/19/13	ND	1.1	1.5	1.1	3.5	--	0.58	0.31	<0.067
	06/24/14	ND	1.0	1.4	<0.5	2.6	--	0.600 J	0.24	<0.066
	07/25/14	ND	--	--	--	--	--	0.880	--	--
Duplicate	07/25/14	ND	--	--	--	--	--	0.90	--	--
	12/16/14	ND	0.9	1.5	1.3	<6.0	--	0.990	0.240	<0.066
Duplicate	12/16/14	ND	0.9	1.5	1.2	<6.0	--	1.000	0.200	<0.066
	06/18/15	ND	<0.5	0.9	0.6	<3.0	--	0.430	0.250	<0.069
	12/09/15	ND	1.0	1.6	1.4	3.8	--	1.400	0.190	<0.069
	01/15/16	ND	0.9	1.4	<1.2	3.5	--	1.400	0.840	0.4
Duplicate	01/15/16	ND	0.9	1.4	<1.1	3.5	--	1.400	0.210	<0.070
	06/13/16	ND	<0.5	1.6	1.4	2.9	--	0.890	0.210	<0.067
	01/13/17	ND	<0.5	1.4	1.3	3.3	--	1.400	0.260	<0.068
	06/13/17	ND	0.7	1.1	<0.5	2.3	--	1.200	0.170	<0.067
	11/08/17	ND	<0.9	1.2	1.2	2.3	--	1.000	0.160	<0.100
	06/20/18	ND	<0.5	1.2	1.2	2.4	--	1.200	0.230	<0.066
	12/13/18	**ND**	**<0.5**	**1.1**	**0.9**	**2.0**	**--**	**0.830**	**0.075**	**<0.100**
MW-205	03/08/07	ND	<0.5	<0.5	<0.5	<1.5	--	<0.048	0.18	<0.095
	06/07/07	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	0.098	<0.100
	09/28/07	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	<0.081	<0.100
	11/27/07	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	0.120	0.560
	02/12/08	ND	<0.500	<0.500	<0.500	<1.00	--	<0.050	<0.248	0.529
	05/14/08	ND	<0.500	<0.500	<0.500	<1.00	--	<0.050	<0.238	<0.476
	09/03/08	ND	<0.500	<0.500	<0.500	<1.00	--	<0.050	<0.240	<0.481
	12/05/08	ND	<0.500	<0.500	<0.500	<1.00	--	<0.050	<0.236	<0.472
	02/17/09	ND	<0.500	<0.500	<0.500	<1.00	--	<0.050	<0.248	<0.495
	05/13/09	ND	<0.500	<0.500	<0.500	<1.00	--	<0.050	<0.245	<0.490
	09/11/09	ND	<0.500	<0.500	<0.500	<1.00	--	0.1	<0.248	<0.495
	04/14/10	ND	<0.50	<0.50	<0.50	<2.0	--	0.051	<0.12	<0.25
	09/22/10	ND	<0.50	<0.50	<0.50	<2.0	--	0.082	0.15	<0.25
	04/26/11	LNAPL	--	--	--	--	--	--	--	--
	09/22/11	ND	<0.50	<0.50	<0.50	<1.0	--	0.07	<0.12	<0.25
MW-205-NEAR	09/22/11	ND	<0.50	<0.50	<0.50	<1.0	--	<0.050	<0.12	<0.25
	04/18/12	ND	<0.50	<0.50	<0.50	<1.0	--	<0.050	0.16[17]	<0.24
Duplicate	04/18/12	ND	<0.50	<0.50	<0.50	<1.0	--	<0.050	0.25[17]	0.44[17]
MW-205-NEAR	04/18/12	ND	<0.50	<0.50	<0.50	<1.0	--	<0.050	7.4[17]	4.8[17]
	10/12/12	ND	<0.50	<0.50	<0.50	<0.50	--	0.027	0.23[17,19,20]	<0.24
Duplicate	10/12/12	ND	<0.50	<0.50	<0.50	<0.50	--	0.035	0.54[17,19,20]	0.34[17]
MW-205-NEAR	10/12/12	ND	<0.50	<0.50	<0.50	<0.50	--	0.036	0.30[17,19,20]	<0.24
	04/26/13	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	<0.030	<0.069
	09/19/13	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	<0.029	<0.067
Duplicate	09/19/13	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	<0.029	<0.067
	06/24/14	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050 UJ	<0.028	<0.066
	12/16/14	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	<0.028	<0.066
	06/18/15	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	<0.028	<0.066
Duplicate	06/18/15	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	<0.028	<0.066
	12/09/15	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	<0.031	<0.072
	06/13/16	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	0.05	<0.068
	01/13/17	MD	<0.5	<0.5	<0.5	<1.5	--	<0.050	0.089	<0.071
	06/13/17	ND	<0.5	<0.5	<0.5	<1.5	--	0.28	<0.029	<0.067
	11/08/17	ND	<0.5	<0.5	<0.5	<1.5	--	0.071	<0.046	<0.100
	06/20/18	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	0.035	<0.070
	12/13/18	**ND**	**<0.5**	**<0.5**	**<0.5**	**<1.5**	**--**	**<0.019**	**<0.045**	**<0.100**
MW-206	03/08/07	ND	<0.5	<0.5	<0.5	<1.5	--	<0.048	<0.075	<0.094
	06/07/07	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	<0.076	<0.095
	09/27/07	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	<0.076	<0.095
	11/27/07	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	<0.077	<0.096
	02/12/08	ND	<0.500	<0.500	<0.500	<1.00	--	<0.050	<0.236	<0.472
	05/13/08	ND	<0.500	<0.500	<0.500	<1.00	--	<0.050	<0.250	<0.505
	09/04/08	ND	<0.500	<0.500	<0.500	<1.00	--	<0.050	<0.240	<0.481
Duplicate	09/04/08	ND	<0.500	<0.500	<0.500	<1.00	--	<0.050	<0.240	<0.481
	12/04/08	ND	<0.500	<0.500	<0.500	<1.00	--	<0.050	<0.236	<0.472
Duplicate	12/04/08	ND	<0.500	<0.500	<0.500	<1.00	--	<0.050	<0.236	<0.472
	02/18/09	ND	<0.500	<0.500	<0.500	<1.00	--	<0.050	<0.278	<0.556
	05/12/09	ND	<0.500	<0.500	<0.500	<1.00	--	<0.050	<0.278	<0.556
	09/11/09	ND	<0.500	<0.500	<0.500	<1.00	--	<0.050	<0.248	<0.495

Appendix C
Historical Summary of Groundwater Analytical Data
Total Petroleum Hydrocarbons

Former Unocal Seattle Marketing Terminal
3001 Elliott Avenue
Seattle, Washington

Monitoring Well[1]	Date Sampled	LNAPL[2]	BTEX (EPA Method 8020 or 8021B) (µg/L)				TPH (EPA Method 418.1) (mg/L)	NWTPH-Gx (mg/L)	NWTPH-D Extended[3] (mg/L)	
			B	T	E	X		Gasoline C_7 - C_{12}	Diesel C_{12} - C_{24}	Heavy Oil >C_{24}
MW-206 (continued)	04/13/10	ND	<0.50	<0.50	<0.50	<2.0	--	<0.050	--	--
	04/14/10	ND	--	--	--	--	--	--	<0.12	<0.24
	09/22/10	ND	<0.50	<0.50	<0.50	<2.0	--	<0.050	<0.12	<0.25
	04/27/11	ND	<0.50	<0.50	<0.50	<1.0	--	<0.050	--	--
	04/28/11	ND	--	--	--	--	--	--	<0.12	<0.24
	09/21/11	ND	<0.50	<0.50	<0.50	<1.0	--	<0.050	<0.12	<0.24
	04/18/12	ND	<0.50	<0.50	<0.50	<1.0	--	<0.050	<0.12	<0.24
	10/11/12	ND	<0.50	<0.50	<0.50	<0.50	--	<0.025	0.16 [17,19,20]	<0.24
	04/25/13	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	<0.029	<0.067
	09/19/13	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	<0.029	<0.069
	06/23/14	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050 UJ	<0.029	<0.067
	12/16/14	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	<0.028	<0.066
	06/17/15	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	<0.029	<0.068
	12/08/15	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	<0.029	<0.067
	06/14/16	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	<0.028	<0.066
	01/13/17	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	<0.028	<0.066
	06/13/17	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	<0.029	<0.067
Duplicate	06/13/17	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	<0.030	<0.069
	11/08/17	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	<0.048	<0.110
	06/20/18	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	<0.028	<0.066
	12/13/18	**ND**	**<0.5**	**<0.5**	**<0.5**	**<1.5**	**--**	**<0.019**	**0.050**	**<0.100**
MW-207	03/08/07	ND	<0.5	<0.5	0.9	<1.5	--	<0.048	0.12	<0.095
Duplicate	03/08/07	ND	<0.5	<0.5	1.1	<1.5	--	<0.048	0.15	<0.095
	06/07/07	ND	<0.5	<0.5	<0.5	<1.5	--	<0.05	<0.077	<0.096
	09/27/07	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	<0.081	<0.10
	11/27/07	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	<0.076	<0.095
	02/12/08	ND	<0.500	<0.500	<0.500	<1.00	--	<0.050	<0.248	<0.495
	05/13/08	ND	<0.500	<0.500	<0.500	<1.00	--	<0.050	<0.250	<0.500
	09/04/08	ND	<0.500	<0.500	<0.500	<1.00	--	<0.050	<0.238	<0.476
	12/03/08	ND	<0.500	<0.500	<0.500	<1.00	--	<0.050	<0.238	<0.476
	02/18/09	ND	<0.500	<0.500	<0.500	<1.00	--	<0.050	<0.248	<0.495
	05/12/09	ND	<0.500	<0.500	<0.500	<1.00	--	<0.050	<0.250	<0.500
	09/11/09	ND	<0.500	<0.500	<0.500	<1.00	--	<0.050	<0.248	<0.495
	04/14/10	ND	<0.50	<0.50	<0.50	<2.0	--	<0.050	<0.12	<0.24
	09/21/10	ND	<0.50	<0.50	<0.50	<2.0	--	<0.050	<0.12	<0.24
Duplicate	09/21/10	ND	<0.50	<0.50	<0.50	<2.0	--	0.092	<0.12	<0.25
	04/27/11	ND	<0.50	<0.50	<0.50	<1.0	--	<0.050	--	--
	04/28/11	ND	--	--	--	--	--	--	<0.12	<0.24
	09/21/11	ND	<0.50	<0.50	<0.50	<1.0	--	<0.050	<0.12	<0.24
	04/18/12	ND	<0.50	<0.50	<0.50	<1.0	--	<0.050	<0.12	<0.24
	10/11/12	ND	<0.50	<0.50	<0.50	<0.50		<0.025	0.15 [17,19,20]	<0.24
	04/25/13	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	<0.029	<0.068
	09/19/13	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	<0.029	<0.067
	06/23/14	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050 UJ	<0.028	<0.066
	12/16/14	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	<0.028	<0.066
	06/17/15	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	<0.028	<0.066
	12/08/15	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	<0.028	<0.066
	06/14/16	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	<0.029	<0.068
	01/13/17	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	<0.029	<0.067
Duplicate	01/13/17	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	0.130	1.700
	06/13/17	ND	<0.5	<0.5	<0.5	<1.5	--	0.071	0.031	<0.067
	11/08/17	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	<0.046	<0.110
Duplicate	11/08/17	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	<0.046	<0.110
	06/20/18	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	<0.028	<0.066
	12/13/18	**ND**	**<0.5**	**<0.5**	**<0.5**	**<1.5**	**--**	**<0.019**	**<0.046**	**<0.100**
MW-209	02/16/16	ND	1.4	1.2	1.3	4.2	--	1.600	0.150	<0.067
	06/13/16	ND	1.5	1.3	1.6	3.7	--	0.930	0.200	<0.066
	09/22/16	ND	0.9	0.9	<1.1	2.9	--	0.990	0.140	<0.072
	01/12/17	ND	1.3	1.3	1.4	3.6	--	1.400	0.140	<0.072
	03/27/17	ND	1.5	1.4	1.5	3.3	--	0.920	0.190	<0.068
	06/16/17	ND	1.1	0.8	<0.5	2.4	--	1.300	0.730	0.230
MW-210	02/16/16	ND	<0.5	1.1	1.4	4.7	--	2.500	8.600	1.600
	06/13/16	ND	<0.5	1.6	<0.5	5.1	--	2.100	3.200	0.510
	09/22/16	ND	1.3	1.1	1.3	4.7	--	2.100	2.300	0.390
	01/12/17	ND	<0.5	1.1	<0.5	<1.5	--	0.130	0.037	<0.070
	03/27/17	ND	<0.5	<0.5	<0.5	<1.5	--	0.220	1.500	0.320
Duplicate	03/27/17	ND	<0.5	<0.5	<0.5	<1.5	--	0.160	0.200	<0.066
	06/16/17	ND	<0.5	0.5	0.6	2.6	--	1.200	2.800	0.550
MW-211	02/16/16	ND	<0.5	<0.5	<0.5	<1.5	--	0.210	0.069	<0.067
	06/13/16	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	0.084	<0.068
	09/22/16	ND	<0.5	<0.5	<0.5	<1.5	--	0.100	0.062	<0.069
	01/12/17	ND	<0.5	<0.5	<0.5	<1.5	--	0.065	0.049	<0.070
	03/27/17	ND	<0.5	<0.5	<0.5	<1.5	--	<0.050	0.061	<0.067
	06/16/17	ND	<0.5	<0.5	<0.5	<1.5	--	0.130	0.081	<0.066
Duplicate	06/16/17	ND	<0.5	<0.5	<0.5	<1.5	--	0.130	0.072	<0.067

Notes:
[1]Monitoring well locations are shown in Figure 2.
[2]LNAPL = light nonaqueous phase liquid.
[3]For December 2000 through June 2002, samples were first analyzed without the sulfuric acid/silica gel cleanup procedure (first or only result). If analytes were detected, the sulfuric acid/silica gel cleanup procedure was performed (second result). For September 2002 and after, samples obtained from Upper Yard wells were analyzed without the sulfuric acid/silica gel cleanup procedure, and samples obtained from Elliott Avenue and Offsite Area wells were analyzed with the sulfuric acid/silica gel cleanup procedure.
[4]According to the laboratory, the sample chromatogram does not resemble the gasoline standard.
[5]According to the laboratory, sample contains diesel-range hydrocarbons that extend into the hydrocarbon range quantified as gasoline.
[6]Due to an error in the identification of two sets of samples, (MW-64 and Dup 121699), the results from the sampling date of 01/04/00 were not considered reliable. The 12/26/99 results were not reported by the laboratory and a resampling took place.
[7]Due to an extraction anomaly during the silica gel cleanup procedure, a second analytical result is not available for this sample.
[8]After review of field procedures and historic analytical results, the sample appears to have been cross-contaminated in the field or in the laboratory.
[9]BTEX and gasoline-range hydrocarbon analyses were completed outside of the recommended holding time. Results should be qualified as estimated.
[10]Samples were extracted 3 or 4 days after expiration of the recommended holding time.
[11]Results should be considered bias low or estimated due to laboratory QA/QC exception.
[12]MW-30 was not sampled between July 1989 and September 1990 because of the presence of free product.
[13]Due to an extraction anomaly, the surrogate recoveries in the WTPH-D extended analyses were outside the established control limits and the results should be considered a low estimated value, according to the laboratory.
[14]The 03/23/99 data for diesel-range hydrocarbons (20.8/14.6 mg/L) for MW-84 appeared anomalous due to field sample handling or laboratory analytical error. The well was resampled on 04/01/99.
[15]Due to a lab error, the sample extract evaporated before testing and was not analyzed with the silica gel cleanup.
[16]Due to the presence of an interferent near its retention time, the normal reporting limit was not attained for this compound. The presence of or concentration cannot be determined.
[17]The chromatographic response resembles a typical fuel pattern.
[18]Sample was reanalyzed due to a surrogate failure. The surrogates were within QC limits in the reanalysis.
[19]Instrument related QC exceeds the control limits.
[20]Compound was found in the blank and sample.
[21]The %RDP between the primary and confirmation column/detector is 40%. The lower value has been reported.

µg/L = micrograms per liter mg/L = milligrams per liter ND = not detected RAL = remedial action level -- = not tested

Appendix C
Historical Summary of Groundwater Analytical Data
Carcinogenic Polycyclic Aromatic Hydrocarbons

Former Unocal Seattle Marketing Terminal
3001 Elliott Avenue
Seattle, Washington

OFFSITE AREA		Carcinogenic PAHs[2,3] (µg/L)								Noncarcinogenic PAHs[2] (µg/L)								
Monitoring Well[1]	**Sample Date**	**Benzo(a)anthracene**	**Benzo(a)pyrene**	**Benzo(b)fluoranthene**	**Benzo(k)fluoranthene**	**Chrysene**	**Dibenzo(a,h)anthracene**	**Indeno(1,2,3-cd)pyrene**	**Total CPAHs[4]**	**Acenaphthene**	**Acenaphthylene**	**Anthracene**	**Benzo(g,h,i)perylene**	**Fluoranthene**	**Fluorene**	**Naphthalene[4]**	**Phenanthrene**	**Pyrene**
RAL		**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**
MW-27	12/13/02	0.0282	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	0.0282	0.398	<0.100	<0.100	<0.100	0.149	<0.100	<0.100	<0.100	<0.100
	06/19/03	0.0639	<0.0100	<0.0100	<0.0100	<0.0100	0.0288	0.0232	0.1159	3.46	<0.100	0.226	<0.100	0.963	0.296	0.188	0.357	0.952
	12/03/03	0.0266	<0.0100	<0.0100	<0.0100	0.0195	<0.0100	<0.0100	0.0461	--	--	--	--	--	--	<0.100	--	--
	06/03/04	0.0357	<0.0100	<0.0100	<0.0100	0.0276	<0.0100	<0.0100	0.0633	2.66	<0.100	0.178	<0.100	0.962	0.348	0.821	0.299	0.826
	12/06/04	0.0286	<0.0100	<0.0100	<0.0100	0.0190	<0.0100	<0.0100	0.0476	1.57	<0.100	<0.100	<0.100	0.269	<0.100	<0.100	<0.100	0.488
	06/03/05	0.0709	0.0127	0.0157	0.0166	0.0440	<0.0100	<0.0100	0.1499	2.01	<0.100	<0.100	<0.100	0.995	<0.100	<0.100	<0.100	1.21
	12/01/05	0.0921	0.0576	0.0649	0.0393	0.0698	<0.0100	0.0444	0.3681	--	--	--	--	--	--	--	--	--
	03/08/07	<0.02	<0.02	<0.02	<0.009	<0.02	<0.02	<0.02	<0.129	--	--	--	--	--	--	--	--	--
MW-27R	09/26/07	<0.0098	<0.0098	<0.0098	<0.0098	<0.0098	<0.0098	<0.0098	<0.0098	--	--	--	--	--	--	0.079 [5]	--	--
	11/27/07	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	0.19	--	--
MW-30	04/26/13	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	--	--	--
	12/14/18	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.02**	**<0.01**	**<0.02**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**
MW-61A-R	**12/14/18**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.02**	**<0.01**	**<0.02**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**
MW-67	06/19/03	0.0769	0.0195	<0.0100	<0.0100	0.0278	0.0849	0.0730	0.2821	1.99	<0.100	0.242	<0.100	0.602	0.106	<0.100	0.229	0.549
	12/03/03	0.0284	0.0101	<0.0100	0.0106	0.0337	<0.0100	<0.0100	0.0828	--	--	--	--	--	--	0.133	--	--
	06/03/04	0.0362	<0.0100	<0.0100	0.0132	0.0389	<0.0100	<0.0100	0.0883	1.25	<0.100	0.152	<0.100	0.839	<0.100	<0.100	<0.100	0.763
	12/06/04	0.0273	<0.0100	<0.0100	<0.0100	0.0258	<0.0100	<0.0100	0.0531	0.930	<0.100	<0.100	<0.100	0.342	<0.100	<0.100	<0.100	0.519
	03/04/05	0.0293	0.01	0.01	0.01	0.0221	0.01	0.01	0.0514	0.793	<0.100	0.148	<0.100	0.518	<0.100	<0.100	<0.100	0.511
	06/03/05	0.0323	<0.0100	<0.0100	<0.0100	0.0262	<0.0100	<0.0100	0.0585	0.714	<0.100	<0.100	<0.100	0.816	<0.100	<0.100	<0.100	0.843
MW-70R	02/16/16	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	--	--	--
Duplicate	02/16/16	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	--	--	--
	06/14/16	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	<0.030	--	--
	09/22/16	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	--	--	--	--	--	--	<0.033	--	--
	01/12/17	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	--	--	--	--	--	--	--	--	--
Duplicate	01/12/17	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	--	--	--	--	--	--	--	--	--
	03/27/17	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	--	--	--
	06/13/17	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	--	--	--
	11/08/17	0.018	0.015	0.026	0.018	0.019	0.019	0.015	0.13	--	--	--	--	--	--	--	--	--
	03/26/18	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	--	--	--	--	--	--	--	--	--
Duplicate	03/26/18	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	--	--	--	--	--	--	--	--	--
	06/20/18	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.01	--	--	--	--	--	--	--	--	--
Duplicate	06/20/18	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.01	--	--	--	--	--	--	--	--	--
	09/27/18	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.02**	**<0.01**	**<0.02**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**
Duplicate	**09/27/18**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.02**	**<0.01**	**<0.02**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**
	12/13/18	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.02**	**<0.01**	**<0.02**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**
MW-76	12/13/02	0.0247	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	0.0247	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
	06/19/03	0.0824	0.0262	<0.0100	<0.0100	0.0258	0.0718	0.0589	0.2651	0.484	<0.100	<0.100	<0.100	0.628	<0.100	<0.100	<0.100	0.342
	12/03/03	0.0194	<0.0100	0.0107	<0.0100	0.0172	<0.0100	<0.0100	0.0473	--	--	--	--	--	--	<0.100	--	--
	06/03/04	<0.0100	<0.0100	0.0104	<0.0100	0.0253	<0.0100	<0.0100	0.0357	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
	12/06/04	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
	06/03/05	0.0725	0.0528	0.0448	0.0452	0.0797	0.0142	0.0267	0.3359	<0.100	<0.100	<0.100	<0.100	0.482	<0.100	<0.100	<0.100	0.369
MW-200	06/07/07	<1	<1	<1	<1	<1	<1	<1	<7	22	<1	<1	<1	<1	6	31	1	<1
	07/06/07	0.01	<0.0095	<0.0095	<0.0095	<0.0095	<0.0095	<0.0095	0.01	20	<0.30	0.51	<0.0095	0.7	5	24	0.93	0.46
	09/26/07	0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	0.011	--	--	--	--	--	--	24 [5]	--	--
Duplicate	9/26/07[D]	0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	0.011	--	--	--	--	--	--	22 [5]	--	--
	11/28/07	0.012	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.012	--	--	--	--	--	--	31	--	--
	02/13/08	0.0126	<0.00990	<0.00990	<0.00990	0.0137	<0.00990	<0.00990	0.0263	--	--	--	--	--	--	--	--	--
	05/13/08	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	--	--	--	--	--	--	--	--	--
Filtered	05/13/08	<0.0101	<0.0101	<0.0101	<0.0101	<0.0101	<0.0101	<0.0101	<0.0101	--	--	--	--	--	--	--	--	--
	09/03/08	<0.00943	<0.00943	<0.00943	<0.00943	<0.00943	<0.00943	<0.00943	<0.00943	--	--	--	--	--	--	--	--	--
Filtered	09/03/08	<0.0476	<0.0476	<0.0476	<0.0476	<0.0476	<0.0476	<0.0476	<0.0476	--	--	--	--	--	--	--	--	--
	12/04/08	<0.00943	<0.00943	<0.00943	<0.00943	<0.00943	<0.00943	<0.00943	<0.00943	--	--	--	--	--	--	--	--	--
Filtered	12/04/08	<0.00962	<0.00962	<0.00962	<0.00962	<0.00962	<0.00962	<0.00962	<0.00962	--	--	--	--	--	--	--	--	--
	02/18/09	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	--	--	--	--	--	--	--	--	--
Filtered	02/18/09	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	--	--	--	--	--	--	--	--	--
	05/13/09	<0.0111	<0.0111	<0.0111	<0.0111	<0.0111	<0.0111	<0.0111	<0.0111	--	--	--	--	--	--	--	--	--
Filtered	05/13/09	<0.0111	<0.0111	<0.0111	<0.0111	<0.0111	<0.0111	<0.0111	<0.0111	--	--	--	--	--	--	--	--	--
	09/11/09	<0.0111	<0.0220	<0.0111	<0.0111	<0.0111	<0.0111	<0.0111	<0.0220	--	--	--	--	--	--	--	--	--
Filtered	09/11/09	<0.0111	<0.0111	<0.0111	<0.0111	<0.0111	<0.0111	<0.0111	<0.0111	--	--	--	--	--	--	--	--	--
	04/14/10	<0.0099	<0.020	<0.0099	<0.0099	<0.0099	<0.0099	<0.0099	<0.020	--	--	--	--	--	--	--	--	--
Filtered	04/14/10	<0.0099	<0.020	<0.0099	<0.0099	<0.0099	<0.0099	<0.0099	<0.020	--	--	--	--	--	--	--	--	--
	09/22/10	0.013	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.013	--	--	--	--	--	--	--	--	--
Filtered	09/22/10	<0.0099	<0.020	<0.0099	<0.0099	<0.0099	<0.0099	<0.0099	<0.020	--	--	--	--	--	--	--	--	--
	04/26/11	<0.094	<0.19	<0.094	<0.094	<0.094	<0.094	<0.094	<0.19	17	0.26	0.77	<0.094	1.3	5.5	13	4.7	0.88
Filtered	04/26/11	<0.094	<0.19	<0.094	<0.094	<0.094	<0.094	<0.094	<0.19	13	0.22	0.24	<0.094	<0.094	3.1	11	1.5	<0.094
Original	9/22/11 [9]	<0.0094	<0.019	<0.0094	<0.0094	<0.0094	<0.0094	<0.0094	<0.19	2.5	0.26	0.16	<0.0094	0.043	2.5	0.70	1.1	0.039
Original Duplicate	9/22/11[D]	0.010	<0.020	<0.0099	<0.0099	<0.0099	<0.0099	<0.0099	0.010	19	0.19	1.1	<0.0099	1.4	6.6	8.50	4.7	1.0
Re-Analysis	9/22/11[7]	<0.0094	<0.019	<0.0094	<0.0094	<0.0094	<0.0094	<0.0094	<0.019	2.6	0.25	0.16	<0.0094	0.045	2.6	0.80	1.3	0.042

Appendix C
Historical Summary of Groundwater Analytical Data
Carcinogenic Polycyclic Aromatic Hydrocarbons

Former Unocal Seattle Marketing Terminal
3001 Elliott Avenue
Seattle, Washington

OFFSITE AREA		Carcinogenic PAHs[2,3] (µg/L)								Noncarcinogenic PAHs[2] (µg/L)								
Monitoring Well[1]	Sample Date	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Indeno(1,2,3-cd)pyrene	Total CPAHs[4]	Acenaphthene	Acenaphthylene	Anthracene	Benzo(g,h,i)perylene	Fluoranthene	Fluorene	Naphthalene[4]	Phenanthrene	Pyrene
RAL		**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**
MW-200 (continued) Filtered	9/22/11[9]	<0.0094	<0.019	<0.0094	<0.0094	<0.0094	<0.0094	<0.0094	<0.019	12	0.12	0.57	<0.0094	0.69	2.8	6.60	2.5	0.52
Duplicate Filtered	9/22/11[D]	<0.0098	<0.020	<0.0098	<0.0098	<0.0098	<0.0098	<0.0098	<0.020	14	0.15	0.57	<0.0098	0.74	3.6	7.00	3.0	0.56
Re-Analysis Filtered	9/22/11[7]	<0.0094	<0.019	<0.0094	<0.0094	<0.0094	<0.0094	<0.0094	<0.019	15	0.16	0.61	<0.0094	0.76	4.0	6.80	3.5	0.57
	04/18/12	<0.019	<0.0096	<0.019	<0.019	<0.019	<0.019	<0.019	<0.038	24[DL]	0.28	0.94	<0.019	1.4	7.8	18[DL]	5.4	1.0
Filtered	04/18/12	<0.019	<0.0096	<0.019	<0.019	<0.019	<0.019	<0.019	<0.038	5.5	0.054	0.046	<0.019	<0.019	0.085	10[DL]	0.036	<0.019
	10/11/12	0.01	<0.019	<0.0095	<0.0095	<0.0095	<0.0095	<0.0095	0.01	23	0.23	0.92	<0.0095	1.00	4.4	8.6	4.4	0.73
Filtered	10/11/12	<0.0095	<0.019	<0.0095	<0.0095	<0.0095	<0.0095	<0.0095	<0.019	14	0.093	0.07	<0.0095	<0.0095	0.73	5.5	0.0099	<0.0095
	04/25/13	0.011	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.011	--	--	--	--	--	--	--	--	--
	09/19/13	0.011	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.011	--	--	--	--	--	--	--	--	--
	06/24/14	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	--	--	--
	12/16/14	0.011	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.011	--	--	--	--	--	--	--	--	--
	06/18/15	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	--	--	--
	12/08/15	0.017	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.017	--	--	--	--	--	--	--	--	--
	06/14/15	0.011	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.011	--	--	--	--	--	--	8.36	--	--
	01/13/17	0.012	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.008	--	--	--	--	--	--	--	--	--
	06/13/17	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	--	--	--
	11/08/17	0.064	0.037	0.11	0.096	0.072	0.081	0.088	0.548	--	--	--	--	--	--	--	--	--
	06/20/18	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.02	--	--	--	--	--	--	--	--	--
	12/13/18	**0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.02**	**<0.01**	**0.010**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**
MW-201	06/07/07	<1	<1	<1	<1	<1	<1	<1	<1	6	<1	<1	<1	<1	2	1	<1	<1
	07/06/07	0.027	0.014	0.017	<0.0096	0.02	<0.0096	<0.0096	0.078	6.7	<0.10	0.52	<0.0096	0.83	2	2.6	0.3	0.72
	09/27/07	0.018	<0.011	<0.011	<0.011	0.027	<0.011	<0.011	0.045	--	--	--	--	--	--	2.3[5]	--	--
	11/27/07	0.016	<0.0095	<0.0095	<0.0095	0.023	<0.0095	<0.0095	0.039	--	--	--	--	--	--	0.99	--	--
	02/12/08	0.0179	0.0584	<0.0490	<0.0490	0.0210	<0.00980	<0.00980	0.0973	--	--	--	--	--	--	--	--	--
	05/14/08	0.051	<0.0472	<0.0472	<0.0472	0.0756	<0.0472	<0.0472	0.1266	--	--	--	--	--	--	--	--	--
Filtered	05/14/08	<0.00952	<0.00952	<0.00952	<0.00952	<0.00952	<0.00952	<0.00952	<0.00952	--	--	--	--	--	--	--	--	--
	09/05/08	0.0243	<0.00962	<0.00962	<0.00962	0.0175	<0.00962	<0.00962	0.0418	--	--	--	--	--	--	--	--	--
Filtered	09/05/08	<0.00962	<0.00962	<0.00962	<0.00962	<0.00962	<0.00962	<0.00962	<0.00962	--	--	--	--	--	--	--	--	--
	12/05/08	0.0247	<0.00980	<0.00980	<0.00980	0.0268	<0.00980	<0.00980	0.0515	--	--	--	--	--	--	--	--	--
Filtered	12/05/08	<0.00971	<0.00971	<0.00971	<0.00971	<0.00971	<0.00971	<0.00971	<0.00971	--	--	--	--	--	--	--	--	--
	02/17/09	<0.00990	<0.00990	<0.00990	<0.00990	<0.00990	<0.00990	<0.00990	<0.00990	--	--	--	--	--	--	--	--	--
Filtered	02/17/09	<0.0105	<0.0105	<0.0105	<0.0105	<0.0105	<0.0105	<0.0105	<0.0105	--	--	--	--	--	--	--	--	--
	05/13/09	0.0129	<0.0100	<0.0100	<0.0100	0.0191	<0.0100	<0.0100	0.0320	--	--	--	--	--	--	--	--	--
Filtered	05/13/09	<0.0111	<0.0111	<0.0111	<0.0111	<0.0111	<0.0111	<0.0111	<0.0111	--	--	--	--	--	--	--	--	--
	09/11/09	0.021	<0.0200	<0.0100	<0.0100	0.025	<0.0100	<0.0100	0.0460	--	--	--	--	--	--	--	--	--
Filtered	09/11/09	<0.0100	<0.0220	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0220	--	--	--	--	--	--	--	--	--
	04/14/10	0.014	<0.020	<0.0099	<0.0099	0.019	<0.0099	<0.0099	0.033	--	--	--	--	--	--	--	--	--
Filtered	04/14/10	<0.0099	<0.020	<0.0099	<0.0099	<0.0099	<0.0099	<0.0099	<0.020	--	--	--	--	--	--	--	--	--
	09/22/10	0.026	<0.020	<0.0099	<0.0099	0.030	<0.0099	<0.0099	0.056	--	--	--	--	--	--	--	--	--
Filtered	09/22/10	<0.0098	<0.020	<0.0098	<0.0098	<0.0098	<0.0098	<0.0098	<0.020	--	--	--	--	--	--	--	--	--
	04/26/11	<0.094	<0.19	<0.094	<0.094	<0.094	<0.094	<0.094	<0.19	7.3	0.10	0.41	<0.094	1.2	1.2	0.25	0.50	0.97
Filtered	04/26/11	<0.094	<0.19	<0.094	<0.094	<0.094	<0.094	<0.094	<0.19	5.5	0.12	<0.094	<0.094	<0.094	0.59	0.22	<0.094	<0.094
Original	9/22/11[8,9]	<0.094	<0.19	<0.094	<0.094	<0.094	<0.094	<0.094	<0.19	8.3	0.10	0.80	<0.094	1.5	1.8	0.40	0.94	1.3
Original Filtered	9/22/11[9]	0.014	<0.019	<0.0094	<0.0094	0.014	<0.0094	<0.0094	0.028	6.3	0.077	0.37	<0.0094	0.63	1.1	0.33	0.55	0.52
Re-Analysis Filtered	9/22/11[7]	0.017	<0.019	<0.0094	<0.0094	0.017	<0.0094	<0.0094	0.032	7.9	0.072	0.47	<0.0094	0.82	1.3	0.48	0.74	0.66
	04/18/12	0.025	<0.0096	<0.019	<0.019	0.021	<0.019	<0.019	0.046	8.2	0.11	0.44	<0.019	1.1	1.3	0.2	0.51	0.85
Filtered	04/18/12	<0.019	<0.0096	<0.019	<0.019	<0.019	<0.019	<0.019	<0.038	1.4	0.022	0.054	<0.019	<0.019	<0.019	0.098	<0.019	<0.019
	10/11/12	0.029	<0.019	<0.0095	<0.0095	0.027	<0.0095	<0.0095	0.056	9.7	0.11	0.6	<0.0095	1.1	0.92	0.27	0.53	1.0
Filtered	10/11/12	<0.019	<0.038	<0.019	<0.019	<0.019	<0.019	<0.019	<0.038	3.9	0.043	0.12	<0.019	<0.019	0.12	0.19	<0.019	<.019
	04/25/13	0.022	<0.010	<0.010	<0.010	0.026	<0.010	<0.010	0.048	--	--	--	--	--	--	--	--	--
	09/19/13	0.02	<0.010	<0.010	<0.010	0.027	<0.010	<0.010	0.047	--	--	--	--	--	--	--	--	--
	06/23/14	0.032	<0.010	<0.010	<0.010	0.034	<0.010	<0.010	0.066	--	--	--	--	--	--	--	--	--
	12/16/14	0.016	<0.010	<0.010	<0.010	0.021	<0.010	<0.010	0.037	--	--	--	--	--	--	--	--	--
	06/18/15	0.034	0.025	0.029	<0.010	0.029	<0.010	0.023	0.140	--	--	--	--	--	--	--	--	--
	12/08/15	0.029	0.011	0.013	<0.010	0.030	<0.010	0.011	0.094	--	--	--	--	--	--	--	--	--
Duplicate	12/08/15	0.022	<0.010	<0.010	<0.010	0.022	<0.010	<0.010	0.044	--	--	--	--	--	--	--	--	--
	06/14/16	0.030	<0.010	0.014	<0.010	0.032	<0.010	<0.010	0.076	--	--	--	--	--	--	0.863	--	--
	01/13/17	0.017	<0.010	<0.010	<0.010	0.017	<0.010	<0.010	0.009	--	--	--	--	--	--	--	--	--
	06/13/17	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	--	--	--
	11/08/17	0.018	<0.010	<0.010	<0.010	0.019	<0.010	<0.010	0.027	--	--	--	--	--	--	--	--	--
	06/20/18	0.010	<0.01	<0.01	<0.01	0.010	<0.02	<0.01	0.020	--	--	--	--	--	--	--	--	--
	12/13/18	**0.020**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.02**	**<0.01**	**0.020**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**
MW-202	06/07/07	<1	<1	<1	<1	<1	<1	<1	<7	2	<1	<1	<1	1	<1	<1	2	1
	07/06/07	0.05	0.014	0.016	<0.0097	0.049	<0.0097	<0.0097	0.129	0.27	<0.025	0.22	<0.0097	0.66	0.073	0.27	0.15	0.53
	09/27/07	0.042	<0.010	<0.010	<0.010	0.040	<0.010	<0.010	0.082	--	--	--	--	--	--	0.18[5]	--	--
	11/26/07	0.043	<0.010	<0.010	<0.010	0.036	<0.010	<0.010	0.079	--	--	--	--	--	--	<0.010	--	--
Filtered	11/26/07	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	--	--	--	--	--	--	0.057	--	--
	02/12/08	0.0457	<0.00990	<0.00990	0.0184	0.0444	<0.00990	<0.00990	0.1085	--	--	--	--	--	--	--	--	--

Appendix C
Historical Summary of Groundwater Analytical Data
Carcinogenic Polycyclic Aromatic Hydrocarbons

Former Unocal Seattle Marketing Terminal
3001 Elliott Avenue
Seattle, Washington

OFFSITE AREA		Carcinogenic PAHs[2,3] (µg/L)								Noncarcinogenic PAHs[2] (µg/L)								
Monitoring Well[1]	Sample Date	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Indeno(1,2,3-cd)pyrene	Total CPAHs[4]	Acenaphthene	Acenaphthylene	Anthracene	Benzo(g,h,i)perylene	Fluoranthene	Fluorene	Naphthalene[4]	Phenanthrene	Pyrene
RAL		**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**
MW-202 (continued) Filtered	02/12/08	<0.00980	<0.00980	<0.00980	<0.00980	<0.00980	<0.00980	<0.00980	<0.00980	--	--	--	--	--	--	--	--	--
	05/13/08	0.0406	<0.00943	0.0116	0.0149	0.0432	<0.00943	<0.00943	0.1103	--	--	--	--	--	--	--	--	--
Filtered	05/13/08	<0.0101	<0.0101	<0.0101	<0.0101	<0.0101	<0.0101	<0.0101	<0.0101	--	--	--	--	--	--	--	--	--
	09/04/08	0.0502	<0.00962	<0.00962	<0.00962	0.0482	<0.00962	<0.00962	0.0984	--	--	--	--	--	--	--	--	--
Filtered	09/04/08	<0.00971	<0.00971	<0.00971	<0.00971	<0.00971	<0.00971	<0.00971	<0.00971	--	--	--	--	--	--	--	--	--
	12/04/08	0.0286	<0.0100	<0.0100	<0.0100	0.0308	<0.0100	<0.0100	0.0594	--	--	--	--	--	--	--	--	--
Filtered	12/04/08	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	--	--	--	--	--	--	--	--	--
	02/18/09	0.0181	<0.00980	<0.00980	<0.00980	0.0222	<0.00980	<0.00980	0.0403	--	--	--	--	--	--	--	--	--
Filtered	02/18/09	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	--	--	--	--	--	--	--	--	--
	05/13/09	0.0146	<0.00943	<0.00943	<0.00943	0.0160	<0.00943	<0.00943	0.0306	--	--	--	--	--	--	--	--	--
Filtered	05/13/09	<0.00952	<0.00952	<0.00952	<0.00952	<0.00952	<0.00952	<0.00952	<0.00952	--	--	--	--	--	--	--	--	--
	09/11/09	0.0490	<0.0200	0.0110	<0.0100	0.0470	<0.0100	<0.0100	0.1070	--	--	--	--	--	--	--	--	--
Filtered	09/11/09	<0.0100	<0.0200	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0200	--	--	--	--	--	--	--	--	--
	04/14/10	0.013	<0.020	<0.0099	<0.0099	0.013	<0.0099	<0.0099	0.026	--	--	--	--	--	--	--	--	--
Filtered	04/14/10	<0.0099	<0.020	<0.0099	<0.0099	<0.0099	<0.0099	<0.0099	<0.020	--	--	--	--	--	--	--	--	--
	09/22/10	0.041	<0.020	0.012	<0.010	0.043	<0.010	<0.010	0.096	--	--	--	--	--	--	--	--	--
Filtered	09/22/10	<0.0095	<0.019	<0.0095	<0.0095	<0.0095	<0.0095	<0.0095	<0.019	--	--	--	--	--	--	--	--	--
	04/27/11	<0.094	<0.19	<0.094	<0.094	<0.094	<0.094	<0.094	<0.19	4.8	<0.094	<0.094	<0.094	0.55	0.36	2.9	<0.094	0.42
Filtered	04/27/11	<0.094	<0.19	<0.094	<0.094	<0.094	<0.094	<0.094	<0.19	3.6	<0.094	<0.094	<0.094	<0.094	0.19	2.6	<0.094	<0.094
	9/21/11 [8,9]	0.015	<0.019	<0.0094	<0.0094	0.013	<0.0094	<0.0094	0.028	0.35	<0.0094	0.021	<0.0094	0.17	0.019	0.16	0.013	0.19
	9/21/11 [9]	<0.0094	<0.019	<0.0094	<0.0094	<0.0094	<0.0094	<0.0094	<0.019	0.28	<0.0094	0.0094	<0.0094	0.059	0.016	0.13	<0.0094	0.065
Re-Analysis Filtered	9/21/11 [7]	<0.0094	<0.019	<0.0094	<0.0094	<0.0094	<0.0094	<0.0094	<0.019	0.35	<0.0094	0.031	<0.0094	0.13	0.026	0.12	0.016	0.14
	04/18/12	0.029	<0.0096	<0.019	<0.019	0.031	<0.019	<0.019	0.06	6.5	0.058	0.051	<0.019	0.54	0.24	1.8	0.11	0.43
Filtered	04/18/12	<0.019	<0.0096	<0.019	<0.019	<0.019	<0.019	<0.019	<0.038	0.40	<0.019	<0.019	<0.019	<0.019	<0.019	0.76	<0.019	<0.019
	10/11/12	0.027	<0.019	<0.0095	<0.0095	0.02	<0.0095	<0.0095	0.02	0.82	0.011	0.068	<0.0095	0.23	0.032	0.075	0.016	0.26
Filtered	10/11/12	<0.019	<0.038	<0.019	<0.019	<0.019	<0.019	<0.019	<0.039	0.07	<0.019	<0.019	<0.019	<0.019	<0.019	0.03	<0.019	<0.019
Filtered	10/11/12	<0.019	<0.038	<0.019	<0.019	<0.019	<0.019	<0.019	<0.039	0.07	<0.019	<0.019	<0.019	<0.019	<0.019	0.03	<0.019	<0.019
	04/25/13	0.019	<0.010	<0.010	<0.010	0.017	<0.010	<0.010	0.036	--	--	--	--	--	--	--	--	--
	09/19/13	0.025	<0.010	<0.010	<0.010	0.026	<0.010	<0.010	0.051	--	--	--	--	--	--	--	--	--
	12/16/14	0.018	<0.010	<0.010	<0.010	0.014	<0.010	<0.010	0.032	--	--	--	--	--	--	--	--	--
	06/18/15	0.013	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.013	--	--	--	--	--	--	--	--	--
	12/08/15	0.025	<0.011	<0.011	<0.011	0.023	<0.011	<0.011	0.048	--	--	--	--	--	--	--	--	--
	06/14/16	0.014	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	0.014	--	--	--	--	--	--	0.98	--	--
	01/13/17	0.023	<0.011	<0.011	<0.011	0.017	<0.011	<0.011	0.023	--	--	--	--	--	--	--	--	--
	06/13/17	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	--	--	--
	11/08/17	<0.010	<0.010	<0.010	<0.010	<0.010	0.021	<0.010	0.021	--	--	--	--	--	--	--	--	--
	06/20/18	0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	0.01	--	--	--	--	--	--	--	--	--
	12/13/18	**0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.02**	**<0.01**	**0.01**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**
Duplicate	**12/13/18**	**0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.02**	**<0.01**	**<0.02**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**
MW-203	06/07/07	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	07/06/07	<0.0096	<0.0096	<0.0096	<0.0096	<0.0096	<0.0096	<0.0096	<0.0096	0.62	<0.0096	0.12	<0.0096	0.16	0.047	0.052	0.013	0.11
	09/28/07	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.07	--	--	--	--	--	--	0.13	--	--
	11/27/07	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	<0.010	--	--
	02/12/08	0.0127	<0.00980	<0.00980	<0.00980	<0.00980	<0.00980	<0.00980	0.0127	--	--	--	--	--	--	--	--	--
Duplicate	02/12/08	<0.00971	<0.00971	<0.00971	<0.00971	<0.00971	<0.00971	<0.00971	<0.00971	--	--	--	--	--	--	--	--	--
	05/14/08	<0.00971	<0.00971	<0.00971	<0.00971	<0.00971	<0.00971	<0.00971	<0.00971	--	--	--	--	--	--	--	--	--
Filtered	05/14/08	<0.00962	<0.00962	<0.00962	<0.00962	<0.00962	<0.00962	<0.00962	<0.00962	--	--	--	--	--	--	--	--	--
	09/03/08	<0.00952	<0.00952	<0.00952	<0.00952	<0.00952	<0.00952	<0.00952	<0.00952	--	--	--	--	--	--	--	--	--
Filtered	09/03/08	<0.00962	<0.00962	<0.00962	<0.00962	<0.00962	<0.00962	<0.00962	<0.00962	--	--	--	--	--	--	--	--	--
	12/04/08	<0.00952	<0.00952	<0.00952	<0.00952	<0.00952	<0.00952	<0.00952	<0.00952	--	--	--	--	--	--	--	--	--
Filtered	12/04/08	<0.00952	<0.00952	<0.00952	<0.00952	<0.00952	<0.00952	<0.00952	<0.00952	--	--	--	--	--	--	--	--	--
	02/17/09	<0.00990	<0.00990	<0.00990	<0.00990	<0.00990	<0.00990	<0.00990	<0.00990	--	--	--	--	--	--	--	--	--
Filtered	02/17/09	<0.00990	<0.00990	<0.00990	<0.00990	<0.00990	<0.00990	<0.00990	<0.00990	--	--	--	--	--	--	--	--	--
	05/13/09	<0.00943	<0.00943	<0.00943	<0.00943	<0.00943	<0.00943	<0.00943	<0.00943	--	--	--	--	--	--	--	--	--
Filtered	05/13/09	<0.00990	<0.00990	<0.00990	<0.00990	<0.00990	<0.00990	<0.00990	<0.00990	--	--	--	--	--	--	--	--	--
	09/11/09	<0.0110	<0.0220	<0.0110	<0.0110	<0.0110	<0.0110	<0.0110	<0.0220	--	--	--	--	--	--	--	--	--
Filtered	09/11/09	<0.0110	<0.0220	<0.0110	<0.0110	<0.0110	<0.0110	<0.0110	<0.0220	--	--	--	--	--	--	--	--	--
	04/14/10	<0.010	<0.020	<0.010	<0.010	<0.010	<0.010	<0.010	<0.020	--	--	--	--	--	--	--	--	--
Filtered	04/14/10	<0.0097	<0.019	<0.0097	<0.0097	<0.0097	<0.0097	<0.0097	<0.019	--	--	--	--	--	--	--	--	--
	09/22/10	<0.010	<0.020	<0.010	<0.010	<0.010	<0.010	<0.010	<0.020	--	--	--	--	--	--	--	--	--
Filtered	09/22/10	<0.010	<0.020	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	--	--	--
	04/27/11	<0.094	<0.19	<0.094	<0.094	<0.094	<0.094	<0.094	<0.19	0.44	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094
Filtered	04/27/11	<0.094	<0.19	<0.094	<0.094	<0.094	<0.094	<0.094	<0.19	0.45	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094
	9/21/11 [9]	<0.0098	<0.020	<0.0098	<0.0098	<0.0098	<0.0098	<0.0098	<0.020	0.34	<0.0098	0.012	<0.0098	0.039	0.0098	0.011	<0.0098	0.079
Re-Analysis	9/21/11[7]	<0.010	<0.020	<0.010	<0.010	<0.010	<0.010	<0.010	<0.020	0.51	<0.010	0.022	<0.010	0.047	0.017	0.02	<0.010	0.10
Filtered	9/21/11 [9]	<0.010	<0.020	<0.010	<0.010	<0.010	<0.010	<0.010	<0.020	0.34	<0.010	0.011	<0.010	0.023	0.011	0.016	<0.010	0.043
Re-Analysis Filtered	9/21/11[7]	<0.0095	<0.019	<0.0095	<0.0095	<0.0095	<0.0095	<0.0095	<0.019	0.31	<0.0095	0.017	<0.0095	0.020	0.013	0.0095	<0.0095	0.039
	04/18/12	<0.019	<0.0096	<0.019	<0.019	<0.019	<0.019	<0.019	<0.038	0.42	<0.019	0.028	<0.019	0.042	<0.019	<0.019	<0.019	0.076

Appendix C
Historical Summary of Groundwater Analytical Data
Carcinogenic Polycyclic Aromatic Hydrocarbons

Former Unocal Seattle Marketing Terminal
3001 Elliott Avenue
Seattle, Washington

OFFSITE AREA		Carcinogenic PAHs[2,3] (µg/L)								Noncarcinogenic PAHs[2] (µg/L)								
Monitoring Well[1]	Sample Date	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Indeno(1,2,3-cd)pyrene	Total CPAHs[4]	Acenaphthene	Acenaphthylene	Anthracene	Benzo(g,h,i)perylene	Fluoranthene	Fluorene	Naphthalene[4]	Phenanthrene	Pyrene
RAL		**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**
MW-203 (continued) Filtered	04/18/12	<0.019	<0.0096	<0.019	<0.019	<0.019	<0.019	<0.019	<0.038	<0.019	<0.019	<0.019	<0.019	<0.019	<0.019	<0.019	<0.019	<0.019
	10/11/12	<0.0095	<0.020	<0.0098	<0.0098	<0.0098	<0.0098	<0.0098	<0.020	0.23	<0.0098	0.035	<0.0098	0.041	0.011	0.013	0.01	0.10
Filtered	10/11/12	<0.0095	<0.019	<0.0095	<0.0095	<0.0095	<0.0095	<0.0095	<0.019	0.056	<0.0095	0.019	<0.0095	<0.0095	<0.0095	0.028	<0.0095	<0.0095
	04/25/13	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	--	--	--	--	--	--	--	--	--
	09/19/13	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	--	--	--
	06/24/14	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	--	--	--
Duplicate	06/24/14	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	--	--	--
	12/16/14	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	--	--	--
	06/18/15	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	--	--	--
	12/07/15	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	--	--	--
	06/15/16	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	0.128	--	--
Duplicate	06/15/16	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	0.099	--	--
	01/13/17	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	--	--	--	--	--	--	--	--	--
	06/13/17	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	--	--	--
	11/08/17	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	--	--	--
	06/20/18	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.02	--	--	--	--	--	--	--	--	--
	12/13/18	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.02**	**<0.01**	**<0.02**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**
MW-204	06/07/07	<1	<1	<1	<1	<1	<1	<1	<7	5	<1	<1	<1	<1	3	<1	<1	<1
	07/06/07	<0.0095	<0.0095	<0.0095	<0.0095	<0.0095	<0.0095	<0.0095	<0.0095	3.3	<0.30	0.19	<0.0095	0.06	2.7	0.45	1.1	0.061
Duplicate	07/06/07	<0.0096	<0.0096	<0.0096	<0.0096	<0.0096	<0.0096	<0.0096	<0.0096	3.3	<0.30	0.18	<0.0096	0.058	2.7	0.44	1	0.064
	09/28/07	0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	--	--	--	--	--	--	0.84	--	--
	11/27/07	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	<0.010	--	--
	02/12/08	<0.00971	<0.00971	<0.00971	<0.00971	<0.00971	<0.00971	<0.00971	<0.00971	--	--	--	--	--	--	--	--	--
	05/14/08	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	--	--	--	--	--	--	--	--	--
Filtered	05/14/08	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	--	--	--	--	--	--	--	--	--
	09/03/08	<0.00962	<0.00962	<0.00962	<0.00962	<0.00962	<0.00962	<0.00962	<0.00962	--	--	--	--	--	--	--	--	--
Filtered	09/03/08	<0.00962	<0.00962	<0.00962	<0.00962	<0.00962	<0.00962	<0.00962	<0.00962	--	--	--	--	--	--	--	--	--
	12/04/08	<0.00980	<0.00980	<0.00980	<0.00980	<0.00980	<0.00980	<0.00980	<0.00980	--	--	--	--	--	--	--	--	--
Filtered	12/04/08	<0.00990	<0.00990	<0.00990	<0.00990	<0.00990	<0.00990	<0.00990	<0.00990	--	--	--	--	--	--	--	--	--
	02/17/09	<0.0105	<0.0105	<0.0105	<0.0105	<0.0105	<0.0105	<0.0105	<0.0105	--	--	--	--	--	--	--	--	--
Duplicate	02/17/09	<0.0105	<0.0105	<0.0105	<0.0105	<0.0105	<0.0105	<0.0105	<0.0105	--	--	--	--	--	--	--	--	--
Filtered	02/17/09	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	--	--	--	--	--	--	--	--	--
Duplicate	02/17/09	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	--	--	--	--	--	--	--	--	--
	05/13/09	<0.0100	<0.0100	<0.0100	<0.0100	0.0193	<0.0100	<0.0100	0.0193	--	--	--	--	--	--	--	--	--
Duplicate	05/13/09	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	--	--	--	--	--	--	--	--	--
Filtered	05/13/09	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	--	--	--	--	--	--	--	--	--
Duplicate	05/13/09	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	--	--	--	--	--	--	--	--	--
	09/11/09	<0.0100	<0.0200	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0200	--	--	--	--	--	--	--	--	--
Duplicate	09/11/09	<0.0100	<0.0200	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0200	--	--	--	--	--	--	--	--	--
Filtered	09/11/09	<0.0110	<0.0220	<0.0110	<0.0110	<0.0110	<0.0110	<0.0110	<0.0220	--	--	--	--	--	--	--	--	--
Duplicate	09/11/09	<0.0096	<0.0190	<0.0096	<0.0096	<0.0096	<0.0096	<0.0096	<0.0190	--	--	--	--	--	--	--	--	--
	04/14/10	<0.0097	<0.019	<0.0097	<0.0097	<0.0097	<0.0097	<0.0097	<0.019	--	--	--	--	--	--	--	--	--
Duplicate	04/14/10	<0.0099	<0.020	<0.0099	<0.0099	0.0099	<0.0099	<0.0099	0.0099	--	--	--	--	--	--	--	--	--
Filtered	04/14/10	<0.010	<0.020	<0.010	<0.010	<0.010	<0.010	<0.010	<0.020	--	--	--	--	--	--	--	--	--
Duplicate	04/14/10	<0.0099	<0.020	<0.0099	<0.0099	<0.0099	<0.0099	<0.0099	<0.020	--	--	--	--	--	--	--	--	--
	09/22/10	<0.010	<0.020	<0.010	<0.010	<0.010	<0.010	<0.010	<0.020	--	--	--	--	--	--	--	--	--
Filtered	09/22/10	<0.010	<0.020	<0.010	<0.010	<0.010	<0.010	<0.010	<0.020	--	--	--	--	--	--	--	--	--
	04/26/11	<0.094	<0.19	<0.094	<0.094	<0.094	<0.094	<0.094	<0.19	2.6	0.33	0.13	<0.094	<0.094	2.7	1.2	1.1	<0.094
Duplicate	04/26/11	<0.094	<0.19	<0.094	<0.094	<0.094	<0.094	<0.094	<0.19	2.5	0.30	0.14	<0.094	<0.094	2.6	1.3	1.0	<0.094
Filtered	04/26/11	<0.094	<0.19	<0.094	<0.094	<0.094	<0.094	<0.094	<0.19	2.6	0.28	<0.094	<0.094	<0.094	2.0	1.1	0.43	<0.094
Duplicate	04/26/11	<0.094	<0.19	<0.094	<0.094	<0.094	<0.094	<0.094	<0.19	2.1	0.23	0.094	<0.094	<0.094	1.7	1.1	0.53	<0.094
Original	09/22/11 [9]	<0.010	<0.020	<0.010	<0.010	<0.010	<0.010	<0.010	<0.020	1.7	0.14	0.16	<0.010	0.039	1.6	0.63	1.0	0.034
Duplicate	09/22/11	<0.010	<0.020	<0.010	<0.010	<0.010	<0.010	<0.010	<0.020	2.3	0.15	0.13	<0.010	0.058	2.2	0.68	0.59	0.054
Re-Analysis	09/22/11 [7]	<0.010	<0.020	<0.010	<0.010	<0.010	<0.010	<0.010	<0.020	2.4	0.19	0.13	<0.010	0.041	2.1	0.61	0.83	0.042
Filtered	09/22/11 [9]	<0.010	<0.020	<0.010	<0.010	<0.010	<0.010	<0.010	<0.020	1.8	0.14	0.067	<0.010	0.018	1.4	0.52	0.72	0.014
Duplicate Filtered	09/22/11	<0.010	<0.020	<0.010	<0.010	<0.010	<0.010	<0.010	<0.020	2.1	0.17	0.079	<0.010	<0.010	1.6	0.65	0.75	<0.010
Re-Analysis Filtered	09/22/11 [7]	<0.0098	<0.020	<0.0098	<0.0098	<0.0098	<0.0098	<0.0098	<0.020	1.6	0.13	0.073	<0.0098	0.015	1.4	0.36	0.54	0.012
NEAR	09/22/11 [9]	<0.010	<0.020	<0.010	<0.010	<0.010	<0.010	<0.010	<0.020	21	0.21	0.98	<0.010	1.3	4.7	9.6	4.1	0.94
NEAR Re-Analysis	09/22/11 [7]	<0.0096	<0.019	<0.0096	<0.0096	<0.0096	<0.0096	<0.0096	<0.019	18	0.21	0.83	<0.0096	1.2	6.0	5.7	4.6	0.89
NEAR Filtered	09/22/11	<0.010	<0.020	<0.010	<0.010	<0.010	<0.010	<0.010	<0.020	1.7	0.14	0.076	<0.010	0.018	1.3	0.53	0.68	0.013
	04/18/12	<0.019	<0.0096	<0.019	<0.019	<0.019	<0.019	<0.019	<0.038	3.3	0.37	0.21	<0.019	0.05	3.2	0.34	1.1	0.032
Filtered	04/18/12	<0.019	<0.0096	<0.019	<0.019	<0.019	<0.019	<0.019	<0.038	2.8	0.19	0.10	<0.019	1.2	<0.019	0.28	<0.019	<0.019
Duplicate	04/18/12	<0.019	<0.0096	<0.019	<0.019	<0.019	<0.019	<0.019	<0.038	3.8	0.41	0.19	<0.019	0.047	3.6	0.37	1.2	0.037
Duplicate Filtered	04/18/12	<0.019	<0.0096	<0.019	<0.019	<0.019	<0.019	<0.019	<0.038	0.82	0.032	0.071	<0.019	<0.019	0.019	0.16	<0.019	<0.019
NEAR	04/18/12	<0.019	<0.0096	<0.019	<0.019	<0.019	<0.019	<0.019	<0.038	3.3	0.36	0.19	<0.019	0.048	3.0	0.33	1.1	0.03
NEAR Duplicate	04/18/12	<0.019	<0.0096	<0.019	<0.019	<0.019	<0.019	<0.019	<0.038	3.2	0.35	0.18	<0.019	0.045	2.9	0.31	1.2	0.037
NEAR Filtered	04/18/12	<0.019	<0.0096	<0.019	<0.019	<0.019	<0.019	<0.019	<0.038	3.2	0.30	0.085	<0.019	<0.019	1.7	0.76	0.023	<0.019
NEAR Duplicate Filtered	04/18/12	<0.019	<0.0096	<0.019	<0.019	<0.019	<0.019	<0.019	<0.038	0.91	0.053	0.084	<0.019	<0.019	0.14	0.21	<0.019	<0.019

Appendix C
Historical Summary of Groundwater Analytical Data
Carcinogenic Polycyclic Aromatic Hydrocarbons

Former Unocal Seattle Marketing Terminal
3001 Elliott Avenue
Seattle, Washington

OFFSITE AREA		Carcinogenic PAHs[2,3] (µg/L)								Noncarcinogenic PAHs[2] (µg/L)								
Monitoring Well[1]	Sample Date	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Indeno(1,2,3-cd)pyrene	Total CPAHs[4]	Acenaphthene	Acenaphthylene	Anthracene	Benzo(g,h,i)perylene	Fluoranthene	Fluorene	Naphthalene[4]	Phenanthrene	Pyrene
RAL		**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**
MW-204 (continued)	10/12/12	<0.095	<0.19	<0.095	<0.095	<0.095	<0.095	<0.095	<0.019	2.5	0.29	0.23	<0.095	<0.095	2.4	0.94	1.1	<0.095
Filtered	10/12/12	<0.095	<0.19	<0.095	<0.095	<0.095	<0.095	<0.095	<0.019	0.98	0.11	<0.095	<0.095	<0.095	0.34	0.57	<0.095	<0.095
Duplicate	10/12/12	<0.095	<0.19	<0.095	<0.095	<0.095	<0.095	<0.095	<0.019	2.5	0.29	0.21	<0.095	<0.095	2.2	0.89	1.0	<0.095
Duplicate Filtered	10/12/12	<0.095	<0.19	<0.095	<0.095	<0.095	<0.095	<0.095	<0.019	2.2	0.24	<0.095	<0.095	<0.095	1.7	1.0	0.17	<0.095
NEAR	10/12/12	<0.095	<0.19	<0.095	<0.095	<0.095	<0.095	<0.095	<0.019	2.0	0.23	0.21	<0.095	<0.095	1.9	0.76	1.0	<0.095
NEAR Filtered	10/12/12	<0.095	<0.19	<0.095	<0.095	<0.095	<0.095	<0.095	<0.019	0.98	0.1	0.097	<0.095	<0.095	0.33	0.63	<0.095	<0.095
	04/26/13	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	--	--	--
Duplicate	04/26/13	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	--	--	--
	09/19/13	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	--	--	--
	06/24/14	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	--	--	--
	12/16/14	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	--	--	--
Duplicate	12/16/14	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	--	--	--
	06/18/15	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	--	--	--	--	--	--	--	--	--
	12/09/15	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	--	--	--
	01/15/16	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	--	--	--
Duplicate	01/15/16	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012	--	--	--	--	--	--	--	--	--
	06/13/16	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	0.15	--	--
	01/13/17	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	--	--	--	--	--	--	--	--	--
	06/13/17	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	--	--	--
	11/08/17	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	--	--	--	--	--	--	--	--	--
	06/20/18	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.02	--	--	--	--	--	--	--	--	--
	12/13/18	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.02**	**<0.01**	**<0.02**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**
MW-205	06/07/07	<1	<1	<1	<1	<1	<1	<1	<1	4	<1	<1	<1	<1	<1	<1	<1	<1
	07/06/07	<0.0096	<0.0096	<0.0096	<0.0096	<0.0096	<0.0096	<0.0096	<0.0096	3.4	0.022	<0.0096	<0.0096	<0.0096	<0.0096	0.041	<0.0096	0.01
	09/28/07	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	0.050	--	--
	11/27/07	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	0.022	--	--
	02/12/08	<0.0111	<0.0111	<0.0111	<0.0111	<0.0111	<0.0111	<0.0111	<0.0111	--	--	--	--	--	--	--	--	--
	05/14/08	<0.00962	<0.00962	<0.00962	<0.00962	<0.00962	<0.00962	<0.00962	<0.00962	--	--	--	--	--	--	--	--	--
Filtered	05/14/08	<0.00952	<0.00952	<0.00952	<0.00952	<0.00952	<0.00952	<0.00952	<0.00952	--	--	--	--	--	--	--	--	--
	09/03/08	<0.00943	<0.00943	<0.00943	<0.00943	<0.00943	<0.00943	<0.00943	<0.00943	--	--	--	--	--	--	--	--	--
Filtered	09/03/08	<0.00943	<0.00943	<0.00943	<0.00943	<0.00943	<0.00943	<0.00943	<0.00943	--	--	--	--	--	--	--	--	--
	12/05/08	<0.00943	<0.00943	<0.00943	<0.00943	<0.00943	<0.00943	<0.00943	<0.00943	--	--	--	--	--	--	--	--	--
Filtered	12/05/08	<0.00943	<0.00943	<0.00943	<0.00943	<0.00943	<0.00943	<0.00943	<0.00943	--	--	--	--	--	--	--	--	--
	02/17/09	<0.00990	<0.00990	<0.00990	<0.00990	<0.00990	<0.00990	<0.00990	<0.00990	--	--	--	--	--	--	--	--	--
Filtered	02/17/09	<0.00990	<0.00990	<0.00990	<0.00990	<0.00990	<0.00990	<0.00990	<0.00990	--	--	--	--	--	--	--	--	--
	05/13/09	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	--	--	--	--	--	--	--	--	--
Filtered	05/13/09	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	--	--	--	--	--	--	--	--	--
	09/11/09	<0.0110	<0.0220	<0.0110	<0.0110	<0.0110	<0.0110	<0.0110	<0.0220	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**
Filtered	09/11/09	<0.0110	<0.0220	<0.0110	<0.0110	<0.0110	<0.0110	<0.0110	<0.0220	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**
	04/14/10	<0.013	<0.026	<0.013	<0.013	<0.013	<0.013	<0.013	<0.026	--	--	--	--	--	--	--	--	--
Filtered	04/14/10	<0.0095	<0.019	<0.0095	<0.0095	<0.0095	<0.0095	<0.0095	<0.019	--	--	--	--	--	--	--	--	--
	09/22/10	<0.0094	<0.019	<0.0094	<0.0094	<0.0094	<0.0094	<0.0094	<0.019	--	--	--	--	--	--	--	--	--
Filtered	09/22/10	<0.0099	<0.020	<0.0099	<0.0099	<0.0099	<0.0099	<0.0099	<0.020	--	--	--	--	--	--	--	--	--
	04/26/11									LNAPL								
Filtered	04/26/11									LNAPL								
	09/22/11	<0.0099	<0.020	<0.0099	<0.0099	<0.0099	<0.0099	<0.0099	<0.020	1.6	<0.0099	<0.0099	<0.0099	<0.0099	<0.0099	0.016	<0.0099	0.015
Filtered	09/22/11	<0.010	<0.020	<0.010	<0.010	<0.010	<0.010	<0.010	<0.020	1.1	<0.010	<0.010	<0.010	<0.010	<0.010	0.011	<0.010	<0.010
NEAR	09/22/11	<0.010	<0.020	<0.010	<0.010	<0.010	<0.010	<0.010	<0.020	1.5	<0.010	<0.010	<0.010	<0.010	<0.010	0.015	<0.010	0.011
NEAR Filtered	09/22/11	<0.0098	<0.020	<0.0098	<0.0098	<0.0098	<0.0098	<0.0098	<0.020	1.4	<0.0098	<0.0098	<0.0098	<0.0098	<0.0098	0.015	<0.0098	<0.0098
	04/18/12	<0.019	<0.0096	<0.019	<0.019	<0.019	<0.019	<0.019	<0.038	1.6	<0.019	<0.019	<0.019	<0.019	<0.019	<0.019	<0.019	<0.019
Filtered	04/18/12	<0.019	<0.0096	<0.019	<0.019	<0.019	<0.019	<0.019	<0.038	0.16	<0.019	<0.019	<0.019	<0.019	<0.019	<0.019	<0.019	<0.019
Duplicate	04/18/12	<0.019	<0.0096	<0.019	<0.019	<0.019	<0.019	<0.019	<0.038	1.9	<0.019	<0.019	<0.019	<0.019	<0.019	<0.019	<0.019	<0.019
Duplicate Filtered	04/18/12	<0.019	<0.0096	<0.019	<0.019	<0.019	<0.019	<0.019	<0.038	0.32	<0.019	<0.019	<0.019	<0.019	<0.019	<0.019	<0.019	<0.019
NEAR	04/18/12	<0.019	<0.0096	<0.019	<0.019	<0.019	<0.019	<0.019	<0.038	1.6	<0.019	<0.019	<0.019	<0.019	<0.019	<0.019	<0.019	<0.019
NEAR Filtered	04/18/12	<0.019	<0.0096	<0.019	<0.019	<0.019	<0.019	<0.019	<0.038	0.8	<0.019	<0.019	<0.019	<0.019	<0.019	<0.019	<0.019	<0.019
	10/12/12	<0.0095	<0.019	<0.0095	<0.0095	<0.0095	<0.0095	<0.0095	<0.019	1.6	<0.0095	<0.0095	<0.0095	<0.0095	<0.0095	0.015	0.0095	<0.0095
Filtered	10/12/12	<0.0095	<0.019	<0.0095	<0.0095	<0.0095	<0.0095	<0.0095	<0.019	0.22	<0.0095	<0.0095	<0.0095	<0.0095	<0.0095	0.013	0.0095	<0.0095
Duplicate	10/12/12	<0.0095	<0.019	<0.0095	<0.0095	<0.0095	<0.0095	<0.0095	<0.019	1.5	0.015	0.011	<0.0095	<0.0095	0.014	0.017	<0.0095	0.0099
Duplicate Filtered	10/12/12	<0.0095	<0.019	<0.0095	<0.0095	<0.0095	<0.0095	<0.0095	<0.019	0.12	<0.0095	<0.0095	<00.095	<0.0095	<0.0095	0.016	<0.0095	<0.0095
NEAR	10/12/12	<0.0095	<0.019	<0.0095	<0.0095	<0.0095	<0.0095	<0.0095	<0.019	1.6	0.017	0.012	<0.0095	<0.0095	0.017	0.016	0.018	0.012
NEAR Filtered	10/12/12	<0.019	<0.038	<0.019	<0.019	<0.019	<0.019	<0.019	<0.038	0.12	<0.019	<0.019	<0.019	<0.019	<0.019	<0.019	<0.019	<0.019
	04/26/13	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	--	--	--
	09/19/13	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	--	--	--
Duplicate	09/19/13	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	--	--	--
	06/24/14	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	--	--	--
	12/16/14	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	--	--	--
	06/18/15	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	--	--	--
Duplicate	06/18/15	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	--	--	--

Appendix C
Historical Summary of Groundwater Analytical Data
Carcinogenic Polycyclic Aromatic Hydrocarbons

Former Unocal Seattle Marketing Terminal
3001 Elliott Avenue
Seattle, Washington

OFFSITE AREA		Carcinogenic PAHs[2,3] (µg/L)								Noncarcinogenic PAHs[2] (µg/L)								
Monitoring Well[1]	Sample Date	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Indeno(1,2,3-cd)pyrene	Total CPAHs[4]	Acenaphthene	Acenaphthylene	Anthracene	Benzo(g,h,i)perylene	Fluoranthene	Fluorene	Naphthalene[4]	Phenanthrene	Pyrene
RAL		0.03	0.03	0.03	0.03	0.03	0.03	0.03	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
MW-205 (continued)	12/09/15	<0.010	0.012	0.011	<0.010	<0.010	<0.010	0.022	0.045	--	--	--	--	--	--	--	--	--
	06/13/16	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	<0.031	--	--
	01/13/17	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	--	--	--	--	--	--	--	--	--
	06/13/17	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	--	--	--
	11/08/17	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	--	--	--
	06/20/18	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.02	--	--	--	--	--	--	--	--	--
	12/13/18	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.02	--	--	--	--	--	--	--	--	--
MW-206	06/07/07	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	07/06/07	<0.0096	<0.0096	<0.0096	<0.0096	<0.0096	<0.0096	<0.0096	<0.0096	1.9	<0.0096	0.069	<0.0096	0.087	0.14	0.19	0.51	0.036
	09/27/07	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	0.063 [5]	--	--
	11/27/07	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	0.031	--	--
	02/12/08	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	--	--	--	--	--	--	--	--	--
	05/13/08	<0.00990	<0.00990	<0.00990	<0.00990	<0.00990	<0.00990	<0.00990	<0.00990	--	--	--	--	--	--	--	--	--
Filtered	05/13/08	<0.00943	<0.00943	<0.00943	<0.00943	<0.00943	<0.00943	<0.00943	<0.00943	--	--	--	--	--	--	--	--	--
	09/04/08	<0.00943	<0.00943	<0.00943	<0.00943	<0.00943	<0.00943	<0.00943	<0.00943	--	--	--	--	--	--	--	--	--
Duplicate[6]	09/04/08	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	--	--	--	--	--	--	--	--	--
Filtered	09/04/08	0.0132	<0.00952	<0.00952	0.0107	0.0134	0.0638	0.0125	0.1136	--	--	--	--	--	--	--	--	--
Duplicate	09/04/08	<0.00952	<0.00952	<0.00952	<0.00952	<0.00952	<0.00952	<0.00952	<0.00952	--	--	--	--	--	--	--	--	--
	10/01/08	<0.0102	<0.0102	<0.0102	<0.0102	<0.0102	<0.0102	<0.0102	<0.0102	--	--	--	--	--	--	--	--	--
Filtered	10/01/08	<0.0101	<0.0101	<0.0101	<0.0101	<0.0101	<0.0101	<0.0101	<0.0101	--	--	--	--	--	--	--	--	--
	12/04/08	<0.00952	<0.00952	<0.00952	<0.00952	<0.00952	<0.00952	<0.00952	<0.00952	--	--	--	--	--	--	--	--	--
Filtered	12/04/08	<0.00943	<0.00943	<0.00943	<0.00943	<0.00943	<0.00943	<0.00943	<0.00943	--	--	--	--	--	--	--	--	--
Duplicate	12/04/08	<0.00962	<0.00962	<0.00962	<0.00962	<0.00962	<0.00962	<0.00962	<0.00962	--	--	--	--	--	--	--	--	--
Filtered	12/04/08	<0.00980	<0.00980	<0.00980	<0.00980	<0.00980	<0.00980	<0.00980	<0.00980	--	--	--	--	--	--	--	--	--
	02/18/09	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	--	--	--	--	--	--	--	--	--
Filtered	02/18/09	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	--	--	--	--	--	--	--	--	--
	05/12/09	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	--	--	--	--	--	--	--	--	--
Filtered	05/12/09	<0.0125	<0.0125	<0.0125	<0.0125	<0.0125	<0.0125	<0.0125	<0.0125	--	--	--	--	--	--	--	--	--
	09/11/09	<0.0100	<0.0200	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0200	--	--	--	--	--	--	--	--	--
Filtered	09/11/09	<0.0110	<0.0220	<0.0110	<0.0110	<0.0110	<0.0110	<0.0110	<0.0220	--	--	--	--	--	--	--	--	--
	04/14/10	<0.010	<0.020	<0.010	<0.010	<0.010	<0.010	<0.010	<0.020	--	--	--	--	--	--	--	--	--
Filtered	04/14/10	<0.0098	<0.020	<0.0098	<0.0098	<0.0098	<0.0098	<0.0098	<0.020	--	--	--	--	--	--	--	--	--
	09/22/10	<0.0095	<0.019	<0.0095	<0.0095	<0.0095	<0.0095	<0.0095	<0.019	--	--	--	--	--	--	--	--	--
Filtered	09/22/10	<0.0099	<0.020	<0.0099	<0.0099	<0.0099	<0.0099	<0.0099	<0.020	--	--	--	--	--	--	--	--	--
	04/27/11	<0.094	<0.19	<0.094	<0.094	<0.094	<0.094	<0.094	<0.19	0.14	<0.094	<0.094	<0.094	0.21	<0.094	<0.094	<0.094	0.15
Filtered	04/27/11	<0.094	<0.19	<0.094	<0.094	<0.094	<0.094	<0.094	<0.19	0.12	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094
	09/21/11	<0.010	<0.020	<0.010	<0.010	<0.010	<0.010	<0.010	<0.020	0.014	<0.010	<0.010	<0.010	0.063	<0.010	0.049	<0.010	0.046
Filtered	09/21/11	<0.010	<0.020	<0.010	<0.010	<0.010	<0.010	<0.010	<0.020	0.047	<0.010	<0.010	<0.010	0.011	<0.010	0.054	<0.010	0.01
	04/18/12	<0.019	<0.0096	<0.019	<0.019	<0.019	<0.019	<0.019	<0.038	0.18	<0.019	0.042	<0.019	0.31	<0.019	0.022	<0.019	0.19
Filtered	04/18/12	<0.019	<0.0096	<0.019	<0.019	<0.019	<0.019	<0.019	<0.038	<0.019	<0.019	<0.019	<0.019	<0.019	<0.019	<0.019	<0.019	<0.019
	10/11/12	0.011	<0.019	<0.0095	<0.0095	<0.0095	<0.0095	<0.0095	0.011	0.21	<0.0095	0.066	<0.0095	0.37	0.018	0.0098	0.014	0.29
Filtered	10/11/12	<0.0095	<0.019	<0.0095	<0.0095	<0.0095	<0.0095	<0.0095	<0.019	0.018	<0.0095	<0.0095	<0.0095	<0.0095	<0.0095	0.011	<0.0095	<0.0095
	04/25/13	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	--	--	--
	09/19/13	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	--	--	--
	06/23/14	<0.010	<0.010	0.014	<0.010	<0.010	<0.010	0.013	0.027	--	--	--	--	--	--	--	--	--
	12/16/14	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	--	--	--
	06/17/15	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	--	--	--
	12/08/15	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	--	--	--
	06/14/16	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	<0.031	--	--
	01/13/17	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	--	--	--	--	--	--	--	--	--
	06/13/17	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	--	--	--
	11/08/17	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	--	--	--
	06/20/18	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.02	--	--	--	--	--	--	--	--	--
	12/13/18	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.02**	**<0.01**	**<0.02**	--	--	--	--	--	--	--	--	--
MW-207	06/07/07	<1	<1	<1	<1	<1	<1	<1	<1	2	<1	<1	<1	<1	<1	<1	<1	<1
	07/06/07	<0.0096	<0.0096	<0.0096	<0.0096	<0.0096	<0.0096	<0.0096	<0.0096	0.31	<1	0.01	<0.0096	0.017	0.033	0.014	0.064	<0.0096
	09/27/07	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	<0.010	--	--
	11/27/07	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	<0.010	--	--
	02/12/08	<0.00990	<0.00990	<0.00990	<0.00990	<0.00990	<0.00990	<0.00990	<0.00990	--	--	--	--	--	--	--	--	--
	05/13/08	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	--	--	--	--	--	--	--	--	--
Filtered	05/13/08	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	--	--	--	--	--	--	--	--	--
	09/04/08	<0.00943	<0.00943	<0.00943	<0.00943	<0.00943	<0.00943	<0.00943	<0.00943	--	--	--	--	--	--	--	--	--
Filtered	09/04/08	<0.00952	<0.00952	0.0303	0.0256	<0.00952	<0.00952	<0.00952	0.0559	--	--	--	--	--	--	--	--	--
	10/01/08	<0.00990	<0.00990	<0.00990	<0.00990	<0.00990	<0.00990	<0.00990	<0.00990	--	--	--	--	--	--	--	--	--
Duplicate	10/01/08	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	--	--	--	--	--	--	--	--	--
Filtered	10/01/08	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	--	--	--	--	--	--	--	--	--
Duplicate	10/01/08	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	--	--	--	--	--	--	--	--	--
	12/03/08	<0.00952	<0.00952	<0.00952	<0.00952	<0.00952	<0.00952	<0.00952	<0.00952	--	--	--	--	--	--	--	--	--

Appendix C
Historical Summary of Groundwater Analytical Data
Carcinogenic Polycyclic Aromatic Hydrocarbons

Former Unocal Seattle Marketing Terminal
3001 Elliott Avenue
Seattle, Washington

OFFSITE AREA		Carcinogenic PAHs[2,3] (µg/L)								Noncarcinogenic PAHs[2] (µg/L)								
Monitoring Well[1]	**Sample Date**	**Benzo(a)anthracene**	**Benzo(a)pyrene**	**Benzo(b)fluoranthene**	**Benzo(k)fluoranthene**	**Chrysene**	**Dibenzo(a,h)anthracene**	**Indeno(1,2,3-cd)pyrene**	**Total CPAHs[4]**	**Acenaphthene**	**Acenaphthylene**	**Anthracene**	**Benzo(g,h,i)perylene**	**Fluoranthene**	**Fluorene**	**Naphthalene[4]**	**Phenanthrene**	**Pyrene**
RAL		**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**
MW-207 (continued) Filtered	12/03/08	<0.00943	<0.00943	<0.00943	<0.00943	<0.00943	<0.00943	<0.00943	<0.00943	--	--	--	--	--	--	--	--	--
	02/18/09	<0.00990	<0.00990	<0.00990	<0.00990	<0.00990	<0.00990	<0.00990	<0.00990	--	--	--	--	--	--	--	--	--
Filtered	02/18/09	<0.00990	<0.00990	<0.00990	<0.00990	<0.00990	<0.00990	<0.00990	<0.00990	--	--	--	--	--	--	--	--	--
	05/12/09	<0.00980	<0.00980	<0.00980	<0.00980	<0.00980	<0.00980	<0.00980	<0.00980	--	--	--	--	--	--	--	--	--
Filtered	05/12/09	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	--	--	--	--	--	--	--	--	--
	09/11/09	<0.0100	<0.0200	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0200	--	--	--	--	--	--	--	--	--
Filtered	09/11/09	<0.0110	<0.0220	<0.0110	<0.0110	<0.0110	<0.0110	<0.0110	<0.0220	--	--	--	--	--	--	--	--	--
	04/14/10	<0.0097	<0.019	<0.0097	<0.0097	<0.0097	<0.0097	<0.0097	<0.019	--	--	--	--	--	--	--	--	--
Filtered	04/14/10	<0.0094	<0.019	<0.0094	<0.0094	<0.0094	<0.0094	<0.0094	<0.019	--	--	--	--	--	--	--	--	--
	09/21/10	<0.0095	<0.019	<0.0095	<0.0095	<0.0095	<0.0095	<0.0095	<0.019	--	--	--	--	--	--	--	--	--
Duplicate	09/21/10	<0.0096	<0.019	<0.0096	<0.0096	<0.0096	<0.0096	<0.0096	<0.019	--	--	--	--	--	--	--	--	--
Filtered	09/21/10	<0.0094	<0.019	<0.0094	<0.0094	<0.0094	<0.0094	<0.0094	<0.019	--	--	--	--	--	--	--	--	--
Duplicate	09/21/10	<0.010	<0.020	<0.010	<0.010	<0.010	<0.010	<0.010	<0.020	--	--	--	--	--	--	--	--	--
	04/27/11	<0.094	<0.19	<0.094	<0.094	<0.094	<0.094	<0.094	<0.19	3.2	<0.094	0.10	<0.094	0.44	1.1	0.17	0.32	0.31
Filtered	04/27/11	<0.094	<0.19	<0.094	<0.094	<0.094	<0.094	<0.094	<0.19	2.6	<0.094	<0.094	<0.094	<0.094	0.53	0.22	<0.094	<0.094
	09/21/11	<0.0099	<0.020	<0.0099	<0.0099	<0.0099	<0.0099	<0.0099	<0.020	0.57	<0.0099	0.031	<0.0099	0.22	0.085	0.035	0.016	0.23
Filtered	09/21/11	<0.0098	<0.020	<0.0098	<0.0098	<0.0098	<0.0098	<0.0098	<0.020	0.35	<0.0098	0.012	<0.0098	0.047	0.045	0.019	<0.0098	0.042
	04/18/12	<0.019	<0.0096	<0.019	<0.019	<0.019	<0.019	<0.019	<0.038	0.84	0.019	0.040	<0.019	0.19	0.074	0.23	0.021	0.17
Filtered	04/18/12	<0.019	<0.0096	<0.019	<0.019	<0.019	<0.019	<0.019	<0.038	0.93	0.021	0.047	<0.019	0.21	0.080	0.23	0.025	0.19
	10/11/12	0.017	<0.019	<0.0095	<0.0095	0.0097	<0.0095	<0.0095	0.0267	0.74	0.013	0.094	<0.0095	0.23	0.12	0.068	0.031	0.34
Filtered	10/11/12	<0.0095	<0.019	<0.0095	<0.0095	<0.0095	<0.0095	<0.0095	<0.019	0.18	<0.0095	0.029	<0.0095	<0.0095	<0.0095	0.033	0.017	<0.0095
	04/25/13	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	--	--	--
	09/19/13	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	--	--	--
	06/23/14	0.019	<0.010	<0.010	<0.010	0.011	<0.010	<0.010	0.03	--	--	--	--	--	--	--	--	--
	12/16/14	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	--	--	--
	06/17/15	0.030	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.030	--	--	--	--	--	--	--	--	--
	12/08/15	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	--	--	--
	06/14/16	1.0	0.98	1.0	0.84	0.85	0.95	0.93	6.55	--	--	--	--	--	--	3.49	--	--
	01/13/17	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	--	--	--
Duplicate	01/13/17	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	--	--	--
	06/13/17	0.020	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	--	--	--
	11/08/17	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	--	--	--
Duplicate	11/08/17	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	--	--	--
	06/20/18	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.02	--	--	--	--	--	--	--	--	--
	12/13/18	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.02**	**<0.01**	**<0.02**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**
MW-209	02/16/16	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	--	--	--	--	--	--	--	--	--
	06/13/16	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	0.21	--	--
	09/22/16	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	<0.030	--	--
	01/12/17	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	--	--	--	--	--	--	--	--	--
	03/27/17	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	--	--	--
	06/13/17	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	--	--	--
MW-210	02/16/16	0.100	0.042	0.050	0.016	0.170	0.012	0.021	0.411	--	--	--	--	--	--	--	--	--
	06/13/16	0.110	0.056	0.073	0.027	0.210	0.015	0.024	0.515	--	--	--	--	--	--	<0.031	--	--
	09/22/16	0.016	0.014	0.016	<0.012	0.029	<0.012	<0.012	0.019	--	--	--	--	--	--	<0.037	--	--
	01/12/17	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	--	--	--
	03/27/17	0.016	<0.010	0.011	<0.010	0.020	<0.010	<0.010	0.009	--	--	--	--	--	--	--	--	--
Duplicate	03/27/17	<0.010	<0.010	<0.010	<0.010	0.012	<0.010	<0.010	0.008	--	--	--	--	--	--	--	--	--
	06/16/17	0.075	0.042	0.044	0.020	0.13	0.017	0.034	0.06	--	--	--	--	--	--	--	--	--
MW-211	02/16/16	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	--	--	--
	06/13/16	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	<0.031	--	--
	09/22/16	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	--	--	--	--	--	--	<0.033	--	--
	01/12/17	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	--	--	--
	03/27/17	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	--	--	--
	06/16/17	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	--	--	--

Notes:
[1]Monitoring well locations are shown on Figure 2.
[2]Analyses by EPA Method 8310 or 8270 (SIM).
[3]WAC 173-340-200 (MTCA).
[4]Numeric sum of detected concentrations. Where no compounds were detected, this figure is equal to the highest reporting limit for an individual compound.
[5]Napthalene detected in the method blank, these data are from the initial extraction of the sample.
[6]Sample was extracted past the holding time.
[7]Sample was re-prepared outside of preparation holding time. Results have been flaged as "H" in the laboratory report.
[8] There was insufficient sample to perform a re-extraction or re-analysis, therefore, the data have been reported.
[9]LCS or LCSD exceeds the control limits/RPD of the LCS exceeds the control limits.
[D]Duplicate of the preceding sample.
RAL = Remedial Action Level per Amendments No. 4 and No. 5 to Order on Consent; applicable for Offsite Area only.
There is no cPAH RAL for groundwater in the Upper Yard, Lower Yard or Elliott Avenue.
µg/L = micrograms per liter
NE = not established

Appendix C
Historical Summary of Groundwater Analytical Data
Carcinogenic Polycyclic Aromatic Hydrocarbons

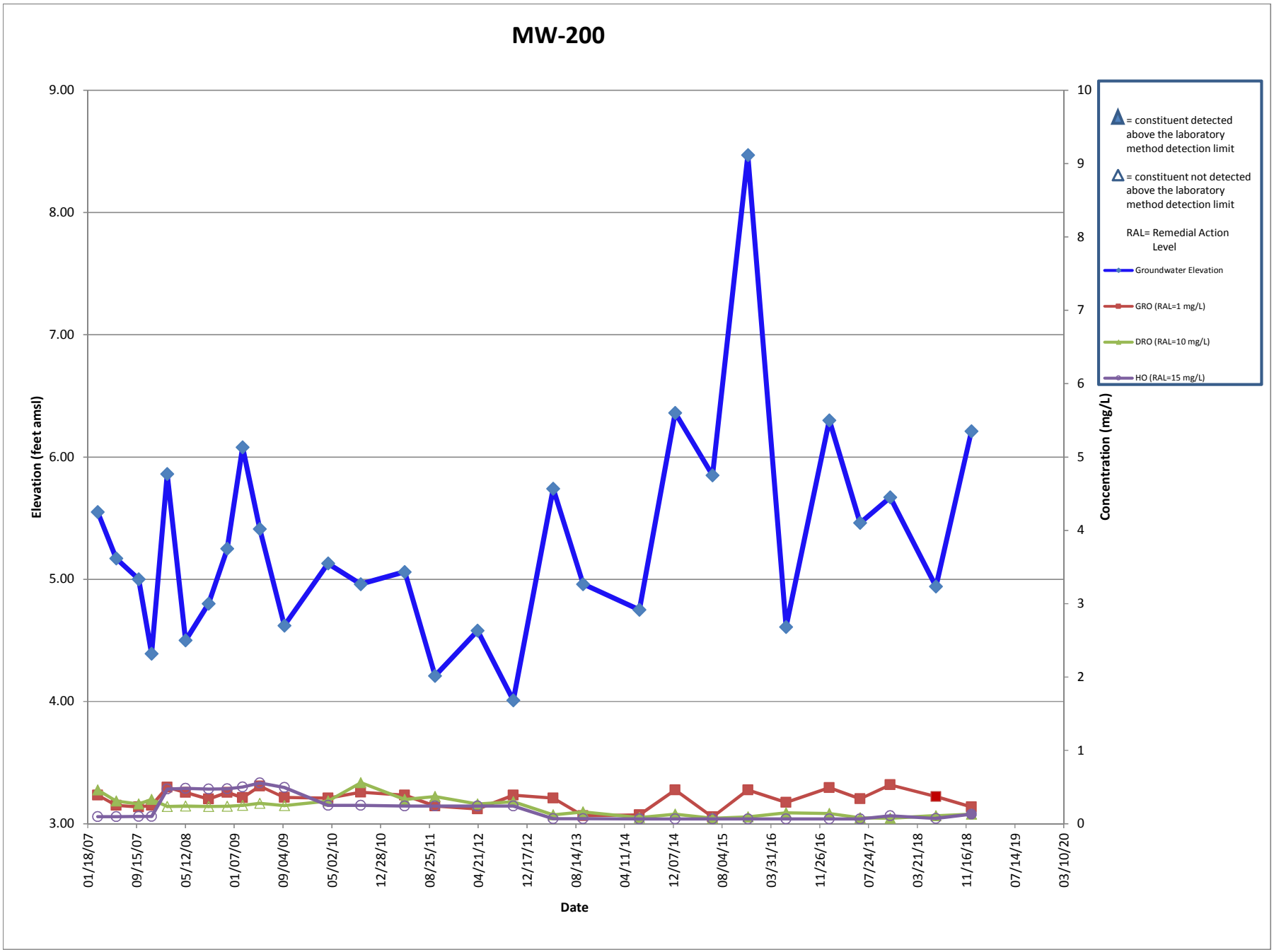
Former Unocal Seattle Marketing Terminal
3001 Elliott Avenue
Seattle, Washington

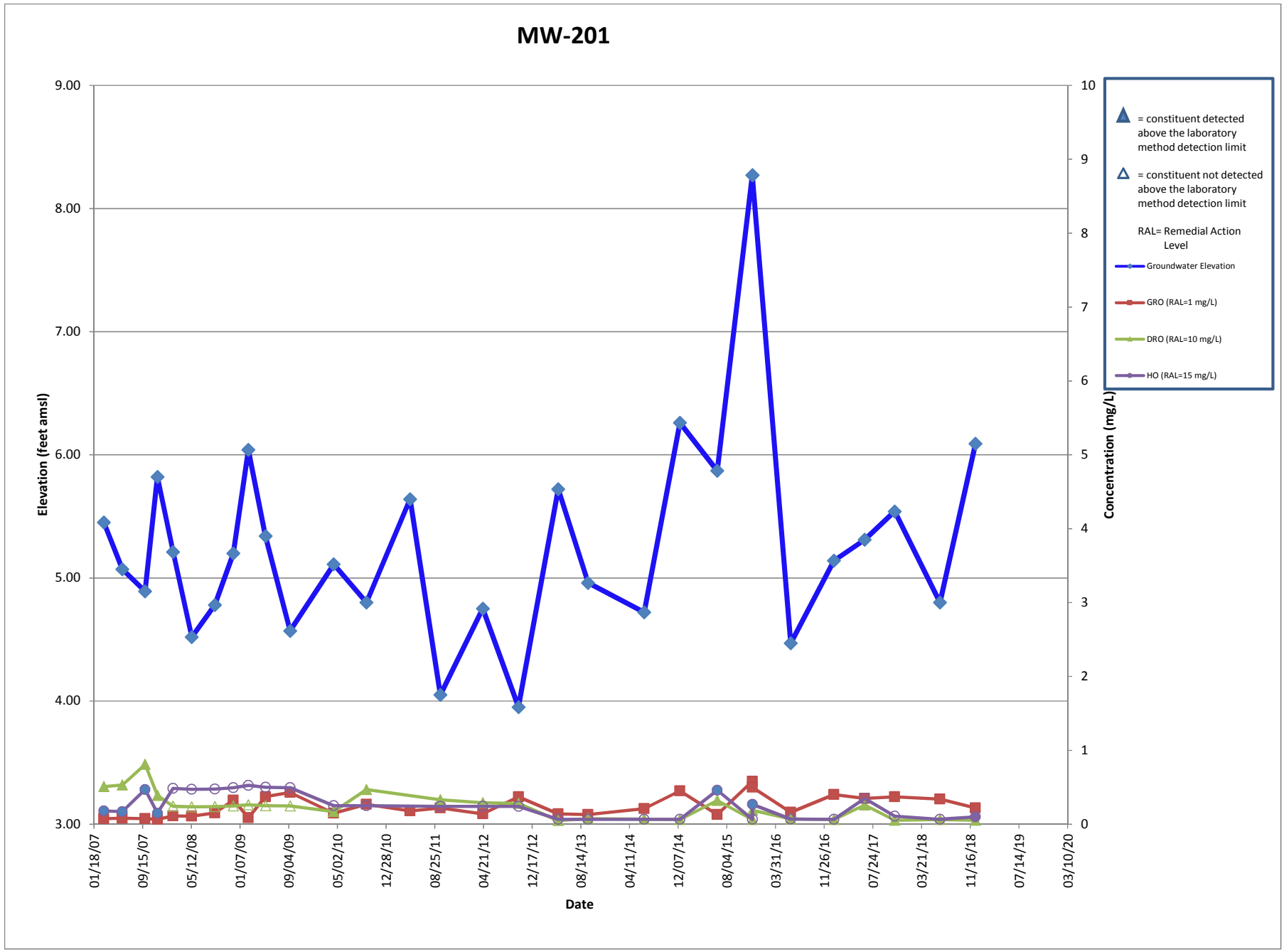
OFFSITE AREA		Carcinogenic PAHs[2,3] (µg/L)								Noncarcinogenic PAHs[2] (µg/L)								
Monitoring Well[1]	Sample Date	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Indeno(1,2,3-cd)pyrene	Total CPAHs[4]	Acenaphthene	Acenaphthylene	Anthracene	Benzo(g,h,i)perylene	Fluoranthene	Fluorene	Naphthalene[4]	Phenanthrene	Pyrene
RAL		**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**

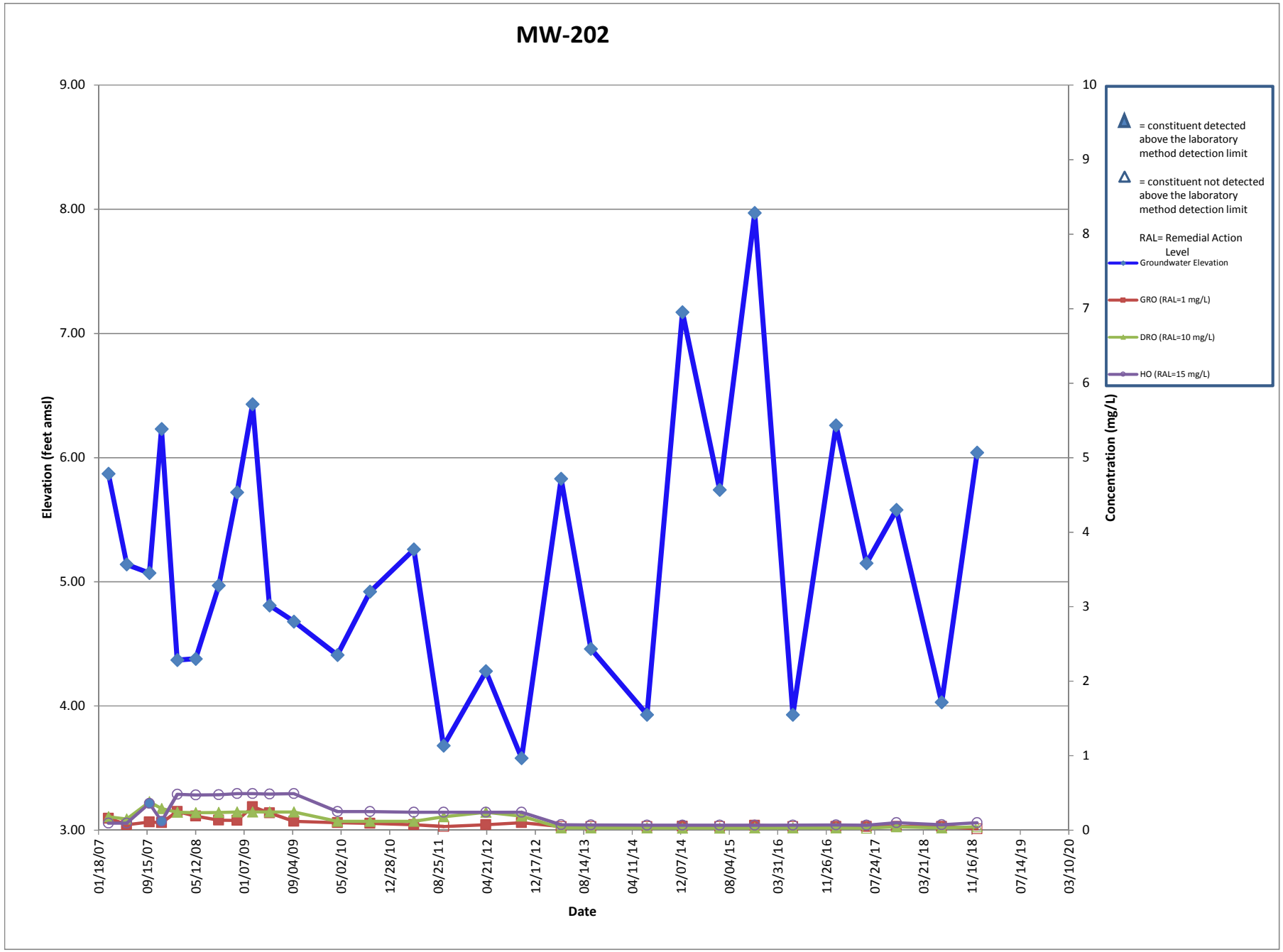
"--" not sampled
cPAHs = carcinogenic polycyclic aromatic hydrocarbons.
PAHs = polynuclear aromatic hydrocarbons.
LNAPL = light nonaqueous phase liquid
Laboratory analyses by TestAmerica of Tacoma, Washington and Lancaster Laboratories of Lancaster, Pennsylvania.
Bolded data are for the current reporting period.
Shading indicates concentration greater than the RAL.
NEAR = The sample was collected from the top of the water column within the respective monitoring well.
DL, RA, RE, IN = Indicates a Dilution, Reanalysis, Re-extraction, or additional Intial metals/anion analysis of the sample.

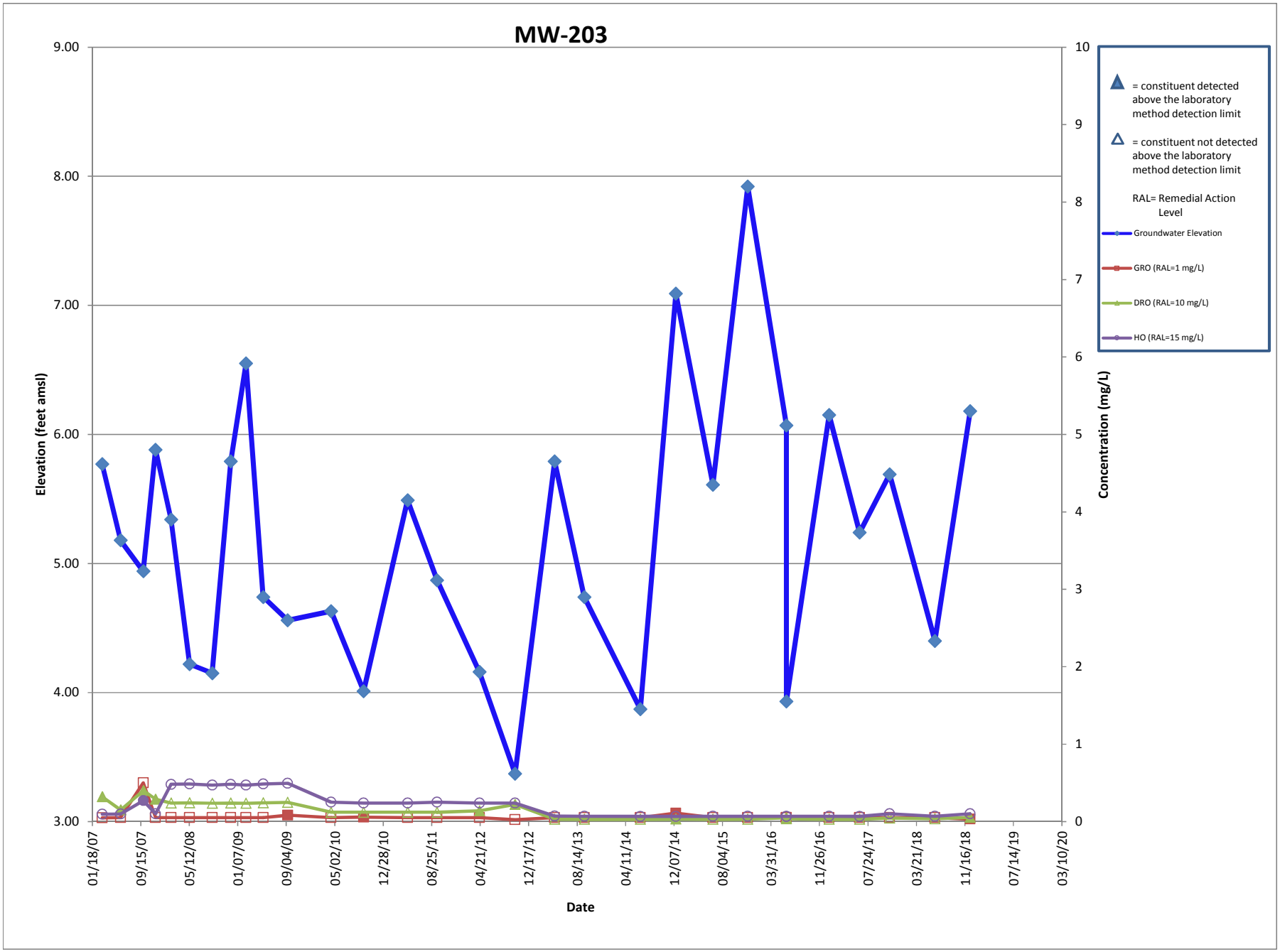
APPENDIX D

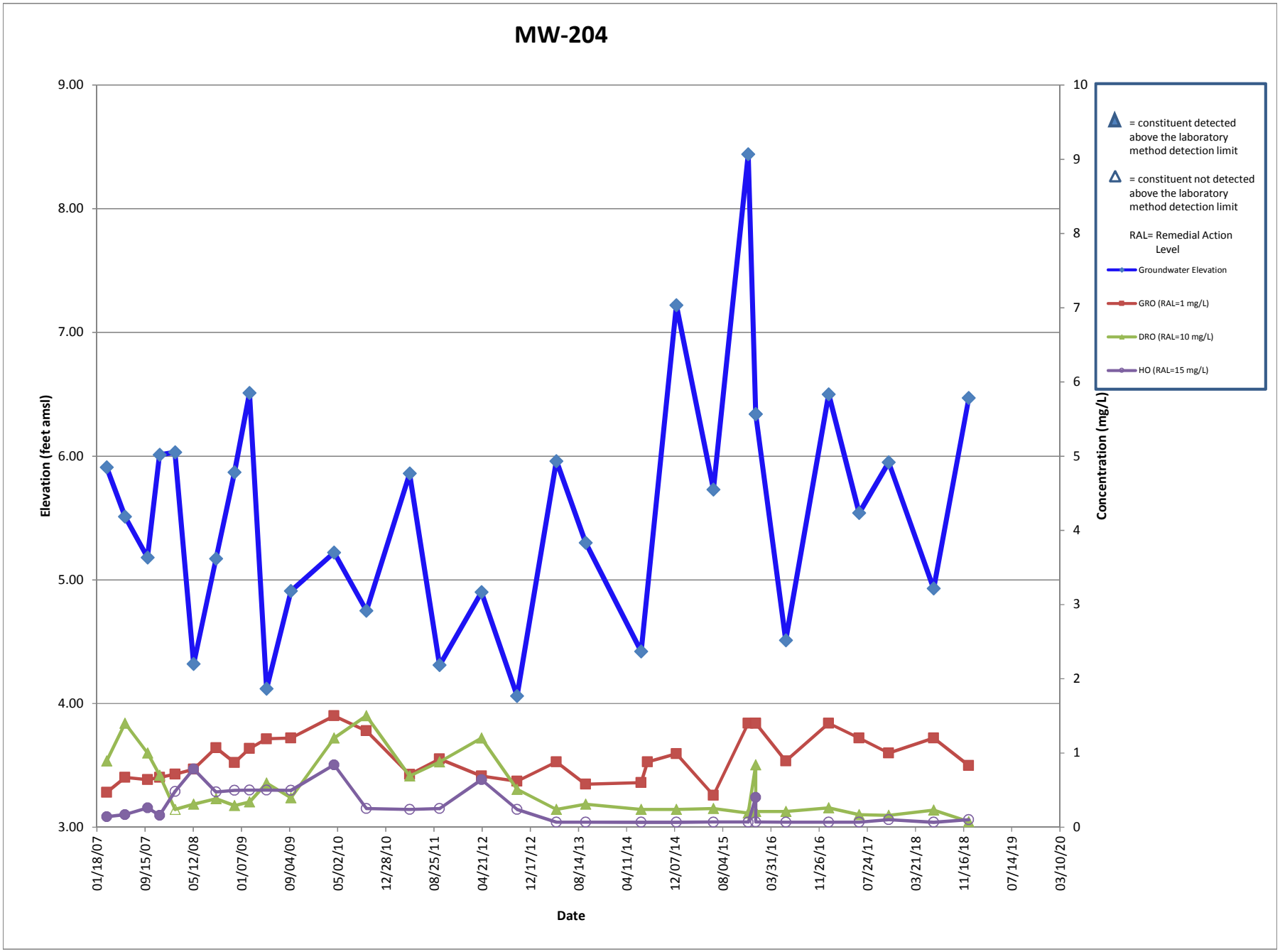
Historical Trends Graphs

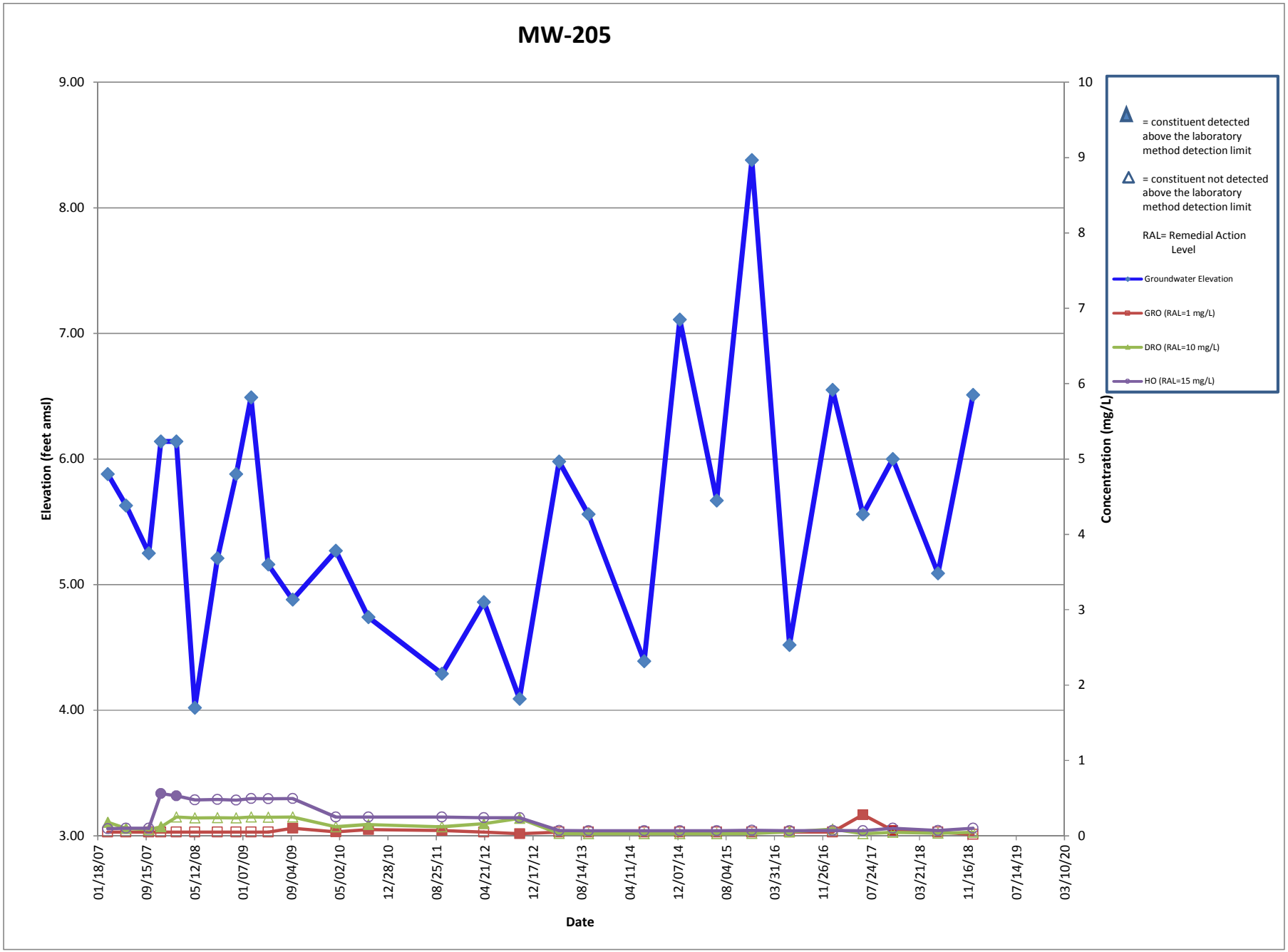

MW-200
9.00
8.00
7.00
6.00
5.00
4.00
3.00
Elevation (feet amsl)
10
9
8
7
6
5
4
3
2
1
0
Concentration (mg/L)
01/18/07
09/15/07
05/12/08
01/07/09
09/04/09
05/02/10
12/28/10
08/25/11
04/21/12
12/17/12
08/14/13
04/11/14
12/07/14
08/04/15
03/31/16
11/26/16
07/24/17
03/21/18
11/16/18
07/14/19
03/10/20
Date
= constituent detected above the laboratory method detection limit
= constituent not detected above the laboratory method detection limit
RAL= Remedial Action Level
Groundwater Elevation
GRO (RAL=1 mg/L)
DRO (RAL=10 mg/L)
HO (RAL=15 mg/L)

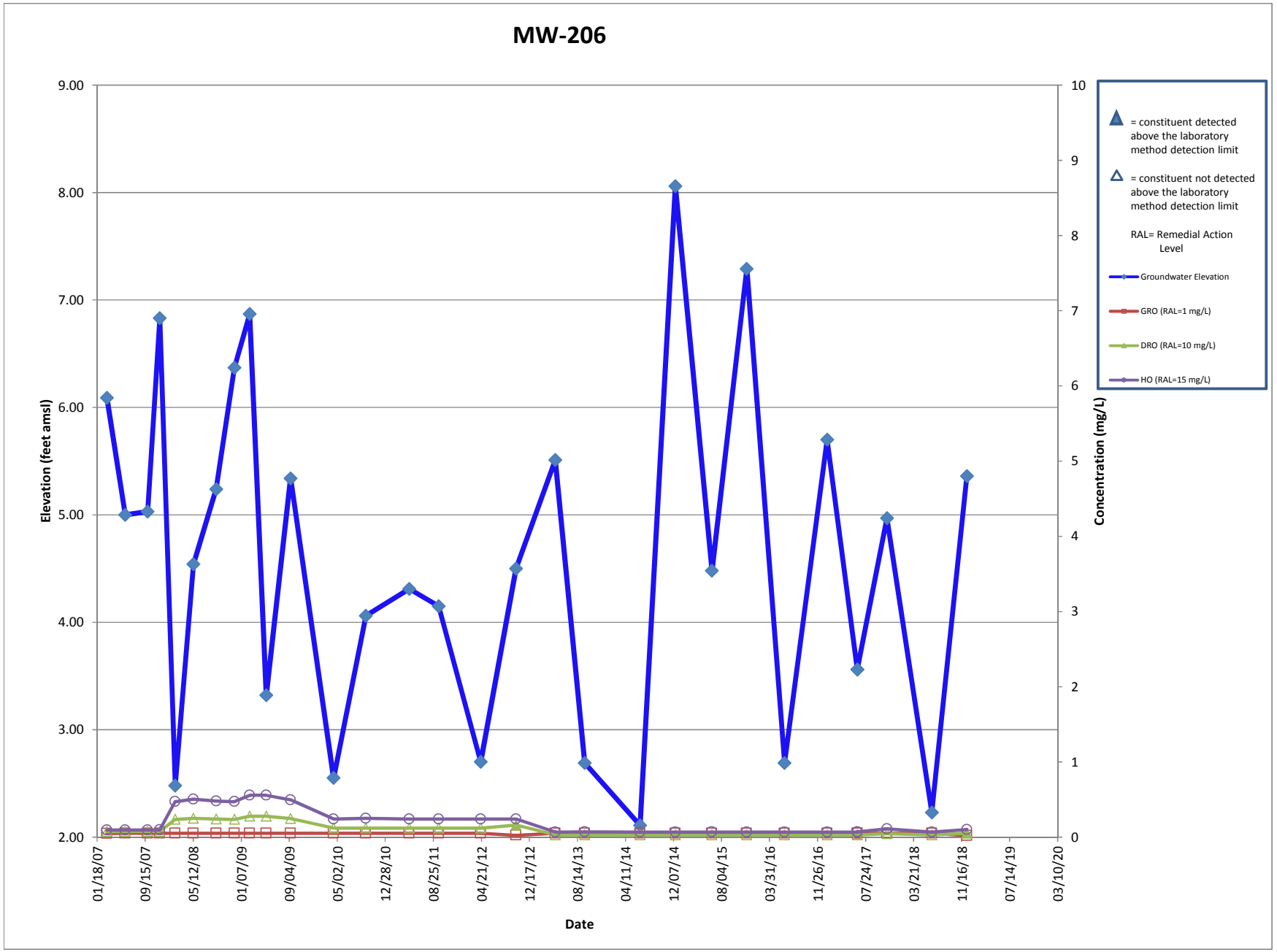

MW-201
Elevation (feet amsl)
Concentration (mg/L)
Date
9.00
8.00
7.00
6.00
5.00
4.00
3.00
10
9
8
7
6
5
4
3
2
1
0
01/18/07
09/15/07
05/12/08
01/07/09
09/04/09
05/02/10
12/28/10
08/25/11
04/21/12
12/17/12
08/14/13
04/11/14
12/07/14
08/04/15
03/31/16
11/26/16
07/24/17
03/21/18
11/16/18
07/14/19
03/10/20
= constituent detected above the laboratory method detection limit
= constituent not detected above the laboratory method detection limit
RAL= Remedial Action Level
Groundwater Elevation
GRO (RAL=1 mg/L)
DRO (RAL=10 mg/L)
HO (RAL=15 mg/L)

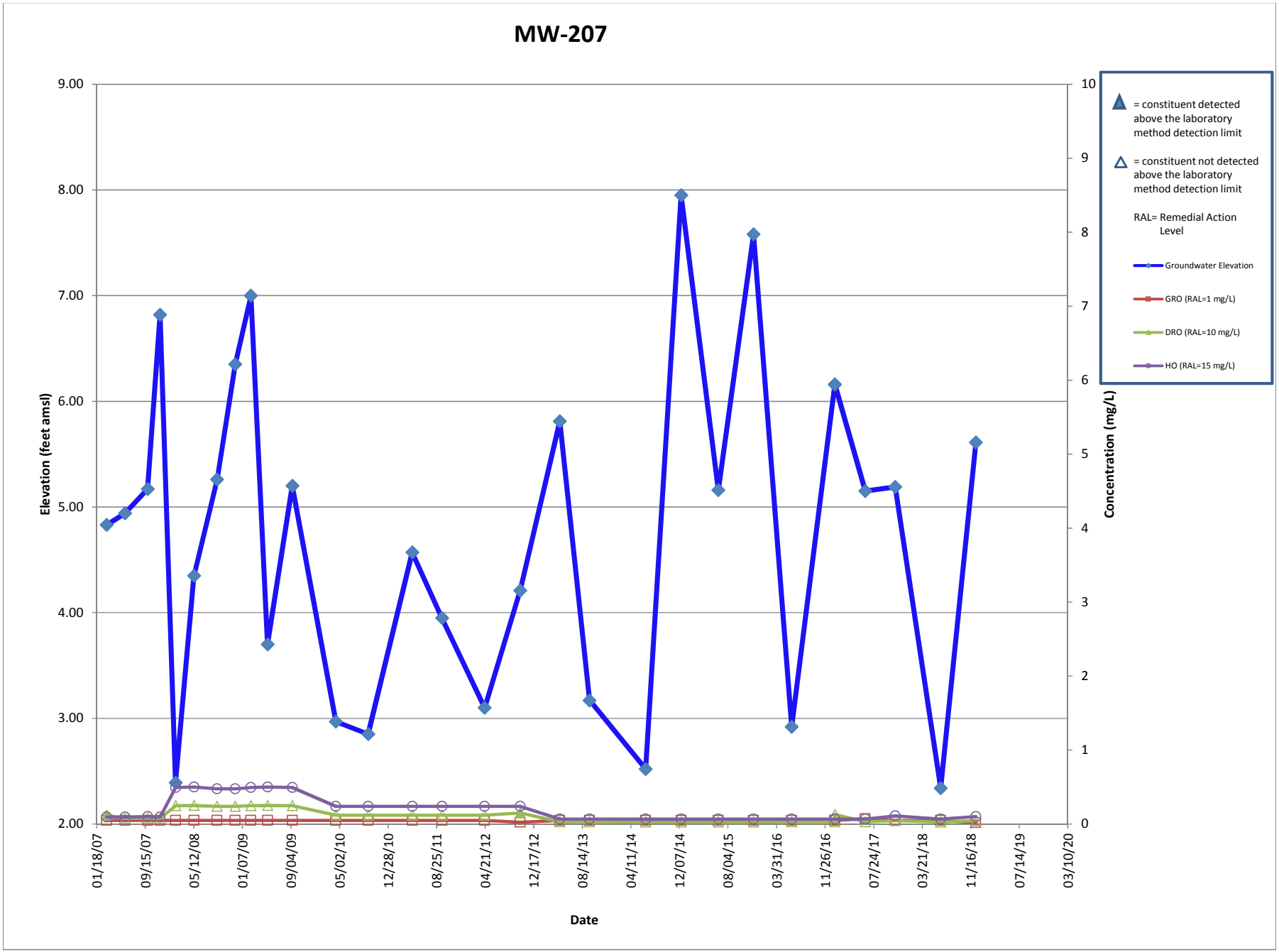

MW-202
Elevation (feet amsl)
Concentration (mg/L)
Date
9.00
8.00
7.00
6.00
5.00
4.00
3.00
10
9
8
7
6
5
4
3
2
1
0
01/18/07
09/15/07
05/12/08
01/07/09
09/04/09
05/02/10
12/28/10
08/25/11
04/21/12
12/17/12
08/14/13
04/11/14
12/07/14
08/04/15
03/31/16
11/26/16
07/24/17
03/21/18
11/16/18
07/14/19
03/10/20
= constituent detected above the laboratory method detection limit
= constituent not detected above the laboratory method detection limit
RAL= Remedial Action Level
Groundwater Elevation
GRO (RAL=1 mg/L)
DRO (RAL=10 mg/L)
HO (RAL=15 mg/L)

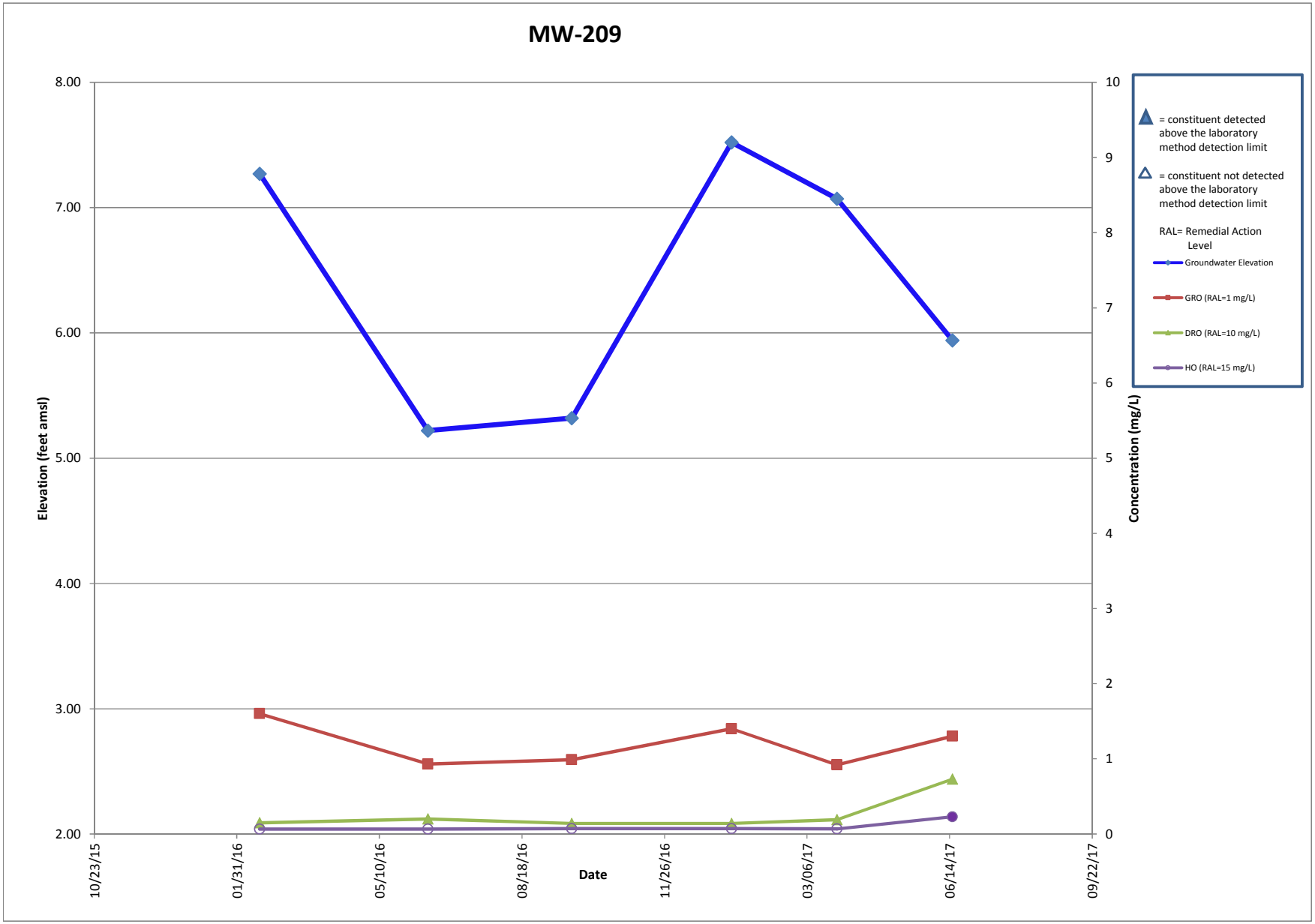

MW-203
9.00
8.00
7.00
6.00
5.00
4.00
3.00
Elevation (feet amsl)
10
9
8
7
6
5
4
3
2
1
0
Concentration (mg/L)
01/18/07
09/15/07
05/12/08
01/07/09
09/04/09
05/02/10
12/28/10
08/25/11
04/21/12
12/17/12
08/14/13
04/11/14
12/07/14
08/04/15
03/31/16
11/26/16
07/24/17
03/21/18
11/16/18
07/14/19
03/10/20
Date
= constituent detected above the laboratory method detection limit
= constituent not detected above the laboratory method detection limit
RAL= Remedial Action Level
Groundwater Elevation
GRO (RAL=1 mg/L)
DRO (RAL=10 mg/L)
HO (RAL=15 mg/L)

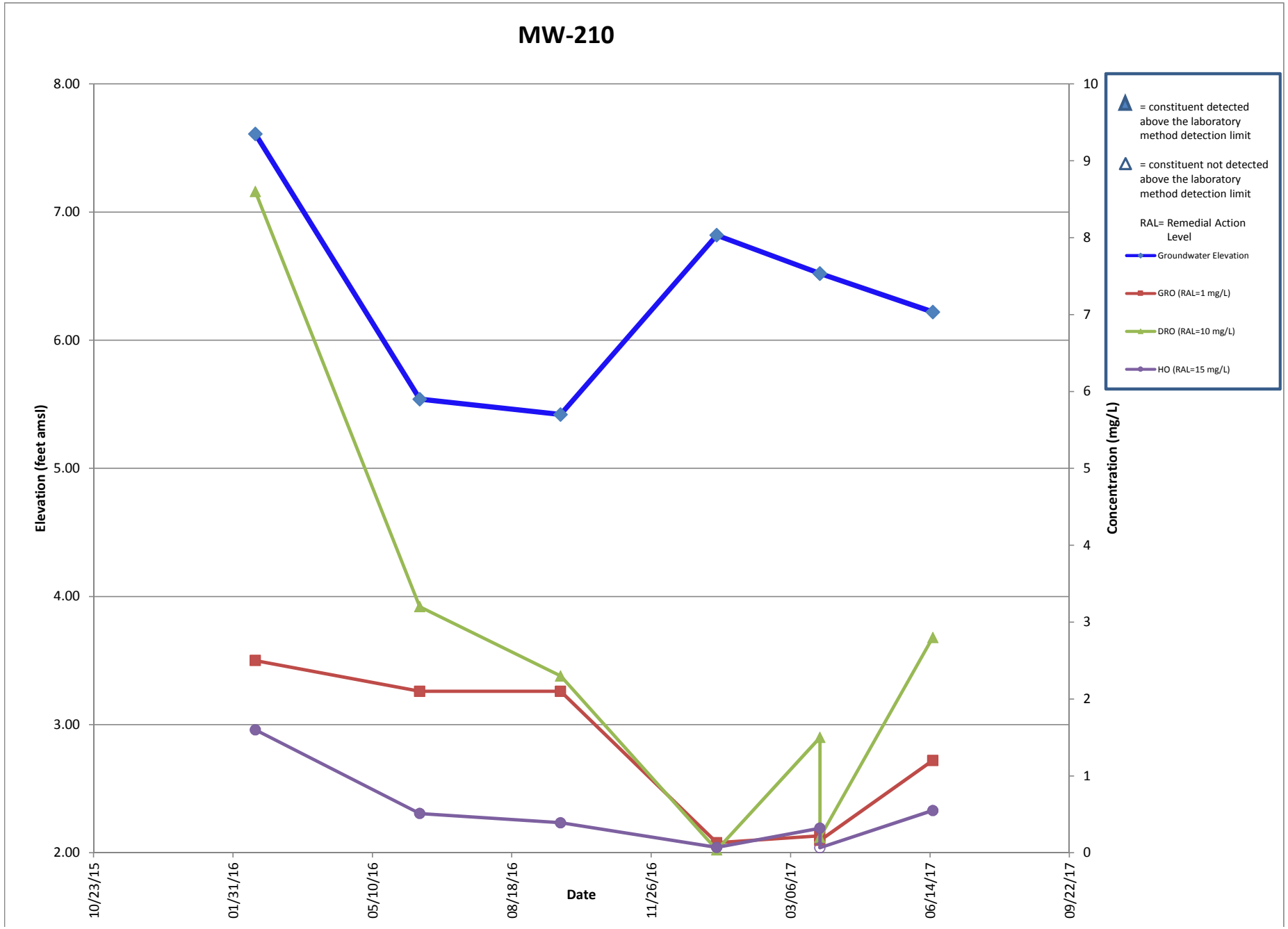

MW-204
9.00
8.00
7.00
6.00
5.00
4.00
3.00
Elevation (feet amsl)
10
9
8
7
6
5
4
3
2
1
0
Concentration (mg/L)
01/18/07
09/15/07
05/12/08
01/07/09
09/04/09
05/02/10
12/28/10
08/25/11
04/21/12
12/17/12
08/14/13
04/11/14
12/07/14
08/04/15
03/31/16
11/26/16
07/24/17
03/21/18
11/16/18
07/14/19
03/10/20
Date
= constituent detected above the laboratory method detection limit
= constituent not detected above the laboratory method detection limit
RAL= Remedial Action Level
Groundwater Elevation
GRO (RAL=1 mg/L)
DRO (RAL=10 mg/L)
HO (RAL=15 mg/L)

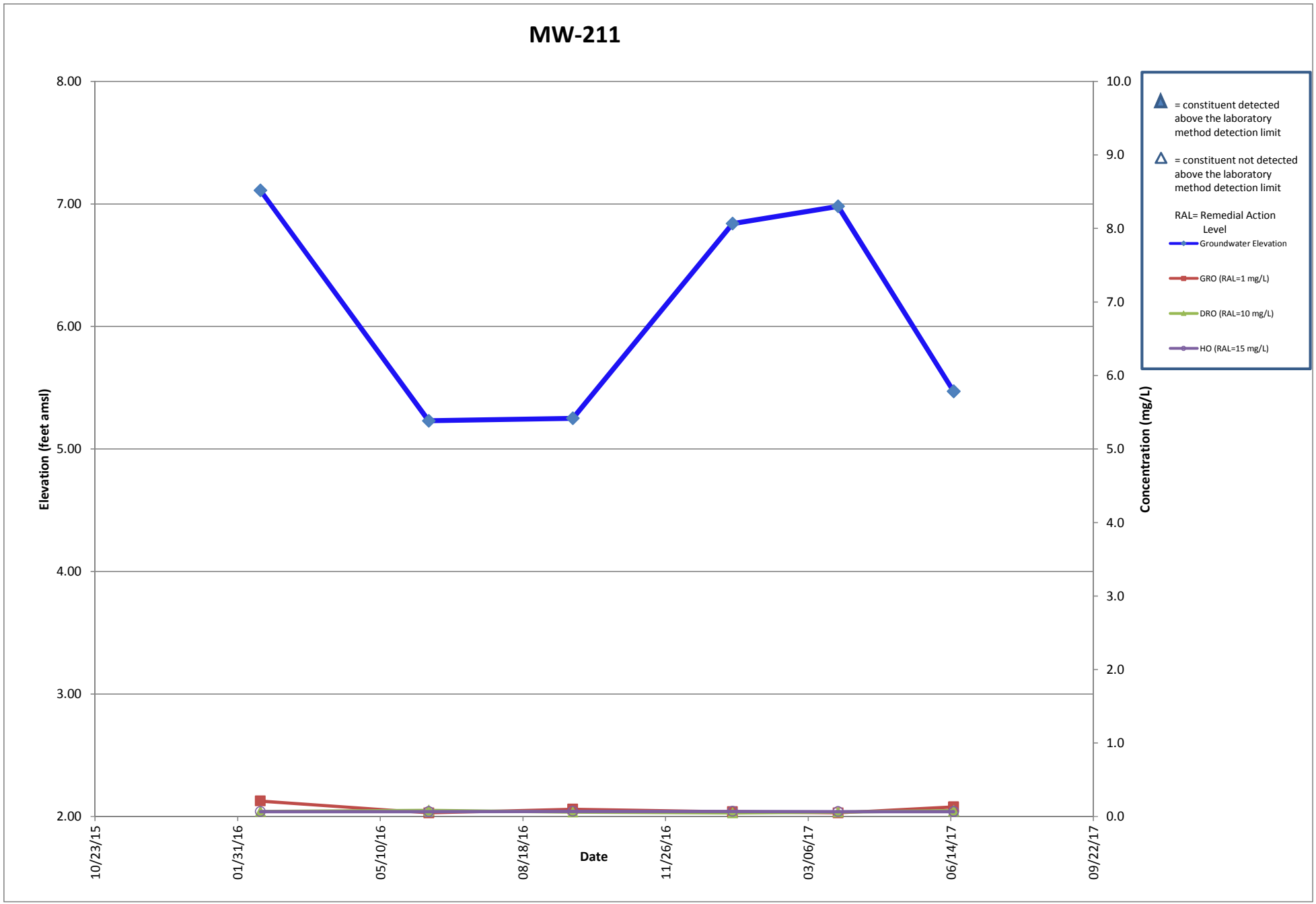

MW-205
Elevation (feet amsl)
Concentration (mg/L)
Date
9.00
8.00
7.00
6.00
5.00
4.00
3.00
10
9
8
7
6
5
4
3
2
1
0
01/18/07
09/15/07
05/12/08
01/07/09
09/04/09
05/02/10
12/28/10
08/25/11
04/21/12
12/17/12
08/14/13
04/11/14
12/07/14
08/04/15
03/31/16
11/26/16
07/24/17
03/21/18
11/16/18
07/14/19
03/10/20
= constituent detected above the laboratory method detection limit
= constituent not detected above the laboratory method detection limit
RAL= Remedial Action Level
Groundwater Elevation
GRO (RAL=1 mg/L)
DRO (RAL=10 mg/L)
HO (RAL=15 mg/L)

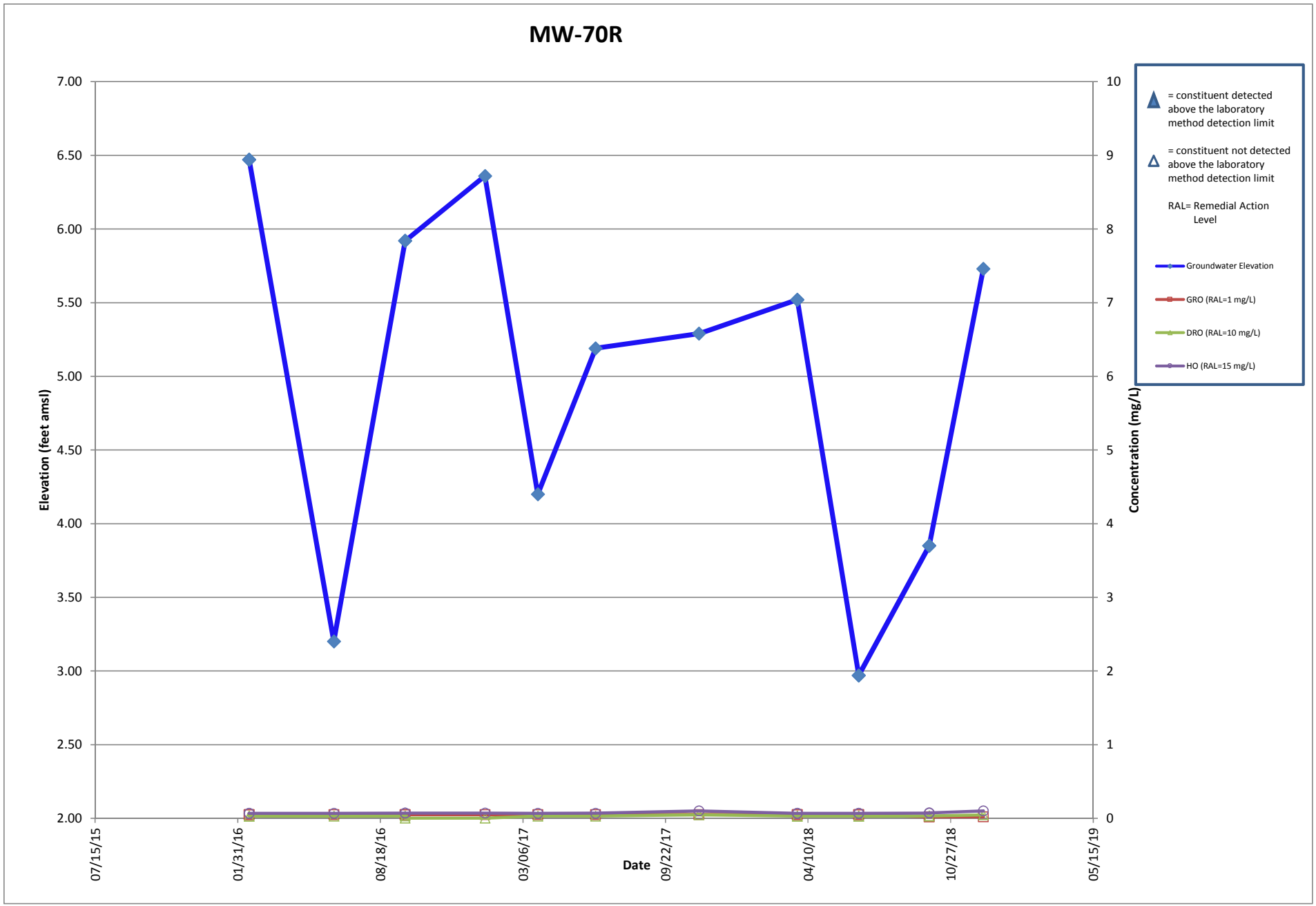

MW-206
Elevation (feet amsl)
Concentration (mg/L)
Date
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
10
9
8
7
6
5
4
3
2
1
0
01/18/07
09/15/07
05/12/08
01/07/09
09/04/09
05/02/10
12/28/10
08/25/11
04/21/12
12/17/12
08/14/13
04/11/14
12/07/14
08/04/15
03/31/16
11/26/16
07/24/17
03/21/18
11/16/18
07/14/19
03/10/20
= constituent detected above the laboratory method detection limit
= constituent not detected above the laboratory method detection limit
RAL= Remedial Action Level
Groundwater Elevation
GRO (RAL=1 mg/L)
DRO (RAL=10 mg/L)
HO (RAL=15 mg/L)

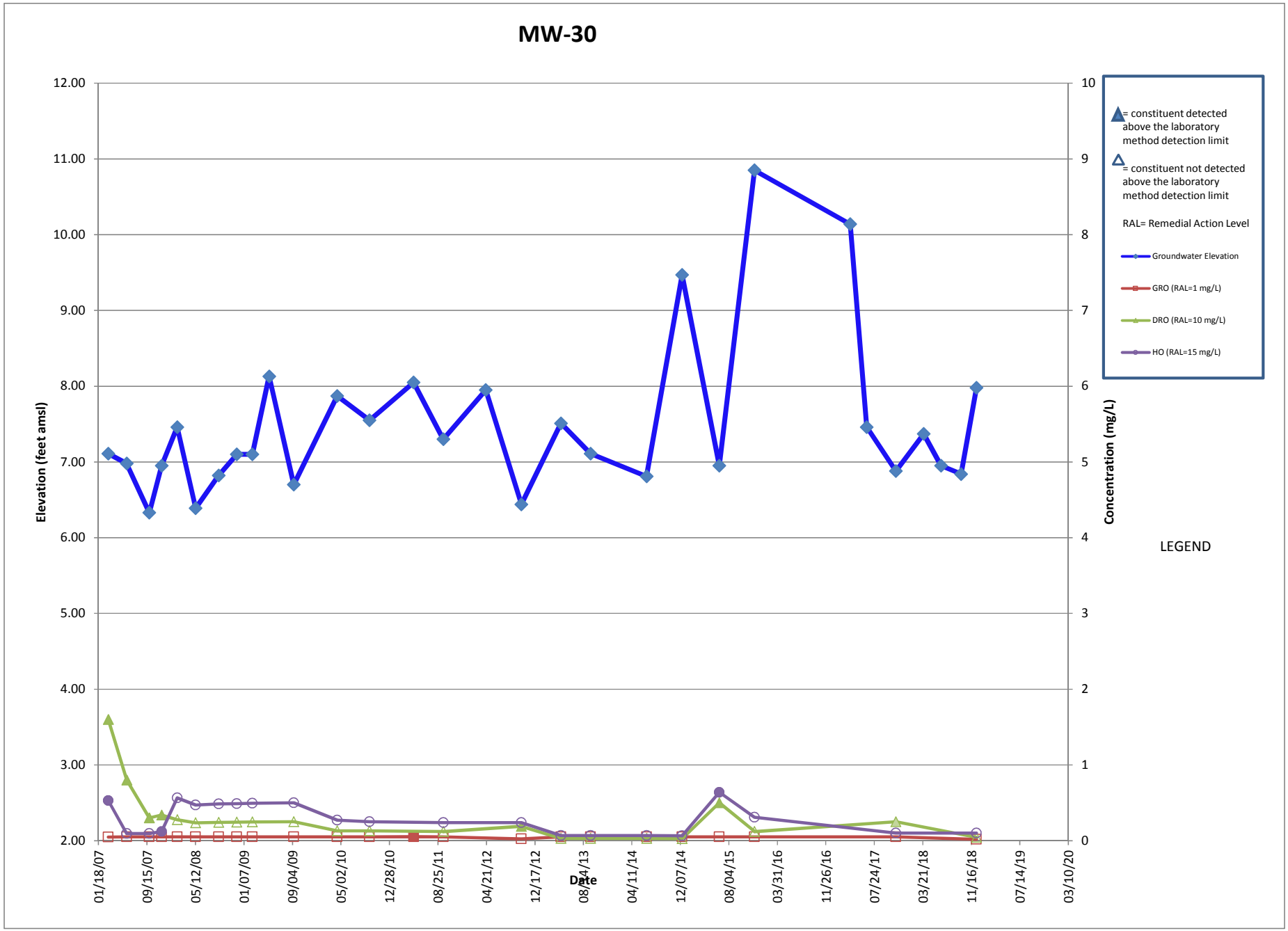

MW-207
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
Elevation (feet amsl)
10
9
8
7
6
5
4
3
2
1
0
Concentration (mg/L)
01/18/07
09/15/07
05/12/08
01/07/09
09/04/09
05/02/10
12/28/10
08/25/11
04/21/12
12/17/12
08/14/13
04/11/14
12/07/14
08/04/15
03/31/16
11/26/16
07/24/17
03/21/18
11/16/18
07/14/19
03/10/20
Date
= constituent detected above the laboratory method detection limit
= constituent not detected above the laboratory method detection limit
RAL= Remedial Action Level
Groundwater Elevation
GRO (RAL=1 mg/L)
DRO (RAL=10 mg/L)
HO (RAL=15 mg/L)


MW-209
8.00
7.00
6.00
5.00
4.00
3.00
2.00
Elevation (feet amsl)
10
9
8
7
6
5
4
3
2
1
0
Concentration (mg/L)
10/23/15
01/31/16
05/10/16
08/18/16
11/26/16
03/06/17
06/14/17
09/22/17
Date
= constituent detected above the laboratory method detection limit
= constituent not detected above the laboratory method detection limit
RAL= Remedial Action Level
Groundwater Elevation
GRO (RAL=1 mg/L)
DRO (RAL=10 mg/L)
HO (RAL=15 mg/L)


MW-210
8.00
7.00
6.00
5.00
4.00
3.00
2.00
Elevation (feet amsl)
10
9
8
7
6
5
4
3
2
1
0
Concentration (mg/L)
10/23/15
01/31/16
05/10/16
08/18/16
11/26/16
03/06/17
06/14/17
09/22/17
Date
= constituent detected above the laboratory method detection limit
= constituent not detected above the laboratory method detection limit
RAL= Remedial Action Level
Groundwater Elevation
GRO (RAL=1 mg/L)
DRO (RAL=10 mg/L)
HO (RAL=15 mg/L)


MW-211
8.00
7.00
6.00
5.00
4.00
3.00
2.00
Elevation (feet amsl)
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
Concentration (mg/L)
10/23/15
01/31/16
05/10/16
08/18/16
11/26/16
03/06/17
06/14/17
09/22/17
Date
= constituent detected above the laboratory method detection limit
= constituent not detected above the laboratory method detection limit
RAL= Remedial Action Level
Groundwater Elevation
GRO (RAL=1 mg/L)
DRO (RAL=10 mg/L)
HO (RAL=15 mg/L)


MW-70R
Elevation (feet amsl)
Concentration (mg/L)
Date
7.00
6.50
6.00
5.50
5.00
4.50
4.00
3.50
3.00
2.50
2.00
10
9
8
7
6
5
4
3
2
1
0
07/15/15
01/31/16
08/18/16
03/06/17
09/22/17
04/10/18
10/27/18
05/15/19
= constituent detected above the laboratory method detection limit
= constituent not detected above the laboratory method detection limit
RAL= Remedial Action Level
Groundwater Elevation
GRO (RAL=1 mg/L)
DRO (RAL=10 mg/L)
HO (RAL=15 mg/L)


MW-30
Elevation (feet amsl)
Concentration (mg/L)
Date
12.00
11.00
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
10
9
8
7
6
5
4
3
2
1
0
01/18/07
09/15/07
05/12/08
01/07/09
09/04/09
05/02/10
12/28/10
08/25/11
04/21/12
12/17/12
08/14/13
04/11/14
12/07/14
08/04/15
03/31/16
11/26/16
07/24/17
03/21/18
11/16/18
07/14/19
03/10/20
= constituent detected above the laboratory method detection limit
= constituent not detected above the laboratory method detection limit
RAL= Remedial Action Level
Groundwater Elevation
GRO (RAL=1 mg/L)
DRO (RAL=10 mg/L)
HO (RAL=15 mg/L)
LEGEND

APPENDIX E

Laboratory report and Chain of Custody Forms

eurofins | Lancaster Laboratories Environmental

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-6766 • www.EurofinsUS.com/LancLabsEnv

ANALYSIS REPORT

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

Chevron Environmental Mgmt Co
BR1 X5139C
6101 Bollinger Canyon Road
San Ramon CA 94583

Report Date: October 22, 2018 10:19

Project: Seattle Terminal

Account #: 11964
Group Number: 1992639
PO Number: 0015268293
Release Number: JOLITZ
State of Sample Origin: WA

Electronic Copy To	Arcadis	Attn: Rebecca Andresen
Electronic Copy To	ARCADIS U.S., Inc.	Attn: Sam Miles

Respectfully Submitted,

Elisabeth A. Knisley
Project Manager

(717) 556-7262

To view our laboratory's current scopes of accreditation please go to http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/ . Historical copies may be requested through your project manager.

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-6766 • www.EurofinsUS.com/LancLabsEnv

SAMPLE INFORMATION

Client Sample Description	Sample Collection Date/Time	ELLE#
MW-70R-W-180927 Grab Groundwater	09/27/2018 14:30	9826973
DUP-01-WD-180927 Grab Groundwater	09/27/2018	9826974
TRIP_BLANK-T-180927 NA Water	09/27/2018	9826975

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Sample Description: **MW-70R-W-180927 Grab Groundwater**
Seattle Terminal
3001 Elliott Ave - Seattle, WA

Project Name: **Seattle Terminal**

Submittal Date/Time: 09/28/2018 10:25
Collection Date/Time: 09/27/2018 14:30

Chevron Environmental Mgmt Co
ELLE Sample #: WW 9826973
ELLE Group #: 1992639
Matrix: Groundwater

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC/MS Semivolatiles	**SW-846 8270D SIM**		**ug/l**	**ug/l**	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
GC Volatiles	**ECY 97-602 NWTPH-Gx**		**ug/l**	**ug/l**	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1
GC Volatiles	**SW-846 8021B**		**ug/l**	**ug/l**	
02102	Benzene	71-43-2	N.D.	0.5	1
02102	Ethylbenzene	100-41-4	N.D.	0.5	1
02102	Toluene	108-88-3	N.D.	0.5	1
02102	Total Xylenes	1330-20-7	N.D.	1.5	1
GC Petroleum Hydrocarbons w/Si	**ECY 97-602 NWTPH-Dx modified**		**ug/l**	**ug/l**	
12005	DRO C12-C24 w/Si Gel	n.a.	N.D.	30	1
12005	HRO C24-C40 w/Si Gel	n.a.	N.D.	70	1

The reverse surrogate, capric acid, is present at <1%.

Sample Comments

State of Washington Lab Certification No. C457
Carcinogenic PAHs have been reported for this sample

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18275WAM026	10/05/2018 16:42	Kira N Beck	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18275WAM026	10/03/2018 08:00	Joshua S Ruth	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18281A94A	10/09/2018 16:11	Linda C Pape	1
02102	BTEX (8021)	SW-846 8021B	1	18281A94A	10/09/2018 16:11	Linda C Pape	1
01146	GC VOA Water Prep	SW-846 5030B	1	18281A94A	10/09/2018 16:11	Linda C Pape	1
12005	NWTPH-Dx water w/ 10g Si Gel	ECY 97-602 NWTPH-Dx modified	1	182810006A	10/10/2018 20:00	Thomas C Wildermuth	1
12007	NW Dx water w/ 10g column	ECY 97-602 NWTPH-Dx 06/97	1	182810006A	10/08/2018 17:00	Kate E Lutte	1

Sample Description: **DUP-01-WD-180927 Grab Groundwater**
Seattle Terminal
3001 Elliott Ave - Seattle, WA

Project Name: **Seattle Terminal**

Submittal Date/Time: 09/28/2018 10:25
Collection Date/Time: 09/27/2018

Chevron Environmental Mgmt Co
ELLE Sample #: WW 9826974
ELLE Group #: 1992639
Matrix: Groundwater

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC/MS Semivolatiles	**SW-846 8270D SIM**		**ug/l**	**ug/l**	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
GC Volatiles	**ECY 97-602 NWTPH-Gx**		**ug/l**	**ug/l**	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1
GC Volatiles	**SW-846 8021B**		**ug/l**	**ug/l**	
02102	Benzene	71-43-2	N.D.	0.5	1
02102	Ethylbenzene	100-41-4	N.D.	0.5	1
02102	Toluene	108-88-3	N.D.	0.5	1
02102	Total Xylenes	1330-20-7	N.D.	1.5	1
GC Petroleum Hydrocarbons w/Si	**ECY 97-602 NWTPH-Dx modified**		**ug/l**	**ug/l**	
12005	DRO C12-C24 w/Si Gel	n.a.	N.D.	31	1
12005	HRO C24-C40 w/Si Gel	n.a.	N.D.	72	1

The reverse surrogate, capric acid, is present at <1%.

Sample Comments

State of Washington Lab Certification No. C457
Carcinogenic PAHs have been reported for this sample

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18275WAM026	10/05/2018 17:10	Kira N Beck	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18275WAM026	10/03/2018 08:00	Joshua S Ruth	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18281A94A	10/09/2018 16:37	Linda C Pape	1
02102	BTEX (8021)	SW-846 8021B	1	18281A94A	10/09/2018 16:37	Linda C Pape	1
01146	GC VOA Water Prep	SW-846 5030B	1	18281A94A	10/09/2018 16:37	Linda C Pape	1
12005	NWTPH-Dx water w/ 10g Si Gel	ECY 97-602 NWTPH-Dx modified	1	182810006A	10/10/2018 20:21	Thomas C Wildermuth	1
12007	NW Dx water w/ 10g column	ECY 97-602 NWTPH-Dx 06/97	1	182810006A	10/08/2018 17:00	Kate E Lutte	1

Sample Description: **TRIP_BLANK-T-180927 NA Water**
Seattle Terminal
3001 Elliott Ave - Seattle, WA

Project Name: **Seattle Terminal**

Submittal Date/Time: 09/28/2018 10:25
Collection Date/Time: 09/27/2018

Chevron Environmental Mgmt Co
ELLE Sample #: WW 9826975
ELLE Group #: 1992639
Matrix: Water

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC Volatiles	**ECY 97-602 NWTPH-Gx**		**ug/l**	**ug/l**	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1
GC Volatiles	**SW-846 8021B**		**ug/l**	**ug/l**	
02102	Benzene	71-43-2	N.D.	0.5	1
02102	Ethylbenzene	100-41-4	N.D.	0.5	1
02102	Toluene	108-88-3	N.D.	0.5	1
02102	Total Xylenes	1330-20-7	N.D.	1.5	1

Sample Comments

State of Washington Lab Certification No. C457

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18281A94A	10/09/2018 15:46	Linda C Pape	1
02102	BTEX (8021)	SW-846 8021B	1	18281A94A	10/09/2018 15:46	Linda C Pape	1
01146	GC VOA Water Prep	SW-846 5030B	1	18281A94A	10/09/2018 15:46	Linda C Pape	1

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Quality Control Summary

Client Name: Chevron Environmental Mgmt Co
Reported: 10/22/2018 10:19

Group Number: 1992639

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result	MDL
	ug/l	ug/l
Batch number: 18275WAM026	Sample number(s): 9826973-9826974	
Benzo(a)anthracene	N.D.	0.01
Benzo(a)pyrene	N.D.	0.01
Benzo(b)fluoranthene	N.D.	0.01
Benzo(k)fluoranthene	N.D.	0.01
Chrysene	N.D.	0.01
Dibenz(a,h)anthracene	N.D.	0.02
Indeno(1,2,3-cd)pyrene	N.D.	0.01
Batch number: 18281A94A	Sample number(s): 9826973-9826975	
Benzene	N.D.	0.03
Ethylbenzene	N.D.	0.05
NWTPH-Gx water C7-C12	N.D.	19
Toluene	N.D.	0.1
Total Xylenes	N.D.	0.1
Batch number: 182810006A	Sample number(s): 9826973-9826974	
DRO C12-C24 w/Si Gel	N.D.	30
HRO C24-C40 w/Si Gel	390	70

LCS/LCSD

Analysis Name	LCS Spike Added	LCS Conc	LCSD Spike Added	LCSD Conc	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
	ug/l	ug/l	ug/l	ug/l					
Batch number: 18275WAM026	Sample number(s): 9826973-9826974								
Benzo(a)anthracene	1.00	1.00			100		67-111		
Benzo(a)pyrene	1.00	1.06			106		69-121		
Benzo(b)fluoranthene	1.00	1.12			112		70-123		
Benzo(k)fluoranthene	1.00	0.995			100		66-120		
Chrysene	1.00	0.931			93		66-109		
Dibenz(a,h)anthracene	1.00	1.07			107		55-123		
Indeno(1,2,3-cd)pyrene	1.00	1.09			109		52-124		
	ug/l	ug/l	ug/l	ug/l					
Batch number: 18281A94A	Sample number(s): 9826973-9826975								
Benzene	20	19.5	20	20.23	98	101	80-120	4	30

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

Quality Control Summary

Client Name: Chevron Environmental Mgmt Co
Reported: 10/22/2018 10:19

Group Number: 1992639

LCS/LCSD (continued)

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Ethylbenzene	20.12	21.56	20.12	22.2	107	110	80-120	3	30
NWTPH-Gx water C7-C12	1100	1408.88	1100	1406.37	128	128	64-131	0	30
Toluene	20.06	20.8	20.06	21.68	104	108	80-120	4	30
Total Xylenes	60.17	68.04	60.17	70.24	113	117	80-120	3	30
	ug/l	ug/l	ug/l	ug/l					
Batch number: 182810006A	Sample number(s): 9826973-9826974								
DRO C12-C24 w/Si Gel	1600.37	882.57	1600.37	832.2	55	52	32-117	6	20

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: SIM SVOAs 8270D MINI
Batch number: 18275WAM026

	Fluoranthene-d10	Benzo(a)pyrene-d12	1-Methylnaphthalene-d10
9826973	93	54	85
9826974	93	62	81
Blank	97	86	83
LCS	96	94	84
Limits:	38-119	18-129	29-112

Analysis Name: BTEX (8021)
Batch number: 18281A94A

	Trifluorotoluene-P	Trifluorotoluene-F
9826973	86	79
9826974	87	79
9826975	87	79
Blank	88	80
LCS	85	101
LCSD	85	103
Limits:	51-120	50-150

Analysis Name: NWTPH-Dx water w/ 10g Si Gel
Batch number: 182810006A

	Orthoterphenyl
9826973	81
9826974	77

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

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Quality Control Summary

Client Name: Chevron Environmental Mgmt Co
Group Number: 1992639
Reported: 10/22/2018 10:19

Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: NWTPH-Dx water w/ 10g Si Gel
Batch number: 182810006A

	Orthoterphenyl
Blank	76
LCS	76
LCSD	76
Limits:	50-150

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

Chevron Generic Analysis Request/Chain of Custody

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Acct. # 11964 For Eurofins Lancaster Laboratories use only Group # 1992639 Sample # 9826973-75

Instructions on reverse side correspond with circled numbers.

1 Client Information

Facility # Seattle Terminal WBS NWENV-PM-001400302

Site Address 3001 Elliot Ave, Seattle, WA 98121

Chevron PM Kim Jolitz Lead Consultant Arcadis

Consultant/Office 1100 Olive Way, Suite 800 Seattle, WA 98101

Consultant Project Mgr. Rebecca Anderson

Consultant Phone # 509-438-9828

Sampler Jason Little (JTL) + Ophillie Ewille

4 Matrix

Soil ☐ Sediment ☐ Water ☒ Potable ☐ Ground ☒ NPDES ☐ Surface ☐ Oil ☐ Air ☐

3 Grab / Composite

2 Sample Identification / Collected

Sample Identification	Collected Date	Collected Time	Grab	Composite
MW-70R	9/27/18	1430	X	
DUP-01	9/27/18	—	X	
TRIP BLANK	—	—	X	

Total Number of Containers: 3 | 3 | 3

5 Analyses Requested

Sample Identification	BTEX + MTBE 8021 ☐ 8260 ☒ Naphth ☐	8260 full scan	Oxygenates ____	TPH-GRO 8015 ☐ 8260 ☐	TPH-DRO	Silica Gel Cleanup ☐	Lead Total ☐ Diss. ☐ Method ____	VPH ☐ EPH ☐ Method ____	NWTPH-Gx C7-C12	NWTPH-Dx w/Silica Gel (Low)	CPAHs by 8270C
MW-70R	X								X	X	X
DUP-01	X								X	X	X
TRIP BLANK	X								X		

SCR #: _____

- ☐ Results in Dry Weight
- ☐ J value reporting needed
- ☐ Must meet lowest detection limits possible for 8260 compounds
- ☐ 8021 MTBE Confirmation
- ☐ Confirm MTBE + Naphthalene
- ☐ Confirm highest hit by 8260
- ☐ Confirm all hits by 8260
- ☐ Run _____ oxy's on highest hit
- ☐ Run _____ oxy's on all hits

6 Remarks

7 Turnaround Time Requested (TAT) (please circle)

Standard | 5 day | 4 day | 72 hour | 48 hour | 24 hour

8 Data Package (circle if required)

Type I - Full | Alaska/Type III | Type VI (Raw Data)

EDD (circle if required): CVX-RTBU-FI_05 (default) | Other: _____

Relinquished by	Date	Time	Received by	Date	Time
[signature]	9/27/18	1650			
[signature]			[signature]		

Relinquished by Commerical Carrier: UPS ____ FedEx X Other ____

Temperature Upon Receipt 0.6 °C

Received by [signature] Date 9/28/18 Time 1025

Custody Seals Intact? Yes No

9

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The white copy should accompany samples to Eurofins Lancaster Laboratories. The yellow copy should be retained by the client.

Issued by Dept. 40 Management

7047.02

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Sample Administration Receipt Documentation Log

Doc Log ID: 228463

Group Number(s): 1992639

Client: Chevron c/o Arcadis

Delivery and Receipt Information

Delivery Method:	Fed Ex	Arrival Timestamp:	09/28/2018 10:25
Number of Packages:	1	Number of Projects:	1

Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	Yes	Sample Date/Times match COC:	Yes
Custody Seal Intact:	Yes	VOA Vial Headspace ≥ 6mm:	No
Samples Chilled:	Yes	Total Trip Blank Qty:	2
Paperwork Enclosed:	Yes	Trip Blank Type:	HCl
Samples Intact:	Yes	Air Quality Samples Present:	No
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

Unpacked by Nicole Reiff (25684) at 16:14 on 09/28/2018

Samples Chilled Details

Thermometer Types: DT = Digital (Temp. Bottle) IR = Infrared (Surface Temp) All Temperatures in °C.

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT146	0.6	DT	Wet	Y	Bagged	N

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Lancaster, PA 17605-2425

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Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL	Below Minimum Quantitation Level	**mL**	milliliter(s)
C	degrees Celsius	**MPN**	Most Probable Number
cfu	colony forming units	**N.D.**	non-detect
CP Units	cobalt-chloroplatinate units	**ng**	nanogram(s)
F	degrees Fahrenheit	**NTU**	nephelometric turbidity units
g	gram(s)	**pg/L**	picogram/liter
IU	International Units	**RL**	Reporting Limit
kg	kilogram(s)	**TNTC**	Too Numerous To Count
L	liter(s)	**µg**	microgram(s)
lb.	pound(s)	**µL**	microliter(s)
m3	cubic meter(s)	**umhos/cm**	micromhos/cm
meq	milliequivalents	**MCL**	Maximum Contamination Limit
mg	milligram(s)		

<	less than
>	greater than
ppm	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.
ppb	parts per billion
Dry weight basis	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as “analyze immediately” are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

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Data Qualifiers

Qualifier	Definition
C	Result confirmed by reanalysis
D1	Indicates for dual column analyses that the result is reported from column 1
D2	Indicates for dual column analyses that the result is reported from column 2
E	Concentration exceeds the calibration range
K1	Initial Calibration Blank is above the QC limit and the sample result is ND
K2	Continuing Calibration Blank is above the QC limit and the sample result is ND
K3	Initial Calibration Verification is above the QC limit and the sample result is ND
K4	Continuing Calibration Verification is above the QC limit and the sample result is ND
J (or G, I, X)	Estimated value >= the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)
P	Concentration difference between the primary and confirmation column >40%. The lower result is reported.
P^	Concentration difference between the primary and confirmation column > 40%. The higher result is reported.
U	Analyte was not detected at the value indicated
V	Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference.
W	The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.
Z	Laboratory Defined - see analysis report

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods.
Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

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ANALYSIS REPORT

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

Chevron Environmental Mgmt Co
BR1 X5139C
6101 Bollinger Canyon Road
San Ramon CA 94583

Report Date: January 14, 2019 11:02

Project: Seattle Terminal

Account #: 11964
Group Number: 2019198
PO Number: 0015268293
Release Number: JOLITZ
State of Sample Origin: WA

Electronic Copy To	Arcadis	Attn: Rebecca Andresen
Electronic Copy To	ARCADIS U.S., Inc.	Attn: Sam Miles

Respectfully Submitted,

Elisabeth A. Knisley
Project Manager

(717) 556-7262

To view our laboratory's current scopes of accreditation please go to https://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/certifications-and-accreditations-eurofins-lancaster-laboratories-environmental/ . Historical copies may be requested through your project manager.

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SAMPLE INFORMATION

Client Sample Description	Sample Collection Date/Time	ELLE#
MW-30-W-181214 Grab Groundwater	12/14/2018 10:00	9943387
MW-61A-R-W-181214 Grab Groundwater	12/14/2018 09:30	9943388
MW-70R-W-181213 Grab Groundwater	12/13/2018 14:05	9943389
MW-200-W-181213 Grab Groundwater	12/13/2018 12:15	9943390
MW-201-W-181213 Grab Groundwater	12/13/2018 11:25	9943391
MW-202-W-181213 Grab Groundwater	12/13/2018 13:00	9943392
MW-203-W-181213 Grab Groundwater	12/13/2018 11:00	9943393
MW-204-W-181213 Grab Groundwater	12/13/2018 10:00	9943394
MW-205-W-181213 Grab Groundwater	12/13/2018 10:05	9943395
MW-206-W-181213 Grab Groundwater	12/13/2018 16:00	9943396
MW-207-W-181213 Grab Groundwater	12/13/2018 14:20	9943397
DUP-1-WD-181213 Grab Groundwater	12/13/2018	9943398
QA-T-181213 NA Water	12/13/2018	9943399

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Sample Description: **MW-30-W-181214 Grab Groundwater**
Seattle Terminal
3001 Elliott Ave - Seattle, WA

Project Name: **Seattle Terminal**

Submittal Date/Time: 12/15/2018 10:40
Collection Date/Time: 12/14/2018 10:00

Chevron Environmental Mgmt Co
ELLE Sample #: WW 9943387
ELLE Group #: 2019198
Matrix: Groundwater

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC/MS Semivolatiles	**SW-846 8270D SIM**		**ug/l**	**ug/l**	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
	The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. Since the recovery is high and the target analyte(s) was not detected in the sample, the data is reported.				
GC Volatiles	**ECY 97-602 NWTPH-Gx**		**ug/l**	**ug/l**	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1
GC Volatiles	**SW-846 8021B**		**ug/l**	**ug/l**	
02102	Benzene	71-43-2	N.D.	0.5	1
02102	Ethylbenzene	100-41-4	N.D.	0.5	1
02102	Toluene	108-88-3	N.D.	0.5	1
02102	Total Xylenes	1330-20-7	N.D.	1.5	1
GC Petroleum Hydrocarbons w/Si	**ECY 97-602 NWTPH-Dx modified**		**ug/l**	**ug/l**	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	45	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1

Sample Comments

State of Washington Lab Certification No. C457
Carcinogenic PAHs have been reported for this sample

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18353WAK026	12/20/2018 23:38	Brandon K Cordova	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18353WAK026	12/20/2018 08:00	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18355A94A	12/22/2018 01:01	Jeremy C Giffin	1
02102	BTEX (8021)	SW-846 8021B	1	18355A94A	12/22/2018 01:01	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18355A94A	12/22/2018 01:00	Jeremy C Giffin	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	183530025A	01/09/2019 16:21	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	183530025A	12/20/2018 08:00	Logan M Brosemer	1

Sample Description: **MW-61A-R-W-181214 Grab Groundwater**
Seattle Terminal
3001 Elliott Ave - Seattle, WA

Chevron Environmental Mgmt Co
ELLE Sample #: WW 9943388
ELLE Group #: 2019198
Matrix: Groundwater

Project Name: **Seattle Terminal**

Submittal Date/Time: 12/15/2018 10:40
Collection Date/Time: 12/14/2018 09:30

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC/MS Semivolatiles	**SW-846 8270D SIM**		**ug/l**	**ug/l**	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
	The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. Since the recovery is high and the target analyte(s) was not detected in the sample, the data is reported.				
GC Volatiles	**ECY 97-602 NWTPH-Gx**		**ug/l**	**ug/l**	
08274	NWTPH-Gx water C7-C12	n.a.	680	19	1
GC Volatiles	**SW-846 8021B**		**ug/l**	**ug/l**	
02102	Benzene	71-43-2	N.D.	0.5	1
02102	Ethylbenzene	100-41-4	0.8	0.5	1
02102	Toluene	108-88-3	N.D.	0.5	1
02102	Total Xylenes	1330-20-7	N.D.	1.5	1
GC Petroleum Hydrocarbons w/Si	**ECY 97-602 NWTPH-Dx modified**		**ug/l**	**ug/l**	
12917	DX DRO C12-C24 w/ SiGel	n.a.	190	45	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1

Sample Comments

State of Washington Lab Certification No. C457
Carcinogenic PAHs have been reported for this sample

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18353WAK026	12/21/2018 00:06	Brandon K Cordova	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18353WAK026	12/20/2018 08:00	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18355A94A	12/22/2018 02:42	Jeremy C Giffin	1
02102	BTEX (8021)	SW-846 8021B	1	18355A94A	12/22/2018 02:42	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18355A94A	12/22/2018 02:41	Jeremy C Giffin	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	183530025A	01/09/2019 16:44	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	183530025A	12/20/2018 08:00	Logan M Brosemer	1

Sample Description: **MW-70R-W-181213 Grab Groundwater**
Seattle Terminal
3001 Elliott Ave - Seattle, WA

Project Name: **Seattle Terminal**

Submittal Date/Time: 12/15/2018 10:40
Collection Date/Time: 12/13/2018 14:05

Chevron Environmental Mgmt Co
ELLE Sample #: WW 9943389
ELLE Group #: 2019198
Matrix: Groundwater

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC/MS Semivolatiles	**SW-846 8270D SIM**		**ug/l**	**ug/l**	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
	The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. Since the recovery is high and the target analyte(s) was not detected in the sample, the data is reported.				
GC Volatiles	**ECY 97-602 NWTPH-Gx**		**ug/l**	**ug/l**	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1
GC Volatiles	**SW-846 8021B**		**ug/l**	**ug/l**	
02102	Benzene	71-43-2	N.D.	0.5	1
02102	Ethylbenzene	100-41-4	N.D.	0.5	1
02102	Toluene	108-88-3	N.D.	0.5	1
02102	Total Xylenes	1330-20-7	N.D.	1.5	1
GC Petroleum Hydrocarbons w/Si	**ECY 97-602 NWTPH-Dx modified**		**ug/l**	**ug/l**	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	45	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1

Sample Comments

State of Washington Lab Certification No. C457
Carcinogenic PAHs have been reported for this sample

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18353WAK026	12/21/2018 00:34	Brandon K Cordova	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18353WAK026	12/20/2018 08:00	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18355A94A	12/22/2018 03:07	Jeremy C Giffin	1
02102	BTEX (8021)	SW-846 8021B	1	18355A94A	12/22/2018 03:07	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18355A94A	12/22/2018 03:06	Jeremy C Giffin	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	183530025A	01/09/2019 17:07	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	183530025A	12/20/2018 08:00	Logan M Brosemer	1

Sample Description: **MW-200-W-181213 Grab Groundwater**
Seattle Terminal
3001 Elliott Ave - Seattle, WA

Project Name: **Seattle Terminal**

Submittal Date/Time: 12/15/2018 10:40
Collection Date/Time: 12/13/2018 12:15

Chevron Environmental Mgmt Co
ELLE Sample #: WW 9943390
ELLE Group #: 2019198
Matrix: Groundwater

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC/MS Semivolatiles	**SW-846 8270D SIM**		**ug/l**	**ug/l**	
14244	Benzo(a)anthracene	56-55-3	0.01	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. The following action was taken:
The sample was re-extracted outside the method required holding time and the QC is again outside of the acceptance limits. The data is reported from the initial trial.

GC Volatiles	**ECY 97-602 NWTPH-Gx**		**ug/l**	**ug/l**	
08274	NWTPH-Gx water C7-C12	n.a.	230	19	1
GC Volatiles	**SW-846 8021B**		**ug/l**	**ug/l**	
02102	Benzene	71-43-2	N.D.	0.5	1
02102	Ethylbenzene	100-41-4	0.6	0.5	1
02102	Toluene	108-88-3	N.D.	0.5	1
02102	Total Xylenes	1330-20-7	N.D.	1.5	1
GC Petroleum Hydrocarbons w/Si	**ECY 97-602 NWTPH-Dx modified**		**ug/l**	**ug/l**	
12917	DX DRO C12-C24 w/ SiGel	n.a.	130	45	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	130	100	1

Sample Comments

State of Washington Lab Certification No. C457
Carcinogenic PAHs have been reported for this sample

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18353WAK026	12/21/2018 01:03	Brandon K Cordova	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18353WAK026	12/20/2018 08:00	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18355A94A	12/22/2018 03:32	Jeremy C Giffin	1
02102	BTEX (8021)	SW-846 8021B	1	18355A94A	12/22/2018 03:32	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18355A94A	12/22/2018 03:31	Jeremy C Giffin	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	183530025A	01/09/2019 17:30	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	183530025A	12/20/2018 08:00	Logan M Brosemer	1

Sample Description: **MW-201-W-181213 Grab Groundwater**
Seattle Terminal
3001 Elliott Ave - Seattle, WA

Project Name: **Seattle Terminal**

Submittal Date/Time: 12/15/2018 10:40
Collection Date/Time: 12/13/2018 11:25

Chevron Environmental Mgmt Co
ELLE Sample #: WW 9943391
ELLE Group #: 2019198
Matrix: Groundwater

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC/MS Semivolatiles	**SW-846 8270D SIM**		**ug/l**	**ug/l**	
14244	Benzo(a)anthracene	56-55-3	0.02	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. The following action was taken:
The sample was re-extracted outside the method required holding time and the QC is again outside of the acceptance limits. The data is reported from the initial trial.

GC Volatiles	**ECY 97-602 NWTPH-Gx**		**ug/l**	**ug/l**	
08274	NWTPH-Gx water C7-C12	n.a.	220	19	1
GC Volatiles	**SW-846 8021B**		**ug/l**	**ug/l**	
02102	Benzene	71-43-2	N.D.	0.5	1
02102	Ethylbenzene	100-41-4	N.D.	0.5	1
02102	Toluene	108-88-3	N.D.	0.5	1
02102	Total Xylenes	1330-20-7	N.D.	1.5	1
GC Petroleum Hydrocarbons w/Si	**ECY 97-602 NWTPH-Dx modified**		**ug/l**	**ug/l**	
12917	DX DRO C12-C24 w/ SiGel	n.a.	54	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1

Sample Comments

State of Washington Lab Certification No. C457
Carcinogenic PAHs have been reported for this sample

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18353WAK026	12/21/2018 01:31	Brandon K Cordova	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18353WAK026	12/20/2018 08:00	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18355A94A	12/22/2018 03:57	Jeremy C Giffin	1
02102	BTEX (8021)	SW-846 8021B	1	18355A94A	12/22/2018 03:57	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18355A94A	12/22/2018 03:56	Jeremy C Giffin	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	183530025A	01/09/2019 17:54	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	183530025A	12/20/2018 08:00	Logan M Brosemer	1

Sample Description: **MW-202-W-181213 Grab Groundwater**
Seattle Terminal
3001 Elliott Ave - Seattle, WA

Project Name: **Seattle Terminal**

Submittal Date/Time: 12/15/2018 10:40
Collection Date/Time: 12/13/2018 13:00

Chevron Environmental Mgmt Co
ELLE Sample #: WW 9943392
ELLE Group #: 2019198
Matrix: Groundwater

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC/MS Semivolatiles	**SW-846 8270D SIM**		**ug/l**	**ug/l**	
14244	Benzo(a)anthracene	56-55-3	0.01	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. The following action was taken:
The sample was re-extracted outside the method required holding time and the QC is again outside of the acceptance limits. The data is reported from the initial trial.

GC Volatiles	**ECY 97-602 NWTPH-Gx**		**ug/l**	**ug/l**	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1
GC Volatiles	**SW-846 8021B**		**ug/l**	**ug/l**	
02102	Benzene	71-43-2	N.D.	0.5	1
02102	Ethylbenzene	100-41-4	N.D.	0.5	1
02102	Toluene	108-88-3	N.D.	0.5	1
02102	Total Xylenes	1330-20-7	N.D.	1.5	1
GC Petroleum Hydrocarbons w/Si	**ECY 97-602 NWTPH-Dx modified**		**ug/l**	**ug/l**	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1

Sample Comments

State of Washington Lab Certification No. C457
Carcinogenic PAHs have been reported for this sample

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18353WAK026	12/21/2018 01:59	Brandon K Cordova	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18353WAK026	12/20/2018 08:00	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18355A94A	12/22/2018 04:23	Jeremy C Giffin	1
02102	BTEX (8021)	SW-846 8021B	1	18355A94A	12/22/2018 04:23	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18355A94A	12/22/2018 04:22	Jeremy C Giffin	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	183530025A	01/09/2019 19:02	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	183530025A	12/20/2018 08:00	Logan M Brosemer	1

Sample Description: **MW-203-W-181213 Grab Groundwater**
Seattle Terminal
3001 Elliott Ave - Seattle, WA

Project Name: **Seattle Terminal**

Submittal Date/Time: 12/15/2018 10:40
Collection Date/Time: 12/13/2018 11:00

Chevron Environmental Mgmt Co
ELLE Sample #: WW 9943393
ELLE Group #: 2019198
Matrix: Groundwater

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC/MS Semivolatiles	**SW-846 8270D SIM**		**ug/l**	**ug/l**	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
	The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. Since the recovery is high and the target analyte(s) was not detected in the sample, the data is reported.				
GC Volatiles	**ECY 97-602 NWTPH-Gx**		**ug/l**	**ug/l**	
08274	NWTPH-Gx water C7-C12	n.a.	32	19	1
GC Volatiles	**SW-846 8021B**		**ug/l**	**ug/l**	
02102	Benzene	71-43-2	N.D.	0.5	1
02102	Ethylbenzene	100-41-4	N.D.	0.5	1
02102	Toluene	108-88-3	N.D.	0.5	1
02102	Total Xylenes	1330-20-7	N.D.	1.5	1
GC Petroleum Hydrocarbons w/Si	**ECY 97-602 NWTPH-Dx modified**		**ug/l**	**ug/l**	
12917	DX DRO C12-C24 w/ SiGel	n.a.	54	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1

Sample Comments

State of Washington Lab Certification No. C457
Carcinogenic PAHs have been reported for this sample

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18353WAK026	12/21/2018 02:28	Brandon K Cordova	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18353WAK026	12/20/2018 08:00	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18355A94A	12/22/2018 04:48	Jeremy C Giffin	1
02102	BTEX (8021)	SW-846 8021B	1	18355A94A	12/22/2018 04:48	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18355A94A	12/22/2018 04:47	Jeremy C Giffin	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	183530025A	01/09/2019 19:25	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	183530025A	12/20/2018 08:00	Logan M Brosemer	1

Sample Description: **MW-204-W-181213 Grab Groundwater**
Seattle Terminal
3001 Elliott Ave - Seattle, WA

Project Name: **Seattle Terminal**

Submittal Date/Time: 12/15/2018 10:40
Collection Date/Time: 12/13/2018 10:00

Chevron Environmental Mgmt Co
ELLE Sample #: WW 9943394
ELLE Group #: 2019198
Matrix: Groundwater

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC/MS Semivolatiles	**SW-846 8270D SIM**		**ug/l**	**ug/l**	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
	The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. Since the recovery is high and the target analyte(s) was not detected in the sample, the data is reported.				
GC Volatiles	**ECY 97-602 NWTPH-Gx**		**ug/l**	**ug/l**	
08274	NWTPH-Gx water C7-C12	n.a.	830	19	1
GC Volatiles	**SW-846 8021B**		**ug/l**	**ug/l**	
02102	Benzene	71-43-2	N.D.	0.5	1
02102	Ethylbenzene	100-41-4	1.1	0.5	1
02102	Toluene	108-88-3	0.9	0.5	1
02102	Total Xylenes	1330-20-7	2.0	1.5	1
GC Petroleum Hydrocarbons w/Si	**ECY 97-602 NWTPH-Dx modified**		**ug/l**	**ug/l**	
12917	DX DRO C12-C24 w/ SiGel	n.a.	75	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1

Sample Comments

State of Washington Lab Certification No. C457
Carcinogenic PAHs have been reported for this sample

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18353WAK026	12/21/2018 02:56	Brandon K Cordova	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18353WAK026	12/20/2018 08:00	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18355A94A	12/22/2018 05:14	Jeremy C Giffin	1
02102	BTEX (8021)	SW-846 8021B	1	18355A94A	12/22/2018 05:14	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18355A94A	12/22/2018 05:13	Jeremy C Giffin	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	183530025A	01/09/2019 19:49	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	183530025A	12/20/2018 08:00	Logan M Brosemer	1

Sample Description: **MW-205-W-181213 Grab Groundwater**
Seattle Terminal
3001 Elliott Ave - Seattle, WA

Project Name: **Seattle Terminal**

Submittal Date/Time: 12/15/2018 10:40
Collection Date/Time: 12/13/2018 10:05

Chevron Environmental Mgmt Co
ELLE Sample #: WW 9943395
ELLE Group #: 2019198
Matrix: Groundwater

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC/MS Semivolatiles	**SW-846 8270D SIM**		**ug/l**	**ug/l**	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
	The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. Since the recovery is high and the target analyte(s) was not detected in the sample, the data is reported.				
GC Volatiles	**ECY 97-602 NWTPH-Gx**		**ug/l**	**ug/l**	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1
GC Volatiles	**SW-846 8021B**		**ug/l**	**ug/l**	
02102	Benzene	71-43-2	N.D.	0.5	1
02102	Ethylbenzene	100-41-4	N.D.	0.5	1
02102	Toluene	108-88-3	N.D.	0.5	1
02102	Total Xylenes	1330-20-7	N.D.	1.5	1
GC Petroleum Hydrocarbons w/Si	**ECY 97-602 NWTPH-Dx modified**		**ug/l**	**ug/l**	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	45	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1

Sample Comments

State of Washington Lab Certification No. C457
Carcinogenic PAHs have been reported for this sample

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18353WAK026	12/21/2018 03:24	Brandon K Cordova	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18353WAK026	12/20/2018 08:00	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18355A94A	12/22/2018 05:39	Jeremy C Giffin	1
02102	BTEX (8021)	SW-846 8021B	1	18355A94A	12/22/2018 05:39	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18355A94A	12/22/2018 05:38	Jeremy C Giffin	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	183530025A	01/09/2019 20:12	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	183530025A	12/20/2018 08:00	Logan M Brosemer	1

Sample Description: **MW-206-W-181213 Grab Groundwater**
Seattle Terminal
3001 Elliott Ave - Seattle, WA

Project Name: **Seattle Terminal**

Submittal Date/Time: 12/15/2018 10:40
Collection Date/Time: 12/13/2018 16:00

Chevron Environmental Mgmt Co
ELLE Sample #: WW 9943396
ELLE Group #: 2019198
Matrix: Groundwater

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC/MS Semivolatiles	**SW-846 8270D SIM**		**ug/l**	**ug/l**	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
	The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. Since the recovery is high and the target analyte(s) was not detected in the sample, the data is reported.				
GC Volatiles	**ECY 97-602 NWTPH-Gx**		**ug/l**	**ug/l**	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1
GC Volatiles	**SW-846 8021B**		**ug/l**	**ug/l**	
02102	Benzene	71-43-2	N.D.	0.5	1
02102	Ethylbenzene	100-41-4	N.D.	0.5	1
02102	Toluene	108-88-3	N.D.	0.5	1
02102	Total Xylenes	1330-20-7	N.D.	1.5	1
GC Petroleum Hydrocarbons w/Si	**ECY 97-602 NWTPH-Dx modified**		**ug/l**	**ug/l**	
12917	DX DRO C12-C24 w/ SiGel	n.a.	50	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1

Sample Comments

State of Washington Lab Certification No. C457
Carcinogenic PAHs have been reported for this sample

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18353WAK026	12/21/2018 03:52	Brandon K Cordova	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18353WAK026	12/20/2018 08:00	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18355A94A	12/22/2018 06:04	Jeremy C Giffin	1
02102	BTEX (8021)	SW-846 8021B	1	18355A94A	12/22/2018 06:04	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18355A94A	12/22/2018 06:03	Jeremy C Giffin	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	183530025A	01/09/2019 20:35	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	183530025A	12/20/2018 08:00	Logan M Brosemer	1

Sample Description: **MW-207-W-181213 Grab Groundwater**
Seattle Terminal
3001 Elliott Ave - Seattle, WA

Chevron Environmental Mgmt Co
ELLE Sample #: WW 9943397
ELLE Group #: 2019198
Matrix: Groundwater

Project Name: **Seattle Terminal**

Submittal Date/Time: 12/15/2018 10:40
Collection Date/Time: 12/13/2018 14:20

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC/MS Semivolatiles	**SW-846 8270D SIM**		**ug/l**	**ug/l**	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. Since the recovery is high and the target analyte(s) was not detected in the sample, the data is reported.					
GC Volatiles	**ECY 97-602 NWTPH-Gx**		**ug/l**	**ug/l**	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1
GC Volatiles	**SW-846 8021B**		**ug/l**	**ug/l**	
02102	Benzene	71-43-2	N.D.	0.5	1
02102	Ethylbenzene	100-41-4	N.D.	0.5	1
02102	Toluene	108-88-3	N.D.	0.5	1
02102	Total Xylenes	1330-20-7	N.D.	1.5	1
GC Petroleum Hydrocarbons w/Si	**ECY 97-602 NWTPH-Dx modified**		**ug/l**	**ug/l**	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
The reverse surrogate, capric acid, is present at <1%.					

Sample Comments

State of Washington Lab Certification No. C457
Carcinogenic PAHs have been reported for this sample

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18353WAK026	12/21/2018 04:21	Brandon K Cordova	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18353WAK026	12/20/2018 08:00	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18355A94A	12/22/2018 06:29	Jeremy C Giffin	1
02102	BTEX (8021)	SW-846 8021B	1	18355A94A	12/22/2018 06:29	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18355A94A	12/22/2018 06:28	Jeremy C Giffin	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	183530026A	01/01/2019 01:23	Marisa Englebright	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	183530026A	12/20/2018 08:00	David S Schrum	1

Sample Description: **DUP-1-WD-181213 Grab Groundwater**
Seattle Terminal
3001 Elliott Ave - Seattle, WA

Project Name: **Seattle Terminal**

Submittal Date/Time: 12/15/2018 10:40
Collection Date/Time: 12/13/2018

Chevron Environmental Mgmt Co
ELLE Sample #: WW 9943398
ELLE Group #: 2019198
Matrix: Groundwater

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC/MS Semivolatiles	**SW-846 8270D SIM**		**ug/l**	**ug/l**	
14244	Benzo(a)anthracene	56-55-3	0.01	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. The following action was taken:
The sample was re-extracted outside the method required holding time and the QC is again outside of the acceptance limits. The data is reported from the initial trial.

GC Volatiles	**ECY 97-602 NWTPH-Gx**		**ug/l**	**ug/l**	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1
GC Volatiles	**SW-846 8021B**		**ug/l**	**ug/l**	
02102	Benzene	71-43-2	N.D.	0.5	1
02102	Ethylbenzene	100-41-4	N.D.	0.5	1
02102	Toluene	108-88-3	N.D.	0.5	1
02102	Total Xylenes	1330-20-7	N.D.	1.5	1
GC Petroleum Hydrocarbons w/Si	**ECY 97-602 NWTPH-Dx modified**		**ug/l**	**ug/l**	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	45	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
Trial ID: RE					
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	45	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1

The recovery for the sample surrogate(s) is outside the QC acceptance limits as noted on the QC Summary. The following action was taken:
The sample was re-extracted outside the method required holding time and the QC is compliant. Results are reported from both trials.

Sample Comments

State of Washington Lab Certification No. C457
Carcinogenic PAHs have been reported for this sample

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18353WAK026	12/21/2018 04:49	Brandon K Cordova	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18353WAK026	12/20/2018 08:00	Logan M Brosemer	1

Sample Description: **DUP-1-WD-181213 Grab Groundwater**
Seattle Terminal
3001 Elliott Ave - Seattle, WA

Project Name: **Seattle Terminal**

Submittal Date/Time: 12/15/2018 10:40
Collection Date/Time: 12/13/2018

Chevron Environmental Mgmt Co
ELLE Sample #: WW 9943398
ELLE Group #: 2019198
Matrix: Groundwater

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18355A94A	12/22/2018 08:11	Jeremy C Giffin	1
02102	BTEX (8021)	SW-846 8021B	1	18355A94A	12/22/2018 08:11	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18355A94A	12/22/2018 08:10	Jeremy C Giffin	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	183530026A	01/01/2019 01:46	Thomas C Wildermuth	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	2-RE	190030024A	01/09/2019 14:02	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	183530026A	12/20/2018 08:00	David S Schrum	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	2	190030024A	01/04/2019 08:30	Joshua S Ruth	1

Sample Description: **QA-T-181213 NA Water**
Seattle Terminal
3001 Elliott Ave - Seattle, WA

Project Name: **Seattle Terminal**

Submittal Date/Time: 12/15/2018 10:40
Collection Date/Time: 12/13/2018

Chevron Environmental Mgmt Co
ELLE Sample #: WW 9943399
ELLE Group #: 2019198
Matrix: Water

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC Volatiles	**ECY 97-602 NWTPH-Gx**		**ug/l**	**ug/l**	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1
GC Volatiles	**SW-846 8021B**		**ug/l**	**ug/l**	
02102	Benzene	71-43-2	N.D.	0.5	1
02102	Ethylbenzene	100-41-4	N.D.	0.5	1
02102	Toluene	108-88-3	N.D.	0.5	1
02102	Total Xylenes	1330-20-7	N.D.	1.5	1

Sample Comments

State of Washington Lab Certification No. C457

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18355A94A	12/21/2018 23:44	Jeremy C Giffin	1
02102	BTEX (8021)	SW-846 8021B	1	18355A94A	12/21/2018 23:44	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18355A94A	12/21/2018 23:43	Jeremy C Giffin	1

Quality Control Summary

Client Name: Chevron Environmental Mgmt Co
Group Number: 2019198
Reported: 01/14/2019 11:02

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result	MDL
	ug/l	ug/l
Batch number: 18353WAK026	Sample number(s): 9943387-9943398	
Benzo(a)anthracene	N.D.	0.01
Benzo(a)pyrene	N.D.	0.01
Benzo(b)fluoranthene	N.D.	0.01
Benzo(k)fluoranthene	N.D.	0.01
Chrysene	N.D.	0.01
Dibenz(a,h)anthracene	N.D.	0.02
Indeno(1,2,3-cd)pyrene	N.D.	0.01
Batch number: 18355A94A	Sample number(s): 9943387-9943399	
Benzene	N.D.	0.03
Ethylbenzene	N.D.	0.05
NWTPH-Gx water C7-C12	N.D.	19
Toluene	N.D.	0.1
Total Xylenes	N.D.	0.1
Batch number: 183530025A	Sample number(s): 9943387-9943396	
DX DRO C12-C24 w/ SiGel	N.D.	45
DX HRO C24-C40 w/ SiGel	N.D.	100
Batch number: 183530026A	Sample number(s): 9943397-9943398	
DX DRO C12-C24 w/ SiGel	N.D.	45
DX HRO C24-C40 w/ SiGel	N.D.	100
Batch number: 190030024A	Sample number(s): 9943398	
DX DRO C12-C24 w/ SiGel	N.D.	45
DX HRO C24-C40 w/ SiGel	N.D.	100

LCS/LCSD

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: 18353WAK026	Sample number(s): 9943387-9943398								
Benzo(a)anthracene	1.00	1.16	1.00	1.09	116*	109	67-111	5	30
Benzo(a)pyrene	1.00	1.15	1.00	1.09	115	109	69-121	5	30
Benzo(b)fluoranthene	1.00	1.19	1.00	1.09	119	109	70-123	8	30
Benzo(k)fluoranthene	1.00	1.07	1.00	1.02	107	102	66-120	4	30

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

Quality Control Summary

Client Name: Chevron Environmental Mgmt Co
Reported: 01/14/2019 11:02

Group Number: 2019198

LCS/LCSD (continued)

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Chrysene	1.00	1.06	1.00	1.01	106	101	66-109	5	30
Dibenz(a,h)anthracene	1.00	1.17	1.00	1.05	117	105	55-123	11	30
Indeno(1,2,3-cd)pyrene	1.00	1.29	1.00	1.21	129*	121	52-124	6	30
	ug/l	**ug/l**	**ug/l**	**ug/l**					
Batch number: 18355A94A	Sample number(s): 9943387-9943399								
Benzene	20	20.75	20	20.49	104	102	80-120	1	30
Ethylbenzene	20.12	22.33	20.12	22.39	111	111	80-120	0	30
NWTPH-Gx water C7-C12	1100	1403.91	1100	1385.85	128	126	64-131	1	30
Toluene	20.06	22.12	20.06	22	110	110	80-120	1	30
Total Xylenes	60.17	67.69	60.17	67.83	112	113	80-120	0	30
	ug/l	**ug/l**	**ug/l**	**ug/l**					
Batch number: 183530025A	Sample number(s): 9943387-9943396								
DX DRO C12-C24 w/ SiGel	600.14	152.04	600.14	230.61	25	38	10-115	41*	20
Batch number: 183530026A	Sample number(s): 9943397-9943398								
DX DRO C12-C24 w/ SiGel	600.14	211.76	600.14	230.59	35	38	10-115	9	20
Batch number: 190030024A	Sample number(s): 9943398								
DX DRO C12-C24 w/ SiGel	600.14	196.25	600.14	226.26	33	38	10-115	14	20

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: SIM SVOAs 8270D MINI
Batch number: 18353WAK026

	Fluoranthene-d10	Benzo(a)pyrene-d12	1-Methylnaphthalene-d10
9943387	112	94	92
9943388	108	88	97
9943389	104	61	93
9943390	87	75	92
9943391	101	80	82
9943392	82	58	83
9943393	81	79	88
9943394	107	75	81
9943395	84	74	84
9943396	102	52	85
9943397	95	68	85
9943398	91	60	85

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

Quality Control Summary

Client Name: Chevron Environmental Mgmt Co
Reported: 01/14/2019 11:02

Group Number: 2019198

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: SIM SVOAs 8270D MINI
Batch number: 18353WAK026

	Fluoranthene-d10	Benzo(a)pyrene-d12	1-Methylnaphthalene-d10
Blank	115	109	98
LCS	108	105	98
LCSD	97	100	92
Limits:	38-119	18-129	29-112

Analysis Name: BTEX (8021)
Batch number: 18355A94A

	Trifluorotoluene-P	Trifluorotoluene-F
9943387	81	67
9943388	77	68
9943389	81	72
9943390	82	75
9943391	96	86
9943392	80	80
9943393	80	69
9943394	73	70
9943395	80	69
9943396	80	69
9943397	80	71
9943398	82	69
9943399	80	86
Blank	81	73
LCS	79	91
LCSD	79	89
Limits:	51-120	50-150

Analysis Name: NWTPH-Dx water w/Si Gel
Batch number: 183530025A

	Orthoterphenyl	Capric Acid
9943387	60	0
9943388	59	0
9943389	56	0
9943390	60	0
9943391	66	0
9943392	76	0
9943393	62	0
9943394	55	0
9943395	82	0
9943396	71	0
Blank	64	0

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

Quality Control Summary

Client Name: Chevron Environmental Mgmt Co
Reported: 01/14/2019 11:02

Group Number: 2019198

Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: NWTPH-Dx water w/Si Gel
Batch number: 183530025A

	Orthoterphenyl	Capric Acid
LCS	56	0
LCSD	59	0
Limits:	50-150	0-1

Analysis Name: NWTPH-Dx water w/Si Gel
Batch number: 183530026A

	Orthoterphenyl	Capric Acid
9943397	53	0
9943398	48*	0
Limits:	50-150	0-1

	Orthoterphenyl
Blank	66
LCS	60
LCSD	58
Limits:	50-150

Analysis Name: NWTPH-Dx water w/Si Gel
Batch number: 190030024A

	Orthoterphenyl	Capric Acid
9943398RE	69	0
Blank	55	0
LCS	55	0
LCSD	61	0
Limits:	50-150	0-1

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

Chevron Northwest Region Analysis Request/Chain of Custody

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For Eurofins Lancaster Laboratories Environmental use only
Acct. # 11964 Group # 2019198 Sample # 994338 7-99
Instructions on reverse side correspond with circled numbers.

SCR #: _____

1 Client Information

Facility # Seattle Terminal WBS NWENV-PMC001400802
Site Address 3001 Elliot Ave, Seattle, WA 98121
Chevron PM: Kim Jolitz
Lead Consultant: Arcadis
Consultant/Office: 1100 Olive Way Suite 800, Seattle WA 9810
Consultant Project Mgr.: Rebecca Andersen
Consultant Phone #: (509) 438-9828
Sampler: Kelsey Frantz / Eric Krenger

4 Matrix

Soil ☐ Sediment ☒ Water: Potable ☐ Ground ☒ NPDES ☐ Surface ☐ Oil ☐ Air ☐

3 Grab / Composite

2 Sample Identification / Collected

5 Analyses Requested

Total Number of Containers
BTEX + MTBE ☐ 8021 ☒ 8260 ☐ Naphth
8260 full scan
Oxygenates ____
NWTPH-Gx
NWTPH-Dx with Silica Gel Cleanup ☒
NWTPH-Dx without Silica Gel Cleanup ☒
WA VPH ☐ WA EPH ☐
Lead Total ☐ Diss. ☐ Method ____
cPAHs by 8270C

Sample Identification	Collected Date	Collected Time	Grab	Composite	Soil	Water	Oil	Total Containers	BTEX + MTBE 8021 / 8260	8260 full scan	Oxygenates	NWTPH-Gx	NWTPH-Dx with Silica Gel Cleanup	NWTPH-Dx without Silica Gel Cleanup	WA VPH	WA EPH	Lead Total	Lead Diss.	cPAHs by 8270C
MW-30	12/14/18	1006	X			X	7		X			X	X						X
MW-61A-R	12/14/18	930					7		X			X	X						X
MW-70R	12/13/18	1405					7		X			X	X						X
MW-200		1215					7		X			X	X						X
MW-201		1125					7		X			X	X						X
MW-202		1306					7		X			X	X						X
MW-203		1100					7		X			X	X						X
MW-204		1006					7		X			X	X						X
MW-205		1005					7		X			X	X						X
MW-206		1600					7		X			X	X						X
MW-207		1420					7		X			X	X						X
DUP-1	↓	—				↓	7		X			X	X						X
Trip Blank	—	—					4		X			X							

6 Remarks

- ☐ Results in Dry Weight
- ☐ J value reporting needed
- ☐ Must meet lowest detection limits possible for 8260 compounds
- ☐ 8021 MTBE Confirmation
- ☐ Confirm MTBE + Naphthalene
- ☐ Confirm highest hit by 8260
- ☐ Confirm all hits by 8260
- ☐ Run _____ oxy's on highest hit
- ☐ Run _____ oxy's on all hits

7 Turnaround Time Requested (TAT) (please circle)

~~Standard~~ | 5 day | 4 day | 72 hour | 48 hour | 24 hour

8 Data Package (circle if required)

Type I - Full
Type VI (Raw Data)

EDD (circle if required)

CVX-RTBU-FI_05 (default)
Other: _____

Relinquished by	Date	Time	Received by	Date	Time
[signature]	12/14/18		FedEx	11/14/18	9
[signature]			[signature]		

Relinquished by Commercial Carrier: UPS ____ FedEx X Other ____

Received by: [signature] Date 12-15-18 Time 1040

Temperature Upon Receipt 0.4 °C

Custody Seals Intact? (Yes) No

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Sample Administration Receipt Documentation Log

Doc Log ID: 236358

Group Number(s): 2019198

Client: Arcadis

Delivery and Receipt Information

Delivery Method:	Fed Ex	Arrival Timestamp:	12/15/2018 10:40
Number of Packages:	2	Number of Projects:	1
State/Province of Origin:	WA		

Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	Yes	Sample Date/Times match COC:	Yes
Custody Seal Intact:	Yes	VOA Vial Headspace ≥ 6mm:	No
Samples Chilled:	Yes	Total Trip Blank Qty:	4
Paperwork Enclosed:	Yes	Trip Blank Type:	HCl
Samples Intact:	No	Air Quality Samples Present:	No
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

Unpacked by Melvin Sanchez (8943) at 14:51 on 12/15/2018

Samples Chilled Details

Thermometer Types: DT = Digital (Temp. Bottle) IR = Infrared (Surface Temp) All Temperatures in °C.

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT42-02	0.4	DT	Wet	Y	Bagged	N
2	DT42-02	0.4	DT	Wet	Y	Bagged	N

Samples Not Intact Details

Sample ID on Label	Bottle Code	Bottle Quantity	Container Salvageable?	Comments
MW-204	250 ml round amber glass - None	1	Y	Bottle has a small crack.
MW-70R	250 ml round amber glass - None	1	N	

2425 New Holland Pike
Lancaster, PA 17605-2425
T | 717-656-2300
F | 717-656-2681
www.LancasterLabs.com

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL	Below Minimum Quantitation Level	**mL**	milliliter(s)
C	degrees Celsius	**MPN**	Most Probable Number
cfu	colony forming units	**N.D.**	non-detect
CP Units	cobalt-chloroplatinate units	**ng**	nanogram(s)
F	degrees Fahrenheit	**NTU**	nephelometric turbidity units
g	gram(s)	**pg/L**	picogram/liter
IU	International Units	**RL**	Reporting Limit
kg	kilogram(s)	**TNTC**	Too Numerous To Count
L	liter(s)	**µg**	microgram(s)
lb.	pound(s)	**µL**	microliter(s)
m3	cubic meter(s)	**umhos/cm**	micromhos/cm
meq	milliequivalents	**MCL**	Maximum Contamination Limit
mg	milligram(s)		

<	less than
>	greater than
ppm	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.
ppb	parts per billion
Dry weight basis	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as “analyze immediately” are not performed within 15 minutes.

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Data Qualifiers

Qualifier	Definition
C	Result confirmed by reanalysis
D1	Indicates for dual column analyses that the result is reported from column 1
D2	Indicates for dual column analyses that the result is reported from column 2
E	Concentration exceeds the calibration range
K1	Initial Calibration Blank is above the QC limit and the sample result is ND
K2	Continuing Calibration Blank is above the QC limit and the sample result is ND
K3	Initial Calibration Verification is above the QC limit and the sample result is ND
K4	Continuing Calibration Verification is above the QC limit and the sample result is ND
J (or G, I, X)	Estimated value >= the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)
P	Concentration difference between the primary and confirmation column >40%. The lower result is reported.
P^	Concentration difference between the primary and confirmation column > 40%. The higher result is reported.
U	Analyte was not detected at the value indicated
V	Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference.
W	The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.
Z	Laboratory Defined - see analysis report

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods.
Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Arcadis U.S., Inc.

1100 Olive Way

Suite 800

Seattle, Washington 98101

Tel 206 325 5254

Fax 206 325 8218

www.arcadis.com