

Annual Compliance Monitoring Report –2010-2011

Shell Seattle Distribution Terminal Seattle, Washington

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February, 2012

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1.0 INTRODUCTION

The purpose of this annual compliance monitoring report is to evaluate groundwater conditions with respect to the cleanup requirements at the Shell (Equilon) Seattle Distribution Terminal on Harbor Island in Seattle, Washington (Figure 1-1). The terminal is comprised of three parcels located at 2555 13th Avenue SW, 1835 13th Avenue SW, and 1711 13th Avenue SW. These parcels are designated as the Main Tank Farm, the North Tank Farm, and the Shoreline Manifold Area, respectively. Compliance monitoring activities described in this report are performed under Consent Decree No. 99 2-07 176 0 SEA with the Washington State Department of Ecology (Ecology). The information presented in this report is based on data collected during the monitoring period of December 2010 through December 2011.

This report is organized into six sections as described below:

- **Introduction.** The document is outlined, and a brief summary of the site hydrogeology is presented.
- **Groundwater Elevation and Flow.** This section presents groundwater elevation data and an interpretation of groundwater flow based on the data.
- **Compliance Monitoring Task Descriptions.** This section describes compliance monitoring tasks presented in the *Compliance Monitoring Plan* and other site cleanup documents.
- **Performance Monitoring Results.** This section presents product and groundwater quality performance monitoring results. Groundwater quality performance monitoring results include an evaluation of long-term concentration trends and natural attenuation processes.
- **Sentry Monitoring Results.** This section presents groundwater quality data from sentry monitoring wells.
- **Summary and Conclusions.** This section summarizes all data and provides conclusions regarding spatial and temporal hydrocarbon concentration trends.

1.1 Overview of Site Hydrogeology

Soil underlying the site consists of man-emplaced grade and dredge fill overlying native estuarine deposits (EMCON, 1997). The uppermost grade fill unit consists of coarse-grained fill varying from less than one foot to approximately two feet thick. The dredge fill unit was created when estuarine deposits near the site were dredged and placed as fill.

The contact between the dredge fill and native estuarine units is not well defined due to similar properties of the two units.

The dredge fill appears to vary from approximately 8 to 20 feet thick at the site. It comprises fine- to medium-grained sand with some gravel. Native estuarine deposits underlie the dredge fill at depths of approximately 8 to 20 feet below grade. These deposits are composed of primarily fine- to medium-grained sand interbedded with thin silt horizons.

Groundwater occurs as a thin lens of fresh water overlying brackish water at depth. The water table lies within the dredge fill 4 to 8 feet below the ground surface. Groundwater within the dredge fill unit occurs under unconfined conditions. The North Tank Farm and Main Terminal areas generally are unaffected by tides; whereas at the Shoreline Manifold Area groundwater quality and elevations are affected by tides.

The native estuarine deposits are fully saturated and groundwater within this unit occurs under unconfined conditions. Water quality and water elevations within this unit are influenced by surrounding surface water bodies and associated tidal fluctuations. Groundwater within the shallower monitoring zone at the site flows in a radial fashion to the north and to the south from a potentiometric high located within the Main Tank Farm area.

1.2 Summary of Cleanup Actions

The primary cleanup action at the site (excavation and removal of petroleum and lead-arsenic impacted soil) was conducted from December 2003 through February 2004. Product recovery actions have been conducted at the Shoreline Manifold Area since a small product release occurred in August 1996. Between August 1996 and March 2006, total fluids pumping, manual product recovery from wells and well points, and vapor recovery have recovered approximately 75 gallons of product.

Cleanup actions since March 2001 include product recovery at the Shoreline Manifold Area and in the North Tank Farm. At the Shoreline Manifold Area, minimal concentrations of hydrocarbons were present in vapors removed by the vapor extraction system. The system was shut down in August 2005, and removed for the installation of a new bulkhead.

In accordance with the previous years monitoring, over the monitoring period December 2010 to December 2011, absorbent socks were placed in monitoring wells MW-210, MW-211 and MW-212. No measurable volume of product was recovered using the absorbent socks over this period.

A product sheen and olfactory evidence of the presence of hydrocarbons were noted in monitoring wells MW-210, and MW-212, but not in monitoring well MW-211(as in previous years).

1.3 Summary of Monitoring Program

Monitoring wells initially included in the *Compliance Monitoring Plan* (Emcon and LCI, 1999) were MW-05, MW-101, MW-102, MW-104, MW-105, MW-111, MW-112A, MW-201, MW-202, MW-203, MW-204, MW-206A, MW-213, MW-214, SH-04, TES-MW-1, TX-03A, TX-04 and TX-06. Quarterly monitoring was conducted until 2006. On February 1, 2006, The RETEC Group, Inc. submitted a letter report titled *Proposed Technical Changes to Shell Harbor Island Compliance Monitoring Plan* (RETEC, 2006). The proposed changes included reducing the monitoring to a semi-annual basis (April and October) on the monitoring wells MW-202, MW-203, TX-03A, and SH-04, and discontinuing the monitoring of natural attenuation parameters and analysis for total lead and arsenic.

At the request of Ecology, URS proposed changes to the compliance monitoring plan in a letter *Proposed Changes to Shell's Seattle Terminal Compliance Monitoring Plan* dated April 8, 2008. URS proposed to conduct monitoring and sampling on a semi-annual basis for monitoring wells MW-104, MW-202, MW-203, MW-213, MW-214, TX-03A and SH-04, and on an annual basis at monitoring wells MW-05, MW-101, MW-102, MW-105, MW-111, MW-112A, MW-201, MW-204, MW-206A, TES-MW-1, TX-04, and TX-06A. This plan was approved by Ecology in a meeting in May 2008. The current monitoring and analytical program is presented in Table 1-1.

During the 2011 monitoring program additional semi-annual samples were obtained from monitoring wells TX-04, TES-MW-1, MW-112A, MW-111 and MW-105 to assess the dissolved groundwater plume along 13th Avenue and the Tank Farm. Sampling for the first round of the semi-annual samples occurred in May 2011 instead of April 2011 to coordinate sampling with the Kinder Morgan Terminal located east of the site.

2.0 GROUNDWATER ELEVATIONS AND FLOW

Monitor wells included in the *Compliance Monitoring Plan* (Emcon and LCI, 1999) screen two depth intervals, described herein as shallow and deep. The shallow depth interval includes groundwater within about 10 feet of the water table and is gauged by monitoring wells A-28, MW-2, MW-05, MW-6, MW-101, MW-102, MW-104, MW-105, MW-107, MW-109, MW-110, MW-111, MW-112A, MW-201, MW-202, MW-203, MW-204, MW-206A, MW-208, MW-210, MW-211, MW-212, TES-MW-1, TX-03A, TX-04, TX-06A, SH-04, and piezometers P-102, P-103, P-104, and P-105. The deep depth interval includes groundwater greater than 10 feet below the water table and is gauged by monitor wells DP-06, MW-06, MW-103, MW-108, MW-205, MW-209, MW-213, and MW-214. The locations of the monitoring wells are shown on Figure 2-1.

Groundwater elevation data for the monitoring period (December 2010 through November 2011) and historical groundwater elevation data are presented in Appendix A. Deep groundwater elevation contour maps were not created by URS for this monitoring period based on communications with the Ecology on September 18, 2007.

At the request of Ecology, groundwater elevation data was collected from the Shell, BP and Kinder Morgan terminals on May 23, 2011. An island wide groundwater elevation contour map was generated for the shallow water zone by Antea Group. The May 2011 groundwater elevation contour map is presented in Appendix B.

The May 2011 and October 2011 groundwater elevation data presented in Appendix A are calculated using measuring point elevation data from an elevation survey performed in September 2004. The datum for the survey is NAD1988. The datum of the previous survey was NGVD1929. The NAD1988 datum is approximately 3.3 feet higher than the NGVD1929. The survey was conducted in part to resolve discrepancies in ground and well casing elevations caused by the February 2001 Nisqually earthquake. The quake changed ground and well casing elevations by a variable, but measurable amount.

3.0 COMPLIANCE MONITORING TASK DESCRIPTIONS

3.1 Performance Monitoring

As described in the *Cleanup Action Plan* (Ecology, 1998), *Compliance Monitoring Plan* (Emcon and LCI, 1999), and *Engineering Design Report* (Lovely and IT, 2000), performance monitoring consists of three components: product thickness and sheen monitoring, groundwater natural attenuation monitoring, and groundwater quality monitoring. Groundwater natural attenuation monitoring is conducted to monitor the effectiveness of natural attenuation processes in reducing the magnitude and extent of dissolved chemical plumes. Groundwater quality monitoring is conducted to monitor the effect of total petroleum range hydrocarbons (TPH) and lead-arsenic impacted soil removal on groundwater concentrations of TPH, benzene, toluene, ethylbenzene, total xylene (BTEX), and lead-arsenic.

As described in the approved *Proposed Changes to Shell's Seattle Terminal Compliance Monitoring Plan* (URS, 2008) the product monitoring was reduced to quarterly, while groundwater natural attenuation and quality monitoring was reduced to semi-annual (October and April) for the following monitoring wells: MW-202, MW-203 and TX-03A.

Product thickness and sheen monitoring was accomplished by quarterly monitoring of product thickness and sheen in monitoring wells MW-204, MW-208, MW-210, MW-211, and MW-212. See Figure 2-1 for locations of these monitoring points.

Performance monitoring for groundwater quality was accomplished by sampling the following monitoring wells, MW-202, MW-203, and TX-03A. Table 1-1 provides a summary of all groundwater performance monitoring wells and the monitoring objective of each well. Performance monitoring results are presented in Section 4.

3.2 Confirmational and Sentry Monitoring

Confirmational and sentry monitoring, described in the *Compliance Monitoring Plan*, consists of product monitoring and groundwater quality monitoring. Confirmational product monitoring comprises quarterly monitoring of product thickness and sheen in monitoring wells MW-204, MW-208, MW-210, MW-211, and MW-212. The compliance criterion for triggering confirmational product monitoring is the absence of product or sheen in any site monitor wells. Product recovery activities in the form of passive recovery using absorbent socks occurred during the reporting period. Hence, performance product monitoring was conducted in lieu of confirmational product monitoring because performance criteria for changing the type of product monitoring had not been met.

Sentry monitoring is designed to provide early warning of off-site migration of site-related chemicals. Sentry groundwater quality monitoring, conducted simultaneously with groundwater performance monitoring, is accomplished by semi-annual monitoring on monitoring wells MW-204, TX-03A, and SH-04, as per the revised compliance

monitoring plan (URS, 2008). Monitoring well TX-03A is also part of performance monitoring. Groundwater in sentry monitoring wells is analyzed for concentrations of BTEX and gasoline to heavy oil range hydrocarbons. Wells included in sentry monitoring are generally located at or near property boundaries of the Shell Harbor Island Terminal.

4.0 PERFORMANCE MONITORING RESULTS

Five product-monitoring events and two compliance groundwater-monitoring events were conducted during the December 2010 through December 2011 monitoring period. Monitoring results are presented in the following subsections.

4.1 Product Performance Monitoring

In the Shoreline Manifold Area, measurable floating product thickness was not detected in monitoring wells MW-204, MW-208, MW-211 and MW-212 during the December 2010 through December 2011 monitoring period, though evidence of a sheen was present in MW-212 during the most recent monitoring round completed in December 2011 (see Table 4-1).

A measurable thickness of floating product was present in MW-210 during multiple monitoring periods. An apparent product thickness of 0.01 was detected, during the April, July and September 2011 monitoring events (see Table 4-1). In December the product thickness was 0.28 feet in MW-210.

Absorbent socks were placed in monitoring wells MW-210, MW-211 and MW-212 throughout the monitoring period to remove product. Measurements of the sock weight indicate that socks placed in this well have been removing product from the well.

It is proposed that the absorbent socks be removed from monitoring wells MW-210, MW-211, and MW-212 during the next O&M visit and groundwater levels allowed to equilibrate over the quarter to determine whether measurable thickness of free product remains at these wells.

4.2 Groundwater Quality Performance Monitoring

Analytical results for the groundwater quality performance monitoring are presented in this subsection. Analytical results for TPH and BTEX are presented in consecutive subsections. Carcinogenic Polycyclic Aromatic Hydrocarbons (cPAHs) were collected from monitoring wells MW-213 and MW-214 and lead was collected from monitoring wells MW-104 and MW-105 during with monitoring period in accordance with approved changes in the compliance monitoring plan (URS, 2008). Recent and historic laboratory results are summarized in Tables 4-2, 4-3, and 4-4. The groundwater cleanup levels for the site are presented on Table 4-5. Field sampling data sheets, which include field parameter measurements, are provided in Appendix C and copies of the laboratory reports are presented in Appendix D. Data validation was performed on laboratory reports. Data were judged acceptable for their intended use with noted qualifiers. Data validation reports are presented in Appendix D. Groundwater results are shown on time series concentration plots for each well sampled in Appendix E.

Two monitoring events were conducted, in May and October 2011. During each monitoring event, groundwater samples were collected from the monitoring wells described in Section 3. Groundwater levels were measured in all wells sampled before each sampling event. Groundwater level data are described in Section 2.

Groundwater samples collected during the sampling events were submitted to Accutest Labs in San Jose, California. Samples were analyzed for concentrations of total petroleum range hydrocarbons as gasoline (TPH-Gas), extended diesel range hydrocarbons (TPH-Diesel), and BTEX as presented in Table 1-1

4.2.1 TPH Results

Site-wide and well-specific TPH results are described below. Concentrations of TPH-Gas and TPH-Diesel are presented on Figure 4-1.

Background Monitoring Well

Monitoring well MW-206A is located upgradient to the North Tank Farm and serves as the site background monitoring well. MW-206A was sampled during the annual monitoring event and the results are presented in Table 4.2k. TPH-Gas and Motor Oil-range hydrocarbons were not detected at or above the method reporting limit of 0.2 mg/L. TPH-Diesel were detected at a concentration of 0.141 mg/L.

Confirmational Monitoring Wells

Monitoring wells MW-213 and MW-214 were sampled during this monitoring period and the results summarized in Tables 4.2l and 4.2m respectively. TPH-Gas and Motor Oil-range hydrocarbons were not detected at or above the method reporting limits in either monitoring well MW-213 or MW-214 (see Tables 4.2l and 4.2m respectively). TPH-Diesel was detected in monitoring well MW-214 at concentrations of 1.27 mg/L during the May 2011 sampling event and 1.51 mg/L during the October 2011 sampling event. TPH-Diesel was not detected at or below method reporting limits in monitoring well MW-213.

Performance and Sentry Monitoring Wells

TPH-Diesel was detected at least once in all performance wells with the exception of monitoring wells TES-MW1 and MW-101 in October 2011. In the case of the sentry wells, TPH-Diesel were not detected at or above method reporting limits in monitoring well MW-05, but was present in the other sentry wells. TX-03A historically has detections of TPH-Diesel at concentrations below the cleanup level however. Diesel analysis is not currently conducted on the samples collected from well TX-03A.

Concentrations of TPH-Diesel varied from 0.0966 mg/L to 1.84 mg/L at TX-04 and MW-202, respectively, during the monitoring period, and none of the groundwater samples contained concentrations of TPH-Diesel in excess of the cleanup level of 10 mg/L.

Concentrations of TPH-Gas were below method reporting limits in groundwater samples collected from monitoring well TES-MW1 and two sentry monitoring wells (MW-05 and MW-111) during the monitoring period. Concentrations of TPH-Gas ranged from 0.0519 mg/L to 8.51 mg/L at TX-06A and TX-03A, respectively, in P&S wells.

In comparison with the TPH-Gas cleanup level of 1 mg/L, concentrations greater than the cleanup level were detected one or more times in groundwater sampled at monitoring wells MW-104, MW-202, MW-203, SH-04, and TX-03A. Concentrations detected at MW-104 ranged from 3.38 mg/L to 4.44 mg/L, at MW-202 from 3.5 mg/L to 4.3 mg/L, at MW-203 from 0.333 mg/L to 1.38 mg/L, at SH-04 from 5.35 mg/L to 5.4 mg/L and at TX-03A from 7.5 mg/L to 8.51 mg/L.

Motor Oil-range hydrocarbons were detected during the May 2011 monitoring round in sentry monitoring well SH-04 (0.13 mg/L) and performance monitoring well MW-203 (0.314 mg/L). Motor oil was also detected at a concentration greater than the detection limit in MW-201 (0.0899 mg/L) and MW-203 (0.118 mg/L) during the October 2011 sampling round. All concentrations were less than the cleanup level of 10 mg/L.

4.2.2 BTEX Results

Benzene concentrations for all wells sampled are shown on Figure 4-2. Toluene and ethyl benzene are not shown on a figure because all detected concentrations are two to three orders of magnitude less than the cleanup level. Total xylenes are not shown on a figure because no cleanup level is established for xylenes.

Background Monitoring Well

The background monitoring well MW-206A was sampled during the annual monitoring event in October 2011, and no BTEX compounds were detected in groundwater sampled from this well.

Confirmational Monitoring Wells

The conformational monitoring wells MW-213 and MW-214 were sampled during May and October 2011. BTEX compounds were not detected in any groundwater collected from these wells during this monitoring period.

Performance and Sentry Monitoring Wells

BTEX compounds were detected in groundwater at five of the performance or sentry monitoring wells (MW-104, MW-111, MW-112A, SH-04 and TX-03A) sampled during this monitoring period.

Concentrations of benzene greater than the cleanup level of 0.071 mg/L were consistently detected in groundwater from monitoring well SH-04 (0.66 mg/L and 0.393 mg/L in the May and October, 2011 rounds, respectively) and monitoring well TX-03A (1.78 mg/L and 3.44 mg/L in May and October rounds, respectively).

Toluene was detected in MW-104 and SH-04 at concentrations of 0.0093 mg/L and 0.0200 mg/L, respectively. These concentrations are less than the cleanup level of 200 mg/L.

Ethylbenzene was detected in MW-104, SH-04, and TX-03A and concentrations ranged from 0.044 mg/L (TX-03A) to 0.15 mg/L (SH-04). These concentrations are less than the cleanup level of 29 mg/L.

Xylene was detected in MW-104, SH-04, and TX-03A at concentrations ranging from 0.0018 mg/L (MW-104) to 0.111 mg/L (TX-03A). No cleanup levels have been established for total xylenes.

4.2.3 cPAHs

During the monitoring period, cPAHs were analyzed in groundwater collected from conformational monitoring wells MW-213 and MW-214. No cPAHs were detected at or above the MDL.

4.3 Natural Attenuation Performance Monitoring

4.3.1 Introduction

Groundwater natural attenuation monitoring was conducted historically to monitor the effectiveness of natural attenuation processes in reducing the magnitude and extent of site-related dissolved chemical plumes. Groundwater natural attenuation monitoring was discontinued in 1996 as described in the approved *Proposed Technical Changes to Shell Harbor Island Compliance Monitoring Plan* (RETEC, 2006).

Natural attenuation monitoring was restarted during 2008 in a reduced number of wells in accordance with the *Proposed Changes to Shell's Seattle Terminal Compliance Monitoring Plan* dated April 8, 2008.

4.3.2 Natural Attenuation Summary

The natural attenuation parameters monitored include total alkalinity, hardness,

total iron, ferrous iron, methane, and sulfate. Analysis of natural attenuation parameters was completed on groundwater sampled from monitoring wells MW-201, MW-202, TES-MW-1 and TX-03A.

Monitoring wells MW-202, MW-203, and TX-03A have been assessed for natural attenuation parameters since 2008. Table 4-6 includes the historical natural attenuation parameters.

Overall, the groundwater monitoring results over the last five years show a decline in concentrations of gasoline and diesel range hydrocarbons, and benzene, with the most marked reductions occurring at monitoring well SH-04. The exceptions to this general trend are at monitoring wells MW112A, MW-202, and TX-03A, where concentrations appear to be increasing or stable. Time series concentration plots for each of these wells are presented in Appendix E.

The field-measured water quality parameters and natural attenuation datum appear to support the presence of both aerobic (oxidizing) and anaerobic (reducing) biodegradation processes. The primary indicators identifying the current state of the groundwater environment are the field measured ORP (redox potential) and dissolved oxygen (DO). Measured DO levels in groundwater below 0.5 mg/L are indicative of degradation via anaerobic bacteria. Under anaerobic conditions, an ORP less than zero (negative) reflect reducing conditions. The presence of methane above background levels normally corresponds to highly anaerobic conditions, which occur after the available oxygen, nitrate, and sulfate have been depleted through microbial metabolism. The methane is produced through reduction of carbon dioxide by microbes (methanogenesis). Aerobic conditions are associated with DO levels above 0.5 mg/L, positive ORP measurements, and the presence of measurable concentrations of other available electron receptors including bicarbonate, nitrate and sulfate.

The field measured pH and temperature was generally within the range favorable for microbial activity, between 6.8-8.8 pH units. The groundwater temperature ranged between approximately 10-19 degrees Celsius. Rates of hydrocarbon biodegradation roughly double for every 10 degree increase in temperature. Microbial activity is greatly inhibited below 5 degree Celsius.

Benzene concentrations remain above the cleanup level in monitoring wells SH-04, and TX-03A. While benzene concentrations are steadily decreasing in monitoring SH-04, they are remaining fairly consistent in monitoring well TX-03A. Similar patterns as described above are evident for gasoline range hydrocarbons in both SH-04 and TX-03A.

Carbon dioxide levels in TX03A are shown to have increased from 0.27 mg/L in Oct. 2010 to 9.29 mg/L in Oct 2011. Dissolved oxygen, used for aerobic biodegradation, appears to be slightly higher than previously measured at 1.72 mg/L compared to 1.39 mg/L in 2010. Sulfate was not detected above laboratory reporting limits in October 2011 compared to a concentration of 6.8mg/L detected

in groundwater from TX03A in October 2010.

The measured ORP of $-100.9 \mu\text{S}/\text{cm}$ is slightly lower than measured ORP in October 2010 but is consistent with the presence of a mostly reducing environment.

5.0 SENTRY MONITORING RESULTS

Groundwater from sentry monitoring wells was analyzed for concentrations of gasoline, diesel and heavy oil range hydrocarbons and BTEX. Concentrations of gasoline, diesel range hydrocarbons, and benzene are posted on Figures 4-1 through 4-2, respectively.

5.1 North Boundary – North Tank Farm

The north boundary of the North Tank Farm is hydraulically downgradient with respect to groundwater flow beneath the North Tank Farm. Groundwater flow beneath the North Tank Farm is predominantly to the north, towards the north end of Harbor Island. Monitor well MW-201 is located along the north boundary and groundwater quality data from this well was designated by the *Compliance Monitoring Plan* as characteristic of groundwater flowing across the north boundary of the North Tank Farm.

During the monitoring year, measured concentrations of gasoline range hydrocarbon, diesel range hydrocarbon, and heavy motor-oil range hydrocarbons in groundwater collected from monitoring well MW-201 were less than the cleanup levels of 1, 10, and 10 mg/L, respectively. Benzene, toluene, ethylbenzene, and xylene concentrations were less than the MDL. Based on these data, hydrocarbon concentrations in shallow groundwater flowing across the north boundary remain below cleanup levels.

5.2 Northern Boundary – Main Tank Farm

The north boundary of the Main Tank Farm represents the northern downgradient edge of a groundwater high that typically occurs in the northern area of the tank farm. Groundwater generally flows in a radial fashion from this groundwater high. According to the *Compliance Monitoring Plan*, monitoring well TX-03A is considered to be the representative sampling point for assessing the quality of groundwater flowing across the northern boundary of the Main Tank Farm. Samples collected from monitoring well TX-03A in May and October 2011 contain concentrations of gasoline range hydrocarbons and benzene in excess of site cleanup levels. The October 2011 sampling event shows elevated levels above previous levels since 2005.

The groundwater in the vicinity of well TX-03A is presently being evaluated to determine nature and extent of dissolved hydrocarbons in groundwater. In November 2011, URS installed four groundwater monitoring wells (MW-301 through MW-304). The results of the investigation are presented in the *Limited Subsurface Investigation Report Shell Harbor Island Terminal Well TX-03A Area*, dated January 19, 2012. The new monitoring well network will be sampled quarterly in 2012 and summarized in next year's Annual Compliance Monitoring Report for the site.

5.3 Western Boundary – Main Tank Farm

Groundwater flow patterns along the western boundary of the Main Tank Farm vary seasonally and are also affected by the groundwater high that typically occurs in the northern portion of the Main Tank Farm. Due to these effects, groundwater along the northerly portion of the western boundary typically flows toward the northwest, while

groundwater along the central portion of the western boundary typically flows west to southwest. Groundwater along the southern portion of the western boundary typically flows south to southwest; although, an occasional groundwater low observed within the southern portion of the Main Tank Farm property can cause groundwater along the southern portion to locally flow east-southeast. Monitoring wells MW-102 and TX-06A are monitored at the west side of the Tank Farm property.

Benzene and toluene were not detected above the cleanup levels of 0.071 mg/L and 200 mg/L respectively in groundwater sampled during the last year from monitoring wells MW-102 and TX-06A. Gasoline and diesel range hydrocarbon levels were below the clean up levels of 1 mg/L and 10 mg/L respectively, and concentrations of heavy motor-oil range hydrocarbons did not exceed the MDL.

5.4 Eastern Boundary – Main Tank Farm

Similar to the western boundary, groundwater flow patterns along the eastern boundary of the Main Tank Farm vary seasonally and are affected by the groundwater high typically occurring in the northern portion of the Main Tank Farm. As such groundwater flow is typically northerly along the northern portion of the eastern boundary, easterly along the central portion, and southerly to southeasterly along the southern portion.

Monitoring wells MW-5, SH-04 and TX-04 were designated as the sentry wells for the eastern boundary of the Main Tank Farm. At monitoring wells MW-5 and TX-04 hydrocarbons concentrations were less than the site cleanup levels.

Monitoring well SH-04 is an off-site monitoring well, located along the southeast boundary of the Main Tank Farm. Samples were collected during the monitoring period in May and October 2011. Benzene concentrations exceeded the cleanup level of 0.071 mg/L during each sampling event. Toluene, ethylbenzene, and total xylenes levels were all less than respective cleanup levels.

Groundwater collected from this well contains the greatest average concentration of petroleum hydrocarbons of all Main Tank Farm compliance wells. The gasoline-range hydrocarbon concentration at monitoring well SH-04 was 5.4 and 5.35 mg/L compared to the cleanup level of 1 mg/L. Diesel range hydrocarbon concentrations of 1.8 and 1.22 mg/L remain lower than the cleanup level of 10 mg/L. The motor oil range hydrocarbon levels were either not detected at or above the method reporting limit or were less than the cleanup level of 10 mg/L.

Based on data from neighboring properties and the Shell Terminal, elevated petroleum hydrocarbon concentrations at this well could be due to historic releases at neighboring facilities, and hydrocarbon concentrations continue to follow a downward trend. Assessment of the groundwater in the vicinity of SH-04 will be continued in 2011.

The groundwater in the vicinity of well SH-04 is presently being evaluated to determine nature and extent of dissolved hydrocarbons in groundwater. In November 2011, URS installed two groundwater monitoring wells (MW-305 and MW-306). The results of the

investigation are presented in the *Limited Subsurface Investigation Report Shell Harbor Island Terminal Well SH-04 Area*, dated January 19, 2012. The new monitoring well network will be sampled quarterly in 2012 and summarized in next year's Annual Compliance Monitoring Report for the site.

5.5 Southern Boundary – Main Tank Farm

Groundwater flow directions along the southern boundary of the Main Tank Farm are generally to the south. Temporary southeasterly or southwesterly directions may occur in response to precipitation events. Monitoring wells MW-104 and MW-105 were sampled in this area during the reporting period.

During the last year, BTEX concentrations were not analyzed for monitoring well MW104. BTEX was not detected above the MDL in groundwater from monitoring well MW-105 during the monitoring period.

Gasoline-range hydrocarbon concentrations at monitoring well MW-104 have exceeded the cleanup level of 1 mg/L on at least one of the two sampling rounds every year for the last five years, and the pattern was repeated in 2011, with a concentration of 4.44 mg/L in May, being followed by a concentration of 3.38 mg/L in October 2011. It should be noted that the general trend of the gasoline range hydrocarbons detected in monitoring well MW-104 is decreasing over time as presented in the time series concentration plots for the well presented in Appendix D, however the trend is leveling out in recent years.

Diesel range hydrocarbons levels in groundwater from monitoring well MW-104 remained below the cleanup level of 10 mg/L. Motor-oil range hydrocarbons were below the MDL for water sampled in 2011.

Concentrations of gasoline range hydrocarbons, diesel range hydrocarbons and motor-oil hydrocarbons did not exceed respective MDLs in groundwater sampled from monitoring well MW-105.

6.0 SUMMARY AND CONCLUSIONS

A summary and conclusions drawn from activities conducted during the December 2010 through December 2011 monitoring period are presented below.

- A minimal amount of product was recovered from absorbent socks placed in monitoring wells MW210, MW211 and MW212, located in the Shoreline Manifold Area, and north of the Main Tank Farm. Given the continued presence of sheen in these wells, it is recommended that the socks be removed from the wells at the next round and the oil/water interface allowed to equilibrate in order to accurately determine whether a measurable thickness of free product will develop in these wells without the presence of the socks.
- Groundwater elevations at the Terminal appear to be consistent with historic levels.
- TPH-Gas concentrations greater than the cleanup level of 1 mg/L were measured in groundwater collected from monitoring wells MW-104, MW-202, MW-203, SH-04, and TX-03A.
- Benzene concentrations exceeding the 0.071 mg/L cleanup level were detected in samples collected from monitoring wells SH-04 and TX-03A, while benzene concentrations in groundwater from all other monitored wells remained less than cleanup criteria.
- Toluene concentrations were less than the cleanup level of 200 mg/L in all groundwater samples. All measured concentrations of ethylbenzene in groundwater were less than the cleanup limit of 29 mg/L.
- TPH-Diesel concentrations in groundwater from all wells sampled were less than the cleanup limit of 10 mg/L.
- TPH-Diesel concentrations are either below method detection limits or less than site cleanup levels for several wells for greater than 5 years and in areas not known for potential TPH-Diesel contamination.
- Hydrocarbon concentration trends in the wells sampled during this reporting period were predominantly within historical ranges and generally decreasing. While still elevated relative to cleanup criteria, concentrations of hydrocarbons in groundwater from monitoring well SH-04 continue to steadily decrease. In contrast, consistently elevated concentrations of hydrocarbons in groundwater in monitoring wells MW-202 and TX-03A suggest that degradation is proceeding very slowly in these wells. Quarterly monitoring in 2012 of the new well networks in the vicinity of wells SH-04 and TX-03A will be further evaluated with Ecology.

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TABLES

**Table 1-1
Compliance Monitoring Program
Shell Harbor Island Terminal
Seattle, Washington**

Well ID	Sampling Frequency	Analysis						Well Class		
		Total Lead	BTEX	TPH-Gx	TPH-Dx	cPAHs	NA Parameters	Natural Attenuation Performance	Groundwater Quality Confirmation	Sentry
MW-104	Semi-Annual	X		X	X					X
MW-202	Semi-Annual			X	X		X ¹	X		
MW-203	Semi-Annual			X	X		X ¹	X		
MW-213	Semi-Annual		X	X	X	X			X	
MW-214	Semi-Annual		X	X	X	X			X	
SH-04	Semi-Annual		X	X	X					X
TX-03A	Semi-Annual		X	X			X ¹	X		X
MW-05	Annual		X	X	X					X
MW-101	Annual		X	X	X			X		
MW-102	Annual		X	X	X					X
MW-105	Annual	X	X	X	X					X
MW-111	Annual		X	X	X					X
MW-112A	Annual		X	X	X					X
MW-201	Annual		X	X	X			X		
MW-204	Annual		X	X	X					X
MW-206A	Annual		X	X	X				X	
TES-MW-1	Annual		X	X	X			X		
TX-04	Annual		X	X	X					X
TX-06A	Annual		X	X	X					X

Notes:

X¹ = Annual sampling only

Annual monitoring will be completed in October of each year.

Semi-Annual monitoring will be completed in April of each year.

**Table 4-1
Product Monitoring Data
Shell Harbor Island Terminal
Seattle, Washington**

Date	MW-204			MW-208			MW-210			MW-211			MW-212		
	Water	Product	Product	Water	Product	Product	Water	Product	Product	Water	Product	Product	Water	Product	Product
	Depth	Depth	Thickness	Depth	Depth	Thickness	Depth	Depth	Thickness	Depth	Depth	Thickness	Depth	Depth	Thickness
01/31/07	10.17	NP	NP	3.98	NP	NP	6.32	6.09	0.23	5.58	NP	NP	4.26	NP	NP
02/26/07	10.56	NP	NP	4.55	NP	NP	6.04	NP	NP	5.24	NP	NP	4.12	NP	NP
03/20/07	10.68	NP	NP	4.68	NP	NP	6.42	6.41	0.01	5.68	NP	NP	4.82	NP	NP
04/26/07	10.99	NP	NP	—	NP	NP	—	NP	NP	6.15	NP	NP	4.97	4.96	0.01
05/25/07	11.29	NP	NP	5.68	NP	NP	7.05	NP	NP	6.60	NP	NP	5.11	NP	NP
06/15/07	11.50	NP	NP	5.93	NP	NP	7.04	NP	NP	6.35	NP	NP	5.03	NP	NP
07/19/07	11.70	NP	NP	5.82	5.81	0.01	6.81	6.80	0.01	6.34	NP	NP	5.29	5.28	0.01
08/17/07	11.81	NP	NP	5.90	NP	NP	6.75	NP	NP	6.22	NP	NP	5.35	NP	NP
09/11/07	—	NP	NP	6.24	NP	NP	7.28	7.28	<.01	6.68	6.68	<.01	5.73	NP	NP
10/29/07	11.80	NP	NP	5.60	NP	NP	6.68	NP	NP	5.25	NP	NP	6.03	NP	NP
11/12/07	11.84	NP	NP	5.56	NP	NP	6.58	6.57- 6.58	<.01	5.82	NP	NP	4.83	—	—
12/26/07	10.84	NP	NP	4.09	NP	NP	5.85	5.84	<.01	4.84	4.85	<.01	4.44	4.43	<.01
01/11/08	10.64	NP	NP	3.84	NP	NP	5.26	5.25	0.01	4.13	4.12	<.01	3.64	3.63	<.01
02/13/08	10.65	NP	NP	4.58	NP	NP	6.60	6.25	0.35	5.75	NP	NP	4.84	NP	NP
03/14/08	11.05	NP	NP	5.37	NP	NP	6.31	NP	NP	5.65	NP	NP	5.01	NP	NP
04/18/08	10.78	NP	NP	5.41	NP	NP	6.46	6.45	0.01	5.81	NP	NP	5.28	NP	NP
05/05/08	11.39	NP	NP	5.84	NP	NP	7.06	7.05	0.01	6.39	NP	NP	5.49	NP	NP
05/20/08	11.53	NP	NP	5.84	NP	NP	7.03	7.02	0.01	6.69	NP	NP	5.52	NP	NP
06/30/08	11.67	NP	NP	5.85	NP	NP	dry	NP	NP	6.35	6.34	0.01	5.45	5.44	0.01
07/10/08	11.70	NP	NP	5.70	NP	NP	6.83	6.80	0.03	6.23	NP	NP	5.24	NP	NP
08/13/08	11.75	NP	NP	5.61	NP	NP	6.75	NP	NP	6.25	NP	NP	6.17	NP	NP
09/02/08	11.82	NP	NP	5.86	NP	NP	6.98	NP	NP	6.40	NP	NP	5.71	NP	NP
10/10/08	11.82	NP	NP	7.11	NP	NP	5.83	NP	NP	6.59	NP	NP	5.83	NP	NP
11/10/08	10.02	NP	NP	4.68	NP	NP	6.40	NP	NP	5.61	NP	NP	5.21	NP	NP
12/08/08	11.48	NP	NP	5.53	NP	NP	6.70	6.52	0.18	5.82	NP	Sheen	5.17	NP	Sheen
01/07/09	11.00	NP	NP	3.93	NP	NP	5.32	NP	Sheen	4.51	NP	Sheen	4.41	NP	Sheen
02/17/09	11.60	NP	NP	5.20	NP	NP	6.40	NP	Sheen	5.72	NP	Sheen	5.21	NP	Sheen
03/06/09	11.21	NP	NP	4.67	NP	NP	6.02	5.59	0.43	4.45	NP	Sheen	4.83	NP	Sheen
04/07/09	—	—	—	—	—	—	6.98	6.96	0.02	—	—	—	—	—	—
07/09/09	11.55	NP	NP	—	—	—	6.90	NP	Sheen	6.34	NP	Sheen	5.56	NP	Sheen
10/20/09	11.75	NP	NP	4.90	NP	NP	6.28	NP	Sheen	5.63	NP	Sheen	4.91	NP	Sheen
01/05/10	10.98	NP	NP	3.60	NP	NP	5.78	NP	Sheen	3.55	NP	NP	3.30	NP	NP
04/26/10	10.7	NP	NP	5.04	NP	NP	6.29	6.28	0.01	5.76	NP	NP	5.05	NP	NP
07/22/10	11.44	NP	NP	5.83	NP	NP	10.02	NP	Sheen	6.74	NP	NP	5.37	NP	Sheen
10/20/10	11.68	NP	NP	5.90	NP	NP	6.78	NP	Sheen	6.20	NP	Sheen	5.45	NP	Sheen
12/12/10	10.79	NP	NP	4.45	NP	NP	5.97	NP	<.01	5.27	NP	NP	4.62	NP	Sheen
04/08/11	9.97	NP	NP	4.62	NP	NP	5.72	5.71	0.01	5.22	NP	NP	4.82	NP	NP
07/28/11	11.08	NP	NP	5.71	NP	NP	6.90	6.89	0.01	6.22	NP	NP	5.38	NP	NP
09/21/11	11.75	NP	NP	6.19	NP	NP	7.06	7.05	0.01	6.55	NP	NP	5.78	NP	Sheen
12/12/11	9.35	NP	NP	5.60	NP	NP	6.82	6.54	0.28	5.92	NP	NP	5.37	NP	Sheen

NOTES:

- Apparent product thickness in feet
- Depth relative to the top of PVC
- Prod depth/thick = product depth/thickness in well (ft)
- = not measured
- NP = no product measured with an oil/water interface probe (<0.01 feet thick)
- NR = not recorded
- Vol = volume of product removed in gallons during time period

Table 4-2a
Petroleum Hydrocarbons and BTEX in Groundwater
Shell Harbor Island Terminal
Seattle, Washington

Location ID	Chemical (mg/L)	Benzene	Toluene	Ethylbenzene	Total Xylenes (mixed isomers)	Gasoline Range Hydrocarbons	Diesel Range Hydrocarbons	Motor Oil Range Hydrocarbons
	Sample Date							
MW-05	04/05/93	< 0.0005	0.0022	0.049	0.014	0.32	< 0.25	< 0.75
MW-05	06/23/93	< 0.0025	0.012	0.31	0.08	1.8	< 0.25	< 0.75
MW-05	09/22/93	< 0.0005	< 0.0005	0.0054	0.0013	< 0.1	0.26	< 0.75
MW-05	12/15/93	< 0.0005	< 0.0005	0.0016	< 0.0005	< 0.1	< 0.25	< 0.75
MW-05	11/19/97	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.1	0.27	< 0.71
MW-05	04/01/98	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.1	< 0.24	< 0.71
MW-05	04/28/99	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.05	0.255	< 0.75
MW-05	07/15/99	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.05	< 0.250	< 0.75
MW-05	10/19/99	< 0.00135	< 0.00058	0.0012	0.0166	0.258	0.332	< 0.75
MW-05	01/13/00	< 0.0005	< 0.0028	< 0.0005	< 0.001	0.066	0.288	< 0.75
MW-05	04/06/00	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.05	< 0.250	< 0.75
MW-05	07/18/00	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.05	< 0.804	< 0.742
MW-05	10/02/00	< 0.00106	< 0.00073	< 0.0005	0.0049	0.135	0.278	< 0.75
MW-05	01/24/01	< 0.000788	0.00604	< 0.0005	0.00139	0.154	0.447	< 0.75
MW-05	04/24/01	0.000728	< 0.0005	< 0.0005	< 0.001	0.0652	0.323	Not Analyzed
MW-05	07/25/01	0.000629	< 0.0005	< 0.0005	< 0.001	0.0552	0.285	Not Analyzed
MW-05	10/30/01	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.05	< 0.25	Not Analyzed
MW-05	05/10/02	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.05	< 0.25	Not Analyzed
MW-05	07/19/02	0.00088	< 0.001	< 0.001	< 0.001	0.027	0.19	< 0.75
MW-05	01/30/03	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	< 0.25	< 0.5
MW-05	04/16/03	< 0.001	< 0.001	< 0.001	0.001	< 0.25	0.71	< 0.5
MW-05	07/18/03	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	< 0.25	< 0.5
MW-05	10/15/03	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	< 0.25	< 0.5
MW-05	01/15/04	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	0.37	< 0.5
MW-05	04/21/04	0.0015	< 0.001	0.0053	< 0.001	< 0.25	0.41	< 0.5
MW-05	07/28/04	0.0015	0.001	< 0.001	0.0017	< 0.25	< 0.25	< 0.5
MW-05	10/19/04	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	< 0.25	< 0.5
MW-05	01/25/05	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	< 0.25	< 0.5
MW-05	04/18/05	< 0.001	< 0.001	< 0.001	< 0.001	0.072	< 0.25	< 0.5
MW-05	07/12/05	< 0.001	< 0.001	< 0.001	< 0.001	0.25	< 0.25	< 0.5
MW-05	10/19/05	< 0.001	< 0.001	< 0.001	< 0.001	0.11	< 0.25	< 0.5
MW-05	01/26/06	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.05	< 0.238	< 0.476
MW-05	11/19/08	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	< 0.25	< 0.5
MW-05	11/17/09	< 0.0005	< 0.001	< 0.001	< 0.001	< 0.1	< 0.1	< 0.1
MW-05	10/29/10	< 0.0005	< 0.001	< 0.001	< 0.001	< 0.1	0.14	< 0.1
MW-05	05/23/11	<.0003	<.0005	<.0003	<.0007	0.0744	Not Analyzed	Not Analyzed
MW-05	10/25/11	< 0.0010	< 0.0010	< 0.0010	< 0.0020	0.115	< 0.095	< 0.19

Note:

Bolded values indicate concentrations greater than the reporting detection limit.

Less than symbol denotes concentration undetected at the reporting detection limit.

Table 4-2b
Petroleum Hydrocarbons and BTEX in Groundwater
Shell Harbor Island Terminal
Seattle, Washington

Location ID	Chemical (mg/L)	Benzene	Toluene	Ethylbenzene	Total Xylenes (mixed isomers)	Gasoline Range Hydrocarbons	Diesel Range Hydrocarbons	Motor Oil Range Hydrocarbons
	Sample Date							
MW-101	04/06/93	0.058	0.0022	0.014	0.0032	1.2	0.40	< 0.75
MW-101	06/18/93	0.12	0.0065	0.016	0.0064	2.4	0.42	< 0.75
MW-101	09/22/93	0.053	0.0018	0.01	0.0048	1.7	0.52	< 0.75
MW-101	12/13/93	0.034	0.0011	0.0028	0.0029	0.76	< 0.25	< 0.75
MW-101	11/04/97	0.0027	< 0.0005	< 0.0005	< 0.0005	0.33	< 0.24	< 0.71
MW-101	04/02/98	0.0022	< 0.0005	0.0011	0.0011	0.62	< 0.24	< 0.75
MW-101	04/29/99	0.00179	< 0.0006	0.00119	< 0.0014	0.325	< 0.25	< 0.75
MW-101	07/16/99	0.00277	< 0.00052	< 0.0008	< 0.0017	0.242	< 0.25	< 0.75
MW-101	10/29/99	0.00156	< 0.0005	< 0.0005	< 0.0011	0.393	< 0.25	< 0.75
MW-101	01/12/00	< 0.0013	< 0.0005	< 0.0011	< 0.0025	0.363	< 0.25	< 0.75
MW-101	04/06/00	< 0.0021	< 0.00153	< 0.00185	< 0.0019	< 0.542	< 0.25	< 0.75
MW-101	07/18/00	< 0.00236	< 0.0005	< 0.00125	< 0.00156	< 0.426	< 0.25	< 0.75
MW-101	10/02/00	< 0.00087	< 0.0005	< 0.0005	< 0.00177	0.418	< 0.25	< 0.75
MW-101	01/24/01	0.000551	0.00135	0.0011	< 0.00119	0.46	< 0.25	< 0.75
MW-101	04/24/01	0.00163	< 0.0005	0.00145	0.00141	0.505	< 0.25	Not Analyzed
MW-101	07/24/01	0.00142	< 0.0005	< 0.0005	0.00107	0.353	< 0.25	Not Analyzed
MW-101	10/18/01	0.00065	< 0.0005	< 0.0005	< 0.001	0.181	< 0.28	Not Analyzed
MW-101	01/10/02	0.00256	0.00263	0.00528	0.00487	0.687	0.28	Not Analyzed
MW-101	04/23/02	0.00157	< 0.0005	0.0032	0.00203	0.495	0.338	Not Analyzed
MW-101	07/22/02	0.0019	0.00022	< 0.001	< 0.001	0.29	0.099	< 0.75
MW-101	10/28/02	0.0014	< 0.001	< 0.001	< 0.001	0.42	< 0.25	< 0.75
MW-101	01/30/03	< 0.001	< 0.001	< 0.001	0.0016	0.33	< 0.25	< 0.5
MW-101	04/15/03	0.0046	< 0.001	0.0012	< 0.001	0.66	< 0.25	< 0.5
MW-101	07/17/03	0.0042	< 0.001	< 0.001	0.0017	0.73 J	< 0.25	< 0.5
MW-101	10/16/03	0.0019	< 0.001	< 0.001	< 0.001	0.43	< 0.25	< 0.5
MW-101	01/16/04	< 0.001	< 0.001	< 0.001	0.0028	0.55	< 0.25	< 0.5
MW-101	04/20/04	0.0016	< 0.001	< 0.001	0.0014	0.67	< 0.25	< 0.5
MW-101	07/28/04	0.0012	< 0.001	< 0.001	0.0011	1	< 0.25	< 0.5
MW-101	10/18/04	0.0011	< 0.001	< 0.001	< 0.001	0.42	< 0.25	< 0.5
MW-101	01/26/05	< 0.001	< 0.001	< 0.001	0.0011	0.51	< 0.25	< 0.5
MW-101	04/19/05	0.0016	< 0.001	< 0.001	< 0.001	0.58	< 0.25	< 0.5
MW-101	07/13/05	< 0.001	< 0.001	< 0.001	< 0.001	0.31	< 0.25	< 0.5
MW-101	10/10/05	< 0.001	< 0.001	< 0.001	< 0.001	0.16	< 0.25	< 0.5
MW-101	01/27/06	< 0.0005	< 0.0005	< 0.0005	< 0.001	0.223	< 0.236	< 0.476
MW-101	11/18/08	< 0.005	< 0.005	< 0.005	< 0.005	0.1	< 0.25	< 0.5
MW-101	11/18/09	< 0.0005	< 0.001	< 0.001	< 0.001	< 0.1	< 0.1	< 0.1
MW-101	10/26/10	< 0.0005	< 0.001	< 0.001	< 0.001	0.15	0.13	< 0.1
MW-101	10/27/11	< 0.0010	< 0.0010	< 0.0010	< 0.0020	0.0936	< 0.10	< 0.20

Note:

Bolded values indicate concentrations greater than the reporting detection limit.

Less than symbol denotes concentration undetected at the reporting detection limit.

Table 4-2c
Petroleum Hydrocarbons and BTEX in Groundwater
Shell Harbor Island Terminal
Seattle, Washington

Location ID	Chemical (mg/L)	Benzene	Toluene	Ethylbenzene	Total Xylenes (mixed isomers)	Gasoline Range Hydrocarbons	Diesel Range Hydrocarbons	Motor Oil Range Hydrocarbons
	Sample Date							
MW-102	04/06/93	0.0022	< 0.0005	< 0.0005	0.0009	< 0.1	0.7	< 0.75
MW-102	06/21/93	0.0057	0.0008	< 0.0005	< 0.0005	< 0.1	< 0.25	< 0.75
MW-102	09/22/93	0.17	0.02	0.25	0.058	2.3	0.38	< 0.75
MW-102	12/13/93	0.009	0.0024	0.0047	0.013	0.21	< 0.25	< 0.75
MW-102	11/04/97	0.03	< 0.0005	< 0.0005	< 0.0005	< 0.1	< 0.24	< 0.71
MW-102	04/02/98	0.016	< 0.0005	0.0016	0.00054	0.76	< 0.24	< 0.71
MW-102	04/28/99	0.0116	< 0.0005	< 0.0005	0.00121	0.109	< 0.25	< 0.75
MW-102	07/15/99	0.0236	< 0.0014	0.00131	< 0.0015	0.264	< 0.25	< 0.75
MW-102	10/20/99	0.0107	< 0.0005	< 0.0005	< 0.00165	0.458	< 0.25	< 0.75
MW-102	01/12/00	0.011	< 0.0011	0.00614	< 0.0019	0.493	< 0.25	< 0.75
MW-102	04/06/00	< 0.0116	< 0.000981	< 0.00171	< 0.00135	< 0.24	< 0.250	< 0.75
MW-102	07/18/00	< 0.0155	< 0.000565	< 0.00081	< 0.00122	< 0.178	< 0.308	< 0.75
MW-102	10/02/00	0.00501	< 0.0005	< 0.0005	< 0.001	0.131	< 0.25	< 0.75
MW-102	01/24/01	0.00486	0.00104	0.00137	< 0.001	0.376	0.367	< 0.75
MW-102	04/24/01	0.00184	< 0.0005	< 0.0005	< 0.001	0.234	< 0.25	Not Analyzed
MW-102	07/24/01	0.00101	< 0.0005	< 0.0005	< 0.001	0.344	< 0.25	Not Analyzed
MW-102	01/10/02	0.000999	0.00149	0.000571	0.00276	< 0.05	< 0.25	Not Analyzed
MW-102	04/24/02	0.00151	< 0.0005	0.000961	0.00106	0.267	0.259	Not Analyzed
MW-102	07/22/02	0.00093	< 0.001	< 0.001	< 0.001	0.094	0.15	< 0.75
MW-102	10/28/02	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	< 0.25	< 0.75
MW-102	01/29/03	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	< 0.25	< 0.5
MW-102	04/14/03	0.0026	< 0.001	< 0.001	< 0.001	< 0.25	< 0.25	< 0.5
MW-102	07/16/03	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	< 0.25	< 0.5
MW-102	10/15/03	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	< 0.25	< 0.5
MW-102	01/14/04	0.0021	< 0.001	< 0.001	< 0.001	< 0.25	< 0.25	< 0.5
MW-102	04/21/04	0.0036	< 0.001	< 0.001	< 0.001	< 0.25	< 0.25	< 0.5
MW-102	07/28/04	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	< 0.25	< 0.5
MW-102	10/18/04	0.0011	< 0.001	< 0.001	< 0.001	< 0.25	< 0.25	< 0.5
MW-102	01/25/05	0.0024	< 0.001	< 0.001	< 0.001	< 0.25	< 0.25	< 0.5
MW-102	04/18/05	0.0027	< 0.001	< 0.001	< 0.001	< 0.05	< 0.25	< 0.5
MW-102	07/13/05	< 0.001	< 0.001	< 0.001	< 0.001	0.077	< 0.25	< 0.5
MW-102	10/19/05	< 0.001	< 0.001	< 0.001	< 0.001	< 0.05	< 0.25	< 0.5
MW-102	01/26/06	0.00498	< 0.0005	0.00174	0.00201	< 0.05	< 0.238	< 0.472
MW-102	11/19/08	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	< 0.25	< 0.5
MW-102	11/18/09	< 0.0005	< 0.001	< 0.001	< 0.001	< 0.1	< 0.1	< 0.1
MW-102	10/28/10	< 0.0005	< 0.001	< 0.001	< 0.001	< 0.1	< 0.1	< 0.1
MW-102	10/26/11	< 0.0010	< 0.0010	< 0.0010	< 0.0020	< 0.20	0.113	< 0.20

Note:

Bolded values indicate concentrations greater than the reporting detection limit.

Less than symbol denotes concentration undetected at the reporting detection limit.

Table 4-2d
Petroleum Hydrocarbons and BTEX in Groundwater
Shell Harbor Island Terminal
Seattle, Washington

Location ID	Chemical (mg/L) Sample Date	Benzene	Toluene	Ethylbenzene	Total Xylenes (mixed isomers)	Gasoline Range Hydrocarbons	Diesel Range Hydrocarbons	Motor Oil Range Hydrocarbons
MW-104	04/02/93	0.017	0.24	0.26	1.2	5.6	0.6	< 0.75
MW-104	06/22/93	0.12	1.1	2.4	13	51	0.92	< 0.75
MW-104	09/22/93	0.087	0.33	1.9	8.1	41	0.83	< 0.75
MW-104	12/17/93	0.0041	0.0057	0.065	0.041	0.98	0.35	< 0.75
MW-104	11/05/97	< 0.0005	0.009	0.23	0.45	3.2	0.69	< 0.71
MW-104	04/01/98	0.011	0.16	2.2	4.8	68	2.7	< 0.71
MW-104	04/28/99	< 0.1	< 0.1	2.92	7.19	36.4	2.47	< 0.75
MW-104	07/15/99	< 0.1	< 0.1	2.35	2.2	23.5	2.62	< 0.75
MW-104	10/19/99	< 0.025	< 0.025	1.7	0.221	11.3	1.16	< 0.75
MW-104	01/13/00	< 0.0005	< 0.0005	0.213	0.107	2.46	0.525	< 0.75
MW-104	04/06/00	< 0.05	< 0.05	< 3.25	< 7.14	< 40.3	3.37	< 0.75
MW-104	05/23/00	Not Analyzed	Not Analyzed	2.15	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
MW-104	07/18/00	< 0.0125	< 0.0241	< 1	< 0.214	< 7.39	< 2.77	< 0.749
MW-104	10/02/00	< 0.0187	< 0.0115	0.328	0.183	6.92	0.74	< 0.75
MW-104	01/24/01	< 0.0005	0.000913	0.00447	0.0141	0.166	0.508	< 0.75
MW-104	04/24/01	0.00502	< 0.005	0.229	0.0296	2.92	0.784	Not Analyzed
MW-104	07/24/01	0.000588	< 0.0005	0.0233	0.0372	0.376	0.304	Not Analyzed
MW-104	10/17/01	0.00427	0.00252	0.0429	0.0426	2.39	0.849	Not Analyzed
MW-104	01/09/02	0.00162	0.00101	0.0046	0.0185	0.193	1.6	Not Analyzed
MW-104	04/23/02	0.00685	0.00618	0.891	0.869	8.65	1.2	Not Analyzed
MW-104	07/19/02	0.0026	0.00087	0.041	0.032	1.1	0.94	Not Analyzed
MW-104	10/24/02	< 0.001	< 0.001	0.038	0.03	2.1	0.57	< 0.75
MW-104	01/28/03	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	0.30	< 0.5
MW-104	04/16/03	0.0061	0.0012	0.22	0.173	3.1	1.1	< 0.5
MW-104	07/16/03	0.0095 J	< 0.001	0.13 J	0.0533 J	1.9 J	0.49	< 0.5
MW-104	10/15/03	< 0.001	< 0.001	0.0062 J	0.011	< 0.25	0.44	< 0.5
MW-104	10/15/03	< 0.001	< 0.001	0.0038 J	0.0092	< 0.25	0.34	< 0.5
MW-104	01/15/04	0.0019	< 0.001	0.15	0.1028	2.7	1.2	< 0.5
MW-104	01/15/04	0.0012	< 0.001	0.1	0.0706	2	1.3	< 0.5
MW-104	04/21/04	0.0066	0.0025	0.35	0.0931	4.3	1.7	< 0.5
MW-104	07/28/04	0.0018	< 0.001	0.048	0.017	2.2	0.87	< 0.5
MW-104	07/28/04	0.0017	< 0.001	0.049	0.019	2.1	1.3	< 0.5
MW-104	10/19/04	< 0.001	< 0.001	0.0021	0.0016	< 0.25	0.61	< 0.5
MW-104	01/24/05	< 0.001	< 0.001	0.0012	< 0.001	< 0.25	0.74	< 0.5
MW-104	04/18/05	< 0.001	< 0.001	0.057	0.0067	1.4	1.2	< 0.5
MW-104	07/12/05	0.0014	< 0.001	0.11	0.012	1.8	0.7	< 0.5
MW-104	10/19/05	< 0.001	< 0.001	0.024	0.0049	0.29	0.62	< 0.5
MW-104	01/25/06	0.00245	0.00129	0.33	0.0273	2.07	3.73	< 0.962
MW-104	10/30/07	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	1.25	Not Analyzed	Not Analyzed
MW-104	05/20/08	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	4.00	2.10	< 0.5
MW-104	11/18/08	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	0.13	0.69	< 0.5
MW-104	04/08/09	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	1.80	1.60	< 0.1
MW-104	11/17/09	< 0.0005	< 0.001	0.0016	< 0.001	0.21	0.17	< 0.1
MW-104	04/27/10	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	3.90	2.50	0.27
MW-104	10/26/10	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	0.23	0.23	< 0.1
MW-104	05/23/11	<0.0006	0.003	0.104	0.0018	4.44	0.45	<0.097
MW-104	10/25/11	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	3.38	0.413	< 0.20

Note:

Bolded values indicate concentrations greater than the reporting detection limit.

Less than symbol denotes concentration undetected at the reporting detection limit.

Table 4-2e
Petroleum Hydrocarbons and BTEX in Groundwater
Shell Harbor Island Terminal
Seattle, Washington

Location ID	Chemical (mg/L)	Benzene	Toluene	Ethylbenzene	Total Xylenes (mixed isomers)	Gasoline Range Hydrocarbons	Diesel Range Hydrocarbons	Motor Oil Range Hydrocarbons
	Sample Date							
MW-105	04/02/93	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.1	< 0.3	< 0.75
MW-105	06/23/93	< 0.0005	< 0.0007	< 0.0005	< 0.0005	< 0.1	< 0.25	< 0.75
MW-105	09/21/93	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.1	< 0.25	< 0.75
MW-105	12/16/93	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.1	0.33	< 0.75
MW-105	04/28/99	< 0.0005	< 0.0005	< 0.0005	0.00106	< 0.05	0.586	< 0.75
MW-105	07/15/99	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.05	0.613	< 0.75
MW-105	10/19/99	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.05	0.704	< 0.75
MW-105	01/13/00	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.05	0.561	< 0.75
MW-105	04/06/00	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.05	0.382	< 0.75
MW-105	07/18/00	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.05	< 0.504	< 0.75
MW-105	10/02/00	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.05	0.37	< 0.75
MW-105	01/24/01	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.05	0.593	< 0.75
MW-105	04/24/01	< 0.0005	< 0.0005	< 0.0005	< 0.001	0.0525	1.64	Not Analyzed
MW-105	07/24/01	< 0.0005	< 0.0005	< 0.0005	< 0.001	0.0537	0.656	Not Analyzed
MW-105	10/17/01	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.05	0.458	Not Analyzed
MW-105	01/10/02	< 0.0005	0.000592	< 0.0005	0.00125	< 0.05	0.721	Not Analyzed
MW-105	04/23/02	< 0.0005	< 0.0005	0.000679	< 0.001	< 0.05	0.806	Not Analyzed
MW-105	07/19/02	0.00056	0.00096	< 0.001	< 0.001	< 0.25	1.2	< 0.75
MW-105	10/24/02	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	0.55	< 0.75
MW-105	01/28/03	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	< 0.25	< 0.5
MW-105	04/16/03	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	1.1	< 0.5
MW-105	10/15/03	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	0.45	< 0.5
MW-105	01/15/04	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	1.4	< 0.5
MW-105	04/21/04	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	0.65	< 0.5
MW-105	07/27/04	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	2.2	< 0.5
MW-105	10/19/04	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	1.8	< 0.5
MW-105	01/24/05	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	3	< 0.5
MW-105	04/18/05	< 0.001	< 0.001	< 0.001	< 0.001	< 0.05	1.3	0.78
MW-105	07/12/05	< 0.001	< 0.001	< 0.001	< 0.001	< 0.05	1.7	< 0.5
MW-105	10/18/05	< 0.001	< 0.001	< 0.001	< 0.001	< 0.05	1.7	0.66
MW-105	01/25/06	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.05	3.95	< 0.962
MW-105	11/19/08	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	Not Analyzed	Not Analyzed
MW-105	11/17/09	< 0.0005	< 0.001	< 0.001	< 0.001	< 0.1	0.17	< 0.1
MW-105	10/26/10	< 0.0005	< 0.001	< 0.001	< 0.001	< 0.1	Not Analyzed	Not Analyzed
MW-105	10/25/11	< 0.0010	< 0.0010	< 0.0010	< 0.0020	< 0.20	0.253	< 0.20

Note:

Bolded values indicate concentrations greater than the reporting detection limit.

Less than symbol denotes concentration undetected at the reporting detection limit.

Table 4-2f
Petroleum Hydrocarbons and BTEX in Groundwater
Shell Harbor Island Terminal
Seattle, Washington

Location ID	Chemical (mg/L)	Benzene	Toluene	Ethylbenzene	Total Xylenes (mixed isomers)	Gasoline Range Hydrocarbons	Diesel Range Hydrocarbons	Motor Oil Range Hydrocarbons
	Sample Date							
MW-111	04/06/93	0.29	0.0035	0.0068	0.0072	0.81	6.6	< 0.75
MW-111	06/23/93	0.41	0.0058	0.0033	0.014	0.91	2.8	< 0.75
MW-111	09/23/93	0.11	0.0039	0.0011	0.013	0.71	2.8	< 0.75
MW-111	12/17/93	0.04	0.0009	< 0.0005	0.0051	0.39	2.3	< 0.75
MW-111	11/05/97	0.049	< 0.0005	< 0.0005	0.0022	0.58	1.6	< 0.71
MW-111	04/01/98	0.0089	< 0.0005	< 0.0005	< 0.0005	0.16	1.3	< 0.71
MW-111	04/28/99	0.00136	< 0.0009	< 0.0005	0.00222	0.361	0.991	< 0.75
MW-111	04/28/99	0.00129	< 0.0001	< 0.0001	0.00357	0.334	0.975	< 0.092
MW-111	07/15/99	< 0.0008	< 0.00295	< 0.0005	< 0.00365	0.562	0.834	< 0.75
MW-111	10/19/99	0.00792	< 0.00085	< 0.0005	< 0.00328	0.548	1.55	< 0.75
MW-111	01/13/00	0.00887	< 0.0005	< 0.0005	< 0.001	0.639	1.74	< 0.75
MW-111	04/06/00	< 0.00285	< 0.0007	< 0.00115	< 0.0037	< 0.526	0.912	< 0.75
MW-111	07/18/00	< 0.00396	< 0.000565	< 0.00106	< 0.00353	< 0.557	< 2.48	< 0.855
MW-111	10/02/00	0.00321	< 0.00165	0.000521	< 0.00328	0.508	0.97	< 0.75
MW-111	01/24/01	< 0.0005	0.00378	0.00132	0.0017	0.352	1.18	< 0.75
MW-111	04/24/01	0.00121	< 0.0005	< 0.0005	< 0.001	0.168	0.502	Not Analyzed
MW-111	07/25/01	0.000549	< 0.0005	< 0.0005	0.00132	0.231	0.452	Not Analyzed
MW-111	10/17/01	0.00317	< 0.0005	< 0.0005	0.00118	0.144	0.502	Not Analyzed
MW-111	01/09/02	0.0555	0.0024	0.000603	0.00601	0.435	4.99	Not Analyzed
MW-111	04/23/02	0.00156	< 0.0005	< 0.0005	0.0012	0.196	0.781	Not Analyzed
MW-111	07/19/02	0.0076	0.00067	0.000079	< 0.001	0.26	0.68	< 0.75
MW-111	10/24/02	0.036	< 0.001	< 0.001	< 0.001	0.31	1.9	< 0.75
MW-111	01/28/03	0.088	< 0.001	< 0.001	0.0012	0.39	1.4	< 0.5
MW-111	04/14/03	0.0083	< 0.001	< 0.001	< 0.001	< 0.25	2	< 0.5
MW-111	07/18/03	0.031	0.0011	< 0.001	< 0.001	< 0.25	0.3	< 0.5
MW-111	10/15/03	0.047	< 0.001	< 0.001	0.0041	< 0.25	0.97	< 0.5
MW-111	01/15/04	0.047	< 0.001	< 0.001	< 0.001	< 0.25	0.98	< 0.5
MW-111	04/21/04	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	0.48	< 0.5
MW-111	07/27/04	0.015	< 0.001	< 0.001	0.0012	< 0.25	0.45	< 0.5
MW-111	10/19/04	0.036	0.0012	< 0.001	0.0035	0.35	0.45	< 0.5
MW-111	01/25/05	0.079	< 0.005	< 0.005	< 0.005	0.58 J	0.63	< 0.5
MW-111	04/18/05	< 0.001	< 0.001	< 0.001	< 0.001	0.096	< 0.25	< 0.5
MW-111	07/12/05	0.0094	< 0.001	< 0.001	< 0.001	0.23	0.26	< 0.5
MW-111	10/18/05	0.017	< 0.001	< 0.001	0.0013	0.26	0.27	< 0.5
MW-111	01/25/06	0.0956	0.00189	0.000796	0.0037	0.683	0.998	< 0.481
MW-111	11/19/08	0.014	< 0.005	< 0.005	< 0.005	0.230	0.370	< 0.5
MW-111	11/17/09	0.041	< 0.001	< 0.001	< 0.001	0.240	0.110	< 0.1
MW-111	10/26/10	0.0043	< 0.001	< 0.001	< 0.001	< 0.1	0.120	< 0.1
MW-111	05/23/11	0.0006	< 0.0005	< 0.0003	< 0.0007	< 0.050	Not Analyzed	Not Analyzed
MW-111	10/25/11	0.00094	< 0.0010	< 0.0010	< 0.0020	< 0.20	0.122	< 0.20

Note:

Bolded values indicate concentrations greater than the reporting detection limit.

Less than symbol denotes concentration undetected at the reporting detection limit.

Table 4-2g
Petroleum Hydrocarbons and BTEX in Groundwater
Shell Harbor Island Terminal
Seattle, Washington

Location ID	Chemical (mg/L)	Benzene	Toluene	Ethylbenzene	Total Xylenes (mixed isomers)	Gasoline Range Hydrocarbons	Diesel Range Hydrocarbons	Motor Oil Range Hydrocarbons
	Sample Date							
MW-112	04/07/93	0.0025	0.0013	< 0.0005	0.0022	< 0.1	1.1	< 0.75
MW-112	06/23/93	0.0014	0.0013	< 0.0005	0.0006	< 0.1	0.60	< 0.75
MW-112	09/23/93	0.0016	0.0005	< 0.0005	0.0008	< 0.1	0.57	< 0.75
MW-112	12/15/93	0.0017	< 0.0005	< 0.0005	0.0009	< 0.1	< 0.25	< 0.75
MW-112	11/05/97	0.00074	< 0.0005	< 0.0005	< 0.0005	0.11	0.45	< 0.71
MW-112	04/02/98	0.0031	< 0.0005	< 0.0005	< 0.0005	0.15	1.3	< 0.75
MW-112	04/28/99	0.000547	< 0.0005	< 0.0005	0.00102	0.0787	0.557	< 0.75
MW-112	07/14/99	< 0.0005	< 0.0035	< 0.0005	< 0.001	0.109	0.748	< 0.75
MW-112	10/19/99	< 0.001	< 0.0005	< 0.0005	< 0.0014	0.139	0.766	< 0.75
MW-112	01/13/00	< 0.00052	< 0.0026	< 0.0005	< 0.001	0.0842	< 0.492	< 1.48
MW-112	04/06/00	< 0.0005	< 0.00055	< 0.0005	< 0.001	< 0.0621	0.299	< 0.75
MW-112	07/21/00	< 0.0005	< 0.00061	< 0.0005	< 0.001	< 0.05	0.534	< 1.33
MW-112	10/02/00	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.05	< 0.25	< 0.75
MW-112A	04/24/02	0.0265	0.000658	< 0.0005	0.00126	0.391	0.804	Not Analyzed
MW-112A	07/19/02	0.081	0.0014	0.00061	0.0014	0.20	1.2	< 0.75
MW-112A	08/27/02	0.19	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
MW-112A	10/23/02	0.056	< 0.001	< 0.001	< 0.001	< 0.25	< 0.25	< 0.75
MW-112A	02/05/03	0.11	0.0017	< 0.001	< 0.001	0.30	0.42	< 0.5
MW-112A	04/16/03	0.027	0.0014	< 0.001	0.0013	0.26	0.39	< 0.5
MW-112A	07/16/03	0.051	< 0.001	< 0.001	< 0.001	< 0.25	0.35	< 0.5
MW-112A	10/15/03	0.0011	< 0.001	< 0.001	< 0.001	< 0.25	< 0.25	< 0.5
MW-112A	01/15/04	0.02	< 0.001	< 0.001	< 0.001	0.25	0.63	< 0.5
MW-112A	04/21/04	< 0.005	< 0.005	< 0.005	< 0.005	< 1.2	0.56	< 0.75
MW-112A	07/27/04	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	0.51	< 0.5
MW-112A	10/19/04	0.0013	< 0.001	< 0.001	< 0.001	< 0.25	0.68	< 0.5
MW-112A	01/24/05	0.003	0.0012	< 0.001	0.001	0.44	0.65	< 0.5
MW-112A	04/20/05	< 0.001	< 0.001	< 0.001	< 0.001	0.42	1.4	< 0.5
MW-112A	07/12/05	0.0029	< 0.001	< 0.001	< 0.001	0.28	0.48	< 0.5
MW-112A	10/18/05	< 0.001	< 0.001	< 0.001	< 0.001	< 0.05	< 0.25	< 0.5
MW-112A	01/26/06	0.00211	< 0.0005	< 0.0005	< 0.001	0.236	0.602	< 0.485
MW-112A	11/19/08	< 0.005	< 0.005	< 0.005	< 0.005	0.300	1.300	< 0.5
MW-112A	11/18/09	0.00075	< 0.001	< 0.001	< 0.001	0.200	0.230	< 0.1
MW-112A	10/29/10	0.03600	< 0.001	< 0.001	0.0015	0.770	0.600	< 0.1
MW-112A	05/24/11	0.00041	< 0.0005	< 0.0003	< 0.0007	0.129	Not Analyzed	Not Analyzed
MW-112A	10/25/11	0.0055	< 0.0010	< 0.0010	< 0.0020	0.292	0.200	< 0.20

Note:

Bolded values indicate concentrations greater than the reporting detection limit.

Less than symbol denotes concentration undetected at the reporting detection limit.

Table 4-2h
Petroleum Hydrocarbons and BTEX in Groundwater
Shell Harbor Island Terminal
Seattle, Washington

Location ID	Chemical (mg/L)	Benzene	Toluene	Ethylbenzene	Total Xylenes (mixed isomers)	Gasoline Range Hydrocarbons	Diesel Range Hydrocarbons	Motor Oil Range Hydrocarbons
	Sample Date							
MW-201	04/01/93	< 0.0005	< 0.0005	0.0088	0.0013	0.56	1.5	< 0.75
MW-201	06/24/93	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.1	0.67	0.75
MW-201	09/20/93	0.0087	< 0.0005	0.0055	< 0.0005	0.27	3.3	< 0.75
MW-201	12/14/93	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.1	0.77	< 0.75
MW-201	11/03/97	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.1	0.37	< 0.71
MW-201	04/03/98	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.1	0.24	< 0.71
MW-201	04/29/99	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.05	0.362	< 0.75
MW-201	07/16/99	< 0.0007	< 0.0005	< 0.0005	< 0.001	< 0.05	0.539	< 0.75
MW-201	10/20/99	< 0.00145	< 0.0005	< 0.00057	< 0.001	0.227	2.65	< 0.75
MW-201	01/12/00	< 0.0005	< 0.0005	< 0.0005	< 0.001	0.0533	2.44	< 0.75
MW-201	04/06/00	< 0.0011	< 0.00186	< 0.0009	< 0.0012	< 0.284	3.02	< 0.75
MW-201	07/18/00	< 0.00459	< 0.0005	< 0.00159	< 0.00132	< 0.32	< 4.34	< 0.966
MW-201	10/02/00	< 0.00226	< 0.00065	< 0.00093	< 0.00178	0.51	2.62	< 0.75
MW-201	01/24/01	< 0.0005	0.00116	< 0.0005	< 0.001	< 0.05	0.708	< 0.75
MW-201	04/24/01	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.05	0.64	Not Analyzed
MW-201	07/24/01	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.05	0.868	Not Analyzed
MW-201	10/18/01	0.00126	< 0.0005	0.000536	0.00103	0.161	1.76	Not Analyzed
MW-201	01/10/02	< 0.0005	0.00105	< 0.0005	0.00154	< 0.05	0.697	Not Analyzed
MW-201	04/24/02	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.05	0.647	Not Analyzed
MW-201	07/30/02	< 0.001	0.0002	< 0.001	< 0.001	0.10	2.0	< 0.75
MW-201	10/25/02	< 0.001	< 0.001	< 0.001	< 0.001	0.31	5.4	< 1.5
MW-201	01/29/03	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	< 0.25	< 0.5
MW-201	04/15/03	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	0.32	< 0.5
MW-201	07/17/03	0.0053	< 0.001	< 0.001	< 0.001	< 0.25	1.2	< 0.5
MW-201	10/16/03	0.0013	< 0.001	< 0.001	< 0.001	0.43	4.6	0.78
MW-201	01/14/04	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	< 0.25	< 0.5
MW-201	04/20/04	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	< 0.25	< 0.5
MW-201	01/26/05	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	0.33	< 0.5
MW-201	04/20/05	< 0.001	< 0.001	< 0.001	0.0021	< 0.25	< 0.25	< 0.5
MW-201	07/13/05	< 0.001	< 0.001	< 0.001	< 0.001	0.12	0.7	< 0.5
MW-201	10/20/05	< 0.001	< 0.001	< 0.001	< 0.001	0.22	4.6	2.3
MW-201	01/26/06	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.050	0.342	< 0.476
MW-201	11/20/08	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	0.41	< 0.5
MW-201	11/19/09	< 0.0005	< 0.001	< 0.001	< 0.001	< 0.1	< 0.1	< 0.1
MW-201	10/27/10	< 0.0005	< 0.001	< 0.001	< 0.001	< 0.1	0.18	< 0.1
MW-201	10/26/11	< 0.0010	< 0.0010	< 0.0010	< 0.0020	0.0899	1.46	0.181

Note:

Bolded values indicate concentrations greater than the reporting detection limit.

Less than symbol denotes concentration undetected at the reporting detection limit.

**Table 4-2i
Petroleum Hydrocarbons and BTEX in Groundwater
Shell Harbor Island Terminal
Seattle, Washington**

Location ID	Chemical (mg/L)	Benzene	Toluene	Ethylbenzene	Total Xylenes (mixed isomers)	Gasoline Range Hydrocarbons	Diesel Range Hydrocarbons	Motor Oil Range Hydrocarbons
	Sample Date							
MW-202	04/01/93	0.006	0.0022	0.045	0.0079	0.42	2.3	< 0.75
MW-202	06/24/93	0.048	0.013	0.41	0.028	3.9	2.7	< 0.75
MW-202	09/20/93	0.069	0.0076	0.2	0.012	1.8	1.5	< 0.75
MW-202	12/14/93	0.03	0.02	0.13	0.035	2.5	1.7	< 0.75
MW-202	11/03/97	0.012	0.012	0.18	0.013	2.4	1.8	< 0.71
MW-202	04/03/98	0.01	0.011	0.091	0.0053	2.1	3.7	< 0.72
MW-202	04/03/98	0.011	0.012	0.097	0.0059	2.3	5.2	0.78
MW-202	04/29/99	< 0.0245	< 0.0065	0.143	0.0204	1.85	3.68	< 0.75
MW-202	07/16/99	< 0.0155	< 0.00405	0.153	< 0.0083	1.61	2.37	< 0.75
MW-202	10/20/99	< 0.175	< 0.005	0.277	< 0.01	2.14	1.33	< 0.75
MW-202	01/12/00	< 0.0272	< 0.0052	0.107	< 0.02	1.56	4.12	< 0.75
MW-202	04/06/00	< 0.00624	< 0.0153	< 0.0548	< 0.00765	< 1.36	2.42	< 0.75
MW-202	07/18/00	< 0.0111	< 0.00557	< 0.0393	< 0.005	< 2.06	< 5.46	< 0.75
MW-202	10/02/00	0.0137	< 0.0042	0.113	< 0.0105	1.91	1.29	< 0.75
MW-202	01/24/01	< 0.00545	0.0148	< 0.017	< 0.0079	1.84	3.06	< 0.75
MW-202	04/24/01	0.0197	0.00466	0.174	0.0105	2.39	0.948	Not Analyzed
MW-202	07/24/01	0.017	0.00424	0.123	0.0109	2.45	1.66	Not Analyzed
MW-202	10/18/01	0.0186	0.00402	0.0406	0.00785	2.22	1.94	Not Analyzed
MW-202	01/10/02	0.0201	0.00782	0.0181	0.0177	5.06	6.38	Not Analyzed
MW-202	02/05/02	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	0.958	Not Analyzed	Not Analyzed
MW-202	04/24/02	0.0186	0.00488	0.067	0.0327	5.71	5.8	Not Analyzed
MW-202	05/10/02	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	5.46	Not Analyzed	Not Analyzed
MW-202	07/23/02	0.068	0.011	0.15	0.0194	2.5	2.9	< 0.75
MW-202	10/25/02	0.011	< 0.001	0.063	0.0035	< 1.2	4.5	< 0.75
MW-202	01/29/03	0.023	< 0.005	0.043	< 0.005	2.1	< 2.5	< 5
MW-202	04/15/03	0.095	< 0.005	0.075	0.0349	1.6	16	< 5
MW-202	06/04/03	0.1	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	8.8	< 2.5
MW-202	07/17/03	0.04	< 0.005	0.11	0.022	1.7 J	11	< 3
MW-202	10/16/03	0.024	< 0.005	0.072	< 0.005	2	5.8	< 5
MW-202	01/14/04	< 0.001	< 0.001	< 0.001	< 0.001	2.5	15	< 10
MW-202	04/20/04	0.014	0.0062	0.074	0.021	4.4	28	< 10
MW-202	01/26/05	< 0.005	< 0.005	< 0.005	< 0.005	7.7	5.2	< 5
MW-202	04/20/05	0.016	0.0022	0.036	0.0237	3.7	6.2	< 5
MW-202	07/13/05	0.016	0.0033	0.067	0.0191	3.5	6.2	< 1
MW-202	10/20/05	0.019	0.0021	0.058	0.0056	3.3	5.9	< 2.5
MW-202	01/26/06	0.0224	0.00598	0.041	0.0191	5.79	11.2	< 4.76
MW-202	04/25/06	0.007	0.0038	0.062	0.0124	6.8	8.7	< 4.85
MW-202	10/12/06	0.009	0.0034	0.083	0.0062	5.7	11.5	0.834
MW-202	04/26/07	0.008	0.0048	0.063	< 0.015	4.8	8.2	1.05
MW-202	10/30/07	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	4.55	10.9	< 1
MW-202	05/20/08	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	2.3	1.8	< 2.5
MW-202	11/20/08	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	5	2.2	< 0.5
MW-202	04/07/09	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	4.8	14	< 0.1
MW-202	11/19/09	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	6.6	20	< 0.5
MW-202	04/27/10	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	3.3	6.4	0.12
MW-202	10/27/10	0.0081	0.0031	0.066	0.0022	6	5.4	< 0.1
MW-202	05/23/11	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	3.5	1.84	< 0.097
MW-202	10/26/11	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	4.3	1.02	< 0.21

Note:

Bolded values indicate concentrations greater than the reporting detection limit.

Less than symbol denotes concentration undetected at the reporting detection limit.

Table 4-2j
Petroleum Hydrocarbons and BTEX in Groundwater
Shell Harbor Island Terminal
Seattle, Washington

Location ID	Chemical (mg/L)	Benzene	Toluene	Ethylbenzene	Total Xylenes (mixed isomers)	Gasoline Range Hydrocarbons	Diesel Range Hydrocarbons	Motor Oil Range Hydrocarbons
	Sample Date							
MW-203	04/01/93	0.0094	0.0017	0.025	0.011	1.3	1.5	< 0.75
MW-203	06/22/93	0.009	0.0024	0.036	0.0098	4.9	1.5	0.79
MW-203	09/20/93	0.0064	0.0014	0.021	0.0071	3.8	1.6	< 0.75
MW-203	12/14/93	0.0054	< 0.001	< 0.001	0.0021	0.34	0.66	< 0.75
MW-203	11/03/97	0.014	< 0.0005	< 0.0005	< 0.0005	2.8	1.00	< 0.71
MW-203	04/03/98	0.0077	< 0.0005	0.27	0.0025	1.3	0.64	< 0.73
MW-203	04/29/99	0.00407	0.00106	0.00309	0.00344	1.16	1.07	< 0.75
MW-203	07/16/99	0.00825	< 0.0011	< 0.0109	< 0.00763	3.41	1.91	< 0.75
MW-203	10/20/99	< 0.008	< 0.00074	< 0.00352	< 0.00315	2.69	0.806	< 0.75
MW-203	01/12/00	< 0.0005	< 0.0005	< 0.0005	0.00197	0.596	0.321	< 0.75
MW-203	04/06/00	< 0.00324	< 0.00329	< 0.00145	< 0.0036	< 0.806	0.505	< 0.75
MW-203	07/18/00	< 0.0142	< 0.00116	< 0.00405	< 0.00348	< 3.3	< 1.26	< 0.75
MW-203	10/02/00	0.00796	< 0.00156	< 0.00318	< 0.00292	2.39	0.64	< 0.75
MW-203	01/24/01	0.022	0.00382	< 0.00335	< 0.0084	1.47	0.548	< 0.75
MW-203	04/24/01	0.0409	0.00156	0.0157	0.00411	2.91	< 0.25	Not Analyzed
MW-203	07/24/01	0.0357	< 0.005	0.0496	0.0128	7.33	1.46	Not Analyzed
MW-203	09/18/01	0.041	< 0.01	0.0622	0.0269	10.9	Not Analyzed	Not Analyzed
MW-203	10/18/01	0.0377	< 0.0025	0.0397	0.0119	10.2	1.54	Not Analyzed
MW-203	01/10/02	0.000504	0.000804	0.000939	0.00201	0.0933	0.489	Not Analyzed
MW-203	04/24/02	0.00382	< 0.0005	0.000849	< 0.001	0.371	0.558	Not Analyzed
MW-203	07/30/02	0.006	< 0.001	< 0.001	0.0082	1.0	0.40	< 0.75
MW-203	10/25/02	0.0063	< 0.001	< 0.001	< 0.001	1.2	< 0.25	< 0.75
MW-203	01/29/03	0.0048	< 0.001	< 0.001	< 0.001	0.97	< 0.25	< 0.5
MW-203	04/15/03	0.0034	< 0.001	0.0019	< 0.001	0.42	< 0.25	< 0.5
MW-203	07/18/03	0.0069	< 0.001	0.002	< 0.001	0.47	< 0.25	< 0.5
MW-203	01/13/04	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	< 0.25	< 0.5
MW-203	04/19/04	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	0.26	< 0.5
MW-203	07/27/04	0.013	< 0.001	0.0069	< 0.001	2.6	0.45	< 0.5
MW-203	10/19/04	0.013	< 0.001	0.015	0.0025	1.6	< 0.25	< 0.5
MW-203	10/19/04	0.017	< 0.001	0.012	0.0018	1.4	< 0.25	< 0.5
MW-203	01/25/05	0.0063	< 0.001	0.011	0.0013	1.6	0.52	0.68
MW-203	04/19/05	0.0068	< 0.001	0.0018	< 0.001	0.63	< 0.25	0.55
MW-203	07/13/05	0.01	< 0.001	0.0077	< 0.001	0.89	< 0.25	< 0.5
MW-203	10/20/05	0.023	0.002	0.021	0.0026	4.2	2.1	1.1
MW-203	01/23/06	0.00186	< 0.0005	0.00182	0.00125	0.76	0.565	< 0.943
MW-203	04/26/06	0.00694	0.00076	0.00079	< 0.003	1.38	0.660	0.625
MW-203	10/13/06	0.02300	0.00553	0.00448	0.00652	6.22	7.390	1.34
MW-203	04/27/07	0.00502	< 0.0005	0.00053	< 0.003	1.24	0.507	0.515
MW-203	05/20/08	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	0.60	0.320	< 0.5
MW-203	11/18/2008	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	0.17	< 0.25	< 0.5
MW-203	04/08/09	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	< 0.1	0.12	0.11
MW-203	11/17/09	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	< 0.1	< 0.1	< 0.1
MW-203	04/26/10	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	0.16	0.18	< 0.1
MW-203	10/25/10	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	0.92	0.36	< 0.1
MW-203	05/23/11	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	0.333	0.085	0.314
MW-203	10/26/11	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	1.38	0.262	0.118
MW-204	07/27/04	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	1.6	< 0.5
MW-204	01/26/05	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	6.2	< 1
MW-204	04/18/05	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	1.5	0.79
MW-204	07/13/05	< 0.001	< 0.001	< 0.001	< 0.001	0.076	1.1	0.59
MW-204	10/19/05	< 0.001	< 0.001	< 0.001	< 0.001	0.082	0.45	< 0.5
MW-204	01/26/06	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.05	5.53	< 0.952
MW-204	04/25/06	< 0.0005	< 0.0005	< 0.0005	< 0.003	0.076	2.5	1.11
MW-204	10/12/06	< 0.0005	< 0.0005	< 0.0005	< 0.003	0.0634	0.90	0.519
MW-204	04/26/07	< 0.0005	< 0.0005	< 0.0005	< 0.003	0.086	1.81	0.749
MW-204	10/30/07	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	< 0.05	Not Analyzed	Not Analyzed
MW-204	11/20/08	< 0.005	< 0.005	< 0.005	< 0.005	0.13	1	< 0.5
MW-204	11/19/09	< 0.0005	< 0.001	< 0.001	< 0.001	< 0.1	3.5	0.16
MW-204	10/27/10	< 0.0005	< 0.001	< 0.001	< 0.001	< 0.1	0.29	< 0.1
MW-204	10/27/11	< 0.0010	< 0.0010	< 0.0010	< 0.0020	0.0660	0.599	< 0.20

Note:

Bolded values indicate concentrations greater than the reporting detection limit.

Less than symbol denotes concentration undetected at the reporting detection limit.

Table 4-2k
Petroleum Hydrocarbons and BTEX in Groundwater
Shell Harbor Island Terminal
Seattle, Washington

Location ID	Chemical (mg/L)	Benzene	Toluene	Ethylbenzene	Total Xylenes (mixed isomers)	Gasoline Range Hydrocarbons	Diesel Range Hydrocarbons	Motor Oil Range Hydrocarbons
	Sample Date							
MW-206	04/01/93	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.1	< 0.25	< 0.75
MW-206	06/22/93	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.1	< 0.25	< 0.75
MW-206	09/20/93	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.1	< 0.25	< 0.75
MW-206	12/14/93	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.1	< 0.25	< 0.75
MW-206	11/03/97	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.1	< 0.24	< 0.71
MW-206	04/03/98	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.1	< 0.24	< 0.71
MW-206	04/28/99	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.05	< 0.25	< 0.75
MW-206	07/15/99	< 0.0005	< 0.0005	< 0.0005	0.00109	< 0.05	< 0.25	< 0.75
MW-206	10/19/99	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.05	0.369	< 0.75
MW-206	01/12/00	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.05	< 0.25	< 0.75
MW-206	04/06/00	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.05	< 0.25	< 0.75
MW-206	07/18/00	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.05	< 0.25	< 0.75
MW-206	10/02/00	< 0.0005	0.00062	< 0.0005	< 0.001	< 0.05	< 0.25	< 0.75
MW-206	01/24/01	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.05	< 0.25	< 0.75
MW-206	04/24/01	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.05	3.58	Not Analyzed
MW-206A	04/24/02	0.00119	< 0.0005	< 0.0005	< 0.001	< 0.05	5.98	Not Analyzed
MW-206A	07/22/02	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	1.1	< 0.75
MW-206A	10/25/02	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	0.73	< 0.75
MW-206A	02/05/03	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	< 0.25	< 0.5
MW-206A	04/17/03	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	< 0.25	< 0.5
MW-206A	07/18/03	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	0.6	< 0.5
MW-206A	01/22/04	< 0.001	< 0.001	< 0.001	0.004	< 0.25	< 0.25	< 0.5
MW-206A	04/19/04	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	< 0.25	< 0.5
MW-206A	07/27/04	< 0.005	< 0.005	< 0.005	< 0.005	< 1.2	1.8	0.78
MW-206A	10/19/04	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	2	1.1
MW-206A	01/25/05	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	2.1	2.2
MW-206A	04/18/05	< 0.001	< 0.001	< 0.001	< 0.001	< 0.05	1.3	1.5
MW-206A	07/13/05	< 0.001	< 0.001	< 0.001	< 0.001	< 0.05	1.2	1.9
MW-206A	10/20/05	< 0.001	< 0.001	< 0.001	< 0.001	< 0.05	2.1	7.9
MW-206A	01/26/06	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.05	4.41	2.54
MW-206A	11/20/08	< 0.005	< 0.005	< 0.005	< 0.005	< 0.25	2.1	1.7
MW-206A	11/19/09	< 0.0005	< 0.001	< 0.001	< 0.001	< 0.1	0.1	< 0.1
MW-206A	10/25/10	< 0.0005	< 0.001	< 0.001	< 0.001	< 0.1	< 0.1	0.18
MW-206A	10/26/11	< 0.0010	< 0.0010	< 0.0010	< 0.0020	< 0.20	0.141	< 0.20

Note:

Bolded values indicate concentrations greater than the reporting detection limit.

Less than symbol denotes concentration undetected at the reporting detection limit.

Table 4-2I
Petroleum Hydrocarbons and BTEX in Groundwater
Shell Harbor Island Terminal
Seattle, Washington

Location ID	Chemical (mg/L)	Benzene	Toluene	Ethylbenzene	Total Xylenes (mixed isomers)	Gasoline Range Hydrocarbons	Diesel Range Hydrocarbons	Motor Oil Range Hydrocarbons
	Sample Date							
MW-213	11/04/97	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.1	< 0.24	< 0.71
MW-213	04/03/98	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.1	< 0.24	< 0.71
MW-213	04/28/99	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.05	< 0.25	< 0.75
MW-213	07/15/99	< 0.0005	< 0.0005	< 0.0005	0.00122	< 0.05	< 0.25	< 0.75
MW-213	10/19/99	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.05	0.522	< 1.45
MW-213	01/11/00	< 0.0005	0.00189	< 0.0005	0.00147	< 0.05	< 0.522	< 1.57
MW-213	04/06/00	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.05	< 0.25	< 0.75
MW-213	07/18/00	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.05	< 0.358	< 0.75
MW-213	10/02/00	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.05	< 0.44	< 1.32
MW-213	01/24/01	< 0.0005	0.000521	< 0.0005	< 0.001	< 0.05	< 0.25	< 0.75
MW-213	04/24/01	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.05	0.25	Not Analyzed
MW-213	07/24/01	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.05	< 0.25	Not Analyzed
MW-213	10/18/01	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.05	< 0.25	Not Analyzed
MW-213	01/11/02	< 0.0005	0.00212	0.000536	0.00306	< 0.05	0.589	Not Analyzed
MW-213	04/24/02	0.00254	< 0.0005	< 0.0005	< 0.001	< 0.05	0.653	Not Analyzed
MW-213	07/22/02	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	0.29	< 0.75
MW-213	10/28/02	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	< 0.25	< 0.75
MW-213	01/30/03	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	< 0.25	< 0.5
MW-213	04/17/03	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	< 0.25	< 0.5
MW-213	07/17/03	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	< 0.25	< 0.5
MW-213	10/16/03	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	< 0.25	< 0.5
MW-213	01/14/04	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	< 0.25	< 0.5
MW-213	04/20/04	< 0.005	< 0.005	< 0.005	< 0.005	< 0.25	< 0.25	< 0.5
MW-213	07/28/04	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	< 0.25	< 0.5
MW-213	10/19/04	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	< 0.25	< 0.5
MW-213	01/25/05	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	< 0.25	< 0.5
MW-213	04/19/05	< 0.001	< 0.001	< 0.001	< 0.001	< 0.05	< 0.25	< 0.5
MW-213	07/12/05	< 0.001	< 0.001	< 0.001	< 0.001	< 0.05	< 0.25	< 0.5
MW-213	10/20/05	< 0.001	< 0.001	< 0.001	< 0.001	< 0.05	0.34	< 0.5
MW-213	01/26/06	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.05	0.653	< 0.495
MW-213	10/30/07	< 0.001	< 0.001	< 0.001	< 0.003	Not Analyzed	Not Analyzed	Not Analyzed
MW-213	11/19/08	< 0.005	< 0.005	< 0.005	< 0.005	< 0.25	< 0.25	< 0.5
MW-213	04/07/09	< 0.0005	< 0.001	< 0.001	< 0.001	< 0.1	< 0.1	< 0.1
MW-213	11/18/09	< 0.0005	< 0.001	< 0.001	< 0.001	< 0.1	< 0.1	< 0.1
MW-213	04/26/10	< 0.0005	< 0.001	< 0.001	< 0.001	< 0.1	< 0.1	< 0.1
MW-213	10/28/10	< 0.0005	< 0.001	< 0.001	< 0.001	< 0.1	< 0.1	< 0.1
MW-213	05/24/11	< 0.0003	< 0.0005	< 0.0003	< 0.0007	<0.050	<0.049	<0.098
MW-213	10/25/11	< 0.0010	< 0.0010	< 0.0010	< 0.0020	< 0.20	< 0.11	< 0.21

Note:

Bolded values indicate concentrations greater than the reporting detection limit.

Less than symbol denotes concentration undetected at the reporting detection limit.

Table 4-2m
Petroleum Hydrocarbons and BTEX in Groundwater
Shell Harbor Island Terminal
Seattle, Washington

Location ID	Chemical (mg/L) Sample Date	Benzene	Toluene	Ethylbenzene	Total Xylenes (mixed isomers)	Gasoline Range Hydrocarbons	Diesel Range Hydrocarbons	Motor Oil Range Hydrocarbons
MW-214	11/04/97	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.1	< 0.24	< 0.71
MW-214	04/03/98	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.1	0.30	< 0.75
MW-214	04/28/99	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.05	< 0.25	< 0.75
MW-214	07/15/99	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.05	< 0.25	< 0.5
MW-214	10/19/99	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.05	< 0.497	< 1.49
MW-214	01/11/00	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.05	< 0.25	< 0.75
MW-214	04/06/00	< 0.0005	< 0.0005	< 0.000555	< 0.00174	< 0.05	< 0.25	< 0.75
MW-214	07/18/00	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.05	< 0.482	< 0.75
MW-214	10/02/00	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.05	< 0.25	< 0.75
MW-214	01/24/01	< 0.0005	0.000553	< 0.0005	< 0.001	< 0.05	< 0.25	< 0.75
MW-214	04/24/01	< 0.0005	< 0.0005	< 0.0005	< 0.001	0.0661	< 0.25	Not Analyzed
MW-214	07/24/01	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.05	< 0.25	Not Analyzed
MW-214	10/18/01	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.05	< 0.25	Not Analyzed
MW-214	01/11/02	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.05	< 0.25	Not Analyzed
MW-214	04/24/02	0.0018	< 0.0005	< 0.0005	< 0.001	< 0.05	0.418	Not Analyzed
MW-214	07/22/02	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	0.091	< 0.75
MW-214	10/28/02	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	< 0.25	< 0.75
MW-214	01/30/03	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	< 0.25	< 0.5
MW-214	04/17/03	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	< 0.25	< 0.5
MW-214	07/17/03	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	< 0.25	< 0.5
MW-214	10/16/03	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	< 0.25	< 0.5
MW-214	01/14/04	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	< 0.25	< 0.5
MW-214	04/20/04	< 0.005	< 0.005	< 0.005	< 0.005	< 0.25	< 0.25	< 0.5
MW-214	07/28/04	< 0.005	< 0.005	< 0.005	< 0.005	< 1.2	< 0.25	< 0.5
MW-214	10/19/04	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	< 0.25	< 0.5
MW-214	01/25/05	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	0.36	< 0.5
MW-214	04/19/05	< 0.001	< 0.001	< 0.001	< 0.001	< 0.05	0.3	< 0.5
MW-214	07/12/05	< 0.001	< 0.001	< 0.001	< 0.001	< 0.05	0.29	< 0.5
MW-214	10/20/05	< 0.001	< 0.001	< 0.001	< 0.001	< 0.05	0.33	< 0.5
MW-214	01/26/06	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.05	0.91	< 0.476
MW-214	10/30/07	< 0.001	< 0.001	< 0.001	< 0.003	Not Analyzed	Not Analyzed	Not Analyzed
MW-214	05/05/08	< 0.005	< 0.005	< 0.005	< 0.005	< 0.25	0.91	< 0.5
MW-214	07/10/08	-	-	-	-	-	< 0.5	< 1
MW-214	11/19/08	< 0.005	< 0.005	< 0.005	< 0.005	< 0.25	0.80	< 0.5
MW-214	04/07/09	< 0.0005	< 0.001	< 0.001	< 0.001	< 0.1	0.17	< 0.1
MW-214	11/18/09	< 0.0005	< 0.001	< 0.001	< 0.001	< 0.1	0.11	< 0.1
MW-214	04/26/10	< 0.0005	< 0.001	< 0.001	< 0.001	< 0.1	0.19	< 0.1
MW-214	10/28/10	< 0.0005	< 0.001	< 0.001	< 0.001	< 0.1	< 0.1	< 0.1
MW-214	05/24/11	<0.0003	<0.0005	<0.0003	<0.0007	<0.050	0.127	<0.097
MW-214D	05/24/11	<0.0003	<0.0005	<0.0003	<0.0007	<0.050	0.128	<0.097
MW-214	10/25/11	< 0.0010	< 0.0010	< 0.0010	< 0.0020	< 0.20	0.126	< 0.21
MW-214D	10/25/11	< 0.0010	< 0.0010	< 0.0010	< 0.0020	< 0.20	0.151	< 0.20

Note:

Bolded values indicate concentrations greater than the reporting detection limit.

Less than symbol denotes concentration undetected at the reporting detection limit.

Table 4-2n
Petroleum Hydrocarbons and BTEX in Groundwater
Shell Harbor Island Terminal
Seattle, Washington

	Chemical (mg/L)							
Location ID	Sample Date	Benzene	Toluene	Ethylbenzene	Total Xylenes (mixed isomers)	Gasoline Range Hydrocarbons	Diesel Range Hydrocarbons	Motor Oil Range Hydrocarbons
SH-04	06/24/93	8.1	8.8	1.4	7	52	7.1	0.99
SH-04	09/23/93	8.4	6.3	2.2	7.1	47	1.5	< 0.75
SH-04	11/04/97	5.9	4.4	1.6	7.6	46	1.8	< 0.71
SH-04	04/02/98	5.6	4.2	1.3	4.9	37	3.9	< 0.73
SH-04	04/28/99	5.27	5.67	1.93	10.1	49.5	2.18	< 0.750
SH-04	07/14/99	4.23	2.27	2.03	8.03	37.9	1.51	< 0.750
SH-04	10/19/99	4.01	2.8	1.87	6.63	39.5	0.928	< 0.750
SH-04	01/13/00	3.25	3.04	1.15	4.66	28.9	1.10	< 0.75
SH-04	04/06/00	< 3.51	< 5.4	< 1.46	< 7.78	< 46.8	1.67	< 1.380
SH-04	07/18/00	< 3.25	< 3.37	< 1.63	< 6.83	< 40.8	< 1.87	< 0.750
SH-04	10/02/00	2.9	1.46	1.05	3.86	26.5	0.66	< 0.75
SH-04	01/24/01	3.0	1.83	1.04	5.33	28.4	7.89	< 0.750
SH-04	04/24/01	3.08	1.47	1.1	3.59	24.1	4.5	Not Analyzed
SH-04	07/25/01	2.58	0.278	0.306	1.02	9.7	2.37	Not Analyzed
SH-04	10/17/01	2.58	0.526	0.23	1.6	9.71	1.44	Not Analyzed
SH-04	01/09/02	2.15	1.19	0.33	3.48	19	10.2	Not Analyzed
SH-04	04/23/02	2.4	3.7	1.84	13.7	51.6	7.41	Not Analyzed
SH-04	05/10/02	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	43.6	Not Analyzed	Not Analyzed
SH-04	07/19/02	1.6	0.93	0.84	5.3	42.0	2.8	< 3.8
SH-04	10/24/02	1.8	0.14	0.11	0.92	10.0	1.1	< 0.75
SH-04	01/29/03	1.1	0.22	0.19	2.25	18.0	1.3	< 0.5
SH-04	07/16/03	1.5	0.61	0.64	4.64	30 J	3.3	< 3
SH-04	10/15/03	1.3	0.066	0.11	1.058	11.0	2.8	< 0.5
SH-04	01/13/04	1.2	0.21	0.14	2.11	15.0	4.7	< 2.5
SH-04	04/20/04	1.5	0.49	0.64	5.79	26.0	6.2	< 10
SH-04	07/27/04	1.3	0.13	0.55	1.78	15.0	5.4	0.53
SH-04	04/20/05	0.98	0.061	0.36	1.07	11.0	4.2	< 1.5
SH-04	04/25/06	1.3	0.09	0.65	2.31	20.0	8.2	2.52
SH-04	10/30/07	0.88	0.032	0.32	0.08	<5.0	Not Analyzed	Not Analyzed
SH-04	05/20/08	1.1	0.05	0.52	0.66	8.9	4.8	0.92
SH-04	11/20/08	0.79	0.032	0.23	0.04	6.6	2.7	< 0.5
SH-04	04/08/09	0.9	0.04	0.25	0.19	9.2	4.7	< 0.1
SH-04	11/16/09	0.48	0.023	0.07	0.02	4.9	3.7	< 0.1
SH-04	04/27/10	0.7	0.03	0.27	0.13	7.3	4.7	0.39
SH-04	10/25/10	0.58	0.019	0.18	0.01	4.0	2.8	< 0.1
SH-04	05/23/11	0.66	0.015	0.15	0.03	5.4	1.8	0.13
SH-04	10/27/11	0.393	0.0200	0.0926	0.0279	5.35	1.22	< 0.19

Note:

Bolded values indicate concentrations greater than the reporting detection limit.

Less than symbol denotes concentration undetected at the reporting detection limit.

Table 4-2o
Petroleum Hydrocarbons and BTEX in Groundwater
Shell Harbor Island Terminal
Seattle, Washington

Location ID	Chemical (mg/L)	Benzene	Toluene	Ethylbenzene	Total Xylenes (mixed isomers)	Gasoline Range Hydrocarbons	Diesel Range Hydrocarbons	Motor Oil Range Hydrocarbons
	Sample Date							
TES-MW-1	04/06/93	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.1	< 0.25	< 0.75
TES-MW-1	06/18/93	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.1	< 0.25	< 0.75
TES-MW-1	09/22/93	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.1	< 0.25	< 0.75
TES-MW-1	12/13/93	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.1	< 0.25	< 0.75
TES-MW-1	12/13/93	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.1	< 0.25	< 0.75
TES-MW-1	11/05/97	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.1	< 0.24	< 0.71
TES-MW-1	04/02/98	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.1	< 0.24	< 0.72
TES-MW-1	04/29/99	< 0.0005	0.000639	< 0.0005	< 0.001	< 0.05	< 0.25	< 0.75
TES-MW-1	07/16/99	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.05	< 0.25	< 0.75
TES-MW-1	10/29/99	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.05	< 0.25	< 0.75
TES-MW-1	01/12/00	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.05	< 0.525	< 1.58
TES-MW-1	04/06/00	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.05	< 0.25	< 0.75
TES-MW-1	10/02/00	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.05	< 0.25	< 0.75
TES-MW-1	01/24/01	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.05	< 0.25	< 0.75
TES-MW-1	04/24/01	0.142	< 0.0025	< 0.0025	< 0.005	< 0.25	< 0.25	Not Analyzed
TES-MW-1	05/22/01	0.45	< 0.005	< 0.005	< 0.01	< 0.5	Not Analyzed	Not Analyzed
TES-MW-1	07/24/01	0.00849	< 0.0005	< 0.0005	< 0.001	< 0.05	< 0.25	Not Analyzed
TES-MW-1	10/18/01	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.05	< 0.25	Not Analyzed
TES-MW-1	01/10/02	< 0.0005	0.00318	0.000703	0.00386	< 0.05	< 0.25	Not Analyzed
TES-MW-1	04/23/02	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.05	< 0.25	Not Analyzed
TES-MW-1	07/22/02	0.0034	< 0.001	0.0022	0.0041	0.033	0.047	< 0.75
TES-MW-1	10/28/02	0.0027	< 0.001	< 0.001	0.0071	< 0.25	< 0.25	< 0.75
TES-MW-1	01/30/03	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	< 0.25	< 0.5
TES-MW-1	04/15/03	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	< 0.25	< 0.5
TES-MW-1	07/17/03	0.012	0.035	0.032	0.157	0.79	< 0.25	< 0.5
TES-MW-1	10/16/03	0.0017	< 0.001	0.023	0.111	0.53	< 0.25	< 0.5
TES-MW-1	01/14/04	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	< 0.25	< 0.5
TES-MW-1	04/20/04	0.0067	< 0.001	0.011	0.043	< 0.25	< 0.25	< 0.5
TES-MW-1	04/20/04	0.0075	< 0.001	0.013	0.049	< 0.25	< 0.25	< 0.5
TES-MW-1	07/28/04	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	< 0.25	< 0.5
TES-MW-1	10/18/04	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	< 0.25	< 0.5
TES-MW-1	01/25/05	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	< 0.25	< 0.5
TES-MW-1	01/25/05	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	< 0.25	< 0.5
TES-MW-1	04/19/05	< 0.001	< 0.001	< 0.001	< 0.001	< 0.05	< 0.25	< 0.5
TES-MW-1	07/13/05	0.001	< 0.001	0.006	0.0189	0.1	< 0.25	< 0.5
TES-MW-1	10/20/05	0.0039	< 0.001	0.013	0.0437	0.23	< 0.25	< 0.5
TES-MW-1	01/27/06	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.05	< 0.240	< 0.481
TES-MW-1	11/18/08	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	< 0.25	< 0.5
TES-MW-1	11/18/09	< 0.0005	< 0.001	< 0.001	< 0.001	< 0.1	< 0.1	< 0.1
TES-MW-1	10/26/10	< 0.0005	< 0.001	< 0.001	< 0.001	< 0.1	< 0.1	< 0.1
TES-MW-1	05/24/11	< 0.0003	< 0.0005	< 0.0003	< 0.0007	< 0.050	Not Analyzed	Not Analyzed
TES-MW-1	10/27/11	< 0.0010	< 0.0010	< 0.0010	< 0.0020	< 0.20	< 0.10	< 0.20

Note:

Bolded values indicate concentrations greater than the reporting detection limit.

Less than symbol denotes concentration undetected at the reporting detection limit.

Table 4-2p
Petroleum Hydrocarbons and BTEX in Groundwater
Shell Harbor Island Terminal
Seattle, Washington

Location ID	Chemical (mg/L)	Benzene	Toluene	Ethylbenzene	Total Xylenes (mixed isomers)	Gasoline Range Hydrocarbons	Diesel Range Hydrocarbons	Motor Oil Range Hydrocarbons
	Sample Date							
TX-03	04/05/93	0.12	0.024	0.0046	0.034	0.81	< 0.25	< 0.75
TX-03	06/22/93	0.16	0.052	0.0072	0.05	1.1	< 0.25	< 0.75
TX-03	09/23/93	0.087	0.027	0.0018	0.063	1.2	0.41	< 0.75
TX-03	12/16/93	0.36	0.062	0.028	0.14	1.3	0.34	< 0.75
TX-03	11/07/97	0.019	< 0.0005	< 0.0005	0.0016	0.27	< 0.24	< 0.71
TX-03	04/02/98	0.085	0.0046	0.021	0.03	0.47	0.33	< 0.73
TX-03	04/29/99	0.146	0.00769	0.033	0.0879	0.88	0.337	< 0.75
TX-03	07/16/99	0.0214	0.00292	< 0.0025	0.00784	0.347	< 0.25	< 0.75
TX-03	10/20/99	0.0726	0.00315	0.00266	0.0117	0.494	< 0.25	< 0.75
TX-03	01/12/00	0.153	0.00388	0.00319	0.0117	0.595	< 0.25	< 0.75
TX-03	04/06/00	< 0.0449	< 0.0041	< 0.00449	< 0.00984	< 0.448	< 0.25	< 0.75
TX-03	07/18/00	< 0.103	< 0.00541	< 0.00644	< 0.0103	< 0.509	< 0.338	< 0.75
TX-03	10/02/00	0.0861	0.00293	0.00144	0.00514	0.116	0.33	< 0.75
TX-03A	04/23/02	4.87	0.0814	0.281	0.469	13.8	1.83	Not Analyzed
TX-03A	05/10/02	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	12.6	Not Analyzed	Not Analyzed
TX-03A	07/19/02	3.7	0.072	0.20	0.25	5.3	1.1	< 0.75
TX-03A	10/24/02	4.9	0.042	0.14	0.18	3.6	0.88	< 0.75
TX-03A	12/04/02	1.8	Not Analyzed	Not Analyzed	Not Analyzed	2.0	Not Analyzed	Not Analyzed
TX-03A	02/05/03	1.6	< 0.005	0.042	0.083	2.9	< 0.25	< 0.5
TX-03A	04/15/03	4.2	0.052	0.095	0.11	< 6.2	0.63	< 0.5
TX-03A	04/15/03	4.1	0.05	0.092	0.11	< 6.2	0.64	< 0.75
TX-03A	07/17/03	3.4	0.054	0.12	0.1365	2.6 J	0.4	< 0.5
TX-03A	07/17/03	3.8	0.055	0.12	0.13	< 6.2 UJ	0.34	< 0.5
TX-03A	10/15/03	3	0.025	0.042	0.083	2.8	0.65	< 0.5
TX-03A	01/13/04	2.9	0.018	0.038	0.091	2.7	0.86	< 0.5
TX-03A	04/19/04	4.4	0.047	0.12	0.11	12	1.3	< 0.5
TX-03A	07/27/04	1.7	0.011	0.016	0.037	5.2	0.81	< 0.5
TX-03A	10/18/04	3.2	0.024	0.062	0.093	7.5	1.2	< 0.5
TX-03A	01/24/05	2.5	0.02	< 0.01	0.065	8.2	0.54	< 0.5
TX-03A	04/19/05	2.5	0.021	0.026	0.049	6.1	0.47	< 0.5
TX-03A	07/12/05	3.1	0.024	0.044	0.054	10	0.32	< 0.5
TX-03A	10/31/07	2.2	0.023	0.060	0.050	<5.0	Not Analyzed	Not Analyzed
TX-03A	05/20/08	0.9	0.007	0.016	0.010	3.0	Not Analyzed	Not Analyzed
TX-03A	11/20/08	2.1	0.019	0.038	0.018	4.5	Not Analyzed	Not Analyzed
TX-03A	04/08/09	1.2	< 0.025	0.028	< 0.025	3.5	Not Analyzed	Not Analyzed
TX-03A	11/17/09	1.0	0.008	0.016	0.011	2.4	Not Analyzed	Not Analyzed
TX-03A	04/27/10	1.7	0.010	0.009	0.010	4.6	Not Analyzed	Not Analyzed
TX-03A	10/25/10	1.7	0.011	0.067	0.013	3.3	Not Analyzed	Not Analyzed
TX-03A	05/23/11	1.78	<0.025	0.044	<0.035	7.5	Not Analyzed	Not Analyzed
TX-03A	10/27/11	3.44	0.0712	0.147	0.111	8.51	Not Analyzed	Not Analyzed

Note:

Bolded values indicate concentrations greater than the reporting detection limit.

Less than symbol denotes concentration undetected at the reporting detection limit.

Table 4-2q
Petroleum Hydrocarbons and BTEX in Groundwater
Shell Harbor Island Terminal
Seattle, Washington

Location ID	Chemical (mg/L)	Benzene	Toluene	Ethylbenzene	Total Xylenes (mixed isomers)	Gasoline Range Hydrocarbons	Diesel Range Hydrocarbons	Motor Oil Range Hydrocarbons
	Sample Date							
TX-04	04/05/93	0.025	0.0094	0.0024	0.027	1.3	3.2	< 0.75
TX-04	06/23/93	0.0089	0.0047	0.0012	0.013	1.2	2.0	< 0.75
TX-04	09/23/93	0.029	0.016	0.0037	0.057	1.5	2.3	< 0.75
TX-04	12/14/93	0.038	0.021	0.0051	0.085	1.9	2.1	< 0.75
TX-04	11/04/97	0.028	0.014	0.00051	0.008	1.8	1.5	< 0.71
TX-04	04/02/98	0.0096	0.12	0.0029	0.014	2.3	1.9	< 0.76
TX-04	04/28/99	0.0143	0.0379	0.142	0.191	2.67	1.39	< 0.75
TX-04	07/14/99	0.00669	0.013	0.0413	0.106	2.29	1.90	< 0.75
TX-04	10/19/99	< 0.0022	< 0.0019	< 0.0005	0.0104	1.21	1.41	< 0.75
TX-04	01/13/00	0.0104	0.0112	0.00577	0.0665	1.95	0.746	< 0.75
TX-04	04/06/00	< 0.0145	< 0.0178	< 0.0265	< 0.213	< 2.65	1.15	< 0.75
TX-04	07/18/00	< 0.00422	< 0.00384	< 0.00251	< 0.0443	< 1.21	< 4.7	< 0.818
TX-04	10/02/00	0.0062	0.0121	0.00392	0.064	1.96	0.89	< 0.75
TX-04	01/24/01	< 0.001	0.00258	0.000776	0.0146	1.16	1.18	< 0.75
TX-04	04/24/01	0.000998	0.000719	0.000994	0.00392	0.937	0.71	Not Analyzed
TX-04	07/25/01	0.0015	0.0014	< 0.0005	0.0046	1.19	0.716	Not Analyzed
TX-04	10/17/01	< 0.0005	0.000644	< 0.0005	0.0036	< 0.05	< 0.25	Not Analyzed
TX-04	01/09/02	0.00482	0.00209	< 0.0005	0.00462	< 0.05	0.615	Not Analyzed
TX-04	04/23/02	0.4010	0.6380	0.32100	2.410	11.30	1.30	Not Analyzed
TX-04	05/10/02	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	< 0.05	Not Analyzed	Not Analyzed
TX-04	07/19/02	< 0.001	0.001200	0.000170	0.00160	0.710	3.70	< 0.75
TX-04	10/23/02	< 0.001	< 0.001	< 0.001	0.0031	0.40	0.860	< 0.75
TX-04	01/29/03	0.0032	< 0.001	< 0.001	0.0014	0.45	< 0.25	< 0.5
TX-04	04/16/03	0.0075	0.004	< 0.001	0.0075	0.37	< 0.25	< 0.5
TX-04	07/18/03	0.0043	0.0027	< 0.001	0.005	0.28	0.35	< 0.5
TX-04	10/15/03	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	0.80	< 0.5
TX-04	01/13/04	0.025000	0.005500	< 0.001	0.01940	0.650	0.59	< 0.5
TX-04	04/21/04	0.0025	0.0017	< 0.001	0.0031	0.47	2.200	< 0.75
TX-04	07/27/04	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	1.50	< 0.5
TX-04	10/18/04	< 0.001	< 0.001	< 0.001	0.0022	0.28	1.2	< 0.5
TX-04	01/24/05	0.0310	0.0071	< 0.001	0.020	0.87	0.64	< 0.5
TX-04	04/20/05	0.014	0.00360	< 0.001	0.0085	0.54	0.73	< 0.5
TX-04	07/12/05	< 0.001	< 0.001	< 0.001	0.00140	0.340	0.82	< 0.5
TX-04	10/18/05	< 0.001	< 0.001	< 0.001	< 0.001	0.20	1.100	< 0.5
TX-04	01/25/06	0.00127	0.001	< 0.0005	0.00151	0.206	0.84	< 0.476
TX-04	11/18/08	< 0.005	< 0.005	< 0.005	< 0.005	0.076	< 0.25	< 0.5
TX-04	11/16/09	< 0.0005	< 0.001	< 0.001	< 0.001	0.17	0.13	< 0.1
TX-04	10/25/10	< 0.0005	< 0.001	< 0.001	< 0.001	< 0.1	0.17	< 0.1
TX-04	05/23/11	< 0.0003	< 0.0005	< 0.0003	< 0.0007	0.055	Not Analyzed	Not Analyzed
TX-04	10/26/11	< 0.0010	< 0.0010	< 0.0010	< 0.0020	< 0.20	0.0966	< 0.20

Note:

Bolded values indicate concentrations greater than the reporting detection limit.

Less than symbol denotes concentration undetected at the reporting detection limit.

Table 4-2r
Petroleum Hydrocarbons and BTEX in Groundwater
Shell Harbor Island Terminal
Seattle, Washington

Location ID	Chemical (mg/L)		Benzene	Toluene	Ethylbenzene	Total Xylenes (mixed isomers)	Gasoline Range Hydrocarbons	Diesel Range Hydrocarbons	Motor Oil Range Hydrocarbons
	Sample Date								
TX-06	04/05/93	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.13	0.70	< 0.75
TX-06	06/23/93	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.13	0.62	< 0.75
TX-06	09/23/93	0.0076	< 0.0005	0.003	0.0037	< 0.0005	0.27	0.96	< 0.75
TX-06	12/15/93	< 0.0005	< 0.0005	< 0.0005	0.0006	< 0.0005	0.14	0.84	< 0.75
TX-06	11/07/97	0.0031	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.37	4.5	< 0.71
TX-06	04/02/98	0.021	0.0044	0.036	0.016	< 0.0005	0.55	12	2.1
TX-06	04/28/99	0.0168	0.00257	0.035	0.0454	< 0.0005	1.38	8.97	0.893
TX-06	07/15/99	0.00514	0.00314	0.0066	0.00454	< 0.0005	0.87	5.74	< 0.75
TX-06	10/20/99	0.00502	0.00218	0.00545	0.00276	< 0.0005	0.761	6.53	< 0.75
TX-06	01/12/00	0.00781	< 0.0015	0.00313	0.00283	< 0.0005	0.856	15.6	< 0.75
TX-06	03/20/00	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	9.68	< 0.75
TX-06	04/06/00	< 0.0025	< 0.00173	< 0.00434	< 0.002	< 0.468	< 0.115	5.61	< 0.75
TX-06	07/18/00	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.115	< 1.34	< 0.75	< 0.75
TX-06	10/02/00	< 0.0005	< 0.0005	< 0.0005	< 0.001	0.17	0.83	< 0.75	< 0.75
TX-06A	04/23/02	0.0322	0.000585	0.000791	0.00206	0.23	5.68	Not Analyzed	< 0.75
TX-06A	07/19/02	0.0002	< 0.001	< 0.001	< 0.001	0.20	1.9	< 0.75	< 0.75
TX-06A	10/24/02	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	1.5	< 0.75	< 0.75
TX-06A	02/05/03	< 0.001	< 0.001	< 0.001	0.0011	< 0.25	0.82	< 0.5	< 0.5
TX-06A	04/16/03	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	3.5	< 0.5	< 0.5
TX-06A	07/16/03	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	6.9	< 1	< 1
TX-06A	10/15/03	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	5.4	< 1.5	< 1.5
TX-06A	01/14/04	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	5.8	< 1	< 1
TX-06A	04/21/04	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	3.4	< 0.75	< 0.75
TX-06A	07/27/04	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	3.6	< 0.5	< 0.5
TX-06A	10/18/04	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	4.1	< 0.5	< 0.5
TX-06A	01/24/05	< 0.001	< 0.001	< 0.001	< 0.001	< 0.25	2.7	< 0.5	< 0.5
TX-06A	04/20/05	< 0.001	< 0.001	< 0.001	< 0.001	0.18	6.3	< 1.5	< 1.5
TX-06A	07/13/05	< 0.001	< 0.001	< 0.001	< 0.001	0.26	2.5	< 0.5	< 0.5
TX-06A	10/18/05	< 0.001	< 0.001	< 0.001	< 0.001	0.072	0.93	< 0.5	< 0.5
TX-06A	01/26/06	< 0.0005	< 0.0005	< 0.0005	< 0.001	0.126	1.57	< 0.476	< 0.476
TX-06A	11/18/08	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	0.49	< 0.5	< 0.5
TX-06A	11/17/09	< 0.0005	< 0.001	< 0.001	< 0.001	< 0.1	0.24	< 0.1	< 0.1
TX-06A	10/28/10	< 0.0005	< 0.001	< 0.001	< 0.001	< 0.1	0.72	< 0.1	< 0.1
TX-06A	10/25/11	< 0.0010	< 0.0010	< 0.0010	< 0.0020	0.0519	0.499	< 0.21	< 0.21

Note:

Bolded values indicate concentrations greater than the reporting detection limit.

Less than symbol denotes concentration undetected at the reporting detection limit.

**Table 4-3a
Carcinogenic PAHs in Groundwater
Shell Harbor Island Terminal
Seattle, Washington**

Location ID	Chemical (mg/L) Sample Date	Benzo(a)- anthracene	Benzo(a)- pyrene	Benzo(b)- fluoranthene	Benzo(k)- fluoranthene	Chrysene	Dibenz(a,h)- anthracene	Indeno(1,2,3- cd)pyrene
MW-213	11/05/97	< 0.000012	< 0.000024	< 0.000024	< 0.000012	< 0.000012	< 0.000024	< 0.000012
MW-213	04/03/98	< 0.000012	< 0.000012	< 0.000024	< 0.000012	< 0.000012	< 0.000033	< 0.000012
MW-213	04/28/99	< 0.0000185	< 0.000018	< 0.0000337	< 0.000034	< 0.000025	< 0.0000656	< 0.0002
MW-213	07/29/99	< 0.0000185	< 0.000018	< 0.0000337	< 0.000034	< 0.000025	< 0.0000656	< 0.0000335
MW-213	10/29/99	< 0.0000185	< 0.000018	< 0.0000337	< 0.000034	< 0.000025	< 0.0000656	< 0.0000335
MW-213	01/11/00	< 0.0000185	< 0.000018	< 0.0000337	< 0.000034	< 0.000025	< 0.0000656	< 0.0000335
MW-213	04/06/00	< 0.0000925	< 0.00009	< 0.000169	< 0.00017	< 0.000125	< 0.000328	< 0.000168
MW-213	07/18/00	< 0.0000185	< 0.000018	< 0.0000337	< 0.000034	< 0.000025	< 0.0000656	< 0.0000335
MW-213	10/02/00	< 0.00002	< 0.00003	< 0.00006	< 0.00002	< 0.00003	< 0.0001	< 0.00005
MW-213	01/24/01	< 0.000042	< 0.0000585	< 0.0000649	< 0.00007	< 0.0000537	< 0.0000453	< 0.0000386
MW-213	04/24/01	< 0.0000185	< 0.000018	< 0.0000337	< 0.000034	< 0.000025	< 0.0000656	< 0.0000335
MW-213	07/24/01	< 0.0000185	< 0.000018	< 0.0000337	< 0.000034	< 0.000025	< 0.0000656	< 0.0000335
MW-213	10/18/01	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0002	< 0.0002
MW-213	01/11/02	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
MW-213	04/24/02	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
MW-213	07/22/02	0.000016	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
MW-213	10/28/02	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
MW-213	01/30/03	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
MW-213	04/17/03	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
MW-213	07/17/03	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
MW-213	10/16/03	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
MW-213	01/14/04	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
MW-213	04/20/04	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
MW-213	07/28/04	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
MW-213	10/19/04	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
MW-213	01/25/05	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
MW-213	04/19/05	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
MW-213	07/12/05	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
MW-213	10/20/05	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
MW-213	01/26/06	< 0.0000943	< 0.0000943	< 0.0000943	< 0.0000943	< 0.0000943	< 0.0000943	< 0.0000943
MW-213	10/30/07	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
MW-213	11/19/08	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
MW-213	04/07/09	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
MW-213	11/18/09	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
MW-213	04/26/10	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
MW-213	10/28/10	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
MW-213	05/24/11	< 0.00003	< 0.00003	< 0.00003	< 0.00003	< 0.00003	< 0.00003	< 0.00003
MW-213	10/25/11	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010

Note:

Bolded values indicate concentrations greater than the reporting detection limit.

Less than symbol denotes concentration undetected at the reporting detection limit.

**Table 4-3b
Carcinogenic PAHs in Groundwater
Shell Harbor Island Terminal
Seattle, Washington**

Location ID	Chemical (mg/L):	Benzo(a)-anthracene	Benzo(a)-pyrene	Benzo(b)-fluoranthene	Benzo(k)-fluoranthene	Chrysene	Dibenz(a,h)-anthracene	Indeno(1,2,3-cd)pyrene
	Sample Date							
MW-214	11/05/97	< 0.000012	< 0.000024	< 0.000024	< 0.000012	< 0.000012	< 0.000024	< 0.000012
MW-214	04/03/98	< 0.000012	< 0.000012	< 0.000024	< 0.000012	< 0.000012	< 0.000033	< 0.000012
MW-214	04/28/99	< 0.0000185	< 0.000018	< 0.0000337	< 0.000034	< 0.000025	< 0.0000656	< 0.0000335
MW-214	07/29/99	< 0.0000185	< 0.000018	< 0.0000337	< 0.000034	< 0.000025	< 0.0000656	< 0.0000335
MW-214	11/11/99	< 0.0000185	< 0.000018	< 0.0000337	< 0.000034	< 0.000025	< 0.0000656	< 0.0001
MW-214	01/11/00	< 0.0000185	< 0.000018	< 0.0000337	< 0.000034	< 0.000025	< 0.0000656	< 0.0000335
MW-214	04/06/00	< 0.0000925	< 0.0009	< 0.000169	< 0.00017	< 0.000125	< 0.000328	< 0.000168
MW-214	07/18/00	< 0.0000185	< 0.000018	< 0.0000337	< 0.000034	< 0.000025	< 0.0000656	< 0.0000335
MW-214	10/02/00	< 0.00002	< 0.00003	< 0.00006	< 0.00002	< 0.00003	< 0.0001	< 0.00005
MW-214	01/24/01	< 0.000042	< 0.0000585	< 0.0000649	< 0.0000707	< 0.0000537	< 0.0000453	< 0.0000386
MW-214	04/24/01	< 0.0000185	< 0.000018	< 0.0000337	< 0.000034	< 0.000025	< 0.0000656	< 0.0000335
MW-214	07/24/01	< 0.0000185	< 0.000018	< 0.0000337	< 0.000034	< 0.000025	< 0.0000656	< 0.0000335
MW-214	10/18/01	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0002	< 0.0002
MW-214	01/11/02	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
MW-214	04/24/02	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
MW-214	07/22/02	0.000013	< 0.0001	0.000029	0.000016	0.000016	0.000025	< 0.0001
MW-214	10/28/02	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
MW-214	01/30/03	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
MW-214	04/17/03	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
MW-214	07/17/03	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
MW-214	10/16/03	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
MW-214	01/14/04	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
MW-214	04/20/04	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
MW-214	07/28/04	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
MW-214	10/19/04	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
MW-214	01/25/05	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
MW-214	04/19/05	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
MW-214	07/12/05	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
MW-214	10/20/05	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
MW-214	01/26/06	< 0.000099	< 0.000099	< 0.000099	< 0.000099	< 0.000099	< 0.000099	< 0.000099
MW-214	10/30/07	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
MW-214	05/05/08	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
MW-214	11/19/08	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
MW-214	04/07/09	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
MW-214	11/18/09	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
MW-214	04/26/10	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
MW-214	10/28/10	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
MW-214	05/24/11	<0.000029	<0.000029	<0.000029	<0.000029	<0.000029	<0.000029	<0.000029
MW-214D	05/24/11	<0.000029	<0.000029	<0.000029	<0.000029	<0.000029	<0.000029	<0.000029
MW-214	10/25/11	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010
MW-214D	10/25/11	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010

Note:

Bolded values indicate concentrations greater than the reporting detection limit.

Less than symbol denotes concentration undetected at the reporting detection limit.

Table 4-4a
Arsenic and Lead in Groundwater
Shell Harbor Island Terminal
Seattle, Washington

Chemical (mg/L):		Dissolved	Total	Dissolved	Total
Location ID	Sample Date	Arsenic	Arsenic	Lead	Lead
MW-05	04/05/93	< 0.001	< 0.001	< 0.001	< 0.001
MW-05	06/23/93	< 0.001	< 0.001	< 0.001	< 0.001
MW-05	09/22/93	< 0.001	< 0.001	< 0.001	< 0.001
MW-05	12/15/93	< 0.001	< 0.001	< 0.001	< 0.001
MW-05	11/19/97	NA	< 0.004	< 0.001	< 0.0062
MW-05	04/01/98	NA	< 0.004	0.0012	< 0.0016
MW-05	04/28/99	< 0.004	< 0.004	< 0.001	< 0.001
MW-05	07/15/99	< 0.004	< 0.004	< 0.001	0.00413
MW-05	07/15/99	< 0.002	< 0.002	< 0.001	0.00458
MW-05	10/19/99	< 0.004	NA	< 0.001	< 0.001
MW-05	01/13/00	< 0.004	< 0.004	< 0.001	< 0.001
MW-05	04/06/00	< 0.004	< 0.004	< 0.001	< 0.001
MW-05	07/18/00	< 0.005	< 0.005	< 0.00252	< 0.00241
MW-05	10/02/00	< 0.005	< 0.005	< 0.001	< 0.001
MW-05	01/24/01	< 0.005	< 0.005	< 0.001	< 0.001
MW-05	04/24/01	0.000938	< 0.000606	< 0.000903	0.00115
MW-05	07/25/01	< 0.001	< 0.001	< 0.001	< 0.001
MW-05	10/30/01	< 0.001	< 0.001	< 0.001	0.00164
MW-05	05/10/02	0.00185	< 0.001	< 0.001	0.0017
MW-05	07/19/02	0.004	< 0.005	< 0.005	< 0.005
MW-05	01/30/03	< 0.005	< 0.005	< 0.005	< 0.005
MW-05	04/16/03	< 0.005	< 0.005	< 0.005	< 0.005
MW-05	07/18/03	< 0.005	< 0.005	< 0.005	< 0.005
MW-05	10/22/03	< 0.005	NA	< 0.005	NA
MW-05	10/22/03	NA	< 0.005	NA	< 0.005
MW-05	01/15/04	< 0.005	< 0.005	< 0.005	< 0.005
MW-05	04/21/04	< 0.005	< 0.005	< 0.005	< 0.005
MW-05	07/28/04	< 0.005	< 0.005	< 0.005	< 0.005
MW-05	10/19/04	< 0.005	< 0.005	< 0.005	< 0.005
MW-05	01/25/05	< 0.005	< 0.005	< 0.005	< 0.005
MW-05	04/18/05	< 0.005	< 0.005	< 0.005	< 0.005
MW-05	07/12/05	< 0.005	< 0.005	< 0.005	< 0.005
MW-05	10/19/05	< 0.005	< 0.005	< 0.005	< 0.005
MW-05	01/25/06	< 0.001	< 0.001	< 0.001	< 0.001
MW-101	04/06/93	0.0037	0.0029	< 0.001	< 0.001
MW-101	06/18/93	0.0064	0.0066	< 0.001	< 0.001
MW-101	09/22/93	0.0059	0.0072	0.0013	0.0016
MW-101	12/13/93	0.0036	0.0037	< 0.001	< 0.001
MW-101	11/04/97	NA	NA	< 0.001	0.0016
MW-101	04/02/98	NA	NA	0.002	0.0018
MW-101	04/29/99	0.00676	0.00658	< 0.001	< 0.001
MW-101	07/16/99	0.00596	0.00578	< 0.001	0.00346
MW-101	10/29/99	0.00752	0.00731	< 0.001	< 0.001
MW-101	01/12/00	0.00699	0.00876	< 0.001	< 0.001
MW-101	04/06/00	< 0.004	0.0174	< 0.001	< 0.001
MW-101	07/18/00	0.00787	< 0.00941	< 0.001	< 0.001
MW-101	10/02/00	0.00741	0.00842	< 0.001	0.00241
MW-101	01/24/01	< 0.005	0.00637	NA	< 0.001
MW-101	04/24/01	0.00475	0.00562	< 0.000903	0.00126
MW-101	07/24/01	0.00538	0.00598	< 0.001	< 0.001
MW-101	10/18/01	0.00629	0.00609	< 0.001	< 0.001
MW-101	01/10/02	0.00541	0.00579	< 0.001	< 0.001
MW-101	04/23/02	0.00565	0.0103	< 0.001	0.00209
MW-101	07/22/02	0.004	0.009	< 0.005	0.002
MW-101	10/28/02	< 0.005	0.00852	< 0.005	< 0.005
MW-101	01/30/03	< 0.005	0.00543	< 0.005	< 0.005
MW-101	04/15/03	0.00734	0.00693	< 0.005	< 0.005
MW-101	07/17/03	< 0.005	< 0.005	< 0.005	< 0.005
MW-101	10/23/03	0.00988	NA	< 0.005	NA
MW-101	10/23/03	NA	0.0105	NA	< 0.005
MW-101	10/23/03	0.00743	NA	< 0.005	NA
MW-101	10/23/03	NA	0.00994	NA	< 0.005

Note:

Bolded values indicate concentrations greater than the reporting detection limit.

Less than symbol denotes concentration undetected at the reporting detection limit.

**Table 4-4b
Arsenic and Lead in Groundwater
Shell Harbor Island Terminal
Seattle, Washington**

Chemical (mg/L):		Dissolved	Total	Dissolved	Total
Location ID	Sample Date	Arsenic	Arsenic	Lead	Lead
MW-101	01/14/04	0.00614	<0.005	< 0.005	< 0.005
MW-101	04/20/04	0.00633	0.00794	< 0.005	< 0.005
MW-101	07/28/04	0.00829	0.00746	< 0.005	< 0.005
MW-101	10/18/04	0.00782	0.00763	< 0.005	< 0.005
MW-101	01/26/05	< 0.005	< 0.005	< 0.005	< 0.005
MW-101	04/19/05	< 0.005	< 0.005	< 0.005	< 0.005
MW-101	07/13/05	0.00502	< 0.005	< 0.005	< 0.005
MW-101	10/20/05	< 0.005	< 0.005	< 0.005	< 0.005
MW-101	01/27/06	0.00447	0.00492	< 0.001	0.00343
MW-102	04/06/93	< 0.001	< 0.001	< 0.001	< 0.001
MW-102	06/21/93	< 0.001	< 0.001	< 0.001	< 0.001
MW-102	09/22/93	< 0.001	0.0011	0.0027	0.0031
MW-102	12/13/93	< 0.001	< 0.001	< 0.001	< 0.001
MW-102	11/04/97	NA	NA	< 0.001	< 0.001
MW-102	04/02/98	NA	NA	< 0.001	< 0.001
MW-102	04/28/99	< 0.004	< 0.004	< 0.001	< 0.001
MW-102	07/15/99	< 0.004	< 0.004	< 0.001	0.00169
MW-102	10/20/99	< 0.004	< 0.004	< 0.001	< 0.001
MW-102	01/12/00	< 0.004	< 0.004	< 0.001	< 0.001
MW-102	04/06/00	NA	<0.004	<0.001	<0.001
MW-102	07/19/00	< 0.005	< 0.005	0.00305	< 0.0012
MW-102	10/02/00	NA	NA	< 0.001	0.00179
MW-102	01/24/01	< 0.005	< 0.005	< 0.001	< 0.001
MW-102	04/24/01	< 0.000606	< 0.000606	< 0.000903	< 0.000903
MW-102	07/24/01	< 0.001	< 0.001	< 0.001	< 0.001
MW-102	10/18/01	< 0.001	NA	< 0.001	NA
MW-102	01/10/02	< 0.001	< 0.001	< 0.001	< 0.001
MW-102	04/24/02	0.0017	0.00179	< 0.001	< 0.001
MW-102	07/22/02	0.004	0.004	< 0.005	< 0.005
MW-102	10/28/02	< 0.005	< 0.005	< 0.005	< 0.005
MW-102	01/29/03	< 0.005	< 0.005	< 0.005	< 0.005
MW-102	10/28/03	NA	< 0.005	NA	< 0.005
MW-102	10/28/03	< 0.005	NA	< 0.005	NA
MW-102	04/21/04	< 0.005	< 0.005	< 0.005	< 0.005
MW-102	07/28/04	< 0.005	< 0.005	< 0.005	< 0.005
MW-102	10/18/04	< 0.005	< 0.005	< 0.005	< 0.005
MW-102	01/25/05	< 0.005	< 0.005	< 0.005	< 0.005
MW-102	04/18/05	< 0.005	< 0.005	< 0.005	< 0.005
MW-102	07/13/05	< 0.005	< 0.005	< 0.005	< 0.005
MW-102	10/19/05	< 0.005	< 0.005	< 0.005	< 0.005
MW-102	01/26/06	< 0.001	< 0.001	< 0.001	0.0353
MW-102	02/16/06	NA	NA	< 0.001	< 0.001

Note:

Bolded values indicate concentrations greater than the reporting detection limit.

Less than symbol denotes concentration undetected at the reporting detection limit.

Table 4-4c
 Arsenic and Lead in Groundwater
 Shell Harbor Island Terminal
 Seattle, Washington

Chemical (mg/L):		Dissolved	Total	Dissolved	Total
Location ID	Sample Date	Arsenic	Arsenic	Lead	Lead
MW-103	04/06/93	< 0.001	< 0.001	< 0.001	0.0043
MW-103	06/21/93	< 0.001	< 0.001	< 0.001	0.0021
MW-103	09/22/93	< 0.0020	< 0.002	< 0.001	< 0.001
MW-103	12/13/93	< 0.001	< 0.001	< 0.004	< 0.002
MW-103	04/02/98	NA	NA	< 0.001	0.0017
MW-103	10/18/01	0.00603	0.00619	< 0.001	< 0.001
MW-104	04/02/93	< 0.001	< 0.001	0.0019	0.0018
MW-104	06/22/93	0.0084	0.0072	0.0093	0.0012
MW-104	09/22/93	0.0087	0.0096	0.0089	0.0084
MW-104	12/17/93	< 0.001	< 0.001	0.0011	< 0.001
MW-104	11/05/97	NA	NA	< 0.001	0.0056
MW-104	04/01/98	NA	NA	0.0073	0.0140
MW-104	04/28/99	< 0.004	< 0.004	< 0.001	< 0.001
MW-104	07/15/99	0.0169	0.0235	0.00456	0.00959
MW-104	01/13/00	< 0.004	0.00586	< 0.001	0.00424
MW-104	04/06/00	0.0185	0.0199	< 0.001	< 0.001
MW-104	07/18/00	0.0149	< 0.0159	0.00593	< 0.00525
MW-104	10/02/00	0.00856	0.00948	0.00203	< 0.001
MW-104	01/24/01	< 0.005	< 0.005	< 0.001	0.00183
MW-104	04/23/02	0.00882	0.00864	0.00266	0.00425
MW-104	07/19/02	0.01	0.007	< 0.005	0.002
MW-104	10/24/02	< 0.005	< 0.005	< 0.005	< 0.005
MW-104	01/28/03	< 0.005	< 0.005	< 0.005	< 0.005
MW-104	04/16/03	0.00605	0.00734	< 0.005	< 0.005
MW-104	07/16/03	< 0.005	< 0.005	< 0.005	< 0.005
MW-104	10/22/03	< 0.005	NA	< 0.005	NA
MW-104	10/22/03	NA	< 0.005	NA	< 0.005
MW-104	01/15/04	< 0.005	0.008	< 0.005	0.00555
MW-104	01/15/04	0.00697	0.00602	< 0.005	< 0.005
MW-104	04/21/04	< 0.005	0.00752	< 0.005	0.00575
MW-104	07/28/04	< 0.005	< 0.005	< 0.005	< 0.005
MW-104	07/28/04	< 0.005	< 0.005	< 0.005	< 0.005
MW-104	10/19/04	< 0.005	< 0.005	< 0.005	< 0.005
MW-104	01/24/05	< 0.005	< 0.005	< 0.005	< 0.005
MW-104	04/18/05	< 0.005	< 0.005	< 0.005	< 0.005
MW-104	07/12/05	< 0.005	< 0.005	< 0.005	< 0.005
MW-104	10/19/05	< 0.005	< 0.005	< 0.005	< 0.005
MW-104	01/25/06	0.00667	0.00177	0.00757	0.0077
MW-104	10/30/07	NA	NA	NA	< 0.002
MW-104	11/19/08	NA	NA	NA	< 0.005
MW-104	04/08/09	NA	NA	NA	0.00326
MW-104	11/17/09	NA	NA	NA	0.00778
MW-104	04/27/10	NA	NA	NA	0.00232
MW-104	05/23/11	NA	NA	NA	< 0.010
MW-104	10/25/11	NA	NA	NA	< 0.010
MW-105	04/02/93	0.0026	0.0028	< 0.001	< 0.001
MW-105	06/23/93	0.0024	0.002	< 0.001	< 0.001
MW-105	09/21/93	0.0039	0.0047	< 0.001	< 0.001
MW-105	12/16/93	0.0048	0.0064	< 0.001	< 0.001
MW-105	04/28/99	0.00552	< 0.004	< 0.001	< 0.001
MW-105	07/15/99	0.00279	0.00781	< 0.001	0.00344
MW-105	10/19/99	0.00789	0.00976	< 0.001	< 0.001
MW-105	01/13/00	< 0.004	0.00562	< 0.001	< 0.001
MW-105	04/06/00	< 0.004	0.00428	< 0.001	0.0026
MW-105	07/18/00	< 0.005	< 0.005	0.00146	< 0.00299
MW-105	10/02/00	0.0057	0.00858	< 0.001	0.00122
MW-105	01/24/01	< 0.005	0.00512	< 0.001	0.00835
MW-105	04/24/01	0.00512	0.00702	< 0.000903	0.00643
MW-105	07/24/01	0.0062	0.00518	< 0.001	0.00249
MW-105	10/17/01	0.00522	< 0.001	< 0.001	< 0.001
MW-105	01/10/02	0.00453	0.0042	< 0.001	0.00488
MW-105	04/23/02	0.00289	0.00371	< 0.001	0.0367
MW-105	07/19/02	< 0.005	< 0.005	< 0.005	0.004
MW-105	10/24/02	< 0.005	< 0.005	< 0.005	< 0.005
MW-105	01/28/03	< 0.005	< 0.005	< 0.005	0.0183
MW-105	04/16/03	< 0.005	< 0.005	< 0.005	< 0.005
MW-105	10/22/03	0.00527	NA	< 0.005	NA
MW-105	10/22/03	NA	0.00608	NA	0.0247
MW-105	01/15/04	0.00545	< 0.005	< 0.005	0.00647
MW-105	04/21/04	< 0.005	< 0.005	< 0.005	0.00793
MW-105	07/27/04	< 0.005	< 0.005	< 0.005	0.0128
MW-105	10/19/04	< 0.005	< 0.005	< 0.005	0.0311
MW-105	01/24/05	< 0.005	< 0.005	< 0.005	0.00824
MW-105	04/18/05	< 0.005	< 0.005	< 0.005	0.00615
MW-105	07/12/05	< 0.005	< 0.005	< 0.005	< 0.005
MW-105	10/18/05	< 0.005	< 0.005	< 0.005	< 0.005
MW-105	01/25/06	0.0014	0.00162	< 0.001	0.00321
MW-105	10/30/07	NA	NA	NA	0.0174
MW-105	11/19/08	NA	NA	NA	< 0.005
MW-105	11/17/09	NA	NA	NA	0.021
MW-105	10/25/11	NA	NA	NA	< 0.010

Bolded values indicate concentrations greater than the reporting detection limit.
 Less than symbol denotes concentration undetected at the reporting detection limit.

**Table 4-4d
Arsenic and Lead in Groundwater
Shell Harbor Island Terminal
Seattle, Washington**

Chemical (mg/L):		Dissolved	Total	Dissolved	Total
Location ID	Sample Date	Arsenic	Arsenic	Lead	Lead
TX-03A	04/23/02	0.00442	0.00495	< 0.001	0.00397
TX-03A	07/19/02	0.007	0.005	< 0.005	< 0.005
TX-03A	10/24/02	< 0.005	< 0.005	< 0.005	< 0.005
TX-03A	02/05/03	< 0.005	< 0.005	< 0.005	< 0.005
TX-03A	04/15/03	0.0058	< 0.005	< 0.005	< 0.005
TX-03A	04/15/03	0.00785	0.00574	< 0.005	< 0.005
TX-03A	07/17/03	< 0.005	< 0.005	< 0.005	< 0.005
TX-03A	07/17/03	< 0.005	< 0.005	< 0.005	< 0.005
TX-03A	10/22/03	0.00583	NA	< 0.005	NA
TX-03A	10/22/03	NA	< 0.005	NA	< 0.005
TX-03A	01/13/04	0.00608	0.0052	< 0.005	< 0.005
TX-03A	04/19/04	0.00769	0.00643	< 0.005	< 0.005
TX-03A	07/27/04	< 0.005	< 0.005	< 0.005	< 0.005
TX-03A	10/18/04	0.00924	0.00905	< 0.005	< 0.005
TX-03A	01/24/05	< 0.005	< 0.005	< 0.005	< 0.005
TX-03A	04/19/05	< 0.005	< 0.005	< 0.005	< 0.005
TX-03A	07/12/05	0.00623	0.0068	< 0.005	< 0.005
TX-03A	10/25/10				34.6
TX-04	04/05/93	0.0048	0.0039	< 0.001	< 0.001
TX-04	06/23/93	0.0078	0.0068	< 0.001	< 0.001
TX-04	09/23/93	0.013	0.011	< 0.001	< 0.001
TX-04	12/14/93	0.0039	0.0054	< 0.001	< 0.001
TX-04	11/04/97	NA	NA	< 0.001	< 0.001
TX-04	04/02/98	NA	NA	< 0.001	< 0.001
TX-04	04/28/99	< 0.004	< 0.004	< 0.001	< 0.001
TX-04	07/14/99	0.00326	0.00515	< 0.001	0.00295
TX-04	10/19/99	< 0.004	0.00713	< 0.001	< 0.001
TX-04	01/13/00	< 0.004	0.0029	< 0.001	< 0.001
TX-04	04/06/00	< 0.004	< 0.004	< 0.001	< 0.001
TX-04	07/18/00	< 0.005	< 0.005	0.00193	< 0.00138
TX-04	10/02/00	NA	NA	< 0.001	0.00266
TX-04	01/24/01	< 0.005	< 0.005	< 0.001	< 0.001
TX-04	04/24/01	0.00168	0.00109	< 0.000903	< 0.000903
TX-04	07/25/01	0.00503	0.00452	< 0.001	< 0.001
TX-04	10/18/01	0.00288	0.00686	< 0.001	0.0169
TX-04	01/09/02	0.00138	0.00772	< 0.001	0.00138
TX-04	04/23/02	0.0062	0.0353	0.00236	0.0128
TX-04	07/19/02	0.005	0.005	< 0.005	< 0.005
TX-04	10/23/02	< 0.005	< 0.005	< 0.005	< 0.005
TX-04	01/29/03	< 0.005	< 0.005	< 0.005	< 0.005
TX-04	07/18/03	< 0.005	< 0.005	< 0.005	< 0.005
TX-04	10/22/03	< 0.005	NA	< 0.005	NA
TX-04	10/22/03	NA	< 0.005	NA	< 0.005
TX-04	01/13/04	< 0.005	< 0.005	< 0.005	< 0.005
TX-04	04/21/04	< 0.005	< 0.005	< 0.005	< 0.005
TX-04	07/27/04	< 0.005	< 0.005	< 0.005	< 0.005
TX-04	10/18/04	< 0.005	< 0.005	< 0.005	< 0.005
TX-04	01/24/05	< 0.005	< 0.005	< 0.005	< 0.005
TX-04	04/20/05	< 0.005	< 0.005	< 0.005	< 0.005
TX-04	07/12/05	< 0.005	< 0.005	< 0.005	< 0.005
TX-04	10/18/05	< 0.005	< 0.005	< 0.005	< 0.005
TX-04	01/25/06	< 0.001	< 0.001	< 0.001	< 0.001

Note:

Bolded values indicate concentrations greater than the reporting detection limit.
Less than symbol denotes concentration undetected at the reporting detection limit.

Table 4-4e
Arsenic and Lead in Groundwater
Shell Harbor Island Terminal
Seattle, Washington

Chemical (mg/L):		Dissolved	Total	Dissolved	Total
Location ID	Sample Date	Arsenic	Arsenic	Lead	Lead
MW-106	04/02/93	0.006	0.0061	0.0027	0.0017
MW-106	06/22/93	0.02	0.025	0.0011	0.0012
MW-106	09/21/93	0.018	0.016	< 0.001	< 0.001
MW-106	12/16/93	0.010	0.014	< 0.001	< 0.001
TES-MW-1	04/06/93	< 0.001	< 0.001	< 0.001	< 0.001
TES-MW-1	06/18/93	< 0.001	< 0.001	< 0.001	< 0.001
TES-MW-1	09/22/93	< 0.0010	< 0.0010	0.0010	< 0.001
TES-MW-1	12/13/93	< 0.0010	< 0.0010	< 0.001	< 0.001
TES-MW-1	12/13/93	< 0.0010	< 0.0010	< 0.0010	< 0.0010
TES-MW-1	11/05/97	NA	NA	< 0.001	< 0.001
TES-MW-1	04/02/98	NA	NA	< 0.001	< 0.001
TES-MW-1	04/29/99	< 0.004	< 0.004	< 0.001	< 0.001
TES-MW-1	07/22/02	< 0.005	< 0.005	< 0.005	< 0.005
TES-MW-1	10/28/02	< 0.005	< 0.005	< 0.005	< 0.005
TES-MW-1	01/30/03	< 0.005	< 0.005	< 0.005	< 0.005
TES-MW-1	04/15/03	< 0.005	< 0.005	< 0.005	< 0.005
TES-MW-1	07/17/03	< 0.005	< 0.005	< 0.005	< 0.005
TES-MW-1	10/23/03	< 0.005	NA	< 0.005	NA
TES-MW-1	10/23/03	NA	< 0.005	NA	< 0.005
TES-MW-1	01/14/04	< 0.005	< 0.005	< 0.005	< 0.005
TES-MW-1	04/20/04	< 0.005	< 0.005	< 0.005	< 0.005
TES-MW-1	04/20/04	< 0.005	< 0.005	< 0.005	< 0.005
TES-MW-1	07/28/04	< 0.005	< 0.005	< 0.005	< 0.005
TES-MW-1	10/18/04	< 0.005	< 0.005	< 0.005	< 0.005
TES-MW-1	01/25/05	< 0.005	< 0.005	< 0.005	< 0.005
TES-MW-1	01/25/05	< 0.005	< 0.005	< 0.005	< 0.005
TES-MW-1	04/19/05	< 0.005	< 0.005	< 0.005	< 0.005
TES-MW-1	07/13/05	< 0.005	< 0.005	< 0.005	< 0.005
TES-MW-1	10/20/05	< 0.005	< 0.005	< 0.005	< 0.005
TES-MW-1	01/27/06	< 0.001	< 0.001	< 0.001	< 0.001
TX-03	04/05/93	0.0026	0.0024	< 0.001	< 0.001
TX-03	06/22/93	0.0081	0.0083	< 0.001	< 0.001
TX-03	09/23/93	0.0063	0.0081	< 0.001	< 0.001
TX-03	12/16/93	0.0047	0.0049	< 0.001	0.0044
TX-03	11/07/97	NA	NA	< 0.001	< 0.001
TX-03	04/02/98	NA	NA	< 0.001	< 0.001
TX-03	04/29/99	0.0191	0.0215	< 0.001	< 0.001
TX-03	07/16/99	0.0273	0.0206	< 0.001	0.00145
TX-03	01/12/00	0.0311	0.0338	< 0.001	< 0.001
TX-03	04/06/00	< 0.004	0.0187	< 0.001	NA
TX-03	07/18/00	0.0339	< 0.0421	0.00143	< 0.00162
TX-03	10/02/00	0.0163	0.0167	< 0.000903	NA

Note:

Bolded values indicate concentrations greater than the reporting detection limit.

Less than symbol denotes concentration undetected at the reporting detection limit.

Table 4-4f
Arsenic and Lead in Groundwater
Shell Harbor Island Terminal
Seattle, Washington

Chemical (mg/L):		Dissolved	Total	Dissolved	Total
Location ID	Sample Date	Arsenic	Arsenic	Lead	Lead
TX-06	04/05/93	0.013	0.015	< 0.001	0.0016
TX-06	06/23/93	0.016	0.017	< 0.001	0.0011
TX-06	09/23/93	0.053	0.058	< 0.001	< 0.001
TX-06	12/15/93	0.055	0.070	< 0.001	< 0.001
TX-06	11/07/97	NA	NA	< 0.001	< 0.001
TX-06	04/02/98	NA	NA	< 0.001	< 0.001
TX-06	07/15/99	0.0402	0.052	< 0.001	0.00152
TX-06	10/20/99	0.0337	0.0444	< 0.001	< 0.001
TX-06	01/12/00	< 0.004	0.0445	< 0.001	< 0.001
TX-06	04/06/00	< 0.004	0.044	< 0.001	< 0.001
TX-06	07/18/00	0.0433	< 0.053	0.00347	< 0.0408
TX-06	10/02/00	0.0374	0.0406	< 0.001	< 0.001
TX-06A	04/23/02	0.00542	0.00551	< 0.001	< 0.001
TX-06A	04/16/03	0.014	0.0126	< 0.005	< 0.005
TX-06A	07/16/03	0.014	0.0137	< 0.005	< 0.005
TX-06A	10/23/03	0.0102	NA	< 0.005	NA
TX-06A	10/23/03	NA	0.0116	NA	< 0.005
TX-06A	01/14/04	0.0119	0.0148	< 0.005	< 0.005
TX-06A	04/21/04	0.00783	0.0127	< 0.005	< 0.005
TX-06A	07/27/04	0.0112	0.0106	< 0.005	< 0.005
TX-06A	10/18/04	0.0108	0.0126	< 0.005	< 0.005
TX-06A	01/24/05	< 0.005	0.0088	< 0.005	< 0.005
TX-06A	04/20/05	0.00586	0.00699	< 0.005	< 0.005
TX-06A	07/13/05	0.0119	0.00743	< 0.005	< 0.005
TX-06A	10/18/05	0.00827	0.0104	< 0.005	< 0.005
TX-06A	01/26/06	0.00506	0.00634	< 0.001	< 0.001

Note:

Bolded values indicate concentrations greater than the reporting detection limit.

Less than symbol denotes concentration undetected at the reporting detection limit.

**Table 4-5
Groundwater Cleanup Levels
Shell Harbor Island Terminal
Seattle, Washington**

Constituent	Cleanup Level ^a (mg/L)
Arsenic	0.036 ^b
Benzene	0.071
Benzo(a)anthracene	0.000031
Benzo(a)pyrene	0.000031
Benzo(b)fluoranthene	0.000031
Benzo(k)fluoranthene	0.000031
Chrysene	0.000031
Dibenzo(a,h)anthracene	0.000031
Ethylbenzene	29
Indeno(1,2,3-cd)pyrene	0.000031
Lead	0.0058
TPH-G	1
TPH-D	10
TPH-O	10
Toluene	200

Notes:

^a Cleanup levels per the *Cleanup Action Plan* (Ecology, 1998), except where noted.

^b Cleanup level based on ambient water quality criteria (chronic criteria for the protection of aquatic organisms) per WAC 173-201A-040.

Table 4-6a
Compliance Monitoring Natural Attenuation Parameters
Shell Harbor Island Terminal
Seattle, Washington

Well	Date	Parameter																			
		TPH-G (mg/L)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Total Xylenes (mg/L)	Total BTEX (mg/L)	Total Alkalinity (mg/L)	Carbon Dioxide (mg/L)	Dissolved Oxygen (mg/L)	Hardness (mg/L)	Iron Total (mg/L)	Ferrous Iron (mg/L)	Methane (mg/L)	ORP (mv)	pH (std. units)	Specific Conductance (µS/cm)	Sulfate (mg/L)	Temperature (°C)	Turbidity (NTU)	
Upgradient Wells	04/29/99	< 0.0500	< 0.0500	0.000639	< 0.000500	< 0.00100	0.000639	20	38	4.3	NM	0.810	0.160	< 50	6.8	4.92	55	6.73	10.0	20.0	
	07/16/99	< 0.0500	< 0.000500	< 0.000500	< 0.000500	< 0.00100	< 0.000500	40	42	3.0	NM	0.351	0.005	< 10	105	4.70	75	11.7	13.0	6.5	
	10/29/99	< 0.0500	< 0.000500	< 0.000500	< 0.000500	< 0.00100	< 0.000500	40	60	2.0	80	0.405	0.008	2.5	55	NM	127	8.01	15.0	19.7	
	01/12/00	< 0.0500	< 0.000500	< 0.000500	< 0.000500	< 0.00100	< 0.000500	20	> 100	7.4	80	3.45	0.005	< 2.0	40	6.91	63	16.7	13.0	45.6	
	04/06/00	< 0.0500	< 0.000500	< 0.000500	< 0.000500	< 0.00100	< 0.000500	60	50	4.0	NM	0.456	0.008	30	55	5.64	72	12.4	10.0	20.1	
	07/18/00	NA	NA	NA	NA	NA	NA	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
	10/02/00	< 0.0500	< 0.000500	< 0.000500	< 0.000500	< 0.00100	< 0.000500	NM	NM	0.9	NM	NM	NM	NM	NM	61	5.76	75	NM	16.0	18.2
	01/24/01	< 0.0500	< 0.000500	< 0.000500	< 0.000500	< 0.00100	< 0.000500	NM	NM	3.9	NM	NM	NM	NM	NM	-24	5.52	89	NM	12.0	5.3
	04/24/01	< 0.25	0.142	< 0.0025	< 0.0025	< 0.005	0.147	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
	05/22/01	< 0.5	0.45	< 0.005	< 0.005	< 0.01	0.46	NM	NM	NA	NM	NM	NM	NM	NM	NA	NA	NA	NA	NA	NA
	07/24/01	< 0.05	0.00849	< 0.0005	< 0.0005	< 0.001	0.00949	NM	NM	0.2	NM	NM	NM	NM	112.3	6.08	250	NM	14.3	16.1	
	10/18/01	< 0.05	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.001	NM	NM	1.2	NM	NM	NM	NM	34.1	6.11	284	NM	15.1	43.4	
	01/10/02	< 0.05	< 0.0005	0.00386	0.000703	0.00386	0.008673	NM	NM	NA	NM	NM	NM	NM	NA	NA	NA	NA	NA	NA	NA
	04/23/02	< 0.05	< 0.0004	< 0.0005	< 0.0005	< 0.001	< 0.001	NM	NM	1.8	NM	NM	NM	NM	142.5	5.59	73	NM	10.6	21.1	
	07/23/02	0.033	0.0031	< 0.001	0.0022	0.0041	0.0376	NM	NM	NM	NM	NM	NM	NM	114	5.99	188	NM	16.3	12.3	
	10/28/02	< 0.25	0.0027	< 0.001	< 0.001	0.0071	0.0098	NM	NM	1.4	NM	NM	NM	NM	81	5.86	137	NM	16.6	3.6	
	01/30/03	< 0.25	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	NM	NM	3.6	NM	NM	NM	NM	204	4.91	106	NM	10.3	19.1	
	04/15/03	< 0.25	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	15	65	4.4	20	1.06	0.4	< 0.0012	10.3	6.54	52	9.99	11.3	5.7	
	07/17/03	0.79	0.012	0.035	0.032	0.157	0.236	NM	NM	0.3	NM	NM	NM	NM	96.8	5.40	187	NM	15.2	4.1	
	10/16/03	0.53	0.0017	< 0.001	0.023	0.111	0.1362	NM	NM	0.2	NM	NM	NM	NM	-18	6.29	266	NM	15.2	6.0	
	10/23/03	NA	NA	NA	NA	NA	NA	NM	NM	3.4	NM	NM	NM	NM	145	5.13	187	NM	15.9	NM	
	01/14/04	< 0.25	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	NM	NM	8.4	NM	NM	NM	NM	100	4.79	223	NM	10.5	4.4	
	04/20/04	< 0.25	0.0067	< 0.001	0.011	0.043	0.0607	40	12.5	3.1	60	0.135	ND	< 0.0012	132.6	4.57	149	39.1	10.7	4.0	
	04/20/04	< 0.25	0.0075	< 0.001	0.013	0.049	0.0685	NM	NM	NM	NM	0.138	NM	0.14	NM	NM	NM	46.3	NM	NM	
	07/28/04	< 0.25	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	NM	NM	1.6	NM	NM	NM	NM	164.7	5.40	171	NM	17.6	4.1	
	10/18/04	< 0.25	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	NM	NM	5.4	NM	NM	NM	NM	245	5.04	106	NM	14.6	-10.0	
	01/25/05	< 0.25	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	NM	NM	5.5	NM	NM	NM	NM	208	4.98	93	NM	11.0	8.0	
	04/20/05	0.18	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	10	50	4.9	< 20	0.844	0	< 0.0012	62	5.33	82	14.6	11.9	NM	
	07/13/05	0.26	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	NM	NM	0.1	NM	NM	NM	NM	155.8	5.52	118	NM	16.4	3.8	
	10/18/05	0.072	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	NM	NM	0.16	NM	NM	NM	NM	99.2	6.44	157	NM	16.1	9.6	
	01/28/06	0.126	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.001	NM	NM	5.52	NM	NM	NM	NM	212.7	5.53	41	NM	8.3	4.5	
	11/18/08	< 0.05	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	NM	NM	7.81	NM	NM	NM	NM	308.0	4.92	311	NM	13.7	13.1	
	11/18/09	< 0.1	< 0.0005	< 0.001	< 0.001	< 0.001	< 0.001	NM	NM	6.19	NM	NM	NM	NM	169.0	4.78	16.3	NM	11.2	0.0	
	10/26/10	< 0.1	< 0.0005	< 0.001	< 0.001	< 0.001	< 0.001	NM	NM	4.80	NM	NM	NM	NM	161.0	4.65	12.0	NM	11.9	15.1	
	10/27/11	< 0.20	< 0.0010	< 0.0010	< 0.0010	< 0.0020	< 0.0050	NM	NM	3.38	NM	NM	NM	NM	-7.2	8.47	104	NM	11.57	10.9	
	Plume Wells	04/29/99	0.325	0.00179	< 0.000600	0.00119	< 0.00140	0.00298	100	42	0.2	NM	5.56	5.69	200	-250	6.03	196	10.9	13.0	46.0
		07/16/99	0.242	0.00277	< 0.000520	< 0.000800	< 0.00170	0.00277	80	28	1.5	NM	5.36	2.20	170	-45	6.29	169	7.22	13.0	15.0
		10/29/99	0.393	0.00156	< 0.000500	< 0.000500	< 0.00110	0.00156	100	36	0.1	60	6.68	2.56	270	-195	NM	133	5.7	14.0	22.0
		01/12/00	0.363	< 0.00130	< 0.000500	< 0.00110	< 0.00250	< 0.00250	80	> 100	0.2	> 400	6.62	0.04	600	-140	7.24	155	3.3	NM	13.5
		04/06/00	0.542	0.0021	0.00153	0.00185	< 0.0019	0.00548	100	34	0.9	NM	6.87	2.43	628	-86	6.95	248	2.01	12.0	26.9
		07/18/00	0.426	< 0.00236	< 0.000500	< 0.00125	< 0.00156	< 0.00236	NM	NM	1.88	NM	NM	NM	NM	NM	7.07	251	NM	14.0	4.8
		10/02/00	0.418	< 0.00087	< 0.000500	< 0.0005	< 0.00177	< 0.00177	NM	NM	1.6	NM	NM	NM	NM	16	7.05	281	NM	15.0	16.7
		01/24/01	0.460	0.00055	0.00135	0.0011	< 0.00119	0.003	NM	NM	1.7	NM	NM	NM	NM	-39	6.8	159	NM	13.0	13.7
		04/24/01	0.505	0.00163	< 0.0005	0.00145	0.00141	0.00474	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
		07/24/01	0.353	0.00142	< 0.0005	< 0.0005	0.00107	0.00299	NM	NM	0.05	NM	NM	NM	NM	-92.3	6.83	190	NM	14.5	10.1
		10/18/01	0.181	0.00065	< 0.0005	< 0.0005	< 0.001	0.00165	NM	NM	0.66	NM	NM	NM	NM	-93.1	6.74	215	NM	15.3	8.1
		01/10/02	0.687	0.00256	0.00263	0.00528	0.00487	0.01534	NM	NM	NA	NM	NM	NM	NM	NA	NA	NA	NA	NA	NA
04/23/02		0.495	0.00157	< 0.0005	0.0032	0.00203	0.50002	NM	NM	0.48	NM	NM	NM	NM	116.3	6.79	288	NM	11.5	20.8	
07/22/02		0.29	0.0019	0.00022	< 0.001	< 0.001	0.00312	NM	NM	NM	NM	NM	NM	NM	-160	7.09	248	NM	16.6	5.8	
10/28/02		0.42	0.0014	< 0.001	< 0.001	< 0.001	0.0029	NM	NM	0.01	NM	NM	NM	NM	56	6.82	185	NM	16.2	0.2	
01/30/03		0.33	< 0.001	< 0.001	< 0.001	< 0.0016	< 0.0016	NM	NM	1.08	NM	NM	NM	NM	-19	6.34	168	NM	12.7	1.5	
04/15/03		0.66	0.0046	< 0.001	0.0012	< 0.001	0.0073	115	31.5	0.51	2,400	8.8	4.8	1.1	19.9	6.89	197	7.24	11.5	9.0	
07/17/03		0.73	0.0042	< 0.001	< 0.001	0.0017	0.0074	NM	NM	0.29	NM	NM	NM	NM	44.6	6.32	263	NM	15.3	4.8	
10/16/03		0.43	0.0019	< 0.001	< 0.001	< 0.001	0.0039	NM	NM	0.28	NM	NM	NM	NM	98.4	7.29	236	NM	15.8	NM	
10/23/03		NA	NA	NA	NA	NA	NA	NM	NM	2.03	NM	NM	NM	NM	-111	6.77	256	NM	15.4	NM	
01/14/04		NA	NA	NA	NA	NA	NA	NM	NM	1.72	NM	NM	NM	NM	-99.7	5.42	202	NM	12.3	1.9	
01/16/04		0.55	< 0.001	< 0.001	< 0.001	0.0028	0.0028	NM	NM	0.87	NM	NM	NM	NM	-61.5	6.52	225	NM	12.4	6.9	

Table 4-6b
Compliance Monitoring Natural Attenuation Parameters
Shell Harbor Island Terminal
Seattle, Washington

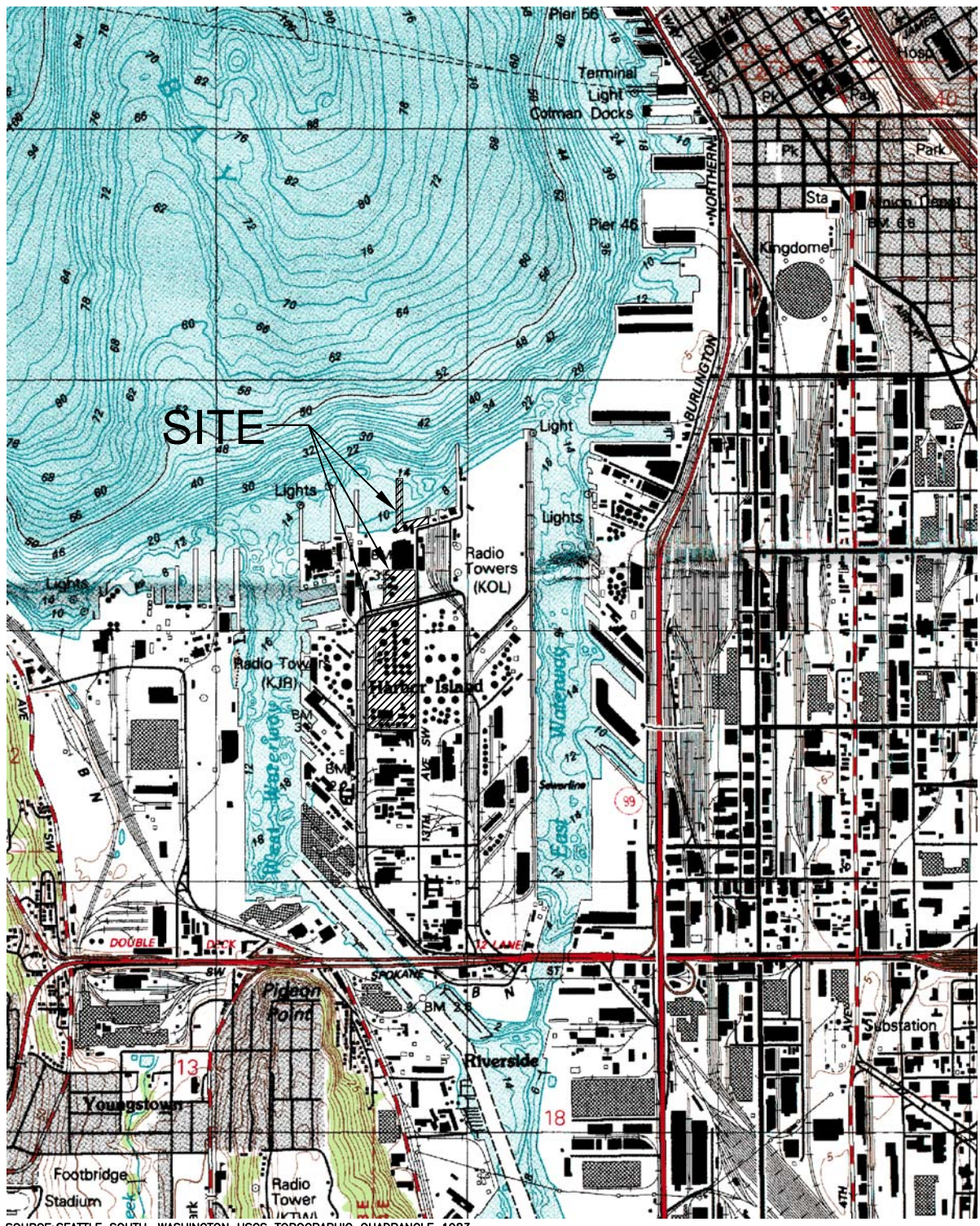
Well	Date	Parameter																			
		TPH-G (mg/L)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Total Xylenes (mg/L)	Total BTEX (mg/L)	Total Alkalinity (mg/L)	Carbon Dioxide (mg/L)	Dissolved Oxygen (mg/L)	Hardness (mg/L)	Iron Total (mg/L)	Ferrous Iron (mg/L)	Methane (mg/L)	ORP (mv)	pH (std. units)	Specific Conductance (<S/cm)	Sulfate (mg/L)	Temperature (°C)	Turbidity (NTU)	
TX-03	04/29/99	0.880	0.146	0.00769	0.0330	0.0879	0.27459	280	100	0.3	NM	30.9	21.1	8,100	-261	6.02	456	0.494	13.0	5.7	
	07/16/99	0.347	0.0214	0.00292	< 0.00250	0.00784	0.03216	240	100	2.6	NM	39.3	24.6	7,100	-110	6.25	444	0.47	15.0	2.8	
	10/29/99	0.494	0.0726	0.00315	0.00266	0.0117	0.09011	260	130	0.7	100	25.9	11.3	2,400	-230	6.73	467	< 0.117	16.0	6.9	
	01/12/00	0.595	0.153	0.00388	0.00319	0.0117	0.17177	220	> 100	1.9	> 400	20.5	8.58	2,500	-87	7.09	428	< 0.20	13.0	13.7	
	04/06/00	0.448	0.0449	0.0041	0.00449	0.00984	0.06333	300	100	1	NM	40.8	28.9	3,410	NM	7.36	472	< 0.21	12.0	3.4	
	07/18/00	0.509	0.103	0.00541	0.00644	0.0103	0.12515	NM	NM	1.3	NM	NM	NM	NM	NM	-25	6.84	520	NM	17.0	8.5
10/02/00	0.116	0.0861	0.00293	0.00144	0.00514	0.09561	NM	NM	0.9	NM	NM	NM	NM	NM	23	6.38	189	NM	16.0	10.4	
TX-03A	04/23/02	13.8	4.87	0.081	0.028	0.469	5.449	NM	NM	6.200	NM	NM	NM	NM	118	6.46	509	NM	12.0	32.2	
	07/19/02	5.3	3.70	0.072	0.200	0.250	4.222	NM	NM	NM	NM	NM	NM	NM	-140	6.64	465	NM	15.4	15.4	
	10/24/02	3.6	4.90	0.042	0.140	0.180	5.262	NM	NM	0.050	NM	NM	NM	NM	-59	6.62	336	NM	17.5	6.8	
	02/05/03	2.9	1.6	< 0.005	0.042	0.083	1.725	NM	NM	0.890	NM	NM	NM	NM	-2	6.02	390	NM	12.5	1.9	
	04/15/03	< 6.2	4.2	0.052	0.095	0.11	4.4695	440	125	0.63	1000	31.2	7.2	8.6	-12.9	6.580	397	< 1	13.3	2.1	
	04/15/03	< 6.2	4.1	0.05	0.092	0.11	4.3645	NM	NM	NM	NM	31.1	NM	6.9	NM	NM	NM	< 1	NM	NM	NM
	07/17/03	2.6	3.4	0.054	0.12	0.1365	3.7105	NM	NM	0.24	NM	NM	NM	NM	40.0	7.00	520	NM	16.2	1.6	
	07/17/03	< 6.2	3.8	0.055	0.12	0.13	4.1175	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	10/15/03	2.8	3	0.025	0.042	0.083	3.155	NM	NM	1.590	NM	NM	NM	NM	-120	6.64	590	NM	15.8	9.0	
	10/22/03	NA	NA	NA	NA	NA	NA	NM	NM	1.760	NM	NM	NM	NM	-137	6.83	526	NM	17.3	NM	
	01/13/04	2.7	2.9	0.018	0.038	0.091	3.052	NM	NM	1.400	NM	NM	NM	NM	-59	6.39	480	NM	14.0	1.8	
	04/19/04	12	4.4	0.047	0.12	0.11	4.677	360	150	1.440	> 600	36.1	6.000	13	21	6.18	560	< 1	13.7	2.4	
	07/27/04	5.2	1.7	0.011	0.016	0.037	1.764	NM	NM	1.310	NM	NM	NM	NM	68	6.26	589	NM	17.9	3.0	
	10/18/04	7.5	3.2	0.024	0.062	0.093	3.379	NM	NM	2.770	NM	NM	NM	NM	-100	6.63	595	NM	16.7	42.0	
	01/24/05	8.2	2.5	0.02	< 0.01	0.065	2.585	NM	NM	1.79	NM	NM	NM	NM	5.0	5.11	563	NM	14.6	43.1	
	04/19/05	6.1	2.5	0.021	0.026	0.049	2.596	320	150	0	> 600	35.3	4	1.9	-86	6.47	552	< 1	13.8	20	
	07/12/05	10	3.1	0.024	0.044	0.054	3.222	NM	NM	0.16	NM	NM	NM	NM	-121.0	6.55	477	NM	17.3	55.6	
	10/31/07	< 5	2.2	0.023	0.060	0.050	2.330	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
	11/20/08	4.5	2.1	0.019	0.038	0.018	6.675	169	210	0.5	NM	39.3	30.4	3.5	-59	6.87	821	< 1	15.8	31.8	
	04/08/09	3.5	1.2	< 0.025	0.028	< 0.025	1.22800	NM	NM	0	NM	NM	NM	NM	-145	6.58	236	NM	12.8	43.1	
	11/17/09	2.4	0.97	0.0078	0.016	0.011	1.0048	202	65.8	1.29	160	32.2	36	12.8	-102	6.39	50.6	1.2	16.3	9.7	
	04/27/10	4.6	1.7	0.0096	0.0087	0.0099	1.7282	NM	NM	0.21	NM	NM	NM	NM	-153	5.76	52.8	NM	13.2	9.5	
	10/25/10	3.3	1.7	0.011	0.067	0.013	1.7910	181	0.27	1.39	140	34.6	30	5.84	-115	6.68	42.5	6.8	15.5	48.0	
	05/23/11	7.5	1.78	< 0.025	0.044	< 0.035	1.8240	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
	10/27/11	8.51	3.44	0.0712	0.147	0.111	3.7692	247	9.29	1.72	196	30.8	20.3	12.2	-100.9	8.50	478	< 0.50	15.44	NM	
	MW-202	04/29/99	1.85	< 0.0245	< 0.00650	0.143	0.0204	0.1634	120	112	0.5	NM	17.7	10	36,000	-220	5.65	268	0.506	12.0	11.0
		07/16/99	1.61	< 0.00155	< 0.00405	0.153	< 0.00830	0.153	100	75	0.7	NM	2.22	1.53	8,800	-145	5.70	226	2.52	13.5	10.0
		10/29/99	2.14	< 0.00500	< 0.00500	0.277	< 0.0100	0.277	100	105	0.5	86	18.83	6.86	3,800	-252	6.41	229	< 0.117	15.0	7.5
		01/12/00	1.56	< 0.0272	< 0.00520	0.107	< 0.0200	0.107	160	> 100	4.3	> 400	31.32	9.37	1,400	-38	6.54	286	1.41	13.0	4.7
		04/06/00	1.36	0.00624	0.0153	0.0548	0.00765	0.08399	100	70	0.6	NM	2.35	1.68	1,430	NM	6.33	289	0.367	12.0	3.3
		07/18/00	2.06	< 0.0111	< 0.00557	0.0393	< 0.005	0.0393	NM	NM	2	NM	NM	NM	NM	-21	6.41	335	NM	15.0	3.2
10/02/00		1.91	0.0137	< 0.0042	0.113	< 0.0105	0.1267	NM	NM	0.2	NM	NM	NM	NM	-32	5.99	373	NM	14.0	17.9	
01/24/01		1.84	< 0.00545	0.0148	< 0.017	< 0.0079	0.0148	NM	NM	1.6	NM	NM	NM	NM	-21	6.08	293	NM	12.0	9.2	
04/24/01		2.39	0.0197	0.00466	0.174	0.0105	0.20886	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
07/24/01		2.45	0.017	0.00424	0.123	0.0109	0.15514	NM	NM	0.03	NM	NM	NM	NM	-64.6	6.28	374	NM	14.5	20.2	
10/18/01		2.22	0.0186	0.00402	0.406	0.00785	0.07107	NM	NM	0.34	NM	NM	NM	NM	45.2	6.13	366	NM	15.3	39.7	
01/10/02		5.06	0.0201	0.00782	0.0181	0.0177	0.06372	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
04/24/02		5.71	0.0186	0.00488	0.067	0.0327	0.12318	NM	NM	4.07	NM	NM	NM	NM	47.3	5.99	319	NM	10.8	20.3	
07/23/02		2.5	0.068	0.011	0.15	0.0194	0.2484	NM	NM	NM	NM	NM	NM	NM	-79	6.33	330	NM	15.5	17.9	
10/24/02		1.2	0.011	< 0.001	0.063	0.0035	0.078	NM	NM	0	NM	NM	NM	NM	-18	6.3	269	NM	15.3	9.0	
01/29/03		2.1	0.023	< 0.005	0.043	< 0.005	0.071	NM	NM	0.79	NM	NM	NM	NM	28	5.66	598	NM	11.6	4.5	
04/15/03		1.6	0.095	< 0.005	0.075	0.0349	0.2074	265	200	0.59	8,000	52.3	6.8	2.5	-38.2	6.2	363	24.8	12.4	7.3	
07/17/03		1.7	0.04	< 0.005	0.11	0.022	0.1745	NM	NM	0.3	NM	NM	NM	NM	-2.3	5.77	279	NM	15.7	4.4	
10/16/03		2	0.024	< 0.005	0.072	< 0.005	0.1035	NM	NM	1.99	NM	NM	NM	NM	-79	6.26	0.317	NM	16.2	10.1	
01/14/04		2.5	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	NM	NM	12.4	NM	NM	NM	NM	-40.2	5.32	52	NM	8.0	9.1	
04/20/04		4.4	0.014	0.0062	0.074	0.021	0.1152	180	160	1.31	> 400	47.8	3	0.92	112	5.27	317	< 1	12.1	9.8	
01/26/05		7.7	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	NM	NM	1.69	NM	NM	NM	NM	3	4.8	218	NM	11.6	126	
04/20/05		3.7	0.016	0.0022	0.036	0.0237	0.0779	200	180	0	> 600	42.2	8	0.9	-60	7.78	44	< 1	12.6	26.0	
07/13/05		3.5	0.016	0.0033	0.067	0.0191	0.1054	NM	NM	0.11	NM	NM	NM	NM	-22	6.09	281	NM	15.7	6.3	
10/20/05		3.3	0.019	0.0021	0.058	0.0056	0.0847	NM	NM	0.44	NM	NM	NM	NM	-47.9	6.42	576	NM	15.5	5.5	
01/26/06		5.79	0.0224	0.00598	0.041	0.0191	0.0885	NM	NM	0.18	NM	NM	NM	NM	-104.7	7.73	213	NM	10.78	70	
10/30/07		4.55																			
11/20/08		5.00	NM	NM	NM	NM	NM	73	220	3.65	228	32.5	36.6	1.8	232.0	6.40	532	< 1	14.50	10	
04/07/09		4.80	NM	NM	NM	NM	NM	NM	NM	0	NM	NM	NM	NM	-82	6.12	0.175	NM	11.86	56.1	
11/19/09		6.60	NM	NM	NM	NM	NM	64	194	1.65	120	45.2	19	2.31	-53	5.81	51.6	82	12.4	29.5	
04/27/10		3.30	NM	NM	NM	NM	NM	NM	NM	0.22	NM	NM	NM	NM	-96	5.46	34	NM	12.3	55.4	
10/27/10		6	0.0081	0.0031	0.066	0.0022	0.0794	75	71.8	2.35	70	34.8	7.4	4.36	-48	6.15	29.5	< 1.0	15	24	
10/26/11	4.30	NM	NM	NM	NM	NM	84	21.3	2.45	45.4	27.4	8.5	6.08	-104.2	8.22	214	< 0.50	12.90	2.72		

Note:
 NM = Not measured
 NA = Not analyzed
 ND = Not detected
 Bold font denotes detected concentration greater than cleanup level for TPH-G (1 mg/L), or benzene (0.071 mg/L)

Table 4-6c
Compliance Monitoring Natural Attenuation Parameters
Shell Harbor Island Terminal
Seattle, Washington

Well	Date	Parameter																			
		TPH-G (mg/L)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Total Xylenes (mg/L)	Total BTEX (mg/L)	Total Alkalinity (mg/L)	Carbon Dioxide (mg/L)	Dissolved Oxygen (mg/L)	Hardness (mg/L)	Iron Total (mg/L)	Ferrous Iron (mg/L)	Methane (mg/L)	ORP (mv)	pH (std. units)	Specific Conductance (µS/cm)	Sulfate (mg/L)	Temperature (°C)	Turbidity (NTU)	
MW-203	04/29/99	1.16	0.00407	0.00106	0.00309	0.00344	0.01166	80	45	1.7	NM	10.6	6.32	7,000	-238	5.46	160	0.888	13.0	44.0	
	07/16/99	3.41	0.00825	< 0.00110	< 0.0109	< 0.00763	0.00825	200	130	0.1	NM	23.2	15.4	1,100	-133	6.11	437	< 0.20	13.5	5.2	
	10/29/99	2.69	< 0.00800	< 0.000740	< 0.00352	< 0.00315	< 0.00800	180	150	2	92	32.24	14.86	1,600	-205	6.49	356	< 0.117	16.0	13.4	
	01/12/00	0.596	< 0.00500	< 0.000500	< 0.000500	0.00197	0.00197	60	> 100	1.2	120	14.1	6.38	550	-47	6.5	77	0.528	13.0	33.4	
	04/06/00	0.806	0.00324	0.00329	< 0.00145	< 0.0036	0.00653	220	140	0.8	NM	24.6	15.9	223	NM	6.41	129	0.524	12.0	11.7	
	07/18/00	3.3	0.0142	< 0.001165	< 0.00405	< 0.00348	0.0142	NM	NM	2.4	NM	NM	NM	NM	17	6.48	407	NM	15.0	7.2	
	10/02/00	2.39	0.00796	< 0.00156	< 0.00318	< 0.00292	0.00796	NM	NM	0.3	NM	NM	NM	NM	3	6.05	363	NM	17.0	15.1	
	01/24/01	1.47	0.022	0.00382	< 0.00335	< 0.0084	0.02582	NM	NM	0.1	NM	NM	NM	NM	-95	5.97	381	NM	12.0	4.2	
	04/24/01	2.91	0.0409	0.00156	0.0157	0.00411	0.06227	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	
	07/24/01	7.33	0.0357	< 0.005	0.0496	0.01280	0.1006	NM	NM	0.08	NM	NM	NM	NM	-76.4	6.38	400	NM	14.2	8.1	
	09/18/01	10.90	0.041	< 0.04	< 0.04	0.02690	0.0746	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	18.0	8.1
	10/18/01	10.20	0.0377	< 0.0025	0.0397	0.01190	0.0516	NM	NM	1.03	NM	NM	NM	NM	NM	65.5	6.25	399	NM	15.0	16.8
	01/10/02	0.09	0.000504	0.000804	0.000939	0.00201	0.004257	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	
	04/24/02	0.37	0.00382	< 0.0005	0.000849	< 0.001	0.005419	NM	NM	2.15	NM	NM	NM	NM	NM	11.3	6.85	212	NM	11.6	87.7
	07/30/02	1.00	0.006	< 0.001	< 0.001	0.00820	0.0152	NM	NM	NM	NM	NM	NM	NM	-126	6.57	440	NM	17.8	8.2	
	10/25/02	1.20	0.0063	< 0.001	< 0.001	< 0.001	0.0078	NM	NM	1.03	NM	NM	NM	NM	10	6.43	270	NM	16.0	12.6	
	01/29/03	0.97	0.0048	0.001	< 0.001	< 0.001	0.00608	NM	NM	2.8	NM	NM	NM	NM	36	6	296	NM	11.6	279	
	04/15/03	0.42	0.0034	< 0.001	0.0019	< 0.001	0.0068	180	95	0.9	400	15.1	7.4	1.2	-53.7	6.39	191	6.14	12.5	10	
	07/18/03	0.47	0.0069	< 0.001	0.002	< 0.001	0.0104	NM	NM	0.5	NM	NM	NM	NM	12.1	6.17	349	NM	14.9	4.7	
	01/13/04	< 0.25	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	NM	NM	2.91	NM	NM	NM	NM	-6.9	6.38	243	NM	12.4	13.7	
	04/19/04	< 0.25	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	220	85	1.02	180	12	1	< 0.0012	110	6.58	369	2.4	13.0	39.2	
	07/27/04	2.6	0.013	< 0.001	0.0069	< 0.001	0.0199	NM	NM	1.12	NM	NM	NM	NM	90.9	6.11	514	NM	16.4	32.2	
	10/18/04	1.6	0.013	< 0.001	0.015	0.0025	0.0305	NM	NM	0.35	NM	NM	NM	NM	136.8	9.42	643	NM	14.8	110	
	01/25/05	1.6	0.0063	< 0.001	0.011	0.0013	0.0186	NM	NM	2.79	NM	NM	NM	NM	21	6.37	476	NM	12.9	210	
	04/19/05	0.63	0.0068	< 0.001	0.0018	< 0.001	0.0086	220	145	0	>600	26.7	5.5	0.43	0	6.22	44	6.48	12.8	5	
	07/13/05	0.89	0.01	< 0.001	0.0077	< 0.001	0.0177	NM	NM	0.67	NM	NM	NM	NM	-46	6.34	351	NM	15.0	15	
10/20/05	4.2	0.023	0.002	0.021	0.0026	0.0486	NM	NM	1.12	NM	NM	NM	NM	-48.7	6.69	902	NM	15.9	34		
01/23/06	0.76	0.00186	< 0.0005	0.00182	0.00125	0.00493	NM	NM	2.2	NM	NM	NM	NM	7.6	6.45	131	NM	11.4	30		
10/31/07	< 0.250																				
11/18/08	0.17	NM	NM	NM	NM	NM	80	< 10	10.3	208	1.56	1.35	< 0.0012	87.0	7.11	448	17.1	13.9	190		
04/08/09	< 0.1	NM	NM	NM	NM	NM	NM	NM	1.87	NM	NM	NM	NM	-31.0	6.83	136	NM	12.2	338		
11/17/09	< 0.1	NM	NM	NM	NM	NM	86	22.1	5.5	86	2.36	< 0.1	< 0.001	197	6.28	25.8	8.3	12.2	45.6		
04/26/10	0.16	NM	NM	NM	NM	NM	NM	NM	0.30	NM	NM	NM	-109.0	6.81	40.9	NM	12.7	80.1			
10/25/10	0.92	NM	NM	NM	NM	NM	139	0.04	1.58	150	7.83	4.3	0.104	-4	6.10	43.8	14	14.1	51.8		
05/23/11	0.33	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM		
10/26/11	1.38	NM	NM	NM	NM	NM	180	26.2	2.94	146	28.1	8.8	0.701	-81	8.40	384.0	< 0.50	13.98	10.9		
Downgradient Well																					
MW-201	04/29/99	< 0.0500	< 0.000500	< 0.000500	< 0.000500	< 0.00100	< 0.000500	20	14	7.9	NM	0.783	0.193	< 50	-103	5.25	48	2.52	12.0	54.0	
	07/16/99	< 0.0500	< 0.000700	< 0.000500	< 0.000500	< 0.00100	< 0.000700	60	36	2.6	NM	0.535	0.361	1,100	482	5.75	84	3.5	14.0	15.0	
	10/29/99	0.227	< 0.00145	< 0.000500	< 0.000570	< 0.00100	< 0.00145	240	50	1.4	100	32.4	21.4	1,400	-212	6.59	375	1.07	14.0	20.5	
	01/12/00	0.0533	< 0.000500	< 0.000500	< 0.000500	< 0.00100	< 0.000500	220	> 100	1.1	300	28.64	9.94	2,080	-28	7.24	276	1.35	13.0	29.7	
	04/06/00	0.284	0.0011	0.00186	< 0.000900	< 0.00120	0.00296	80	40	1.3	NM	0.448	0.392	3,080	NM	6.61	209	0.462	12.0	13.5	
	07/18/00	0.32	< 0.00459	< 0.000500	< 0.00159	< 0.00132	< 0.00459	NM	NM	2.4	NM	NM	NM	NM	-27	6.64	343	NM	16.0	15.2	
	10/02/00	0.51	< 0.00226	< 0.000651	< 0.000930	< 0.00178	< 0.00226	NM	NM	0.1	NM	NM	NM	NM	-20	6.3	505	NM	15.0	5.6	
	01/24/01	< 0.500	< 0.000500	0.00116	< 0.000500	< 0.00100	0.00116	NM	NM	3	NM	NM	NM	NM	5	5.49	99	NM	10.0	10.8	
	04/24/01	< 0.05	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.001	NA	NA	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	
	07/24/01	< 0.05	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.001	NM	NM	0.08	NM	NM	NM	NM	89.5	6.01	118	NM	13.8	13.1	
	10/18/01	0.161	0.00126	< 0.0005	0.000536	0.00103	0.003066	NM	NM	2.78	NM	NM	NM	NM	24.8	6.23	428	NM	14.0	45.4	
	01/10/02	< 0.05	< 0.0005	0.00105	< 0.0005	0.00154	0.003099	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	
	04/23/02	< 0.05	< 0.0005	< 0.0005	< 0.0005	< 0.001	< 0.001	NM	NM	0.65	NM	NM	NM	NM	87.3	5.88	46	NM	10.0	10.8	
	07/30/02	0.1	< 0.001	0.0002	< 0.001	< 0.001	0.0002	NM	NM	NM	NM	NM	NM	NM	-49	6.73	440	NM	17.4	14.1	
	10/25/02	0.31	< 0.0001	< 0.001	< 0.001	< 0.001	< 0.001	NM	NM	0.08	NM	NM	NM	NM	29	6.4	529	NM	14.7	1.6	
	01/29/03	< 0.25	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	NM	NM	6.71	NM	NM	NM	NM	145	5.24	55	NM	9.4	4.0	
	04/15/03	< 0.25	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	40	20	3.09	20	0.148	0.4	0.0016	-104	6.29	30	4.43	11.4	9.4	
	07/17/03	< 0.25	0.0053	< 0.001	< 0.001	< 0.001	0.0073	NM	NM	0.29	NM	NM	NM	NM	35.2	5.53	188	NM	14.8	3.7	
	10/16/03	0.43	0.0013	< 0.001	< 0.001	< 0.001	0.0033	NM	NM	1.88	NM	NM	NM	NM	-87	6.52	783	NM	15.3	4.7	
	01/14/04	< 0.25	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	NM	NM	1.98	NM	NM	NM	NM	-95.5	5.59	282	NM	12.0	1.5	
	04/20/04	< 0.25	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	40	30	5.52	> 400	0.0772	ND	< 0.0012	61.3	5	101	5.71	11.4	7.0	
	01/26/05	< 0.25	< 0.001	< 0.001	< 0.001	< 0.001	<														

FIGURES



SOURCE: SEATTLE SOUTH, WASHINGTON USGS TOPOGRAPHIC QUADRANGLE 1983.

NOTE:
HARBOR ISLAND CULTURAL FEATURES DEPICTED ON THIS
MAP DO NOT REFLECT ISLAND-WIDE RE-DEVELOPMENT
BY THE PORT OF SEATTLE AND OTHER PARTIES.

SITE VICINITY MAP

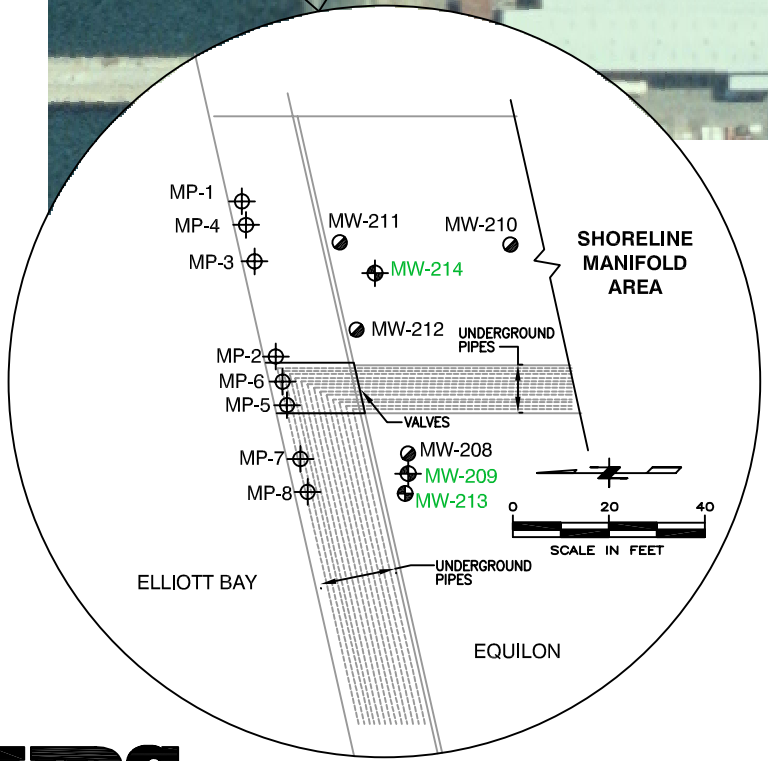
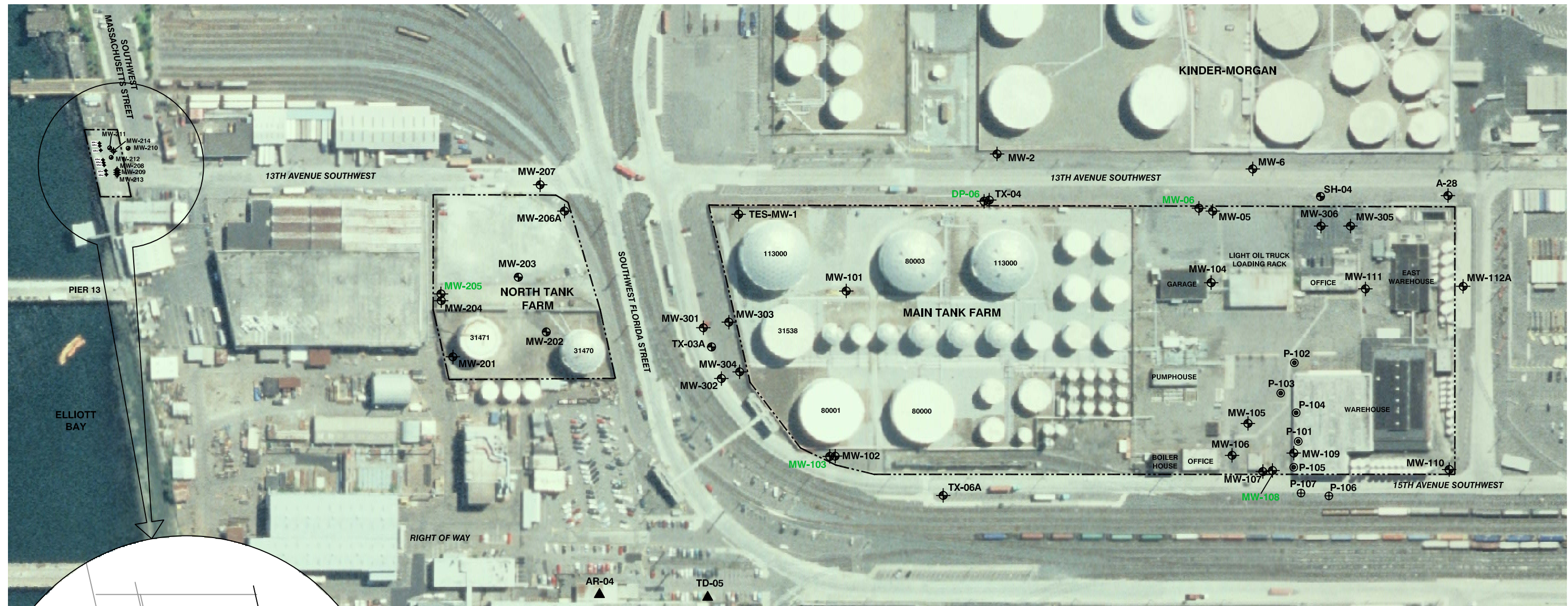
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SEATTLE, WASHINGTON

DECEMBER 2011
46194214

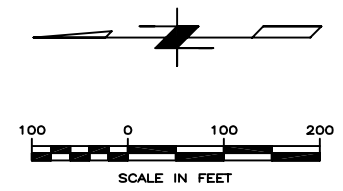


FIGURE 1-1

O:\2521158 Shell\2011\2011 Terminals\46194288 Seattle Terminal\5000 Technical\2011 Annual Report\Annual 2011 Groundwater Report\Figure 2-1.dwg Feb 23, 2012 - 9:05am



- LEGEND**
- MW-212 ⊕ Shallow Groundwater monitoring well location
 - MW-205 ⊕ Green font denotes deep well
 - MW-210 ⊕ Groundwater sampling well location
 - AR-04 ▲ Monitoring well location – not currently gauged or sampled
 - MW-210 ⊕ Product recovery / monitoring well location
 - WP-1 ⊕ Former product recovery / monitoring well point location
 - P-101 ⊕ Piezometer location
 - P-107 ⊕ Abandoned well – exact location uncertain
 - Shell property line

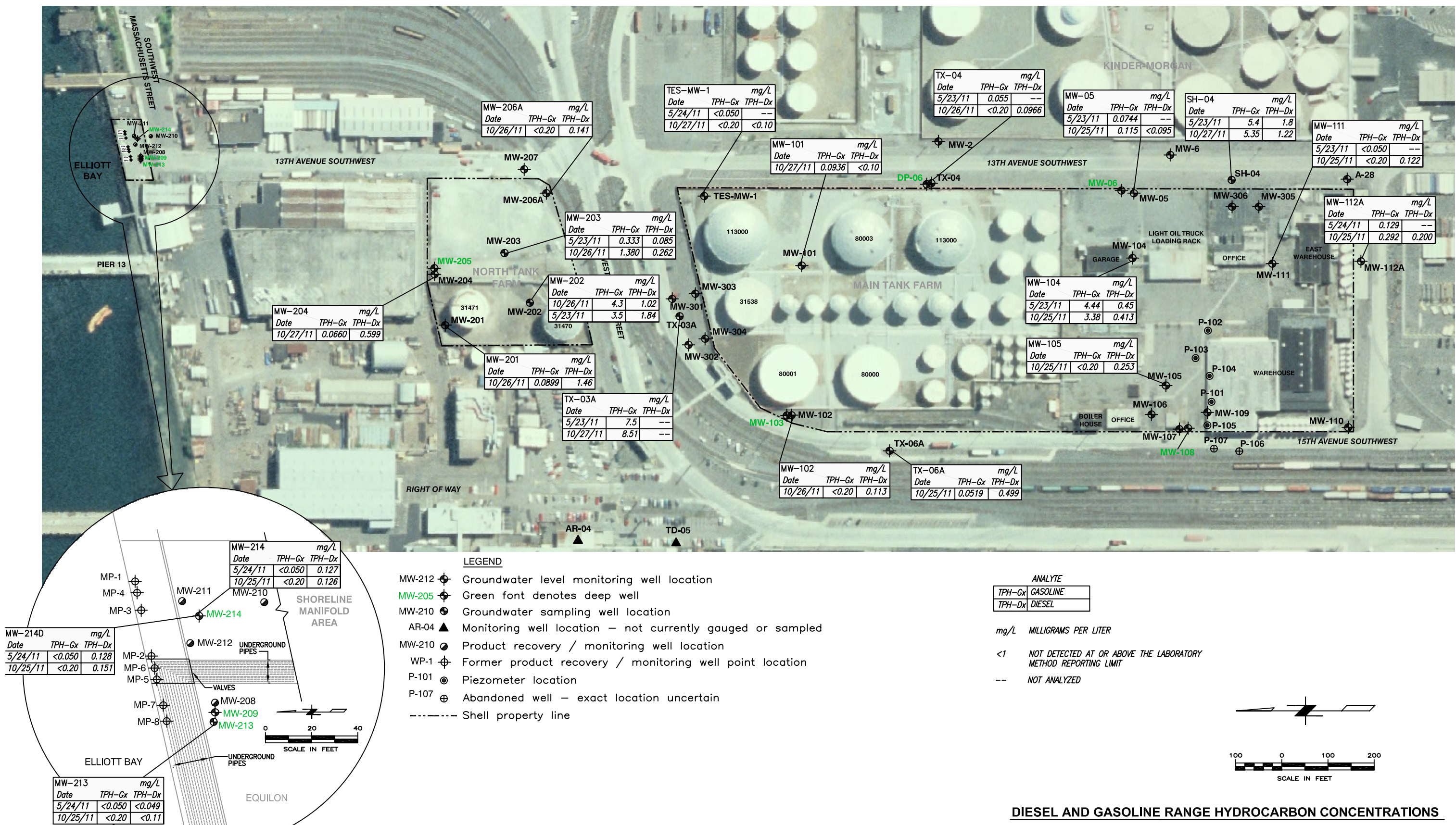


MONITORING WELL LOCATIONS

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 46194225 SEATTLE, WASHINGTON



FIGURE 2-1

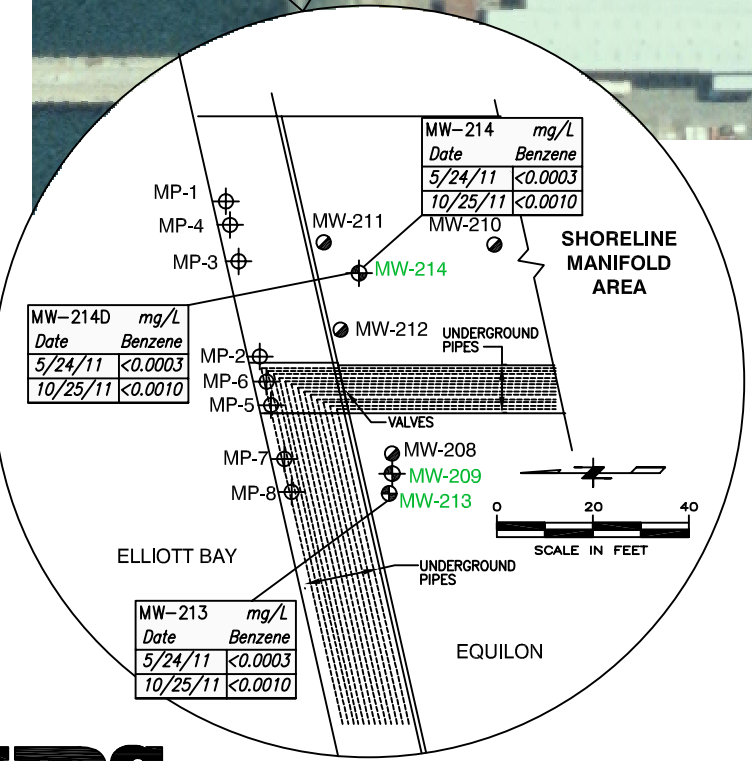
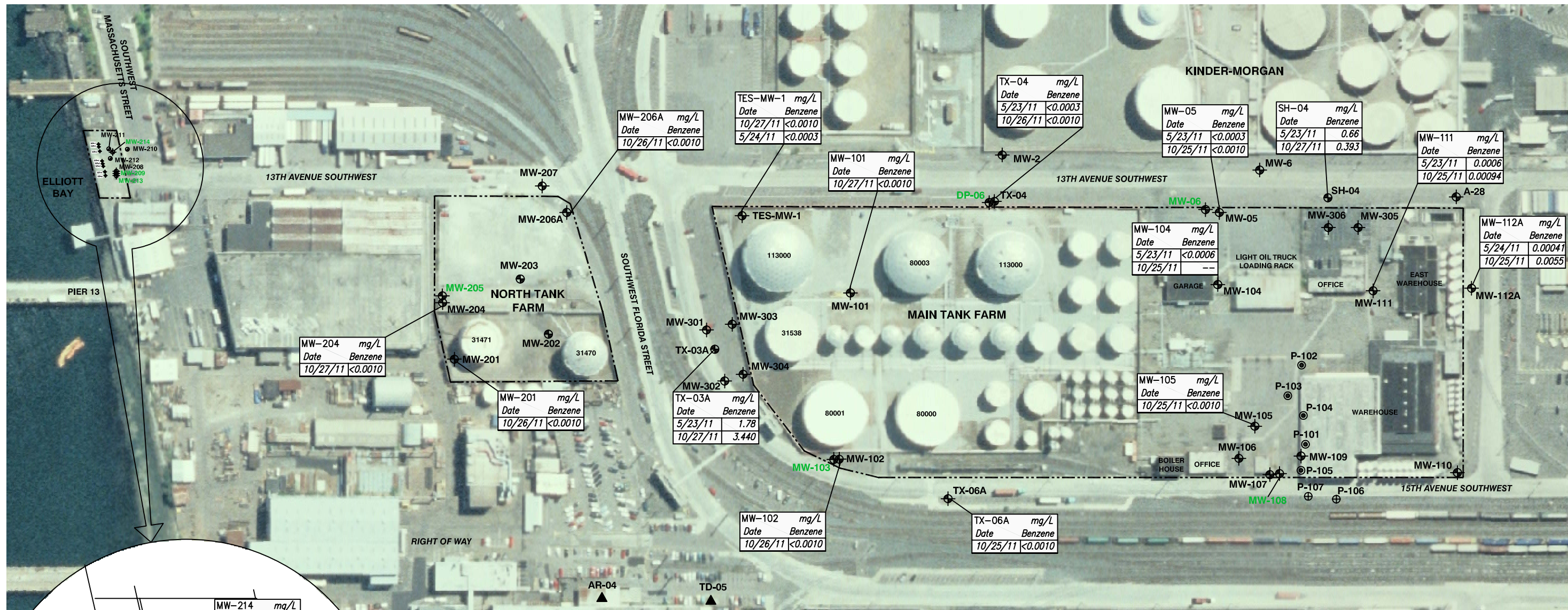


DIESEL AND GASOLINE RANGE HYDROCARBON CONCENTRATIONS

DECEMBER 2011
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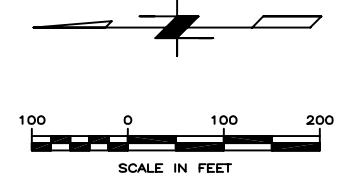
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FIGURE 4-1



- LEGEND**
- MW-212 ⊕ Groundwater level monitoring well location
 - MW-205 ⊕ Green font denotes deep well
 - MW-210 ⊕ Groundwater sampling well location
 - AR-04 ▲ Monitoring well location – not currently gauged or sampled
 - MW-210 ⊕ Product recovery / monitoring well location
 - WP-1 ⊕ Former product recovery / monitoring well point location
 - P-101 ⊕ Piezometer location
 - P-107 ⊕ Abandoned well – exact location uncertain
 - Shell property line

mg/L MILLIGRAMS PER LITER
 <0.0005 NOT DETECTED AT OR ABOVE THE LABORATORY METHOD REPORTING LIMIT
 -- NOT ANALYZED



BENZENE CONCENTRATIONS

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 SEATTLE, WASHINGTON



FIGURE 4-2

APPENDIX A

Groundwater Elevation Data

Groundwater Elevation Data
Shell Harbor Island Terminal-Seattle, Washington
Incident Number 300036

Location	Date	MP Elevation (ft)	Depth to Water (ft)	Water Elevation (ft)
MW-05	1/11/1900	10.39	5.15	5.24
MW-05	4/6/1993	10.39	6.12	4.27
MW-05	5/13/1993	10.39	5.92	4.47
MW-05	6/10/1993	10.39	5.98	4.41
MW-05	7/8/1993	10.39	6.23	4.16
MW-05	8/3/1993	10.39	6.50	3.89
MW-05	10/8/1993	10.39	7.22	3.17
MW-05	11/5/1993	10.39	7.42	2.97
MW-05	12/3/1993	10.39	7.38	3.01
MW-05	1/5/1994	10.39	6.64	3.75
MW-05	2/4/1994	10.39	6.54	3.85
MW-05	8/28/1995	10.39	Not Measured	Not Measured
MW-05	9/27/1995	10.39	8.35	2.04
MW-05	4/27/1999	10.39	8.07	2.32
MW-05	7/14/1999	10.39	5.88	4.51
MW-05	10/18/1999	10.39	7.00	3.39
MW-05	4/5/2000	10.39	5.05	5.34
MW-05	7/18/2000	10.39	6.30	4.09
MW-05	10/2/2000	10.39	7.15	3.24
MW-05	1/22/2001	10.39	6.50	3.89
MW-05	7/23/2001	10.39	7.43	2.96
MW-05	7/18/2002	10.39	7.10	3.29
MW-05	1/30/2003	10.39	5.84	4.55
MW-05	4/15/2003	10.39	5.80	4.59
MW-05	7/17/2003	10.39	7.12	3.27
MW-05	10/15/2003	10.39	7.78	2.61
MW-05	10/23/2003	10.39	7.80	2.59
MW-05	1/13/2004	10.39	5.65	4.74
MW-05	4/19/2004	13.57	6.35	7.22
MW-05	7/27/2004	13.57	7.32	6.25
MW-05	10/18/2004	13.57	7.36	6.21
MW-05	1/24/2005	13.57	6.26	7.31
MW-05	4/18/2005	13.57	6.27	7.30
MW-05	7/12/2005	13.57	6.85	6.72
MW-05	10/18/2005	13.57	7.60	5.97
MW-05	1/25/2006	13.57	4.78	8.79
MW-05	4/25/2006	13.57	5.90	7.67
MW-05	10/11/2006	13.57	7.62	5.95
MW-05	11/19/2008	13.57	8.23	5.34
MW-05	11/16/2009	13.57	6.44	7.13
MW-05	10/29/2010	13.57	6.57	7.00
MW-05	10/25/2011	13.57	7.25	6.32

Groundwater Elevation Data
Shell Harbor Island Terminal-Seattle, Washington
Incident Number 300036

Location	Date	MP Elevation (ft)	Depth to Water (ft)	Water Elevation (ft)
MW-101	4/6/1993	15.14	10.48	4.66
MW-101	5/13/1993	15.14	10.32	4.82
MW-101	6/10/1993	15.14	10.45	4.69
MW-101	7/8/1993	15.14	10.75	4.39
MW-101	8/3/1993	15.14	11.09	4.05
MW-101	9/8/1993	15.14	11.52	3.62
MW-101	10/8/1993	15.14	11.89	3.25
MW-101	11/5/1993	15.14	12.13	3.01
MW-101	12/3/1993	15.14	12.14	3.00
MW-101	1/5/1994	15.14	11.16	3.98
MW-101	2/4/1994	15.14	11.02	4.12
MW-101	8/28/1995	15.14	11.25	3.89
MW-101	9/27/1995	15.14	11.49	3.65
MW-101	4/27/1999	15.14	9.22	5.92
MW-101	7/14/1999	15.14	10.73	4.41
MW-101	10/18/1999	15.14	11.78	3.36
MW-101	1/11/2000	15.14	9.73	5.41
MW-101	4/5/2000	15.14	9.85	5.29
MW-101	7/18/2000	15.14	11.01	4.13
MW-101	10/2/2000	15.14	11.85	3.29
MW-101	1/22/2001	15.14	11.67	3.47
MW-101	7/23/2001	15.14	12.33	2.81
MW-101	10/16/2001	15.14	13.15	1.99
MW-101	4/23/2002	15.14	10.81	4.33
MW-101	7/18/2002	15.14	11.88	3.26
MW-101	10/23/2002	15.14	12.73	2.41
MW-101	1/30/2003	15.14	10.09	5.05
MW-101	4/15/2003	15.14	10.36	4.78
MW-101	7/17/2003	15.14	11.94	3.20
MW-101	10/15/2003	15.14	12.68	2.46
MW-101	1/13/2004	15.14	10.06	5.08
MW-101	4/19/2004	18.21	11.13	7.08
MW-101	7/27/2004	18.21	12.07	6.14
MW-101	10/18/2004	18.21	12.19	6.02
MW-101	1/24/2005	18.21	10.61	7.60
MW-101	4/18/2005	18.21	10.86	7.35
MW-101	7/12/2005	18.21	11.61	6.60
MW-101	10/18/2005	18.21	12.45	5.76
MW-101	1/25/2006	18.21	9.21	9.00
MW-101	4/25/2006	18.21	10.75	7.46
MW-101	10/11/2006	18.21	12.39	5.82
MW-101	11/18/2008	18.21	11.45	6.76
MW-101	11/16/2009	18.21	10.95	7.26
MW-101	10/26/2010	18.21	11.36	6.85
MW-101	10/25/2011	18.21	12.15	6.06

**Groundwater Elevation Data
Shell Harbor Island Terminal-Seattle, Washington
Incident Number 300036**

Location	Date	MP Elevation (ft)	Depth to Water (ft)	Water Elevation (ft)
MW-102	4/6/1993	12.51	7.99	4.52
MW-102	5/13/1993	12.51	7.82	4.69
MW-102	6/10/1993	12.51	7.80	4.71
MW-102	7/8/1993	12.51	8.32	4.19
MW-102	8/3/1993	12.51	8.68	3.83
MW-102	9/8/1993	12.51	9.03	3.48
MW-102	10/8/1993	12.51	9.44	3.07
MW-102	11/5/1993	12.51	9.62	2.89
MW-102	12/3/1993	12.51	9.42	3.09
MW-102	1/5/1994	12.51	8.50	4.01
MW-102	2/4/1994	12.51	8.52	3.99
MW-102	8/28/1995	12.51	8.86	3.65
MW-102	9/27/1995	12.51	9.17	3.34
MW-102	4/27/1999	12.51	6.68	5.83
MW-102	7/14/1999	12.51	8.40	4.11
MW-102	10/18/1999	12.51	9.38	3.13
MW-102	1/11/2000	12.51	7.43	5.08
MW-102	4/5/2000	12.51	7.55	4.96
MW-102	7/18/2000	12.51	8.37	4.14
MW-102	10/2/2000	12.51	9.45	3.06
MW-102	1/22/2001	12.51	9.12	3.39
MW-102	7/23/2001	12.51	9.91	2.60
MW-102	4/23/2002	12.51	8.17	4.34
MW-102	7/18/2002	12.51	9.44	3.07
MW-102	7/18/2002	12.51	9.44	3.07
MW-102	10/23/2002	12.51	10.05	2.46
MW-102	1/28/2003	12.51	7.20	5.31
MW-102	4/15/2003	12.51	7.75	4.76
MW-102	7/17/2003	12.51	9.51	3.00
MW-102	10/15/2003	12.51	10.11	2.40
MW-102	1/13/2004	12.51	7.49	5.02
MW-102	4/19/2004	15.60	8.72	6.88
MW-102	7/27/2004	15.60	9.62	5.98
MW-102	10/18/2004	15.60	9.54	6.06
MW-102	1/24/2005	15.60	7.92	7.68
MW-102	4/18/2005	15.60	8.20	7.40
MW-102	7/12/2005	15.60	9.10	6.50
MW-102	10/18/2005	15.60	9.87	5.73
MW-102	1/25/2006	15.60	3.94	11.66
MW-102	4/25/2006	15.60	8.24	7.36
MW-102	10/11/2006	15.60	9.84	5.76
MW-102	11/19/2008	15.60	8.79	6.81
MW-102	11/16/2009	15.60	8.10	7.50
MW-102	10/28/2010	15.60	8.64	6.96
MW-102	10/25/2011	15.60	9.59	6.01

Groundwater Elevation Data
Shell Harbor Island Terminal-Seattle, Washington
Incident Number 300036

Location	Date	MP Elevation (ft)	Depth to Water (ft)	Water Elevation (ft)
MW-104	4/6/1993	10.22	5.98	4.24
MW-104	5/13/1993	10.22	6.79	3.43
MW-104	6/10/1993	10.22	5.85	4.37
MW-104	7/8/1993	10.22	6.13	4.09
MW-104	8/3/1993	10.22	6.38	3.84
MW-104	9/8/1993	10.22	6.72	3.50
MW-104	10/8/1993	10.22	7.05	3.17
MW-104	11/5/1993	10.22	7.26	2.96
MW-104	12/3/1993	10.22	7.26	2.96
MW-104	1/5/1994	10.22	6.64	3.58
MW-104	2/4/1994	10.22	6.46	3.76
MW-104	8/28/1995	10.22	6.43	3.79
MW-104	9/27/1995	10.22	6.70	3.52
MW-104	4/27/1999	10.22	2.41	7.81
MW-104	7/14/1999	10.22	5.62	4.60
MW-104	10/18/1999	10.22	6.80	3.42
MW-104	1/11/2000	10.22	5.04	5.18
MW-104	4/5/2000	10.22	4.80	5.42
MW-104	7/18/2000	10.22	6.15	4.07
MW-104	10/2/2000	10.22	7.02	3.20
MW-104	1/22/2001	10.22	6.45	3.77
MW-104	7/23/2001	10.22	7.39	2.83
MW-104	10/16/2001	10.22	8.59	1.63
MW-104	4/23/2002	10.22	5.91	4.31
MW-104	7/18/2002	10.22	7.07	3.15
MW-104	10/23/2002	10.22	7.74	2.48
MW-104	1/28/2003	10.22	6.03	4.19
MW-104	4/15/2003	10.22	5.75	4.47
MW-104	7/17/2003	10.22	7.08	3.14
MW-104	10/15/2003	10.22	7.76	2.46
MW-104	1/13/2004	10.22	5.58	4.64
MW-104	4/19/2004	13.46	6.30	7.16
MW-104	7/27/2004	13.46	7.25	6.21
MW-104	10/18/2004	13.46	7.34	6.12
MW-104	1/24/2005	13.46	6.27	7.19
MW-104	4/18/2005	13.46	6.22	7.24
MW-104	7/12/2005	13.46	6.81	6.65
MW-104	10/18/2005	13.46	7.55	5.91
MW-104	1/25/2006	13.46	4.78	8.68
MW-104	4/25/2006	13.46	5.82	7.64
MW-104	10/11/2006	13.46	7.54	5.92
MW-104	11/18/2008	13.46	6.74	6.72
MW-104	4/8/2009	13.46	6.27	7.19
MW-104	11/16/2009	13.46	6.39	7.07
MW-104	4/27/2010	13.46	5.45	8.01
MW-104	10/26/2010	13.46	6.53	6.93
MW-104	10/25/2011	13.46	7.15	6.31

**Groundwater Elevation Data
Shell Harbor Island Terminal-Seattle, Washington
Incident Number 300036**

Location	Date	MP Elevation (ft)	Depth to Water (ft)	Water Elevation (ft)
MW-105	4/6/1993	9.05	4.97	4.08
MW-105	5/13/1993	9.05	4.88	4.17
MW-105	6/10/1993	9.05	4.83	4.22
MW-105	7/8/1993	9.05	5.20	3.85
MW-105	8/3/1993	9.05	5.43	3.62
MW-105	9/8/1993	9.05	6.76	2.29
MW-105	10/8/1993	9.05	6.06	2.99
MW-105	11/5/1993	9.05	6.28	2.77
MW-105	12/3/1993	9.05	6.18	2.87
MW-105	1/5/1994	9.05	5.65	3.40
MW-105	2/4/1994	9.05	5.63	3.42
MW-105	8/28/1995	9.05	5.39	3.66
MW-105	9/27/1995	9.05	5.70	3.35
MW-105	4/27/1999	9.05	3.39	5.66
MW-105	7/14/1999	9.05	4.58	4.47
MW-105	10/18/1999	9.05	5.79	3.26
MW-105	1/11/2000	9.05	3.97	5.08
MW-105	4/5/2000	9.05	3.84	5.21
MW-105	7/18/2000	9.05	4.90	4.15
MW-105	10/2/2000	9.05	6.22	2.83
MW-105	1/22/2001	9.05	5.56	3.49
MW-105	7/23/2001	9.05	6.48	2.57
MW-105	4/23/2002	9.05	5.25	3.80
MW-105	7/18/2002	9.05	6.17	2.88
MW-105	10/23/2002	9.05	6.78	2.27
MW-105	1/28/2003	9.05	5.02	4.03
MW-105	4/15/2003	9.05	4.97	4.08
MW-105	7/17/2003	9.05	6.2	2.85
MW-105	10/15/2003	9.05	6.66	2.39
MW-105	1/13/2004	9.05	5.01	4.04
MW-105	4/19/2004	12.18	5.51	6.67
MW-105	7/27/2004	12.18	6.28	5.90
MW-105	10/18/2004	12.18	6.15	6.03
MW-105	1/24/2005	12.18	5.02	7.16
MW-105	4/18/2005	12.18	5.19	6.99
MW-105	7/12/2005	12.18	5.82	6.36
MW-105	10/18/2005	12.18	6.44	5.74
MW-105	1/25/2006	12.18	4.05	8.13
MW-105	4/25/2006	12.18	5.00	7.18
MW-105	10/11/2006	12.18	6.51	5.67
MW-105	11/19/2008	12.18	5.52	6.66
MW-105	11/16/2009	12.18	5.03	7.15
MW-105	10/26/2010	12.18	5.33	6.85
MW-105	10/25/2011	12.18	6.06	6.12

**Groundwater Elevation Data
Shell Harbor Island Terminal-Seattle, Washington
Incident Number 300036**

Location	Date	MP Elevation (ft)	Depth to Water (ft)	Water Elevation (ft)
MW-111	4/6/1993	8.61	4.95	3.66
MW-111	5/13/1993	8.61	4.87	3.74
MW-111	6/10/1993	8.61	4.84	3.77
MW-111	7/8/1993	8.61	5.11	3.50
MW-111	8/3/1993	8.61	5.29	3.32
MW-111	9/8/1993	8.61	5.56	3.05
MW-111	10/8/1993	8.61	5.81	2.80
MW-111	11/5/1993	8.61	5.97	2.64
MW-111	12/3/1993	8.61	5.93	2.68
MW-111	1/5/1994	8.61	5.45	3.16
MW-111	2/4/1994	8.61	5.28	3.33
MW-111	8/28/1995	8.61	5.28	3.33
MW-111	9/27/1995	8.61	5.45	3.16
MW-111	4/27/1999	8.61	3.55	5.06
MW-111	7/14/1999	8.61	4.65	3.96
MW-111	10/18/1999	8.61	5.59	3.02
MW-111	1/11/2000	8.61	4.18	4.43
MW-111	4/5/2000	8.61	3.94	4.67
MW-111	7/13/2000	8.61	5.30	3.31
MW-111	10/2/2000	8.61	5.68	2.93
MW-111	1/22/2001	8.61	5.37	3.24
MW-111	7/23/2001	8.61	6.22	2.39
MW-111	10/16/2001	8.61	7.37	1.24
MW-111	4/23/2002	8.61	5.28	3.33
MW-111	7/18/2002	8.61	5.94	2.67
MW-111	10/23/2002	8.61	6.50	2.11
MW-111	1/28/2003	8.61	5.05	3.56
MW-111	4/15/2003	8.61	5.03	3.58
MW-111	7/17/2003	8.61	6.05	2.56
MW-111	10/15/2003	8.61	6.45	2.16
MW-111	1/13/2004	8.61	4.84	3.77
MW-111	4/19/2004	11.88	5.46	6.42
MW-111	7/27/2004	11.88	6.16	5.72
MW-111	10/18/2004	11.88	6.11	5.77
MW-111	1/24/2005	11.88	5.33	6.55
MW-111	4/18/2005	11.88	5.27	6.61
MW-111	7/12/2005	11.88	5.75	6.13
MW-111	10/18/2005	11.88	6.26	5.62
MW-111	1/25/2006	11.88	4.42	7.46
MW-111	4/25/2006	11.88	4.88	7.00
MW-111	10/11/2006	11.88	6.30	5.58
MW-111	11/19/2008	11.88	8.62	3.26
MW-111	11/16/2009	11.88	5.30	6.58
MW-111	10/26/2010	11.88	5.35	6.53
MW-111	10/25/2011	11.88	5.89	5.99

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Location	Date	MP Elevation (ft)	Depth to Water (ft)	Water Elevation (ft)
MW-112	4/6/1993	9.98	6.69	3.29
MW-112	5/13/1993	9.98	6.61	3.37
MW-112	6/10/1993	9.98	6.51	3.47
MW-112	7/8/1993	9.98	6.83	3.15
MW-112	8/3/1993	9.98	7.00	2.98
MW-112	9/8/1993	9.98	7.24	2.74
MW-112	10/8/1993	9.98	7.50	2.48
MW-112	11/5/1993	9.98	7.56	2.42
MW-112	12/3/1993	9.98	7.41	2.57
MW-112	1/5/1994	9.98	6.93	3.05
MW-112	2/4/1994	9.98	6.83	3.15
MW-112	8/28/1995	9.98	6.98	3.00
MW-112	9/27/1995	9.98	7.13	2.85
MW-112	4/27/1999	9.98	5.66	4.32
MW-112	7/14/1999	9.98	6.57	3.41
MW-112	10/18/1999	9.98	7.36	2.62
MW-112	1/11/2000	9.98	5.89	4.09
MW-112	4/5/2000	9.98	5.81	4.17
MW-112	7/18/2000	9.98	7.11	2.87
MW-112	10/2/2000	9.98	7.57	2.41
MW-112	4/25/2006	9.98	6.44	3.54
MW-112A	4/24/2002	9.98	6.85	3.13
MW-112A	7/18/2002	9.98	7.22	2.76
MW-112A	10/23/2002	9.98	7.52	2.46
MW-112A	1/28/2003	9.98	6.25	3.73
MW-112A	4/15/2003	9.98	6.47	3.51
MW-112A	7/17/2003	9.98	7.3	2.68
MW-112A	10/15/2003	9.98	7.49	2.49
MW-112A	1/13/2004	9.98	6.2	3.78
MW-112A	4/19/2004	12.52	6.93	5.59
MW-112A	7/27/2004	12.52	7.41	5.11
MW-112A	10/18/2004	12.52	7.15	5.37
MW-112A	1/24/2005	12.52	6.52	6.00
MW-112A	4/18/2005	12.52	6.6	5.92
MW-112A	7/12/2005	12.52	7.1	5.42
MW-112A	10/18/2005	12.52	7.34	5.18
MW-112A	1/25/2006	12.52	5.95	6.57
MW-112A	10/11/2006	12.52	7.43	5.09
MW-112A	11/19/2008	12.52	6.73	5.79
MW-112A	11/16/2009	12.52	6.35	6.17
MW-112A	10/29/2010	12.52	6.51	6.01
MW-112A	10/25/2011	12.52	7.03	5.49
MW-201	4/6/1993	17.07	14.03	3.04
MW-201	5/13/1993	17.07	14.02	3.05
MW-201	6/10/1993	17.07	13.97	3.10
MW-201	7/8/1993	17.07	14.25	2.82
MW-201	8/3/1993	17.07	14.48	2.59
MW-201	9/8/1993	17.07	14.68	2.39

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MW-201	10/8/1993	17.07	14.90	2.17
MW-201	11/5/1993	17.07	15.03	2.04
MW-201	12/3/1993	17.07	14.96	2.11
MW-201	1/5/1994	17.07	14.10	2.97
MW-201	2/4/1994	17.07	14.32	2.75
MW-201	8/28/1995	17.07	14.49	2.58
MW-201	9/27/1995	17.07	14.56	2.51
MW-201	4/27/1999	17.07	13.04	4.03
MW-201	7/14/1999	17.07	14.26	2.81
MW-201	10/18/1999	17.07	14.93	2.14
MW-201	1/11/2000	17.07	13.03	4.04
MW-201	4/5/2000	17.07	13.90	3.17
MW-201	7/18/2000	17.07	14.09	2.98
MW-201	10/2/2000	17.07	14.82	2.25
MW-201	1/22/2001	17.07	14.43	2.64
MW-201	7/23/2001	17.07	14.95	2.12
MW-201	10/16/2001	17.07	16.11	0.96
MW-201	4/24/2002	17.07	14.23	2.84
MW-201	7/18/2002	17.07	14.73	2.34
MW-201	10/23/2002	17.07	15.13	1.94
MW-201	1/28/2003	17.07	13.13	3.94
MW-201	4/15/2003	17.07	13.58	3.49
MW-201	7/17/2003	17.07	14.70	2.37
MW-201	10/15/2003	17.07	14.99	2.08
MW-201	1/13/2004	17.07	12.71	4.36
MW-201	4/19/2004	20.18	14.07	6.11
MW-201	7/27/2004	20.18	14.70	5.48
MW-201	10/18/2004	20.18	14.70	5.48
MW-201	1/24/2005	20.18	13.44	6.74
MW-201	4/18/2005	20.18	13.73	6.45
MW-201	7/12/2005	20.18	14.47	5.71
MW-201	10/18/2005	20.18	14.99	5.19
MW-201	1/25/2006	20.18	12.61	7.57
MW-201	4/25/2006	20.18	13.94	6.24
MW-201	10/11/2006	20.18	15.00	5.18
MW-201	11/20/2008	20.18	13.77	6.41
MW-201	11/16/2009	20.18	13.74	6.44
MW-201	10/27/2010	20.18	14.42	5.76
MW-201	10/26/2011	20.18	14.94	5.24
MW-202	4/6/1993	16.77	13.23	3.54
MW-202	5/13/1993	16.77	13.17	3.60
MW-202	6/10/1993	16.77	13.26	3.51
MW-202	7/8/1993	16.77	13.54	3.23
MW-202	8/3/1993	16.77	13.76	3.01
MW-202	9/8/1993	16.77	14.04	2.73
MW-202	10/8/1993	16.77	14.30	2.47
MW-202	11/5/1993	16.77	14.48	2.29
MW-202	12/3/1993	16.77	14.34	2.43

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Location	Date	MP Elevation (ft)	Depth to Water (ft)	Water Elevation (ft)
MW-202	1/5/1994	16.77	13.73	3.04
MW-202	2/4/1994	16.77	13.63	3.14
MW-202	8/28/1995	16.77	13.78	2.99
MW-202	9/27/1995	16.77	13.95	2.82
MW-202	4/27/1999	16.77	12.38	4.39
MW-202	7/14/1999	16.77	13.57	3.20
MW-202	10/18/1999	16.77	14.31	2.46
MW-202	1/11/2000	16.77	12.95	3.82
MW-202	4/5/2000	16.77	12.96	3.81
MW-202	7/18/2000	16.77	13.21	3.56
MW-202	10/2/2000	16.77	14.25	2.52
MW-202	1/22/2001	16.77	14.46	2.31
MW-202	7/23/2001	16.77	14.64	2.13
MW-202	10/16/2001	16.77	15.81	0.96
MW-202	4/24/2002	16.77	13.80	2.97
MW-202	7/18/2002	16.77	14.28	2.49
MW-202	10/23/2002	16.77	14.73	2.04
MW-202	1/28/2003	16.77	12.95	3.82
MW-202	4/15/2003	16.77	13.13	3.64
MW-202	7/17/2003	16.77	14.30	2.47
MW-202	10/15/2003	16.77	14.62	2.15
MW-202	1/13/2004	16.77	12.81	3.96
MW-202	4/19/2004	19.86	13.61	6.25
MW-202	7/27/2004	19.86	14.29	5.57
MW-202	10/18/2004	19.86	14.30	5.56
MW-202	1/24/2005	19.86	13.29	6.57
MW-202	4/18/2005	19.86	13.51	6.35
MW-202	7/12/2005	19.86	14.02	5.84
MW-202	10/18/2005	19.86	14.59	5.27
MW-202	1/25/2006	19.86	12.38	7.48
MW-202	4/25/2006	19.86	13.43	6.43
MW-202	10/11/2006	19.86	14.58	5.28
MW-202	11/20/2008	19.86	13.92	5.94
MW-202	4/7/2009	19.86	13.71	6.15
MW-202	11/16/2009	19.86	13.70	6.16
MW-202	4/27/2010	19.86	13.24	6.62
MW-202	10/27/2010	19.86	14.04	5.82
MW-202	10/26/2011	19.86	14.45	5.41
MW-203	4/6/1993	11.04	7.39	3.65
MW-203	5/13/1993	11.04	7.31	3.73
MW-203	6/10/1993	11.04	7.40	3.64
MW-203	7/8/1993	11.04	7.66	3.38
MW-203	8/3/1993	11.04	7.93	3.11
MW-203	9/8/1993	11.04	8.20	2.84
MW-203	10/8/1993	11.04	8.46	2.58
MW-203	11/5/1993	11.04	8.65	2.39
MW-203	12/3/1993	11.04	8.64	2.40
MW-203	1/5/1994	11.04	7.99	3.05

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Location	Date	MP Elevation (ft)	Depth to Water (ft)	Water Elevation (ft)
MW-203	2/4/1994	11.04	7.88	3.16
MW-203	8/28/1995	11.04	7.86	3.18
MW-203	9/27/1995	11.04	8.02	3.02
MW-203	4/27/1999	11.04	6.32	4.72
MW-203	7/14/1999	11.04	7.58	3.46
MW-203	10/18/1999	11.04	8.42	2.62
MW-203	1/11/2000	11.04	6.98	4.06
MW-203	4/5/2000	11.04	6.92	4.12
MW-203	7/18/2000	11.04	8.00	3.04
MW-203	10/2/2000	11.04	8.40	2.64
MW-203	1/22/2001	11.04	8.47	2.57
MW-203	7/23/2001	11.04	8.69	2.35
MW-203	10/16/2001	11.04	9.73	1.31
MW-203	4/24/2002	11.04	7.45	3.59
MW-203	10/23/2002	11.04	8.80	2.24
MW-203	1/28/2003	11.04	6.76	4.28
MW-203	4/15/2003	11.04	7.05	3.99
MW-203	7/17/2003	11.04	8.25	2.79
MW-203	1/13/2004	11.04	6.71	4.33
MW-203	4/19/2004	13.99	7.58	6.41
MW-203	7/27/2004	13.99	8.25	5.74
MW-203	10/18/2004	13.99	8.34	5.65
MW-203	1/24/2005	13.99	7.31	6.68
MW-203	4/18/2005	13.99	7.43	6.56
MW-203	7/12/2005	13.99	7.96	6.03
MW-203	10/18/2005	13.99	8.64	5.35
MW-203	1/25/2006	13.99	6.41	7.58
MW-203	4/25/2006	13.99	7.18	6.81
MW-203	10/11/2006	13.99	8.58	5.41
MW-203	11/18/2008	13.99	8.01	5.98
MW-203	4/8/2009	13.99	7.63	6.36
MW-203	11/16/2009	13.99	4.97	9.02
MW-203	4/26/2010	13.99	7.17	6.82
MW-203	10/25/2010	13.99	8.10	5.89
MW-203	10/26/2011	13.99	5.45	8.54
MW-204	4/6/1993	14.21	10.97	3.24
MW-204	5/13/1993	14.21	10.92	3.29
MW-204	6/10/1993	14.21	10.98	3.23
MW-204	7/8/1993	14.21	11.20	3.01
MW-204	8/3/1993	14.21	11.44	2.77
MW-204	9/8/1993	14.21	11.64	2.57
MW-204	10/8/1993	14.21	11.85	2.36
MW-204	11/5/1993	14.21	12.03	2.18
MW-204	12/3/1993	14.21	12.01	2.20
MW-204	1/5/1994	14.21	11.42	2.79
MW-204	2/4/1994	14.21	11.35	2.86
MW-204	8/28/1995	14.21	11.58	2.63
MW-204	9/27/1995	14.21	11.57	2.64

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Location	Date	MP Elevation (ft)	Depth to Water (ft)	Water Elevation (ft)
MW-204	4/5/2000	14.21	Not Measured	Not Measured
MW-204	10/2/2000	14.21	Not Measured	Not Measured
MW-204	1/22/2001	14.21	11.69	2.52
MW-204	7/23/2001	14.21	12.05	2.16
MW-204	10/16/2001	14.21	13.17	1.04
MW-204	7/27/2004	14.21	11.67	2.54
MW-204	10/18/2004	17.27	11.71	5.56
MW-204	1/24/2005	17.27	10.72	6.55
MW-204	4/18/2005	17.27	10.98	6.29
MW-204	7/12/2005	17.27	11.4	5.87
MW-204	10/18/2005	17.27	11.98	5.29
MW-204	1/25/2006	17.27	9.96	7.31
MW-204	10/11/2006	17.27	11.96	5.31
MW-204	11/20/2008	17.27	11.45	5.82
MW-204	11/16/2009	17.27	11.20	6.07
MW-204	10/27/2010	17.27	11.54	5.73
MW-204	10/27/2011	17.27	10.71	6.56
MW-206	4/6/1993	10.75	9.83	0.92
MW-206	5/13/1993	10.75	6.72	4.03
MW-206	6/10/1993	10.75	6.78	3.97
MW-206	7/8/1993	10.75	7.08	3.67
MW-206	8/3/1993	10.75	7.35	3.40
MW-206	9/8/1993	10.75	7.66	3.09
MW-206	10/8/1993	10.75	7.95	2.80
MW-206	11/5/1993	10.75	8.15	2.60
MW-206	12/3/1993	10.75	8.17	2.58
MW-206	1/5/1994	10.75	7.42	3.33
MW-206	2/4/1994	10.75	7.24	3.51
MW-206	8/28/1995	10.75	7.01	3.74
MW-206	9/27/1995	10.75	7.19	3.56
MW-206	4/27/1999	10.75	5.59	5.16
MW-206	7/14/1999	10.75	6.97	3.78
MW-206	10/18/1999	10.75	7.88	2.87
MW-206	1/11/2000	10.75	6.34	4.41
MW-206	4/5/2000	10.75	6.32	4.43
MW-206	7/18/2000	10.75	7.11	3.64
MW-206	10/2/2000	10.75	7.92	2.83
MW-206	1/22/2001	10.75	8.93	1.82
MW-206	4/25/2006	10.75	9.30	1.45
MW-206	10/11/2006	10.75	10.44	0.31
MW-206A	4/24/2002	10.75	7.43	3.32
MW-206A	7/18/2002	10.75	8.07	2.68
MW-206A	10/23/2002	10.75	8.55	2.20
MW-206A	1/28/2003	10.75	6.40	4.35
MW-206A	4/15/2003	10.75	5.26	5.49
MW-206A	7/17/2003	10.75	8.06	2.69
MW-206A	4/19/2004	15.9	9.51	6.39
MW-206A	7/27/2004	15.9	10.23	5.67

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MW-206A	10/18/2004	15.9	10.17	5.73
MW-206A	1/24/2005	15.9	9.18	6.72
MW-206A	4/18/2005	15.9	9.38	6.52
MW-206A	7/12/2005	15.9	9.87	6.03
MW-206A	10/18/2005	15.9	10.50	5.40
MW-206A	1/25/2006	15.9	8.23	7.67
MW-206A	11/20/2008	15.9	9.81	6.09
MW-206A	11/16/2009	15.9	9.48	6.42
MW-206A	10/25/2010	15.9	9.74	6.16
MW-206A	10/26/2011	15.9	10.25	5.65
MW-213	7/23/2001	8.57	10.17	-1.60
MW-213	10/16/2001	8.57	5.81	2.76
MW-213	4/24/2002	8.57	7.34	1.23
MW-213	7/18/2002	8.57	7.39	1.18
MW-213	10/23/2002	8.57	5.04	3.53
MW-213	1/28/2003	8.57	4.60	3.97
MW-213	4/15/2003	8.57	4.43	4.14
MW-213	7/17/2003	8.57	10.24	-1.67
MW-213	10/15/2003	8.57	5.85	2.72
MW-213	1/13/2004	8.57	5.02	3.55
MW-213	4/19/2004	8.57	7.91	0.66
MW-213	7/27/2004	8.57	6.94	1.63
MW-213	10/18/2004	8.57	5.70	2.87
MW-213	1/24/2005	8.57	4.70	3.87
MW-213	4/18/2005	8.57	7.43	1.14
MW-213	7/12/2005	8.57	8.72	-0.15
MW-213	10/18/2005	8.57	7.24	1.33
MW-213	1/25/2006	8.57	5.79	2.78
MW-213	4/25/2006	8.57	7.82	0.75
MW-213	10/11/2006	8.57	6.09	2.48
MW-213	11/19/2008	8.57	5.98	2.59
MW-213	4/7/2009	8.57	7.69	0.88
MW-213	11/16/2009	8.57	4.97	3.60
MW-213	4/26/2010	8.57	8.22	0.35
MW-213	10/28/2010	8.57	5.33	3.24
MW-213	10/25/2011	8.57	7.43	1.14
MW-214	7/23/2001	8.63	10.37	-1.74
MW-214	10/19/2001	8.63	5.74	2.89
MW-214	4/24/2002	8.63	7.94	0.69
MW-214	7/18/2002	8.63	7.25	1.38
MW-214	10/23/2002	8.63	5.85	2.78
MW-214	1/28/2003	8.63	4.25	4.38
MW-214	4/15/2003	8.63	4.66	3.97
MW-214	7/17/2003	8.63	10.40	-1.77
MW-214	10/15/2003	8.63	4.89	3.74
MW-214	1/13/2004	8.63	4.86	3.77
MW-214	4/19/2004	8.63	7.92	0.71
MW-214	7/27/2004	8.63	6.42	2.21

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Location	Date	MP Elevation (ft)	Depth to Water (ft)	Water Elevation (ft)
MW-214	10/18/2004	8.63	5.37	3.26
MW-214	1/24/2005	8.63	5.00	3.63
MW-214	4/18/2005	8.63	7.65	0.98
MW-214	7/12/2005	8.63	8.82	-0.19
MW-214	10/18/2005	8.63	7.18	1.45
MW-214	1/25/2006	8.63	5.96	2.67
MW-214	4/25/2006	8.63	7.80	0.83
MW-214	10/11/2006	8.63	5.95	2.68
MW-214	11/19/2008	8.63	5.50	3.13
MW-214	4/7/2009	12.92	7.05	5.87
MW-214	11/16/2009	12.92	5.28	7.64
MW-214	4/26/2010	12.92	7.80	5.12
MW-214	10/28/2010	12.92	5.25	7.67
MW-214	10/25/2011	12.92	7.78	5.14
SH-04	5/13/1993	12.92	9.69	3.23
SH-04	7/8/1993	12.92	9.94	2.98
SH-04	8/3/1993	12.92	10.15	2.77
SH-04	9/8/1993	12.92	10.50	2.42
SH-04	10/8/1993	12.92	10.72	2.20
SH-04	11/5/1993	12.92	10.88	2.04
SH-04	12/3/1993	12.92	10.78	2.14
SH-04	1/5/1994	12.92	10.20	2.72
SH-04	2/4/1994	12.92	10.12	2.80
SH-04	8/28/1995	12.92	10.15	2.77
SH-04	9/27/1995	12.92	10.37	2.55
SH-04	4/27/1999	12.92	8.55	4.37
SH-04	7/14/1999	12.92	7.63	5.29
SH-04	10/18/1999	12.92	10.58	2.34
SH-04	1/11/2000	12.92	9.06	3.86
SH-04	4/5/2000	12.92	8.94	3.98
SH-04	7/18/2000	12.92	9.96	2.96
SH-04	10/2/2000	12.92	10.62	2.30
SH-04	1/22/2001	12.92	10.13	2.79
SH-04	7/23/2001	12.92	6.98	5.94
SH-04	10/16/2001	12.92	12.20	0.72
SH-04	4/23/2002	12.92	9.91	3.01
SH-04	7/18/2002	12.92	10.74	2.18
SH-04	10/23/2002	12.92	11.27	1.65
SH-04	1/28/2003	12.92	9.73	3.19
SH-04	4/15/2003	12.92	9.69	3.23
SH-04	7/17/2003	12.92	10.78	2.14
SH-04	10/15/2003	12.92	11.19	1.73
SH-04	1/13/2004	12.92	9.61	3.31
SH-04	4/19/2004	16.62	10.05	6.57
SH-04	7/27/2004	16.62	10.90	5.72
SH-04	10/18/2004	16.62	10.89	5.73
SH-04	1/24/2005	16.62	10.03	6.59
SH-04	4/18/2005	16.62	10.03	6.59

Groundwater Elevation Data
Shell Harbor Island Terminal-Seattle, Washington
Incident Number 300036

Location	Date	MP Elevation (ft)	Depth to Water (ft)	Water Elevation (ft)
SH-04	7/12/2005	16.62	10.51	6.11
SH-04	10/18/2005	16.62	11.01	5.61
SH-04	1/25/2006	16.62	8.98	7.64
SH-04	10/11/2006	16.62	11.06	5.56
SH-04	11/20/2008	16.62	10.40	6.22
SH-04	4/8/2009	16.62	10.01	6.61
SH-04	11/16/2009	16.62	10.09	6.53
SH-04	4/27/2010	16.62	9.33	7.29
SH-04	10/25/2010	16.62	10.23	6.39
SH-04	10/27/2011	16.62	10.68	5.94
TES-MW-1	4/6/1993	13.10	8.79	4.31
TES-MW-1	5/13/1993	13.10	8.61	4.49
TES-MW-1	6/10/1993	13.10	8.63	4.47
TES-MW-1	7/8/1993	13.10	8.98	4.12
TES-MW-1	8/3/1993	13.10	9.28	3.82
TES-MW-1	9/8/1993	13.10	8.66	4.44
TES-MW-1	10/8/1993	13.10	9.98	3.12
TES-MW-1	11/5/1993	13.1	10.20	2.90
TES-MW-1	12/3/1993	13.10	10.17	2.93
TES-MW-1	1/5/1994	13.10	9.30	3.80
TES-MW-1	2/4/1994	13.10	9.19	3.91
TES-MW-1	8/28/1995	13.10	9.26	3.84
TES-MW-1	9/27/1995	13.10	9.53	3.57
TES-MW-1	4/27/1999	13.10	7.49	5.61
TES-MW-1	7/14/1999	13.10	8.90	4.20
TES-MW-1	10/18/1999	13.10	9.88	3.22
TES-MW-1	1/11/2000	13.10	7.59	5.51
TES-MW-1	4/5/2000	13.10	8.20	4.90
TES-MW-1	10/2/2000	13.10	9.99	3.11
TES-MW-1	1/22/2001	13.10	9.65	3.45
TES-MW-1	7/23/2001	13.10	10.77	2.33
TES-MW-1	10/16/2001	13.10	11.93	1.17
TES-MW-1	4/23/2002	13.10	9.32	3.78
TES-MW-1	7/18/2002	13.10	10.34	2.76
TES-MW-1	10/23/2002	13.10	10.92	2.18
TES-MW-1	1/30/2003	13.10	8.43	4.67
TES-MW-1	4/15/2003	13.10	8.89	4.21
TES-MW-1	7/17/2003	13.10	10.41	2.69
TES-MW-1	10/15/2003	13.10	10.82	2.28
TES-MW-1	1/13/2004	13.10	8.82	4.28
TES-MW-1	4/19/2004	16.15	9.76	6.39
TES-MW-1	7/27/2004	16.15	10.48	5.67
TES-MW-1	10/18/2004	16.15	10.27	5.88
TES-MW-1	1/24/2005	16.15	9.26	6.89

Groundwater Elevation Data
Shell Harbor Island Terminal-Seattle, Washington
Incident Number 300036

Location	Date	MP Elevation (ft)	Depth to Water (ft)	Water Elevation (ft)
TES-MW-1	4/18/2005	16.15	9.46	6.69
TES-MW-1	7/12/2005	16.15	10.10	6.05
TES-MW-1	10/18/2005	16.15	10.70	5.45
TES-MW-1	1/25/2006	16.15	8.17	7.98
TES-MW-1	4/25/2006	16.15	9.33	6.82
TES-MW-1	10/11/2006	16.15	10.66	5.49
TES-MW-1	11/18/2008	16.15	9.85	6.30
TES-MW-1	11/16/2009	16.15	9.35	6.80
TES-MW-1	10/26/2010	16.15	9.66	6.49
TES-MW-1	10/27/2011	16.15	10.42	5.73
TX-03	4/6/1993	9.58	5.57	4.01
TX-03	6/10/1993	9.58	5.50	4.08
TX-03	7/8/1993	9.58	5.81	3.77
TX-03	8/3/1993	9.58	6.08	3.50
TX-03	9/8/1993	9.58	6.42	3.16
TX-03	10/8/1993	9.58	6.74	2.84
TX-03	11/5/1993	9.58	6.91	2.67
TX-03	12/3/1993	9.58	6.90	2.68
TX-03	1/5/1994	9.58	6.16	3.42
TX-03	2/4/1994	9.58	Not Measured	Not Measured
TX-03	8/28/1995	9.58	6.16	3.42
TX-03	9/27/1995	9.58	Not Measured	Not Measured
TX-03	4/27/1999	9.58	4.68	4.90
TX-03	7/14/1999	9.58	5.87	3.71
TX-03	10/18/1999	9.58	6.71	2.87
TX-03	1/11/2000	9.58	5.30	4.28
TX-03	4/5/2000	9.58	5.31	4.27
TX-03	7/18/2000	9.58	5.98	3.60
TX-03	10/2/2000	9.58	6.65	2.93
TX-03A	4/23/2002	9.58	6.25	3.33
TX-03A	7/18/2002	9.58	6.75	2.83
TX-03A	10/23/2002	9.58	7.15	2.43
TX-03A	1/28/2003	9.58	5.40	4.18
TX-03A	4/15/2003	9.58	5.76	3.82
TX-03A	7/17/2003	9.58	6.76	2.82
TX-03A	10/15/2003	9.58	7.05	2.53
TX-03A	1/13/2004	9.58	5.46	4.12
TX-03A	4/19/2004	12.26	6.22	6.04
TX-03A	7/27/2004	12.26	6.78	5.48
TX-03A	10/18/2004	12.26	6.69	5.57
TX-03A	1/24/2005	12.26	5.76	6.50
TX-03A	4/18/2005	12.26	5.91	6.35
TX-03A	7/12/2005	12.26	6.41	5.85
TX-03A	10/18/2005	12.26	6.92	5.34
TX-03A	1/25/2006	12.26	4.82	7.44
TX-03A	4/25/2006	12.26	5.82	6.44

Groundwater Elevation Data
Shell Harbor Island Terminal-Seattle, Washington
Incident Number 300036

Location	Date	MP Elevation (ft)	Depth to Water (ft)	Water Elevation (ft)
TX-03A	10/11/2006	12.26	6.91	5.35
TX-03A	11/20/2008	12.26	6.14	6.12
TX-03A	4/8/2009	12.26	5.90	6.36
TX-03A	11/16/2009	12.26	5.80	6.46
TX-03A	4/27/2010	12.26	5.53	6.73
TX-03A	10/25/2010	12.26	6.20	6.06
TX-03A	10/27/2011	12.26	6.74	5.52
TX-04	4/6/1993	14.36	9.97	4.39
TX-04	5/13/1993	14.36	9.83	4.53
TX-04	6/10/1993	14.36	9.87	4.49
TX-04	7/8/1993	14.36	10.24	4.12
TX-04	8/3/1993	14.36	10.54	3.82
TX-04	9/8/1993	14.36	10.96	3.40
TX-04	10/8/1993	14.36	11.28	3.08
TX-04	11/5/1993	14.36	11.51	2.85
TX-04	12/3/1993	14.36	11.43	2.93
TX-04	1/5/1994	14.36	10.60	3.76
TX-04	2/4/1994	14.36	10.45	3.91
TX-04	8/28/1995	14.36	10.64	3.72
TX-04	9/27/1995	14.36	10.88	3.48
TX-04	4/27/1999	14.36	8.57	5.79
TX-04	7/14/1999	14.36	10.01	4.35
TX-04	10/18/1999	14.36	11.12	3.24
TX-04	1/11/2000	14.36	9.06	5.30
TX-04	4/5/2000	14.36	9.04	5.32
TX-04	7/18/2000	14.36	10.41	3.95
TX-04	10/2/2000	14.36	11.23	3.13
TX-04	1/22/2001	14.36	10.70	3.66
TX-04	7/23/2001	14.36	11.50	2.86
TX-04	10/16/2001	14.36	9.57	4.79
TX-04	4/23/2002	14.36	6.81	7.55
TX-04	7/18/2002	14.36	11.33	3.03
TX-04	10/23/2002	14.36	11.79	2.57
TX-04	1/28/2003	14.36	9.51	4.85
TX-04	4/15/2003	14.36	9.55	4.81
TX-04	7/17/2003	14.36	11.28	3.08
TX-04	10/15/2003	14.36	11.93	2.43
TX-04	1/13/2004	14.36	9.54	4.82
TX-04	4/19/2004	17.65	10.50	7.15
TX-04	7/27/2004	17.65	11.46	6.19
TX-04	10/18/2004	17.65	11.46	6.19
TX-04	1/24/2005	17.65	10.16	7.49
TX-04	4/18/2005	17.65	10.35	7.30
TX-04	7/12/2005	17.65	11.04	6.61
TX-04	10/18/2005	17.65	11.79	5.86
TX-04	1/25/2006	17.65	8.43	9.22
TX-04	4/25/2006	17.65	10.22	7.43
TX-04	10/11/2006	17.65	11.77	5.88

Groundwater Elevation Data
Shell Harbor Island Terminal-Seattle, Washington
Incident Number 300036

Location	Date	MP Elevation (ft)	Depth to Water (ft)	Water Elevation (ft)
TX-04	11/18/2008	17.65	10.84	6.81
TX-04	11/16/2009	17.65	10.39	7.26
TX-04	10/25/2010	17.65	10.77	6.88
TX-04	10/26/2011	17.65	11.47	6.18
TX-06	4/6/1993	8.58	3.85	4.73
TX-06	6/10/1993	8.58	3.71	4.87
TX-06	9/8/1993	8.58	4.96	3.62
TX-06	10/8/1993	8.58	5.35	3.23
TX-06	11/5/1993	8.58	5.54	3.04
TX-06	12/3/1993	8.58	5.37	3.21
TX-06	1/5/1994	8.58	4.48	4.10
TX-06	2/4/1994	8.58	4.43	4.15
TX-06	8/28/1995	8.58	4.75	3.83
TX-06	9/27/1995	8.58	5.78	2.80
TX-06	4/27/1999	8.58	2.62	5.96
TX-06	7/14/1999	8.58	4.05	4.53
TX-06	10/18/1999	8.58	5.19	3.39
TX-06	1/11/2000	8.58	2.98	5.60
TX-06	4/5/2000	8.58	3.16	5.42
TX-06	7/18/2000	8.58	4.25	4.33
TX-06	10/2/2000	8.58	5.23	3.35
TX-06	4/25/2006	8.58	3.88	4.70
TX-06A	4/23/2002	8.58	3.98	4.60
TX-06A	7/18/2002	8.58	4.14	4.44
TX-06A	10/23/2002	8.58	5.98	2.60
TX-06A	1/28/2003	8.58	3.40	5.18
TX-06A	4/15/2003	8.58	3.57	5.01
TX-06A	7/17/2003	8.58	5.24	3.34
TX-06A	10/15/2003	8.58	6.01	2.57
TX-06A	1/13/2004	8.58	3.36	5.22
TX-06A	4/19/2004	11.67	4.41	7.26
TX-06A	7/27/2004	11.67	5.39	6.28
TX-06A	10/18/2004	11.67	5.23	6.44
TX-06A	1/24/2005	11.67	3.66	8.01
TX-06A	4/18/2005	11.67	3.89	7.78
TX-06A	7/12/2005	11.67	4.78	6.89
TX-06A	10/18/2005	11.67	5.63	6.04
TX-06A	1/25/2006	11.67	3.00	8.67
TX-06A	4/25/2006	11.67	5.54	6.13
TX-06A	11/18/2008	11.67	4.56	7.11
TX-06A	11/16/2009	11.67	3.99	7.68
TX-06A	10/28/2010	11.67	4.47	7.2
TX-06A	10/25/2011	11.67	5.4	6.27

APPENDIX B

May 2011 Groundwater Elevation Contour Map



LEGEND

- ◆ MONITORING WELL (KINDER MORGAN)
- ▲ MONITORING WELL (BP)
- MONITORING WELL (SHELL)
- KINDER MORGAN PROPERTY BOUNDARY
- BP PROPERTY BOUNDARY
- SHELL PROPERTY BOUNDARY

(6.38) GROUNDWATER ELEVATION (FEET), 5-23-2011
 — 7.0 — GROUNDWATER ELEVATION CONTOUR (INTERVAL = 0.5 FEET)
 NOTE: GROUNDWATER ELEVATIONS AND CONTOURS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988

North



FIGURE 1
 GROUNDWATER CONTOUR MAP
 HARBOR ISLAND, SEATTLE, WASHINGTON
 KMLT, SHELL AND BP COOPERATIVE GAUGING 5-23-2011

PROJECT NO. STKM-001-W	PREPARED BY DR	DRAWN BY DR
DATE 8/22/11	REVIEWED BY DL	FILE NAME STKM001S



APPENDIX C

Field Sampling Data Sheets

ENVIRONMENTAL WELL, REMEDIATION COMPOUND, and SITE INSPECTION FORM

COST CENTER # 30003611
 ADDRESS 2555 1st Ave SW
 DATE 10/22/10
 CITY & STATE Spokane WA

Well ID	Observations Upon Arrival					Well Pad Condition	Note Repairs Made Detailed Explanation of Maintenance Recommended and Performed	Repair Date and PMI Initials
	Manway Cover, Type, Size, & Condition	Well Cap Type & Condition	Well Lock Condition (if present)	Well Pad Condition	Well Pad Condition			
MW-204	OK	2" end cap OK	none	OK				
MW-208	bolts stripped OK	2" Twist Lock OK	frozen	OK				
MW-210	Bolt holes Broken	2" end cap OK	none	OK				
MW-211	bolts missing OK	4" Twist Lock OK	none	OK				
MW-212	bolts missing OK	4" Twist Lock OK	none	none				
On-site Drinking Water Well								
Remediation Compound								
OK	Chain link OK							
Number of Drums On-site	Drum Condition	Labeled Correctly and Writing Legible	Drums Scheduled for Pickup	Drums Located to Min Business Interference	Emergency Contact Info Visible	Cleaning / Repairs Recommended and Conducted	Repair Date and PMI Initials	
0								
Detailed Explanation of Any Issues Resolved							Date Drums Removed from Site and PMI Initials	

Groundwater monitoring well covers must be painted in accordance with applicable regulations. All environmental wells and the remediation compound were in good condition, locked, and secured upon my departure (unless otherwise noted above).

Field Personnel Signature

Shell Harbor Island Terminal Monthly O & M

Field Personnel: DAVE LEWIS	Arrival Time: 0700
Project Number: 4619 4268.00002	Departure Time:
Date: 4/8/11	Weather: Clear 40°

Well ID	Time	DTP (ft)	DTW (ft)	Product Thickness (ft)	Odor?	Sheen?	Sock Wt (oz)	2nd Sock Wt (oz)	Rotate sock?	Change sock?
MW-204	0717	-	9.97	-	NO	NO				
MW-208	0742	-	4.62	-	NO	NO				
MW-210	0748	5.71	5.72	.01	YES	YES	20	3	NO	YES
MW-211	0746	-	5.22	-	NO	NO	32	9	NO	YES
MW-212	0744	-	4.82	-	NO	NO	32	9	NO	YES

Note: 2nd sock wt. is the wt. after the current sock is rotated or the wt. of a new sock to be installed in the well

Tide Level (H) : M : L

Comments and Well Maintenance Issues:

Checklist:

<ul style="list-style-type: none"> interface probe trash bag nitrile gloves decon. equipment 	<ul style="list-style-type: none"> sock scale clean socks PPE (safety boots, hard hat, safety glasses, gloves and safety vest) 	<ul style="list-style-type: none"> METAL BUCKET FLASHLIGHT TOOLS
--	---	---

ENVIRONMENTAL WELL, REMEDIATION COMPOUND, and SITE INSPECTION FORM

COST CENTER # 30003611
 DATE 4/8/11

ADDRESS 2555 13th AVE. SW
 CITY & STATE SEATTLE, WA

Well ID	Observations Upon Arrival						Well Pad Condition	Detailed Explanation of Maintenance Recommended and Performed	Note Repairs Made	Repair Date and PMI Initials
	Manway Cover, Type, Size, & Condition	Well Cap Type & Condition	Well Lock Condition (if present)	Well Pad Condition	Detailed Explanation of Maintenance Recommended and Performed	Note Repairs Made				
MW-204	OK	2" end cap OK	none	OK						
MW-208	Bolt stopped OK	2" Twist lock OK	frozen	OK						
MW-210	Bolt holes Broken	2" end cap OK	none	OK						
MW-211	Bolt missing OK	4" Twist lock OK	none	OK						
MW-212	Bolt missing OK	4" Twist lock OK	none	none						
On-site Drinking Water Well										
Remediation Compound										
OK	Chain Link	Condition of Area Inside Enclosure	Equipment Condition	Emergency Contact Info Visible						
Number of Drums On-site	Drum Condition	Labeled Correctly and Writing Legible	Drums Scheduled for Pickup	Drums Located to Min Business Interference						
0										

Groundwater monitoring well covers must be painted in accordance with applicable regulations.

All environmental wells and the remediation compound were in good condition, locked, and secured upon my departure (unless otherwise noted above).

Field Personnel Signature



Chain of Custody

URS Corporation
1501 4th Avenue, Suite 1400
Seattle, WA 98101-1616
206.438.2700

Contact: BRIAN PLETCHER ^{URS} PORTLAND, OR

Phone No.: 503-887-7258

Page 1 of 2

Installation ID	Job No.	Sample Collection	Sample Collection		Matrix Type	Sample Type	Shipping Date	Sampling Co.	
			Date (mm/dd/yy)	Time (24 Hr.)					
SHELLY HARBOR ISLAND	46194268						URS		
MW-202-0511		5/23/11	1035		H ₂ O				
TX-03A-0511		"	1205		"				
MW-203-0511		"	1215		"				
MW-104-0511		"	1340		"				
MW-05-0511		"	1315		"				
MW-111-0511		"	1445		"				
SH-04-0511		"	1545		"				
TX-04-0511		"	1600		"				
MW-213-0511		5/24/11	0915		"				
MW-214-0511		"	0925		"				
Preservation: A = HCL to pH < 2; B = HNO ₃ to pH < 2; C = H ₂ SO ₄ to pH < 2; D = NaOH to pH < 12; E = Other (specify)									
Relinquished by Sampler: (Signature)		Date		Time		Received by: (Signature)		Time	
Dave Lewis		5/25/11		0800					
Relinquished by: (Signature)		Date		Time		Received by: (Signature)		Time	
Relinquished by: (Signature)		Date		Time		Received by Lab: (Signature)		Time	

Analytical Methods
 N W P H - 6 X
 N W P H - 6 X
 B T E X
 P A H S
 T O T A L L E A D

5 DAY TAT

NUMBER OF BOTTLES PER ANALYTICAL METHODS

Laboratory Name:	ACCUTEST NORTHERN CA	
Laboratory Contract No.:		
Samples Disposed by:	Date	Time

Matrix Types: A - Air; PR - Product; SD - Sediment; SL - Soil; TI - Tissue; WR - Water
 Sample Types: ER - Equipment Rinsate; ES - Environmental Sample; FB - Field Blank; TB - Trip Blank



Chain of Custody

URS Corporation
 1501 4th Avenue, Suite 1400
 Seattle, WA 98101-1616
 206.438.2700

Contact: Brian Pletcher / URS

Phone No.: 503-887-7258

Site ID	Zone ID	Airbill Co./Number	Installation ID	Job No.	Sampling Co.	Shipping Date	Sample Collection			Sample Type	Indicate Any Condition That Would Affect Sample Analysis	Indicate Samples Containing Quantities for MS/MSD Analysis	Remarks
					URS		Date (mm/dd/yy)	Time (24 Hr.)	Matrix Type				
SHELL/HARBOR ISLAND													
MW-214D-0511				5/24/11	0915	11:20		X	X	X		5 DAY TAT	
MW-112A-0511				"	1110	"		X	X	X			
TES-mw-1-0511				"	1230	"		X	X	X			
TRIP BLANK													
Analytical Methods WTPH-GX BTEX WTPH-DX PAHs													
NUMBER OF BOTTLES PER ANALYTICAL METHODS													
Preservation: A = HCL to pH < 2; B = HNO ₃ to pH < 2; C = H ₂ SO ₄ to pH < 2; D = NaOH to pH < 12; E = Other (specify)													
Relinquished by Sampler: (Signature)					Date	Time	Received by: (Signature)		Laboratory Name:				
Diane Lewis					5/25/11	0800			ACQUEST NORTHERN CA				
Relinquished by: (Signature)					Date	Time	Received by: (Signature)		Laboratory Contract No.:				
					Date	Time	Received by Lab: (Signature)						
Relinquished by: (Signature)					Date	Time	Received by: (Signature)		Samples Disposed by:				
					Date	Time	Received by: (Signature)						

Matrix Types: A - Air; PR - Product; SD - Sediment; SL - Soil; T1 - Tissue; WR - Water; Distribution: White = Accompanies Shipment; Canary = Lab Copy; Pink = Field Copy; Goldenrod = URS Sample Control Copy
 Sample Types: ER - Equipment Rinse; ES - Environmental Sample; FB - Field Blank; TB - Trip Blank

GROUNDWATER SAMPLING DATA SHEET

Project Name: <u>Shell/Harbor Island</u>	Sample Number: <u>MW-112A-0511</u>
Project Number: <u>0614 4619 4268 .00001</u>	Station Number: <u>MW-112A</u>
Date: <u>5/24/11</u>	Well Diameter: <u>2"</u>
Weather: <u>Sunny, 60°</u>	Screen Interval:
Samplers: <u>Hydro</u>	Measuring Point: <u>TOC</u>
Purge Method: <u>low flow peristaltic</u>	Depth to water: <u>6.07</u>
Sample Method: <u>" " "</u>	Depth to bottom: <u>14.68</u>
Tubing Type: <u>1/8" poly</u>	Depth to NAPL:
Pump Intake Depth:	NAPL thickness:

Water Disposal/quantity:	Meter Information:	Calibration
QA/QC Samples:	Model	Date
Duplicate:	Temp.: <u>YSI</u>	
Replicate:	pH:	
MS/MSD:	Conductivity:	
Blank:	ORP	

Containers:	Analysis	Type	No. of Primary	No. of MS/MSD	Turbidity:
	<u>NWTPH-Gx</u>	<u>40 ml VOA</u>	<u>3</u>		Comments: <u>amber colored water, organic material</u> <u>SAMPLE TIME = 1110</u>
	<u>NO BTEX</u>	<u>"</u>	<u>3</u>		

Field Parameters	Units	0 Minutes	5 Minutes	10 Minutes	15 Minutes	20 Minutes	25 Minutes	30 Minutes
Temperature	°C	14.39	13.77	14.00	13.67	13.83	13.35	13.25
pH	-	8.26	8.14	8.29	8.25	8.20	8.05	7.89
Conductivity	µm/cm	7.30	2.65	2.02	1.96	1.98	1.94	1.95
ORP		-89.0	-68.9	-60.4	-55.6	-56.7	-49.0	-41.9
DO	mg/L	6.38	2.73	6.42	5.51	4.04	3.42	3.00
Turbidity	-	-	-	-	-	-	-	-
Time	-	1030	1035	1040	1045	1050	1055	1100
Water Level	ft	6.15	6.14	6.15	6.14	6.14	6.14	6.14
Flow Rate	ml/min	300	300	300	300	300	300	300

Field Parameters	Units	35 Minutes	Minutes	Minutes	Minutes	Minutes	Minutes	Sample
Temperature	°C	13.20						
pH	-	7.84						
Conductivity	µm/cm	1.99						
ORP		-39.7						
DO	mg/L	2.86						
Turbidity	-	-						
Time	-	1105						
Water Level	ft	6.15						
Flow Rate	ml/min	300						

GROUNDWATER SAMPLING DATA SHEET

Project Name: <i>Shell/Harbor Island</i>	Sample Number: <i>MW-213-0511</i>
Project Number: <i>46194268-00001</i>	Station Number: <i>MW-213</i>
Date: <i>5/25/11</i>	Well Diameter: <i>2"</i>
Weather: <i>overcast 50°</i>	Screen Interval:
Samplers: <i>DLevs</i>	Measuring Point: <i>TOC</i>
Purge Method: <i>low-flow peristaltic</i>	Depth to water: <i>6.42 6.62</i>
Sample Method: <i>" "</i>	Depth to bottom: <i>34.18</i>
Tubing Type: <i>1/8" Poly</i>	Depth to NAPL:
Pump Intake Depth:	NAPL thickness:

Water Disposal/quantity:	Meter Information:	Calibration
QA/QC Samples:	Model	Date
Duplicate:	Temp.: <i>YSI</i>	
Replicate:	pH:	
MS/MSD:	Conductivity:	
Blank:	ORP	
	DO	
	Turbidity:	

Containers:	Analysis	Type	No. of Primary	No. of MS/MSD
	<i>NWTPH-6x</i>	<i>40ml vial</i>	<i>3</i>	
	<i>NWTPH-Dx</i>	<i>1L amber</i>	<i>2</i>	
	<i>BTEX</i>	<i>40ml vial</i>	<i>3</i>	
	<i>PAH</i>	<i>1L amber</i>	<i>2</i>	

Comments:

Field Parameters	Units	0 Minutes	3 Minutes	6 Minutes	9 Minutes	12 Minutes	15 Minutes	18 Minutes
Temperature	<i>°C</i>	<i>12.21</i>	<i>12.38</i>	<i>12.50</i>	<i>12.58</i>	<i>12.68</i>	<i>12.74</i>	<i>12.84</i>
pH		<i>8.67</i>	<i>9.16</i>	<i>9.30</i>	<i>9.41</i>	<i>9.64</i>	<i>9.69</i>	<i>6.68</i>
Conductivity	<i>us/cm</i>	<i>21752</i>	<i>22810</i>	<i>22970</i>	<i>23046</i>	<i>23276</i>	<i>23318</i>	<i>23361</i>
ORP	<i>mV</i>	<i>-238.5</i>	<i>-264.9</i>	<i>-278.2</i>	<i>-284.1</i>	<i>-297.4</i>	<i>-301.8</i>	
DO	<i>mg/L</i>	<i>12.34</i>	<i>8.51</i>	<i>7.34</i>	<i>6.86</i>	<i>6.16</i>	<i>6.06</i>	<i>6.00</i> <i>6.00</i>
Turbidity								
Time		<i>0855</i>	<i>0858</i>	<i>0901</i>	<i>0904</i>	<i>0907</i>	<i>0910</i>	<i>0913</i>
Water Level	<i>10 ft</i>		<i>6.78</i>	<i>6.79</i>	<i>6.80</i>	<i>6.80</i>	<i>6.80</i>	<i>6.80</i>
Flow Rate	<i>gal/min</i>	<i>200</i>	<i>200</i>	<i>200</i>	<i>200</i>	<i>200</i>	<i>200</i>	<i>200</i>

Field Parameters	Units	Minutes	Minutes	Minutes	Minutes	Minutes	Minutes	Sample
Temperature								
pH								
Conductivity								
ORP								
DO								
Turbidity								
Time								<i>0915</i>
Water Level								
Flow Rate								

GROUNDWATER SAMPLING DATA SHEET

Project Name: <u>SHIELL HARBOR ISLAND TERMINAL</u>				Sample Number: <u>NW-214-0511</u>				
Project Number:				Station Number: <u>NW-214</u>				
Date: <u>24 MAY 2011</u>				Well Diameter: <u>2"</u>				
Weather: <u>OVER CAST 50'S</u>				Screen Interval:				
Samplers: <u>C. PEARSON</u>				Measuring Point: <u>btoc</u>				
Purge Method: <u>LOW FLOW</u>				Depth to water: <u>6.87</u>				
Sample Method: <u>LOW FLOW</u>				Depth to bottom: <u>39.65</u>				
Tubing Type: <u>1/8" POLY</u>				Depth to NAPL: <u>-</u>				
Pump Intake Depth: <u>25' btoc</u>				NAPL thickness: <u>-</u>				
Water Disposal/quantity:				Meter Information:			Calibration	
QA/QC Samples:				Model			Date	
Duplicate: <u>NW-214-0511</u>				Temp.: <u>HORIBA U-19</u>			<u>5/22/11</u>	
Replicate: <u>-</u>				pH:				
MS/MSD: <u>-</u>				Conductivity:				
Blank: <u>-</u>				ORP				
Containers:				DO				
				Turbidity:				
Analysis		Type	No. of Primary	No. of MS/MSD	Comments:			
TPH-Dx		VOA's	3	-	DUPLICATE COLLECTED H ₂ S ODOR (MOD. STRONG) SAMPLE TIME = 9:25 DUP SAMPLE TIME = 9:15			
TPH-Dx		AMBERS	2	-				
BTEX		VOA's	3	-				
PAH's		AMBERS	2	-				
Field Parameters	Units	0 Minutes	5 Minutes	10 Minutes	15 Minutes	20 Minutes	25 Minutes	30 Minutes
Temperature	°C	12.5	12.6	12.7	12.9	13.3	13.7	13.4
pH	-	7.33	6.88	6.28	7.14	7.37	7.47	7.48
Conductivity	µm/cm	4.07	6.48	15.0	15.3	16.6	16.8	16.8
ORP	-	-	-	-	-	-	-	-
DO	mg/L	15.30	16.13	16.11	16.65	18.35	19.99	19.99
Turbidity	-	-	-	-	-	-	-	-
Time	-	845	850	855	900	905	910	915
Water Level	0.01 ft	-	6.94	6.97	6.96	6.94	6.93	6.90
Flow Rate	ml/min	200	200	200	200	200	200	200
Field Parameters	Units	35 Minutes	Minutes	Minutes	Minutes	Minutes	Minutes	Sample
Temperature	°C	13.5						
pH	-	7.43						
Conductivity	µm/cm	16.7						
ORP	-	-						
DO	mg/L	19.99						
Turbidity	-	-						
Time	-	920						
Water Level	0.01 ft							
Flow Rate	ml/min							

GROUNDWATER SAMPLING DATA SHEET

Project Name: <i>Shell/Harbor Island</i>	Sample Number: <i>TES-MW-1-0511</i>
Project Number: <i>4619/4268.00001</i>	Station Number: <i>TES-MW-1</i>
Date: <i>5/24/11</i>	Well Diameter:
Weather: <i>Sunny, 65°</i>	Screen Interval:
Samplers: <i>Denny C Pearson</i>	Measuring Point: <i>TOC</i>
Purge Method: <i>lo-flo peristaltic</i>	Depth to water: <i>8.83</i>
Sample Method: <i>"</i>	Depth to bottom: <i>20.12</i>
Tubing Type: <i>1/8" poly</i>	Depth to NAPL:
Pump Intake Depth:	NAPL thickness:

Water Disposal/quantity:	Meter Information:	Calibration Date
QA/QC Samples:	Model	Date
Duplicate:	Temp.: <i>YSI</i>	
Replicate:	pH:	
MS/MSD:	Conductivity:	
Blank:	ORP	

Containers:	Analysis	Type	No. of Primary	No. of MS/MSD	Turbidity:
	<i>NWTPH-6-X</i>	<i>40ml VOA</i>	<i>3</i>		<div style="font-size: 2em;">✓</div>
	<i>BTEX</i>	<i>"</i>	<i>3</i>		

Field Parameters	Units	0 Minutes	3 Minutes	6 Minutes	9 Minutes	12 Minutes	15 Minutes	18 Minutes
Temperature	<i>°C</i>	<i>12.72</i>	<i>12.34</i>	<i>12.92</i>	<i>13.07</i>	<i>12.91</i>		
pH		<i>7.12</i>	<i>7.01</i>	<i>6.85</i>	<i>6.80</i>	<i>6.80</i>		
Conductivity	<i>uS/cm</i>	<i>82</i>	<i>82</i>	<i>82</i>	<i>81</i>	<i>80</i>		
ORP	<i>mv</i>	<i>12.0</i>	<i>23.5</i>	<i>30.3</i>	<i>31.0</i>	<i>30.8</i>		
DO	<i>mg/L</i>	<i>15.18</i>	<i>6.86</i>	<i>4.85</i>	<i>4.57</i>	<i>4.57</i>		
Turbidity		<i>—</i>	<i>—</i>	<i>—</i>	<i>—</i>	<i>—</i>		
Time		<i>1212</i>	<i>1215</i>	<i>1218</i>	<i>1221</i>	<i>1224</i>		
Water Level	<i>.01 ft.</i>	<i>9.08</i>		<i>9.12</i>	<i>9.17</i>	<i>9.18</i>		
Flow Rate	<i>ml/min</i>	<i>200</i>	<i>150</i>		<i>150</i>	<i>150</i>		

Field Parameters	Units	Minutes	Minutes	Minutes	Minutes	Minutes	Minutes	Sample
Temperature								
pH								
Conductivity								
ORP								
DO								
Turbidity								
Time								
Water Level								<i>1230</i>
Flow Rate								

GROUNDWATER SAMPLING DATA SHEET

Project Name: <i>Shell/Harbor Island</i>	Sample Number: <i>SH-04-0511</i>
Project Number: <i>96194268.00001</i>	Station Number: <i>SH-04</i>
Date: <i>5/23/11</i>	Well Diameter: <i>2"</i>
Weather: <i>Sunny 60°</i>	Screen Interval:
Samplers: <i>Drews</i>	Measuring Point: <i>TOC</i>
Purge Method: <i>low-flow peristaltic</i>	Depth to water: <i>9.24</i>
Sample Method:	Depth to bottom: <i>16.09</i>
Tubing Type: <i>1/8" poly</i>	Depth to NAPL:
Pump Intake Depth:	NAPL thickness:

Water Disposal/quantity:	Meter Information:	Calibration Date
QA/QC Samples:	Model	
Duplicate:	Temp.: <i>YSI</i>	
Replicate:	pH:	
MS/MSD:	Conductivity:	
Blank:	ORP	

Containers:	Analysis	Type	No. of Primary	No. of MS/MSD
	<i>NWTPH-GX</i>	<i>40ml vol</i>	<i>3</i>	
	<i>BTEX</i>	<i>"</i>	<i>3</i>	
	<i>NWTPH-DX</i>	<i>1 Lamber</i>	<i>2</i>	

DO	
Turbidity:	
Comments:	

Field Parameters	Units	0 Minutes	3 Minutes	6 Minutes	9 Minutes	12 Minutes	15 Minutes	18 Minutes
Temperature	<i>°C</i>	<i>13.93</i>	<i>13.32</i>	<i>13.31</i>	<i>13.20</i>	<i>13.25</i>	<i>13.22</i>	
pH		<i>6.64</i>	<i>6.45</i>	<i>6.44</i>	<i>6.45</i>	<i>6.40</i>	<i>6.39</i>	
Conductivity	<i>uS/cm</i>	<i>1211</i>	<i>1231</i>	<i>1236</i>	<i>1247</i>	<i>1252</i>	<i>1255</i>	
ORP	<i>mV</i>	<i>-57.1</i>	<i>-34.1</i>	<i>-32.1</i>	<i>-35.0</i>	<i>-37.6</i>	<i>-37.9</i>	
DO	<i>mg/L</i>	<i>8.92</i>	<i>2.41</i>	<i>1.78</i>	<i>1.45</i>	<i>1.38</i>	<i>1.35</i>	
Turbidity		<i>—</i>	<i>—</i>	<i>—</i>	<i>—</i>	<i>—</i>	<i>—</i>	<i>—</i>
Time		<i>1523</i>	<i>1526</i>	<i>1529</i>	<i>1532</i>	<i>1535</i>	<i>1540</i>	
Water Level	<i>o.i/f.t.</i>		<i>9.34</i>	<i>9.36</i>	<i>9.38</i>		<i>9.41</i>	
Flow Rate	<i>gal/min</i>		<i>250</i>	<i>250</i>	<i>250</i>		<i>250</i>	

Field Parameters	Units	Minutes	Minutes	Minutes	Minutes	Minutes	Minutes	Sample
Temperature								
pH								
Conductivity								
ORP								
DO								
Turbidity								
Time								<i>1545</i>
Water Level								
Flow Rate								

GROUNDWATER SAMPLING DATA SHEET

Project Name: <u>Skeef/Harbor Island</u>	Sample Number: <u>MW-04 MW-111</u> 111
Project Number: <u>46194260.00001</u>	Station Number: <u>MW-111</u>
Date: <u>5/23/11</u>	Well Diameter: <u>2"</u>
Weather: <u>Sunny 60°</u>	Screen Interval:
Samplers: <u>D. Lewis, C Pearson</u>	Measuring Point: <u>TOC</u>
Purge Method: <u>bo-flu peristaltic</u>	Depth to water: <u>3.57 4.56 4.51</u>
Sample Method:	Depth to bottom: <u>14.72</u>
Tubing Type: <u>1/8" poly</u>	Depth to NAPL:
Pump Intake Depth:	NAPL thickness:

Water Disposal/quantity:	Meter Information:	Calibration
QA/QC Samples:	Model	Date
Duplicate:	Temp.: <u>YSI</u>	<u>5/22/11</u>
Replicate:	pH:	
MS/MSD:	Conductivity:	
Blank:	ORP	

Containers:	Analysis	Type	No. of Primary	No. of MS/MSD
	<u>NWTPH-Gx</u>	<u>40ml VOA</u>	<u>3</u>	
	<u>BTEX</u>	<u>"</u>	<u>3</u>	

DO	✓
Turbidity:	✓
Comments:	

Field Parameters	Units	0 Minutes	3 Minutes	6 Minutes	9 Minutes	12 Minutes	15 Minutes	18 Minutes
Temperature	<u>°C</u>	<u>16.84</u>	<u>16.07</u>	<u>15.94</u>	<u>16.04</u>	<u>15.78</u>	<u>15.77</u>	<u>15.87</u>
pH		<u>5.78</u>	<u>6.04</u>	<u>5.80</u>	<u>5.78</u>	<u>5.71</u>	<u>5.61</u>	<u>5.52</u>
Conductivity	<u>µS/cm</u>	<u>117</u>	<u>108</u>	<u>104</u>	<u>102</u>	<u>99</u>	<u>98</u>	<u>98</u>
ORP	<u>mV</u>	<u>39.8</u>	<u>41.9</u>	<u>57.4</u>	<u>55.7</u>	<u>59.6</u>	<u>66.8</u>	<u>71.8</u>
DO	<u>mg/L</u>	<u>3.89</u>	<u>1.62</u>	<u>1.50</u>	<u>1.45</u>	<u>1.29</u>	<u>1.22</u>	<u>1.11</u>
Turbidity								
Time		<u>1421</u>	<u>1424</u>	<u>1427</u>	<u>1430</u>	<u>1433</u>	<u>1436</u>	<u>1439</u>
Water Level	<u>ft.</u>	<u>250</u>	<u>4.56</u>		<u>4.56</u>	<u>4.56</u>	<u>4.56</u>	<u>4.56</u>
Flow Rate	<u>ml/min</u>	<u>250</u>	<u>250</u>		<u>250</u>	<u>250</u>	<u>250</u>	<u>250</u>

Field Parameters	Units	Minutes	Minutes	Minutes	Minutes	Minutes	Minutes	Sample
Temperature								
pH								
Conductivity								
ORP								
DO								
Turbidity								
Time								<u>1445</u>
Water Level								
Flow Rate								

GROUNDWATER SAMPLING DATA SHEET

TX-04-0511

Project Name: <u>SHELL-HARBOR ISLAND TERMINAL</u>	Sample Number: <u>SH-04-0511</u>
Project Number:	Station Number: <u>SH-04 TX-04</u>
Date:	Well Diameter: <u>2"</u>
Weather: <u>PARTLY CLOUDY; 60°</u>	Screen Interval:
Samplers: <u>C. PEARSON</u>	Measuring Point: <u>btoc</u>
Purge Method: <u>LOW FLOW</u>	Depth to water: <u>9.47</u>
Sample Method: <u>LOW FLOW</u>	Depth to bottom: <u>17.98</u>
Tubing Type: <u>1/8" PDL4</u>	Depth to NAPL: <u>-</u>
Pump Intake Depth: <u>14'</u>	NAPL thickness: <u>-</u>

Water Disposal/quantity: <u>ON SITE</u>	Meter Information:	Calibration Date
QA/QC Samples:	Model	Date
Duplicate:	Temp.: <u>HORIBA U-10</u>	<u>5/22/11</u>
Replicate:	pH:	
MS/MSD:	Conductivity:	
Blank:	ORP	

Containers:	Analysis	Type	No. of Primary	No. of MS/MSD	DO
	TPH-GX	VOAs	3	0	Turbidity:
	BTEX	VOAs	3	0	Comments:
					<u>SAMPLE TIME: 1600</u>

Field Parameters	Units	0 Minutes	5 Minutes	10 Minutes	15 Minutes	20 Minutes	25 Minutes	30 Minutes
Temperature	°C	15.8	14.3	13.8	13.4	13.4	13.7	13.7
pH	-	6.01	6.00	6.01	6.02	5.96	5.84	5.78
Conductivity	µS/cm	2.90	5.31	5.41	5.49	5.19	5.57	5.37
ORP	-	-	-	-	-	-	-	-
DO	mg/L	19.99	19.99	19.99	19.99	19.99	19.99	19.99
Turbidity	-	-	-	-	-	-	-	-
Time	-	1515	1520	1525	1530	1535	1540	1545
Water Level	0.01 ft	9.55	9.55	9.55	9.55	9.55	9.55	9.55
Flow Rate	ml/min	200	200	200	200	200	200	200

Field Parameters	Units	35 Minutes	40 Minutes	Minutes	Minutes	Minutes	Minutes	Sample
Temperature	°C	13.7	13.8					
pH	-	5.66	5.60					
Conductivity	µS/cm	5.51	5.70					
ORP	-	-	-					
DO	mg/L	19.99	19.99					
Turbidity	-	-	-					
Time	-	1550	1555					
Water Level	0.01 ft	9.55	9.55					
Flow Rate	ml/min	200	200					

GROUNDWATER SAMPLING DATA SHEET

Project Name: <u>SHELL HARBOR ISLAND TERMINAL</u>	Sample Number: <u>MW-203-0511</u>
Project Number:	Station Number: <u>MW-203</u>
Date: <u>MAY 23, 2011</u>	Well Diameter: <u>2"</u>
Weather: <u>OVERCAST 60'S</u>	Screen Interval:
Samplers: <u>C. PEARSON</u>	Measuring Point: <u>btoc</u>
Purge Method: <u>LOW FLOW</u>	Depth to water: <u>7.10</u>
Sample Method: <u>LOW FLOW</u>	Depth to bottom: <u>14.03</u>
Tubing Type: <u>1/8" POLY</u>	Depth to NAPL: <u>-</u>
Pump Intake Depth: <u>10.5</u>	NAPL thickness: <u>-</u>

Water Disposal/quantity: QA/QC Samples: Duplicate: <u>N/A</u> Replicate: <u>N/A</u> MS/MSD: <u>N/A</u> Blank: <u>N/A</u>	Meter Information:	Calibration
	Model	Date
	Temp.: <u>HORIBA</u>	<u>5/22/11</u>
	pH: <u>U-10</u>	
	Conductivity:	

Containers:	Analysis	Type	No. of Primary	No. of MS/MSD	Comments:
<u>1L AMBER</u>	<u>TPH-DX</u>		<u>2</u>		<u>SLOW RECHARGE / DATA</u> <u>SAMPLE TIME = 12:15</u>
<u>VOAS</u>	<u>TPH-CX</u>		<u>3</u>		

Field Parameters	Units	0 Minutes	5 Minutes	10 Minutes	15 Minutes	20 Minutes	25 Minutes	30 Minutes
Temperature	<u>°C</u>	<u>12.0</u>	<u>12.9</u>	<u>12.5</u>	<u>12.7</u>	<u>12.5</u>	<u>12.2</u>	<u>CR 5/23/11</u>
pH	<u>-</u>	<u>6.27</u>	<u>5.15</u>	<u>5.14</u>	<u>5.12</u>	<u>5.15</u>	<u>5.17</u>	
Conductivity	<u>µS/cm</u>	<u>3.13</u>	<u>2.87</u>	<u>2.85</u>	<u>2.85</u>	<u>2.87</u>	<u>2.86</u>	
ORP	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	
DO	<u>mg/L</u>	<u>15.97</u>	<u>16.72</u>	<u>17.56</u>	<u>18.26</u>	<u>18.32</u>	<u>18.31</u>	
Turbidity	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	
Time	<u>-</u>	<u>1145</u>	<u>1150</u>	<u>1155</u>	<u>1200</u>	<u>1205</u>	<u>1210</u>	
Water Level	<u>0.01 ft</u>	<u>7.10</u>	<u>10.20</u>	<u>10.51</u>	<u>11.70</u>	<u>11.70</u>	<u>11.79</u>	
Flow Rate	<u>ml/min</u>	<u>400</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	

Field Parameters	Units	Minutes	Minutes	Minutes	Minutes	Minutes	Minutes	Sample
Temperature								
pH								
Conductivity								
ORP								
DO								
Turbidity								
Time								
Water Level								
Flow Rate								

GROUNDWATER SAMPLING DATA SHEET

Project Name: <u>SHEN-HARBOR ISLAND TERMINAL</u>	Sample Number: <u>MW-05-0511</u>
Project Number:	Station Number: <u>MW-05</u>
Date: <u>23 MAY 2011</u>	Well Diameter: <u>2"</u>
Weather: <u>SUNNY / PARTLY CLOUDY, 60'S</u>	Screen Interval:
Samplers: <u>C. PEARSON</u>	Measuring Point: <u>btoc</u>
Purge Method: <u>LOW FLOW</u>	Depth to water: <u>5.39</u>
Sample Method: <u>LOW FLOW</u>	Depth to bottom: <u>46.79 - 17.90</u>
Tubing Type: <u>1/8" POLY</u>	Depth to NAPL: <u>-</u>
Pump Intake Depth: <u>14'</u>	NAPL thickness: <u>-</u>

Water Disposal/quantity:	Meter Information:	Calibration
QA/QC Samples:	Model	Date
Duplicate: <u>N/A</u>	Temp.: <u>HORIBA U-10</u>	<u>5/22/11</u>
Replicate: <u>N/A</u>	pH:	
MS/MSD: <u>N/A</u>	Conductivity:	
Blank: <u>N/A</u>	ORP	
	DO	
	Turbidity:	

	Analysis	Type	No. of Primary	No. of MS/MSD	
	<u>BTEX</u>	<u>VOA_s</u>	<u>3</u>	<u>0</u>	Comments: SAMPLE TIME = 1345 * SUSPICIOUS DO NOT WORKING PROPERLY @ THIS WELL - CORRECTION DO WAS MAKING OUT HORIBA U-10.
	<u>TPH - GX</u>	<u>VOA_s</u>	<u>3</u>	<u>0</u>	

Field Parameters	Units	0 Minutes	5 Minutes	10 Minutes	15 Minutes	20 Minutes	25 Minutes	30 Minutes
Temperature	<u>°C</u>	<u>16.0</u>	<u>15.8</u>	<u>15.8</u>	<u>15.7</u>	<u>15.9</u>	<u>15.7</u>	<u>15.5</u>
pH	<u>-</u>	<u>5.84</u>	<u>5.51</u>	<u>5.29</u>	<u>5.07</u>	<u>4.89</u>	<u>4.76</u>	<u>4.64</u>
Conductivity	<u>µm/cm</u>	<u>2.90</u>	<u>2.94</u>	<u>3.05</u>	<u>3.11</u>	<u>3.27</u>	<u>3.28</u>	<u>3.47</u>
ORP	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
DO *	<u>mg/L</u>	<u>19.99</u>	<u>19.99</u>	<u>19.99</u>	<u>19.80</u>	<u>19.99</u>	<u>19.99</u>	<u>19.99</u>
Turbidity	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Time	<u>-</u>	<u>1310</u>	<u>1315</u>	<u>1320</u>	<u>1325</u>	<u>1330</u>	<u>1335</u>	<u>1340</u>
Water Level	<u>0.01 Ft</u>	<u>5.37</u>	<u>5.37</u>	<u>5.37</u>	<u>5.37</u>	<u>5.37</u>	<u>5.37</u>	<u>5.37</u>
Flow Rate	<u>ml/min</u>	<u>300</u>	<u>300</u>	<u>300</u>	<u>300</u>	<u>300</u>	<u>300</u>	<u>300</u>

Field Parameters	Units	Minutes	Minutes	Minutes	Minutes	Minutes	Minutes	Sample
Temperature								
pH								
Conductivity								
ORP								
DO								
Turbidity								
Time								
Water Level								
Flow Rate								

OK 5/23/11

GROUNDWATER SAMPLING DATA SHEET

Project Name: <i>Shell/Harbor Island</i>				Sample Number: <i>MW-104-0511</i>				
Project Number: <i>46194620.00001</i>				Station Number: <i>MW-104</i>				
Date: <i>5/23/11</i>				Well Diameter: <i>2"</i>				
Weather: <i>cloudy, 60°</i>				Screen Interval:				
Samplers: <i>Drew's</i>				Measuring Point: <i>TOC</i>				
Purge Method: <i>lo-flo peristaltic</i>				Depth to water: <i>5.23</i>				
Sample Method: <i>" "</i>				Depth to bottom: <i>14.75</i>				
Tubing Type: <i>1/8" poly</i>				Depth to NAPL:				
Pump Intake Depth:				NAPL thickness:				
Water Disposal/quantity:				Meter Information:				
QA/QC Samples:				Model		Calibration		
Duplicate:				Temp.: <i>49.1</i>		Date: <i>5/22/11</i>		
Replicate:				pH:				
MS/MSD:				Conductivity:				
Blank:				ORP				
Containers:				DO				
Analysis		Type	No. of Primary	No. of MS/MSD	Turbidity:		Comments:	
<i>NWTPH-GX</i>		<i>4mm VOA</i>	<i>3</i>		<i>✓</i>		<i>✓</i>	
<i>BTEX</i>		<i>"</i>	<i>3</i>					
<i>NWTPH-DX</i>		<i>12amber</i>	<i>2</i>					

Field Parameters	Units	0 Minutes	<i>3</i> Minutes	6 Minutes	9 Minutes	12 Minutes	15 Minutes	18 Minutes
Temperature	<i>°C</i>	<i>16.66</i>	<i>16.54</i>	<i>16.56</i>	<i>16.57</i>	<i>16.60</i>	<i>16.58</i>	<i>16.57</i>
pH		<i>5.72</i>	<i>5.90</i>	<i>6.09</i>	<i>6.27</i>	<i>6.42</i>	<i>6.55</i>	<i>6.58</i>
Conductivity	<i>uS/cm</i>	<i>364</i>	<i>349</i>	<i>337</i>	<i>332</i>	<i>326</i>	<i>326</i>	<i>326</i>
ORP	<i>mV</i>	<i>28.4</i>	<i>28.9</i>	<i>-48.7</i>	<i>-54.9</i>	<i>-71.1</i>	<i>-73.1</i>	<i>-73.5</i>
DO	<i>mg/L</i>	<i>1.27</i>	<i>1.59</i>	<i>1.03</i>	<i>0.83</i>	<i>0.72</i>	<i>0.67</i>	<i>0.62</i>
Turbidity								
Time		<i>1318</i>	<i>1321</i>	<i>1324</i>	<i>1327</i>	<i>1330</i>	<i>1333</i>	<i>1336</i>
Water Level	<i>0.1 ft.</i>		<i>5.28</i>	<i>5.28</i>	<i>5.28</i>	<i>5.28</i>		<i>5.28</i>
Flow Rate	<i>ml/min</i>	<i>200</i>		<i>200</i>	<i>200</i>	<i>200</i>		<i>200</i>

Field Parameters	Units	Minutes	Minutes	Minutes	Minutes	Minutes	Minutes	Sample
Temperature								
pH								
Conductivity								
ORP								
DO								
Turbidity								
Time								<i>1340</i>
Water Level								
Flow Rate								

GROUNDWATER SAMPLING DATA SHEET

Project Name: <i>Shell/ Harbor Island</i>	Sample Number: <i>TX-03A-0511</i>
Project Number: <i>46194268.00001</i>	Station Number: <i>TX-03A</i>
Date: <i>5/23/11</i>	Well Diameter: <i>2"</i>
Weather: <i>overcast, 60"</i>	Screen Interval:
Samplers: <i>Dewin</i>	Measuring Point: <i>TOC</i>
Purge Method: <i>low-flow peristaltic</i>	Depth to water: <i>5.43</i>
Sample Method: <i>" "</i>	Depth to bottom: <i>14.85</i>
Tubing Type: <i>1/8" poly</i>	Depth to NAPL:
Pump Intake Depth:	NAPL thickness:

Water Disposal/quantity:	Meter Information:	Calibration
QA/QC Samples:	Model	Date
Duplicate:	Temp.: <i>YSI</i>	<i>5/22/11</i>
Replicate:	pH:	
MS/MSD:	Conductivity:	
Blank:	ORP	

Containers:	Analysis	Type	No. of Primary	No. of MS/MSD	DO	Turbidity:
<i>NWTPH-6x</i>		<i>40ml vva</i>	<i>3</i>			
<i>BTEX</i>		<i>40ml vva</i>	<i>3</i>			

Field Parameters	Units	0 Minutes	3 Minutes	6 Minutes	9 Minutes	12 Minutes	15 Minutes	18 Minutes
Temperature	<i>°C</i>	<i>13.93</i>	<i>13.34</i>	<i>13.23</i>	<i>13.29</i>	<i>13.20</i>	<i>13.11</i>	<i>13.09</i>
pH		<i>5.78</i>	<i>5.87</i>	<i>6.10</i>	<i>6.09</i>	<i>6.23</i>	<i>6.24</i>	<i>6.24</i>
Conductivity	<i>uS/cm</i>	<i>493</i>	<i>501</i>	<i>506</i>	<i>504</i>	<i>504</i>	<i>503</i>	<i>503</i>
ORP	<i>mV</i>	<i>-31.1</i>	<i>-28.5</i>	<i>-38.5</i>	<i>-39.5</i>	<i>-38.0</i>	<i>-38.5</i>	<i>-39.0</i>
DO	<i>mg/L</i>	<i>6.50</i>	<i>2.24</i>	<i>1.12</i>	<i>0.90</i>	<i>0.78</i>	<i>0.74</i>	<i>0.72</i>
Turbidity		<i>-</i>	<i>-</i>	<i>-</i>	<i>-</i>	<i>-</i>	<i>-</i>	<i>-</i>
Time		<i>1245</i>	<i>1248</i>	<i>1251</i>	<i>1254</i>	<i>1257</i>	<i>1300</i>	<i>1303</i>
Water Level	<i>0 ft</i>	<i>5.46</i>	<i>5.47</i>	<i>5.48</i>	<i>5.49</i>	<i>5.50</i>	<i>5.51</i>	<i>5.52</i>
Flow Rate	<i>ml/min</i>	<i>250</i>	<i>250</i>	<i>250</i>	<i>250</i>	<i>250</i>	<i>250</i>	<i>250</i>

Field Parameters	Units	Minutes	Minutes	Minutes	Minutes	Minutes	Minutes	Sample
Temperature								
pH								
Conductivity								
ORP								
DO								
Turbidity								
Time								<i>1305</i>
Water Level								
Flow Rate								

GROUNDWATER SAMPLING DATA SHEET

Project Name: <i>Shell/Harbor Island</i>	Sample Number: <i>MW-202-0511</i>
Project Number: <i>46194268.00001</i>	Station Number: <i>MW-202</i>
Date: <i>5/23/11</i>	Well Diameter: <i>2"</i>
Weather: <i>overcast, 60°</i>	Screen Interval:
Samplers: <i>D Lewis C Pearson</i>	Measuring Point: <i>TOC</i>
Purge Method: <i>peristaltic lo-flow</i>	Depth to water: <i>13.12</i>
Sample Method: <i>"</i>	Depth to bottom: <i>21.75</i>
Tubing Type: <i>1/8" poly</i>	Depth to NAPL:
Pump Intake Depth:	NAPL thickness:

Water Disposal/quantity:	Meter Information:	Calibration
QA/QC Samples:	Model	Date
Duplicate:	Temp.: <i>Hunter 751</i>	<i>5/22/11</i>
Replicate:	pH:	
MS/MSD:	Conductivity:	
Blank:	ORP	

Containers:	Analysis	Type	No. of Primary	No. of MS/MSD	DO
<i>NWTPH-Dx</i>					Comments: <i>Strong petroleum-like odor, no sheen</i>
<i>NWTPH-Bx</i>					

Field Parameters	Units	0 Minutes	3 Minutes	6 Minutes	9 Minutes	12 Minutes	15 Minutes	18 Minutes
Temperature	<i>°C</i>	<i>11.80</i>	<i>11.53</i>	<i>11.41</i>	<i>11.35</i>	<i>11.33</i>	<i>11.26</i>	<i>11.27</i>
pH		<i>7.58</i>	<i>7.70</i>	<i>7.77</i>	<i>7.74</i>	<i>7.85</i>	<i>7.82</i>	<i>7.81</i>
Conductivity	<i>uS/cm</i>	<i>2.98</i>	<i>2.53</i>	<i>2.39</i>	<i>2.25</i>	<i>2.17</i>	<i>2.13</i>	<i>2.09</i>
ORP	<i>mV</i>	<i>88.8</i>	<i>-119.7</i>	<i>-143.9</i>	<i>-148.9</i>	<i>-154.4</i>	<i>-158.8</i>	<i>-152.4</i>
DO	<i>mg/L</i>	<i>3.22</i>	<i>1.44</i>	<i>1.22</i>	<i>1.06</i>	<i>0.97</i>	<i>0.85</i>	<i>0.76</i>
Turbidity		<i>-</i>	<i>-</i>	<i>-</i>	<i>-</i>	<i>-</i>	<i>-</i>	<i>-</i>
Time		<i>1014</i>	<i>1017</i>	<i>1020</i>	<i>1023</i>	<i>1026</i>	<i>1029</i>	<i>1032</i>
Water Level	<i>0.1 ft.</i>	<i>13.40</i>	<i>13.40</i>	<i>13.40</i>	<i>13.40</i>	<i>13.40</i>	<i>13.40</i>	<i>13.40</i>
Flow Rate	<i>ml/min</i>	<i>400</i>	<i>400</i>	<i>400</i>	<i>400</i>	<i>400</i>	<i>400</i>	<i>400</i>

Field Parameters	Units	Minutes	Minutes	Minutes	Minutes	Minutes	Minutes	Sample
Temperature								
pH								
Conductivity								
ORP								
DO								
Turbidity								
Time								<i>1035</i>
Water Level								
Flow Rate								

Shell Harbor Island Terminal Monthly O & M

Field Personnel:	DAVE LEWIS	Arrival Time:	0800
Project Number:	46194268.01144	Departure Time:	
Date:	7/28/11	Weather:	clear 60°

Well ID	Time	DTP (ft)	DTW (ft)	Product Thickness (ft)	Odor?	Sheen?	Sock Wt (oz)	2nd Sock Wt (oz)	Rotate sock?	Change sock?
MW-204	0900	—	11.03	—	no	no	—	—	—	—
MW-208	0840	—	5.71	—	no	no	—	—	—	—
MW-210	0846	6.89	6.90	.01	yes	yes	47	—	no	yes
MW-211	0844	—	6.22	—	no	no	58	8	no	yes
MW-212	0842	—	5.38	—	no	no	54	8	no	yes

Note: 2nd sock wt. is the wt. after the current sock is rotated or the wt. of a new sock to be installed in the well

Tide Level H (M): L

Comments and Well Maintenance Issues:

<p>Checklist:</p> <ul style="list-style-type: none"> interface probe trash bag nitrile gloves decon equipment 	<p>METAL BUCKET</p> <p>FLASHLIGHT TOOLS</p> <p>sock scale</p> <p>clean socks</p> <p>PPE (safety boots, hard hat, safety glasses, gloves and safety vest)</p>
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ENVIRONMENTAL WELL, REMEDIATION COMPOUND, and SITE INSPECTION FORM

COST CENTER # 3000 3611
 DATE 7/28/11
 ADDRESS 2555 13th AVE SW
 CITY & STATE Seattle, WA

Well ID	Observations Upon Arrival					Well Pad Condition	Note Repairs Made Detailed Explanation of Maintenance Recommended and Performed	Repair Date and PM Initials
	Manway Cover, Type, Size, & Condition	Well Cap Type & Condition	Well Lock Condition (if present)	Well Pad Condition	Emergency Contact Info			
MW-204	monument	2" end cap	none	none	none			
MW-208	bolts stripped OK	2" twist lock	broken	OK	OK			
MW-210	Bolt heads broken	2" Twist lock	none	OK	OK			
MW-211	bolts missing OK	4" Twist lock OK	none	OK	OK			
MW-212	bolts missing OK	4" Twist lock OK	none	none	none			
On-site Drinking Water Well								
Remediation Compound	Type and Condition of Enclosure	Condition of Area Inside Enclosure	Equipment Condition	Emergency Contact Info	Cleaning / Repairs Recommended and Conducted	Repair Date and PM Initials		
OK	chainlink OK			Visible				
Number of Drums On-site	Drum Condition	Labeled Correctly and Writing Legible	Drums Scheduled for Pickup	Drums Located to Min Business Interference	Detailed Explanation of Any Issues Resolved	Date Drums Removed from Site and PM Initials		
Ø								

*Groundwater monitoring well covers must be painted in accordance with applicable regulations.

All environmental wells and the remediation compound were in good condition, locked, and secured upon my departure (unless otherwise noted above).

Field Personnel Signature

**Shell Harbor Island Terminal
Monthly O & M**

Field Personnel: DAVE LEWIS Arrival Time: 1015
 Project Number: 46194768-01144 Departure Time:
 Date: 9/21/11 Weather: overcast 70°

Well ID	Time	DTP (ft)	DTW (ft)	Product Thickness (ft)	Odor?	Sheen?	Sock Wt (oz)	2nd Sock Wt (oz)	Rotate sock?	Change sock?
MW-204	1034	-	11.75	-	no	no	-	-	-	-
MW-208	1057	-	6.19	-	no	no	-	-	-	-
MW-210	1104	7.05	7.06	1.01	yes	yes	46	-	no	yes
MW-211	1100	-	6.55	-	no	no	56	8	no	yes
MW-212	1102	-	5.78	-	yes	yes	55	8	no	yes

Note: 2nd sock wt. is the wt. after the current sock is rotated or the wt. of a new sock to be installed in the well

Tide Level H M L

Comments and Well Maintenance Issues:

Checklist:
 interface probe
 trash bag
 nitrile gloves
 decon equipment

sock scale
 clean socks
 PPE (safety boots, hard hat, safety glasses, gloves and safety vest)

**METAL BUCKET
 FLASHLIGHT
 TOOLS**

ENVIRONMENTAL WELL, REMEDIATION COMPOUND, and SITE INSPECTION FORM

COST CENTER # 30003611
 DATE 9/2/11

ADDRESS 2555 13th AVE SW
 CITY & STATE Seattle, WA

Well ID	Observations Upon Arrival				Well Pad Condition	Detailed Explanation of Maintenance Recommended and Performed	Note Repairs Made	Repair Date and PM Initials
	Manway Cover, Type, Size, & Condition	Well Cap Type & Condition	Well Lock Condition (if present)	Well Pad Condition				
MW-204	manway	2" end cap	none	none				
MW-208	bolts stripped	2" target lock	frozen	OK				
MW-210	Bolts/bolts broken	2" target lock	none	OK				
MW-211	bolts missing	4" target lock	none	OK				
MW-212	bolts missing	4" target lock	none	none				
On-site Drinking Water Well								
Remediation Compound	Type and Condition of Enclosure	Condition of Area Inside Enclosure	Equipment Condition	Emergency Contact Info	Cleaning / Repairs Recommended and Conducted	Repair Date and PM Initials		
OK	clean lock							
Number of Drums On-site	Drum Condition	Labeled Correctly and Writing Legible	Drums Scheduled for Pickup	Drums Located to Min Business Interference	Detailed Explanation of Any Issues Resolved	Date Drums Removed from Site and PM Initials		
1	OK							

Groundwater monitoring well covers must be painted in accordance with applicable regulations.
 All environmental wells and the remediation compound were in good condition, locked, and secured upon my departure (unless otherwise noted above).
 Environmental Well, Remediation Compound, and Site Inspection Form
 Version 1.0 April 2005, ajf
 Field Personnel Signature

GROUNDWATER SAMPLING DATA SHEET

Project Name: <i>Shell/Harbor Island</i>	Sample Number: 110 MW-05-1011
Project Number: <i>46194304</i>	Station Number:
Date: <i>10/25/11</i>	Well Diameter: <i>2" MW-05</i>
Weather: <i>cloudy - 50°</i>	Screen Interval:
Samplers: <i>Peristaltic pump</i>	Measuring Point: <i>TOC</i>
Purge Method: <i>peristaltic pump</i>	Depth to water: <i>7.25</i>
Sample Method: <i>"</i>	Depth to bottom: <i>46.79</i>
Tubing Type: <i>1/8" poly</i>	Depth to NAPL:
Pump Intake Depth: <i>44'</i>	NAPL thickness:

Water Disposal/quantity:	Meter Information:	Calibration
QA/QC Samples:	Model	Date
Duplicate:	Temp.: <i>45.1</i>	<i>10/25/11</i>
Replicate:	pH:	
MS/MSD:	Conductivity:	
Blank:	ORP	

Containers:	Analysis	Type	No. of Primary	No. of MS/MSD	Comments:
<i>BTEX</i>					
<i>TPH-G</i>					
<i>TPH-D</i>					

Field Parameters	Units	0 Minutes	3 Minutes	6 Minutes	9 Minutes	12 Minutes	15 Minutes	18 Minutes
Temperature		<i>15.14</i>	<i>15.20</i>	<i>15.21</i>	<i>15.21</i>	<i>15.21</i>	<i>15.21</i>	
pH		<i>7.66</i>	<i>7.60</i>	<i>7.72</i>	<i>7.74</i>	<i>7.75</i>	<i>7.75</i>	
Conductivity		<i>310</i>	<i>308</i>	<i>308</i>	<i>308</i>	<i>307</i>	<i>305</i>	
ORP		<i>-89.2</i>	<i>-95.5</i>	<i>-105.0</i>	<i>-105.9</i>	<i>-106.7</i>	<i>-107.2</i>	
DO		<i>21.69</i>	<i>9.67</i>	<i>5.82</i>	<i>5.75</i>	<i>5.70</i>	<i>5.68</i>	
Turbidity							<i>72.4</i>	<i>7</i>
Time		<i>1533</i>	<i>1536</i>	<i>1539</i>	<i>1542</i>	<i>1545</i>	<i>1548</i>	
Water Level		<i>7.39</i>	<i>7.41</i>	<i>7.41</i>	<i>7.43</i>	<i>7.45</i>	<i>7.47</i>	
Flow Rate		<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>	

Field Parameters	Units	Minutes	Minutes	Minutes	Minutes	Minutes	Minutes	Sample
Temperature								
pH								
Conductivity								
ORP								
DO								
Turbidity								
Time								<i>1550</i>
Water Level								
Flow Rate								

GROUNDWATER SAMPLING DATA SHEET

Project Name: <i>Shell / Harbor Island</i>				Sample Number: <i>MW-101-1011</i>			
Project Number: <i>46194304</i>				Station Number: <i>MW-101</i>			
Date: <i>10/27/11</i>				Well Diameter: <i>2"</i>			
Weather: <i>Foggy, 45°</i>				Screen Interval:			
Samplers: <i>2 New 1/2"</i>				Measuring Point: <i>TOC</i>			
Purge Method: <i>peristaltic pump</i>				Depth to water: <i>12.15</i>			
Sample Method: <i>"</i>				Depth to bottom: <i>15.74</i>			
Tubing Type: <i>1/8" poly</i>				Depth to NAPL:			
Pump Intake Depth: <i>13.5-15</i>				NAPL thickness:			
Water Disposal/quantity: <i>OWS</i>				Meter Information:			Calibration
QA/QC Samples:				Model			Date
Duplicate:				Temp.: <i>YSI</i>			<i>10/27/11</i>
Replicate:				pH:			
MS/MSD:				Conductivity:			
Blank:				ORP			
Containers:				DO			
Analysis	Type	No. of Primary	No. of MS/MSD	Turbidity:			
<i>TPH-G</i>				<div style="font-size: 2em;">↓</div>			
<i>TPH-D</i>							
<i>BTEX</i>							
				Comments:			

Field Parameters	Units	0	3	6	9	12	15	18
		Minutes	Minutes	Minutes	Minutes	Minutes	Minutes	Minutes
Temperature	<i>°C</i>	12.95	12.80	12.04	11.71	11.65	11.64	11.63
pH		8.73	8.67	8.72	8.71	8.76	8.79	8.81
Conductivity	<i>µS/cm</i>	215	216	219	221	224	226	228
ORP	<i>mV</i>	-95.5	-103.8	-106.0	-107.1	-107.8	-107.9	-108.2
DO	<i>mg/L</i>	13.34	10.74	8.76	7.50	5.98	5.72	5.65
Turbidity	<i>NTU</i>							15.1
Time		0830	0833	0836	0839	0842	0845	0848
Water Level		12.22	12.23	12.24	12.25	12.26	12.27	12.28
Flow Rate	<i>ml/min</i>	100	100	100	100	100	100	100

Field Parameters	Units	Minutes	Minutes	Minutes	Minutes	Minutes	Minutes	Sample
Temperature								
pH								
Conductivity								
ORP								
DO								
Turbidity								
Time								<i>0850</i>
Water Level								
Flow Rate								

GROUNDWATER SAMPLING DATA SHEET

Project Name: <u>Shell/Harbor Island</u>	Sample Number: <u>MW-102-1011</u>
Project Number: <u>40194304</u>	Station Number: <u>MW-102</u>
Date: <u>10/26/11</u>	Well Diameter: <u>2"</u>
Weather: <u>overcast, 50°</u>	Screen Interval:
Samplers: <u>DJews</u>	Measuring Point:
Purge Method: <u>peristaltic pump</u>	Depth to water: <u>9.59</u>
Sample Method: <u>" "</u>	Depth to bottom: <u>17.48</u>
Tubing Type: <u>1/8" poly</u>	Depth to NAPL:
Pump Intake Depth: <u>15'</u>	NAPL thickness:

Water Disposal/quantity: <u>OWS</u>	Meter Information:	Calibration Date
QA/QC Samples:	Model	Date
Duplicate:	Temp.: <u>YSI</u>	<u>10/26/11</u>
Replicate:	pH:	
MS/MSD:	Conductivity:	
Blank:	ORP	

Containers:	Analysis	Type	No. of Primary	No. of MS/MSD	Comments:
	<u>BTEX</u>				
	<u>TPH-G</u>				
	<u>TPH-D</u>				

Field Parameters	Units	0	3	6	9	12	15	18
		Minutes	Minutes	Minutes	Minutes	Minutes	Minutes	Minutes
Temperature	<u>°C</u>	13.83	13.92	14.28	14.57	14.69	14.76	14.79
pH		8.23	8.44	8.46	8.46	8.49	8.56	8.59
Conductivity	<u>uS/cm</u>	537	537	504	444	437	432	430
ORP	<u>mV</u>	-78.2	-103.1	-117.0	-116.8	-122.1	-124.1	-124.5
DO	<u>mg/L</u>	16.24	7.17	3.41	2.58	2.19	2.13	2.09
Turbidity	<u>NTU</u>							10.89
Time		1524	1527	1530	1533	1536	1539	1542
Water Level		9.64	9.64	9.64	9.64	9.64	9.64	9.64
Flow Rate	<u>100 ml/min</u>	100	100	100	100	100	100	100

Field Parameters	Units	Minutes	Minutes	Minutes	Minutes	Minutes	Minutes	Sample
Temperature								
pH								
Conductivity								
ORP								
DO								
Turbidity								
Time								
Water Level								
Flow Rate								

1545

GROUNDWATER SAMPLING DATA SHEET

Project Name: <i>Shell/Hacker Island</i>				Sample Number: <i>MW-104-10 11</i>			
Project Number: <i>46194304</i>				Station Number: <i>MW-104</i>			
Date: <i>10/25/11</i>				Well Diameter: <i>2"</i>			
Weather: <i>Clouds 50°</i>				Screen Interval:			
Samplers: <i>Drew</i>				Measuring Point: <i>TOC</i>			
Purge Method: <i>peristaltic pump</i>				Depth to water: <i>7.15</i>			
Sample Method:				Depth to bottom: <i>14.75</i>			
Tubing Type: <i>1/2" poly</i>				Depth to NAPL:			
Pump Intake Depth: <i>12'</i>				NAPL thickness:			
Water Disposal/quantity:				Meter Information:		Calibration	
QA/QC Samples:				Model		Date	
Duplicate:				Temp.: <i>YSI</i>		<i>10/25/11</i>	
Replicate:				pH:			
MS/MSD:				Conductivity:			
Blank:				ORP			
Containers:				DO			
Analysis		Type	No. of Primary	No. of MS/MSD	Turbidity:		
<i>Total lead</i>					<i>gasoline-like odor</i>		
<i>TPH-A</i>							
<i>TPH-D</i>							

Field Parameters	Units	0	3	6	9	12	15	18
		Minutes	Minutes	Minutes	Minutes	Minutes	Minutes	Minutes
Temperature	<i>°C</i>	18.46	18.55	18.70	18.74	18.76	18.76	18.77
pH		7.36	7.63	7.89	8.05	8.10	8.12	8.12
Conductivity	<i>µS/cm</i>	398	393	378	365	360	357	354
ORP	<i>mV</i>	-98.0	-115.8	-129.0	-135.8	-135.0	-135.4	-135.8
DO	<i>mg/L</i>	15.83	7.65	5.35	5.08	5.00	4.96	4.93
Turbidity	<i>NTU</i>							10.9
Time		14.41	1444	1447	1450	1453	1455	14.9 14.59
Water Level		17.18	17.18	17.18	17.18	17.18	17.18	17.18
Flow Rate	<i>ml/min</i>	200	200	200	200	200	200	200

Field Parameters	Units	Minutes	Minutes	Minutes	Minutes	Minutes	Minutes	Sample
Temperature								
pH								
Conductivity								
ORP								
DO								
Turbidity								
Time								1500
Water Level								
Flow Rate								

GROUNDWATER SAMPLING DATA SHEET

Project Name: <i>Shell/Harbor Island</i>				Sample Number: <i>MW-105-1011</i>			
Project Number: <i>46194304</i>				Station Number: <i>MW-105</i>			
Date: <i>10/25/11</i>				Well Diameter: <i>2"</i>			
Weather: <i>Cloudy - 50°</i>				Screen Interval:			
Samplers: <i>DJews</i>				Measuring Point: <i>TOC</i>			
Purge Method: <i>peristaltic pump</i>				Depth to water: <i>6.06</i>			
Sample Method: <i>" "</i>				Depth to bottom: <i>14.02</i>			
Tubing Type: <i>1/8" poly</i>				Depth to NAPL:			
Pump Intake Depth: <i>12'</i>				NAPL thickness:			
Water Disposal/quantity: <i>OWS</i>				Meter Information:		Calibration	
QA/QC Samples:				Model		Date	
Duplicate:				Temp.: <i>YSI</i>		<i>10/25/11</i>	
Replicate:				pH:			
MS/MSD:				Conductivity:			
Blank:				ORP			
Containers:				DO			
Analysis		Type	No. of Primary	No. of MS/MSD	Turbidity:		
<i>Total Lead</i>					↓		↓
<i>BTEX</i>							
<i>TPH-G</i>							
<i>TPH-D</i>							
				Comments:			

Field Parameters	Units	0 Minutes	3 Minutes	6 Minutes	9 Minutes	12 Minutes	15 Minutes	18 Minutes
Temperature	°C	17.59	17.22	17.72	17.73	17.80	17.82	17.85
pH		7.62	7.43	7.54	7.64	7.72	7.74	7.74
Conductivity	µS/cm	130	129	134	135	136	136	136
ORP	mV	-58.4	-59.8	-65.2	-68.2	-71.5	-72.1	-72.5
DO	mg/L	1320	8.60	9.62	4.85	4.60	4.55	4.53
Turbidity	NTU							27.0
Time		1239	1242	1245	1248	1251	1254	1257
Water Level		6.06	6.06	6.06	6.06	6.06	6.06	6.06
Flow Rate	ml/min	200		200	200	200	200	200

Field Parameters	Units	Minutes	Minutes	Minutes	Minutes	Minutes	Minutes	Sample
Temperature								
pH								
Conductivity								
ORP								
DO								
Turbidity								
Time								1300
Water Level								
Flow Rate								

GROUNDWATER SAMPLING DATA SHEET

Project Name: <i>Shell / Harbor Island</i>	Sample Number: <i>MW-111-1011</i>
Project Number: <i>46194304</i>	Station Number: <i>MW-111</i>
Date: <i>12/25/11</i>	Well Diameter: <i>2"</i>
Weather: <i>Cloudy 50°</i>	Screen Interval:
Samplers: <i>D/Dows</i>	Measuring Point: <i>TOC</i>
Purge Method: <i>peristaltic pump</i>	Depth to water: <i>5.89</i>
Sample Method: <i>" "</i>	Depth to bottom: <i>14.72</i>
Tubing Type: <i>1/8" poly</i>	Depth to NAPL:
Pump Intake Depth: <i>12'</i>	NAPL thickness:

Water Disposal/quantity: <i>OWS</i>	Meter Information:
QA/QC Samples:	Model
Duplicate:	Temp.: <i>YSI</i>
Replicate:	pH:
MS/MSD:	Calibration Date: <i>10/25/11</i>
Blank:	Conductivity:
	ORP

Containers:	Analysis	Type	No. of Primary	No. of MS/MSD	Comments:
	<i>BTEX</i>				<div style="font-size: 2em;">✓</div>
	<i>TPH-G</i>				
	<i>TPH-D</i>				

Field Parameters	Units	0 Minutes	3 Minutes	6 Minutes	9 Minutes	12 Minutes	15 Minutes	18 Minutes
Temperature	<i>°C</i>	17.95	18.12	18.29	18.40	18.48	18.50	18.52
pH		8.32	8.32	8.27	8.28	8.33	8.33	8.33
Conductivity	<i>µs/cm</i>	209	198	167	144	137	135	133
ORP	<i>mV</i>	-100.9	-103.6	-97.4	-89.8	-88.2	-88.0	-87.7
DO	<i>mg/L</i>	8.09	5.63	4.54	3.54	3.30	3.27	3.25
Turbidity	<i>NTU</i>							19.0
Time		1345	1348	1351	1354	1357	13 1400	1403
Water Level		5.92	5.92	5.92	5.92	5.92	5.92	5.92
Flow Rate	<i>ml/min</i>	200	200	200	200	200	200	200

Field Parameters	Units	Minutes	Minutes	Minutes	Minutes	Minutes	Minutes	Sample
Temperature								
pH								
Conductivity								
ORP								
DO								
Turbidity								
Time								<i>1405</i>
Water Level								
Flow Rate								

GROUNDWATER SAMPLING DATA SHEET

Project Name: <i>Shell Harbor Island</i>	Sample Number: <i>MW-112A-1011</i>
Project Number: <i>46194304</i>	Station Number: <i>MW-112A</i>
Date: <i>10/25/11</i>	Well Diameter: <i>2"</i>
Weather: <i>clouds, 50°</i>	Screen Interval:
Samplers: <i>2 screws</i>	Measuring Point: <i>TC</i>
Purge Method: <i>peristaltic pump</i>	Depth to water: <i>7.03</i>
Sample Method: <i>" "</i>	Depth to bottom: <i>14.68</i>
Tubing Type: <i>1/2" poly</i>	Depth to NAPL:
Pump Intake Depth: <i>12'</i>	NAPL thickness:

Water Disposal/quantity: <i>OWS</i>	Meter Information:
QA/QC Samples:	Model
Duplicate:	Temp.: <i>451</i>
Replicate:	pH:
MS/MSD:	Conductivity:
Blank:	ORP
	DO
	Turbidity:

Containers:	Analysis	Type	No. of Primary	No. of MS/MSD	Comments:
	<i>BTEX</i>				<i>faint fuel-like odor, must colored water, organic material</i>
	<i>TPH-G</i>				
	<i>TPH-D</i>				

Field Parameters	Units	0 Minutes	3 Minutes	6 Minutes	9 Minutes	12 Minutes	15 Minutes	18 Minutes
Temperature	<i>°C</i>	<i>16.95</i>	<i>16.94</i>	<i>17.00</i>	<i>17.10</i>	<i>17.10</i>	<i>17.11</i>	
pH		<i>8.50</i>	<i>8.34</i>	<i>8.30</i>	<i>8.26</i>	<i>8.24</i>	<i>8.22</i>	
Conductivity	<i>µS/cm</i>	<i>690</i>	<i>556</i>	<i>500</i>	<i>494</i>	<i>490</i>	<i>488</i>	
ORP	<i>mV</i>	<i>-130.7</i>	<i>-129.8</i>	<i>-130.0</i>	<i>-130.3</i>	<i>-130.5</i>	<i>-130.9</i>	
DO	<i>mg/L</i>	<i>22.34</i>	<i>9.66</i>	<i>8.00</i>	<i>7.43</i>	<i>7.39</i>	<i>7.35</i>	
Turbidity	<i>NTU</i>						<i>16.5</i>	
Time		<i>1123</i>	<i>1126</i>	<i>1129</i>	<i>1132</i>	<i>1135</i>	<i>1138</i>	
Water Level		<i>7.08</i>	<i>7.09</i>	<i>7.11</i>	<i>7.13</i>	<i>7.15</i>	<i>7.18</i>	
Flow Rate	<i>ml/min</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>	

Field Parameters	Units	Minutes	Minutes	Minutes	Minutes	Minutes	Minutes	Sample
Temperature								
pH								
Conductivity								
ORP								
DO								
Turbidity								
Time								<i>1140</i>
Water Level								
Flow Rate								

GROUNDWATER SAMPLING DATA SHEET

Project Name: <i>Shell/Harbor Island</i>	Sample Number: <i>MW-201-1011</i>
Project Number: <i>46194/304</i>	Station Number: <i>MW-201</i>
Date: <i>10/26/11</i>	Well Diameter: <i>2"</i>
Weather: <i>foggy 45°</i>	Screen Interval:
Samplers: <i>Dewis</i>	Measuring Point: <i>TOC</i>
Purge Method: <i>peristaltic pump</i>	Depth to water: <i>14.45 14.94</i>
Sample Method: <i>" "</i>	Depth to bottom: <i>21.54</i>
Tubing Type: <i>1/8" poly</i>	Depth to NAPL:
Pump Intake Depth: <i>13' 19'</i>	NAPL thickness:

Water Disposal/quantity: <i>OWS</i>	Meter Information:	Calibration Date
QA/QC Samples:	Model	Date
Duplicate:	Temp.: <i>YSI</i>	<i>10/26/11</i>
Replicate:	pH:	
MS/MSD:	Conductivity:	
Blank:	ORP	

Containers:	Analysis	Type	No. of Primary	No. of MS/MSD	DO
	<i>BTEX</i>				
	<i>TPH-G</i>				
	<i>TPH-D</i>				

Field Parameters	Units	0 Minutes	3 Minutes	6 Minutes	9 Minutes	12 Minutes	15 Minutes	18 Minutes
Temperature	<i>°C</i>	<i>11.09</i>	<i>11.32</i>	<i>11.36</i>	<i>11.46</i>	<i>11.50</i>	<i>11.52</i>	<i>11.53</i>
pH		<i>7.68</i>	<i>7.59</i>	<i>7.59</i>	<i>7.59</i>	<i>7.59</i>	<i>7.59</i>	<i>7.59</i>
Conductivity	<i>µS/cm</i>	<i>705</i>	<i>716</i>	<i>716</i>	<i>701</i>	<i>679</i>	<i>660</i>	<i>655</i>
ORP	<i>mV</i>	<i>-46.2</i>	<i>-70.9</i>	<i>-75.5</i>	<i>-77.9</i>	<i>-76.9</i>	<i>-76.4</i>	<i>-76.0</i>
DO	<i>mg/L</i>	<i>32.37</i>	<i>7.78</i>	<i>5.08</i>	<i>3.31</i>	<i>2.87</i>	<i>2.80</i>	<i>2.77</i>
Turbidity	<i>NTU</i>							<i>5.9</i>
Time		<i>0951</i>	<i>0954</i>	<i>0957</i>	<i>1000</i>	<i>1003</i>	<i>1006</i>	<i>1009</i>
Water Level		<i>14.98</i>	<i>15.02</i>	<i>15.06</i>	<i>15.10</i>	<i>15.14</i>	<i>15.18</i>	<i>15.22</i>
Flow Rate	<i>ml/min</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>

Field Parameters	Units	Minutes	Minutes	Minutes	Minutes	Minutes	Minutes	Sample
Temperature								
pH								
Conductivity								
ORP								
DO								
Turbidity								
Time								<i>10/10</i>
Water Level								
Flow Rate								

GROUNDWATER SAMPLING DATA SHEET

Project Name: <i>Shell/Harbor Island</i>	Sample Number: <i>MW-202-1011</i>
Project Number: <i>46194304</i>	Station Number: <i>MW-202</i>
Date: <i>10/26/11</i>	Well Diameter: <i>2"</i>
Weather: <i>foggy 45°</i>	Screen Interval:
Samplers: <i>Lewis</i>	Measuring Point: <i>70C</i>
Purge Method: <i>peristaltic pump</i>	Depth to water: <i>14.45</i>
Sample Method:	Depth to bottom: <i>21.75</i>
Tubing Type: <i>1/8" poly</i>	Depth to NAPL:
Pump Intake Depth: <i>19'</i>	NAPL thickness:
Water Disposal/quantity: <i>OWS</i>	

QA/QC Samples:		Meter Information:		Calibration
Duplicate:		Temp.: <i>451</i>	Model	Date: <i>10/26/11</i>
Replicate:		pH:		
MS/MSD:		Conductivity:		
Blank:		ORP		
Containers:		DO		
Analysis	Type	No. of Primary	No. of MS/MSD	Turbidity:
<i>TPH-G</i>				
<i>TPH-D</i>				
<i>NA parameters</i>				
				Comments:
				<i>fuel-like odor</i>

Field Parameters	Units	0	3	6	9	12	15	18
		Minutes	Minutes	Minutes	Minutes	Minutes	Minutes	Minutes
Temperature	<i>°C</i>	12.48	12.39	12.50	12.72	12.92	12.91	12.90
pH		8.88	8.20	8.18	8.17	8.21	8.22	8.22
Conductivity	<i>µs/cm</i>	220	219	216	214	214	214	214
ORP	<i>mV</i>	-85.5	-87.2	-95.7	-97.0	-103.6	-103.9	-104.2
DO	<i>mg/L</i>	25.80	9.92	5.22	3.47	2.50	2.47	2.45
Turbidity	<i>NTU</i>							2.72
Time		1142	1145	1148	1151	1154	1157	1200
Water Level		14.49	14.50	14.51	14.52	14.53	14.54	14.55
Flow Rate	<i>ml/min</i>	100	100	100	100	100	100	100

Field Parameters	Units	Minutes	Minutes	Minutes	Minutes	Minutes	Minutes	Sample
Temperature								
pH								
Conductivity								
ORP								
DO								
Turbidity								
Time								1200
Water Level								
Flow Rate								

GROUNDWATER SAMPLING DATA SHEET

Project Name: <i>Shell/Harbor Island</i>				Sample Number: <i>MW-203-1061</i>			
Project Number: <i>46194304</i>				Station Number: <i>MW-203</i>			
Date: <i>10/26/11</i>				Well Diameter: <i>2"</i>			
Weather: <i>foggy 45°</i>				Screen Interval:			
Samplers: <i>Stevens</i>				Measuring Point: <i>TDC</i>			
Purge Method: <i>peristaltic pump</i>				Depth to water: <i>5.45</i>			
Sample Method:				Depth to bottom: <i>14.90</i>			
Tubing Type: <i>1/8" poly</i>				Depth to NAPL:			
Pump Intake Depth: <i>13</i>				NAPL thickness:			
Water Disposal/quantity:				Meter Information:			Calibration
QA/QC Samples:				Model			Date
Duplicate:				Temp.: <i>YSI</i>			<i>10/26/11</i>
Replicate:				pH:			
MS/MSD:				Conductivity:			
Blank:				ORP			
Containers:				DO			
Analysis	Type	No. of Primary	No. of MS/MSD	Turbidity:			
<i>TPH-G</i>				Comments: <i>fuel-like odor</i>			
<i>TPH-D</i>							
<i>NA parameters</i>							

Field Parameters	Units	0	3	6	9	12	15	18
		Minutes	Minutes	Minutes	Minutes	Minutes	Minutes	Minutes
Temperature	<i>OC</i>	<i>13.16</i>	<i>13.62</i>	<i>13.82</i>	<i>13.94</i>	<i>13.96</i>	<i>13.98</i>	
pH		<i>8.02</i>	<i>8.34</i>	<i>8.39</i>	<i>8.40</i>	<i>8.40</i>	<i>8.40</i>	
Conductivity	<i>us/cm°</i>	<i>381</i>	<i>382</i>	<i>384</i>	<i>384</i>	<i>384</i>	<i>384</i>	
ORP	<i>mV</i>	<i>-48.8</i>	<i>-70.1</i>	<i>-76.4</i>	<i>-79.9</i>	<i>-80.4</i>	<i>-80.9</i>	
DO	<i>mg/L</i>	<i>9.94</i>	<i>6.06</i>	<i>4.10</i>	<i>3.18</i>	<i>2.99</i>	<i>2.94</i>	
Turbidity	<i>NTU</i>						<i>10.9</i>	
Time		<i>1311</i>	<i>1314</i>	<i>1317</i>	<i>1320</i>	<i>1323</i>	<i>1326</i>	
Water Level		<i>5.60</i>	<i>5.65</i>	<i>5.72</i>	<i>5.77</i>	<i>5.82</i>	<i>5.88</i>	
Flow Rate	<i>ml/min</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>	

Field Parameters	Units	Minutes	Minutes	Minutes	Minutes	Minutes	Minutes	Sample
Temperature								
pH								
Conductivity								
ORP								
DO								
Turbidity								
Time								<i>1330</i>
Water Level								
Flow Rate								

GROUNDWATER SAMPLING DATA SHEET

Project Name: <i>Shell/Harbor Island</i>				Sample Number: <i>MW-204-1011</i>			
Project Number: <i>46194304</i>				Station Number: <i>MW-204</i>			
Date: <i>10/27/11</i>				Well Diameter: <i>2"</i>			
Weather: <i>clearing 50°</i>				Screen Interval:			
Samplers: <i>Drews</i>				Measuring Point: <i>TOC</i>			
Purge Method: <i>peristaltic pump</i>				Depth to water: <i>10.71</i>			
Sample Method: <i>peristaltic pump</i>				Depth to bottom: <i>17.75</i>			
Tubing Type: <i>1/8" poly</i>				Depth to NAPL:			
Pump Intake Depth: <i>15'</i>				NAPL thickness:			
Water Disposal/quantity:				Meter Information:			Calibration
QA/QC Samples:				Model			Date
Duplicate:				Temp.: <i>YSI</i>			<i>10/27/11</i>
Replicate:				pH:			
MS/MSD:				Conductivity:			
Blank:				ORP			
Containers:				DO			
				Turbidity:			
				Comments:			

Field Parameters	Units	Time							
		0 Minutes	3 Minutes	6 Minutes	9 Minutes	12 Minutes	15 Minutes	18 Minutes	
Temperature	<i>°C</i>	16.7	15.6	13.9	13.4	12.8	11.5	11.5	
pH		5.50	5.89	6.00	6.30	6.89	6.89	6.89	
Conductivity	<i>µS/cm</i>	590	530	510	490	468	461	460	
ORP	<i>mV</i>	-10	-30	-32	-34	-35	-40	-43	
DO	<i>mg/L</i>	4.20	4.10	3.57	3.00	2.90	2.80	2.75	
Turbidity	<i>NTU</i>							15.7	
Time		1100	1103	1106	1109	1112	1115	1118	
Water Level		10.90	10.91	10.92	10.93	10.94	10.95	10.96	
Flow Rate	<i>ml/min</i>	100	100	100	100	100	100	100	

Field Parameters	Units	Minutes	Minutes	Minutes	Minutes	Minutes	Minutes	Sample
Temperature								
pH								
Conductivity								
ORP								
DO								
Turbidity								
Time								<i>1120</i>
Water Level								
Flow Rate								

GROUNDWATER SAMPLING DATA SHEET

MW-206A-1011

Project Name: <u>Shell / Harbor Island</u>	Sample Number: <u>SH-04-104</u>
Project Number: <u>461914304</u>	Station Number: <u>MW-206A-104</u>
Date: <u>10/26/11</u>	Well Diameter: <u>2"</u>
Weather: <u>foggy, 40°</u>	Screen Interval:
Samplers: <u>Drew's</u>	Measuring Point: <u>TOC</u>
Purge Method: <u>peristaltic pump</u>	Depth to water: <u>10.25</u>
Sample Method: <u>"</u>	Depth to bottom: <u>16.09 / 16.66</u>
Tubing Type: <u>1/8" poly</u>	Depth to NAPL:
Pump Intake Depth: <u>9'</u>	NAPL thickness:

Water Disposal/quantity: <u>OWS</u>	Meter Information:
QA/QC Samples:	Model
Duplicate:	Temp.: <u>YSI</u>
Replicate:	pH:
MS/MSD:	Conductivity:
Blank:	ORP

Containers:	Analysis	Type	No. of Primary	No. of MS/MSD	Comments:
	<u>BTEX</u>				
	<u>TPH-G</u>				
	<u>TPH-D</u>				

Field Parameters	Units	0 Minutes	3 Minutes	6 Minutes	9 Minutes	12 Minutes	15 Minutes	18 Minutes
Temperature	<u>°C</u>	14.07	13.63	13.50	13.23	12.75	12.61	12.50
pH		6.76	7.02	7.19	7.32	7.40	7.48	7.54
Conductivity	<u>uS/cm</u>	699	706	702	704	698	695	693
ORP	<u>mV</u>	-39.9	-69.6	-81.0	-94.5	-99.6	-104.1	-105.7
DO	<u>mg/L</u>	13.33	7.60	4.50	3.48	2.93	2.97	2.94
Turbidity	<u>NTU</u>							
Time		0807	0810	0813	0816	0819	0822	0825
Water Level		10.35	10.45	10.50	10.45	10.50	10.55	10.60
Flow Rate	<u>ml/min</u>	100	100	100	100	100	100	100

Field Parameters	Units	21 Minutes	Minutes	Minutes	Minutes	Minutes	Minutes	Sample
Temperature		12.45						
pH		7.56						
Conductivity		692						
ORP		-106.2						
DO		2.90						
Turbidity		6.7						
Time		0828						0830
Water Level		10.6						
Flow Rate		100						

GROUNDWATER SAMPLING DATA SHEET

Project Name: <i>Shell/Harbor Island</i>				Sample Number: <i>MW-213-10 MW-214-10 </i>			
Project Number: <i>46/9/4304</i>				Station Number: <i>MW-213-MW-214</i>			
Date: <i>10/25/11</i>				Well Diameter: <i>2"</i>			
Weather: <i>foggy 40°</i>				Screen Interval: <i>FOC</i>			
Samplers: <i>Shaw</i>				Measuring Point: <i>FOC</i>			
Purge Method: <i>peristaltic pump</i>				Depth to water: <i>7.78 7.43</i>			
Sample Method: <i>" "</i>				Depth to bottom: <i>39.65 39.18</i>			
Tubing Type: <i>1/8" poly</i>				Depth to NAPL:			
Pump Intake Depth: <i>37</i>				NAPL thickness:			
Water Disposal/quantity: <i>OWS</i>				Meter Information:		Calibration	
QA/QC Samples:				Model		Date	
Duplicate: <i>MW-211D-10 </i>				Temp.: <i>YSI</i>		<i>10/25/11</i>	
Replicate:				pH:			
MS/MSD:				Conductivity:			
Blank:				ORP			
Containers:				DO			
Analysis		Type	No. of Primary	No. of MS/MSD	Turbidity:		
<i>BTEX</i>					↓		↓
<i>NWTPH-G</i>							
<i>NWTPH-D</i>							
<i>PAH</i>							
Comments:							

Field Parameters	Units	0 Minutes	3 Minutes	6 Minutes	9 Minutes	12 Minutes	15 Minutes	18 Minutes
Temperature	<i>OC</i>	<i>11.93</i>					<i>12.64</i>	<i>12.60</i>
pH		<i>8.85</i>					<i>8.61</i>	<i>8.59</i>
Conductivity	<i>uS/cm</i>	<i>680</i>					<i>4636</i>	<i>4812</i>
ORP	<i>mV</i>	<i>-218.2</i>					<i>-205.7</i>	<i>-205.0</i>
DO	<i>mg/L</i>	<i>23.27</i>					<i>10.70</i>	<i>10.60</i>
Turbidity	<i>NTU</i>							
Time		<i>0949</i>	<i>0951</i>	<i>0954</i>	<i>0957</i>	<i>1000</i>	<i>1003</i>	<i>1006</i>
Water Level		<i>07.43</i>					<i>07.43</i>	<i>7.43</i>
Flow Rate	<i>ml/min</i>	<i>100</i>					<i>100</i>	<i>100</i>

Field Parameters	Units	21 Minutes	Minutes	Minutes	Minutes	Minutes	Minutes	Sample
Temperature		<i>12.59</i>						
pH		<i>8.57</i>						
Conductivity		<i>4800</i>						
ORP		<i>-205.9</i>						
DO	<i>10.51</i>	<i>204.2</i>						
Turbidity		<i>9.7</i>						
Time		<i>1009</i>						<i>1010</i>
Water Level		<i>7.43</i>						
Flow Rate		<i>100</i>						

GROUNDWATER SAMPLING DATA SHEET

MW-214-7011

Project Name: <i>Shell / Harbor Island</i>	Sample Number: <i>MW-214-1011</i>
Project Number: <i>46194304</i>	Station Number: <i>MW-214 MW-214</i>
Date: <i>10/25/11</i>	Well Diameter: <i>2"</i>
Weather: <i>foggy 40°</i>	Screen Interval:
Samplers: <i>D Lewis</i>	Measuring Point: <i>TOC</i>
Purge Method: <i>peristaltic pump</i>	Depth to water: <i>7.43 7.78</i>
Sample Method: <i>" "</i>	Depth to bottom: <i>39.18 39.65</i>
Tubing Type: <i>1/2" poly</i>	Depth to NAPL:
Pump Intake Depth:	NAPL thickness:

Water Disposal/quantity: <i>OWS</i>	Meter Information:	Calibration
QA/QC Samples:	Model	Date
Duplicate: <i>MW-214-D-1011 0945</i>	Temp.: <i>45.1</i>	<i>10/25/11</i>
Replicate:	pH:	
MS/MSD:	Conductivity:	
Blank:	ORP	

Containers:	Analysis	Type	No. of Primary	No. of MS/MSD	Comments:
	<i>BTEX</i>				<i>sulfur-like smell</i>
	<i>TPH-G</i>				
	<i>TPH-D</i>				
	<i>PAH</i>				

Field Parameters	Units	0 Minutes	3 Minutes	6 Minutes	9 Minutes	12 Minutes	15 Minutes	18 Minutes
Temperature	<i>°C</i>	<i>12.43</i>				<i>12.88</i>	<i>12.88</i>	<i>12.86</i>
pH		<i>8.83</i>				<i>8.72</i>	<i>8.71</i>	<i>8.70</i>
Conductivity	<i>µS/cm</i>	<i>12695</i>				<i>13508</i>	<i>13500</i>	<i>13481</i>
ORP	<i>mV</i>	<i>-219.0</i>				<i>-285.3</i>	<i>-286.0</i>	<i>-286.9</i>
DO	<i>mg/L</i>	<i>15.43</i>				<i>7.64</i>	<i>7.60</i>	<i>7.55</i>
Turbidity	<i>NTU</i>							<i>7.2</i>
Time		<i>0856</i>	<i>0859</i>	<i>0902</i>	<i>0905</i>	<i>0908</i>	<i>0911</i>	<i>0914</i>
Water Level		<i>-08</i>				<i>7.43</i>	<i>7.43</i>	<i>7.43</i>
Flow Rate	<i>ml/min</i>	<i>100</i>				<i>100</i>	<i>100</i>	<i>100</i>

Field Parameters	Units	Minutes	Minutes	Minutes	Minutes	Minutes	Minutes	Sample
Temperature								
pH								
Conductivity								
ORP								
DO								
Turbidity								
Time								<i>0915</i>
Water Level								
Flow Rate								

GROUNDWATER SAMPLING DATA SHEET

Project Name: <i>Shell / Harbor Island</i>	Sample Number: <i>SH-04-1011</i>
Project Number: <i>46194304</i>	Station Number: <i>SH-04</i>
Date: <i>10/27/11</i>	Well Diameter: <i>2"</i>
Weather: <i>clear 40°</i>	Screen Interval:
Samplers: <i>2 Xerox</i>	Measuring Point: <i>TOC</i>
Purge Method: <i>peristaltic pump</i>	Depth to water: <i>10.68</i>
Sample Method: <i>" "</i>	Depth to bottom: <i>16.09</i>
Tubing Type: <i>1/8" poly</i>	Depth to NAPL:
Pump Intake Depth: <i>14'</i>	NAPL thickness:
Water Disposal/quantity: <i>OWS</i>	

QA/QC Samples:	Meter Information:		Calibration
		Model	Date
Duplicate:	Temp.: <i>YSI</i>		<i>10/27/11</i>
Replicate:	pH:		
MS/MSD:	Conductivity:		
Blank:	ORP		

Containers:	Analysis	Type	No. of Primary	No. of MS/MSD	Turbidity:
	<i>BTEX</i>				↓
	<i>TPH-G</i>				↓
	<i>TPH-D</i>				↓

Field Parameters	Units	0 Minutes	3 Minutes	6 Minutes	9 Minutes	12 Minutes	15 Minutes	18 Minutes
Temperature	<i>OC</i>	<i>14.62</i>	<i>14.78</i>	<i>15.16</i>	<i>15.39</i>	<i>15.55</i>	<i>15.62</i>	<i>15.65</i>
pH		<i>7.58</i>	<i>7.65</i>	<i>7.92</i>	<i>8.66</i>	<i>8.05</i>	<i>8.12</i>	<i>8.15</i>
Conductivity	<i>uS/cm</i>	<i>712</i>	<i>736</i>	<i>742</i>	<i>871</i>	<i>876</i>	<i>879</i>	<i>881</i>
ORP	<i>mV</i>	<i>-51.9</i>	<i>-81.3</i>	<i>-103.2</i>	<i>-115.8</i>	<i>-116.7</i>	<i>-116.8</i>	<i>-116.9</i>
DO	<i>mg/L</i>	<i>17.22</i>	<i>10.95</i>	<i>6.00</i>	<i>2.75</i>	<i>2.14</i>	<i>2.16</i>	<i>2.12</i>
Turbidity	<i>NTU</i>							<i>59.7</i>
Time		<i>0641</i>	<i>0644</i>	<i>0647</i>	<i>0650</i>	<i>0653</i>	<i>0656</i>	<i>0659</i>
Water Level		<i>10.72</i>	<i>10.73</i>	<i>10.74</i>	<i>10.75</i>	<i>10.76</i>	<i>10.77</i>	<i>10.78</i>
Flow Rate	<i>ml/min</i>	<i>200</i>	<i>200</i>	<i>200</i>	<i>200</i>	<i>200</i>	<i>200</i>	<i>200</i>

Field Parameters	Units	Minutes	Minutes	Minutes	Minutes	Minutes	Minutes	Sample
Temperature								
pH								
Conductivity								
ORP								
DO								
Turbidity								
Time								<i>0700</i>
Water Level								
Flow Rate								

GROUNDWATER SAMPLING DATA SHEET

Project Name: <i>Shell Harbor Island</i>	Sample Number: <i>TES-MWI-1011</i>
Project Number: <i>4619 4304</i>	Station Number: <i>TES-MWI</i>
Date: <i>10/27/11</i>	Well Diameter: <i>4"</i>
Weather: <i>foggy, 45°</i>	Screen Interval:
Samplers: <i>Drew's</i>	Measuring Point: <i>TOC</i>
Purge Method: <i>peristaltic pump</i>	Depth to water: <i>10.42</i>
Sample Method: <i>"</i>	Depth to bottom: <i>20.12</i>
Tubing Type: <i>1/8" poly</i>	Depth to NAPL:
Pump Intake Depth: <i>17.5</i>	NAPL thickness:

Water Disposal/quantity: <i>OWS</i>	Meter Information:
QA/QC Samples:	Model
Duplicate:	Date
Replicate:	Temp.: <i>7.51</i>
MS/MSD:	pH:
Blank:	Conductivity:
	ORP
	DO
	Turbidity:

Containers:	Analysis	Type	No. of Primary	No. of MS/MSD	Comments:
	<i>TPH-G</i>				
	<i>TPH-D</i>				
	<i>BTEX</i>				

Field Parameters	Units	0 Minutes	3 Minutes	6 Minutes	9 Minutes	12 Minutes	15 Minutes	18 Minutes
Temperature	<i>°C</i>	<i>12.63</i>	<i>12.58</i>	<i>11.77</i>	<i>11.60</i>	<i>11.59</i>	<i>11.58</i>	<i>11.57</i>
pH		<i>8.90</i>	<i>8.66</i>	<i>8.57</i>	<i>8.55</i>	<i>8.50</i>	<i>8.49</i>	<i>8.47</i>
Conductivity	<i>µS/cm</i>	<i>102</i>	<i>106</i>	<i>103</i>	<i>101</i>	<i>102</i>	<i>103</i>	<i>104</i>
ORP	<i>mV</i>	<i>-35.5</i>	<i>-20.8</i>	<i>-12.1</i>	<i>-9.2</i>	<i>-7.6</i>	<i>-7.4</i>	<i>-7.2</i>
DO	<i>mg/L</i>	<i>8.90</i>	<i>6.39</i>	<i>4.40</i>	<i>3.59</i>	<i>3.44</i>	<i>3.40</i>	<i>3.38</i>
Turbidity	<i>NTU</i>							<i>10.9</i>
Time		<i>0915</i>	<i>0918</i>	<i>0921</i>	<i>0924</i>	<i>0927</i>	<i>0930</i>	<i>0933</i>
Water Level		<i>10.64</i>	<i>10.66</i>	<i>10.68</i>	<i>10.70</i>	<i>10.72</i>	<i>10.74</i>	<i>10.75</i>
Flow Rate	<i>ml/min</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>

Field Parameters	Units	Minutes	Minutes	Minutes	Minutes	Minutes	Minutes	Sample
Temperature								
pH								
Conductivity								
ORP								
DO								
Turbidity								
Time								<i>0935</i>
Water Level								
Flow Rate								

GROUNDWATER SAMPLING DATA SHEET

Project Name: <i>Shell/Harbo Island</i>				Sample Number: <i>TX-03A-1011</i>			
Project Number: <i>4619 4304</i>				Station Number: <i>TX-03A</i>			
Date: <i>10/27/10</i>				Well Diameter: <i>2"</i>			
Weather: <i>Clear, 50°</i>				Screen Interval:			
Samplers: <i>D Seals</i>				Measuring Point: <i>TOC</i>			
Purge Method: <i>peristaltic pump</i>				Depth to water: <i>14.92</i> <i>6.74</i>			
Sample Method: <i>" "</i>				Depth to bottom: <i>14.92</i>			
Tubing Type: <i>1/8" poly</i>				Depth to NAPL:			
Pump Intake Depth: <i>13'</i>				NAPL thickness:			
Water Disposal/quantity:				Meter Information:		Calibration	
QA/QC Samples:				Model		Date	
Duplicate:				Temp.: <i>YSI</i>		<i>10/27/11</i>	
Replicate:				pH:			
MS/MSD:				Conductivity:			
Blank:				ORP			
Containers:				DO			
Analysis		Type	No. of Primary	No. of MS/MSD	Turbidity:		
<i>BTEX</i>					↓		↓
<i>TPH-G</i>					↓		↓
<i>NA parameters</i>					↓		↓
				Comments:			
				<i>faint fuel-like odor</i>			

Field Parameters	Units	0	3	6	9	12	15	18
		Minutes	Minutes	Minutes	Minutes	Minutes	Minutes	Minutes
Temperature	<i>OC</i>	<i>15.38</i>	<i>15.16</i>	<i>15.20</i>	<i>15.26</i>	<i>15.35</i>	<i>15.42</i>	<i>15.44</i>
pH		<i>8.30</i>	<i>8.33</i>	<i>8.37</i>	<i>8.42</i>	<i>8.45</i>	<i>8.49</i>	<i>8.50</i>
Conductivity	<i>us/cm^c</i>	<i>483</i>	<i>482</i>	<i>480</i>	<i>479</i>	<i>478</i>	<i>477</i>	<i>478</i>
ORP	<i>mv</i>	<i>-69.3</i>	<i>-83.3</i>	<i>-89.2</i>	<i>-92.8</i>	<i>-96.6</i>	<i>-100.0</i>	<i>-100.9</i>
DO	<i>mg/L</i>	<i>7.08</i>	<i>4.38</i>	<i>3.24</i>	<i>2.67</i>	<i>2.24</i>	<i>1.84</i>	<i>1.72</i>
Turbidity	<i>NTU</i>							
Time		<i>1304</i>	<i>1307</i>	<i>1310</i>	<i>1313</i>	<i>1316</i>	<i>1319</i>	<i>1322</i>
Water Level		<i>6.89</i>	<i>6.92</i>	<i>6.95</i>	<i>6.98</i>	<i>6.99</i>	<i>7.04</i>	<i>7.08</i>
Flow Rate	<i>ml/min</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>
Field Parameters	Units	21						Sample
Temperature		<i>15.45</i>						
pH		<i>8.51</i>						
Conductivity		<i>478</i>						
ORP		<i>-101.5</i>						
DO		<i>1.60</i>						
Turbidity		<i>29.9</i>						
Time		<i>1325</i>						<i>1330</i>
Water Level		<i>7.11</i>						
Flow Rate		<i>100</i>						

GROUNDWATER SAMPLING DATA SHEET

Project Name: <i>Shell / Harbor Island</i>	Sample Number: <i>TX-04-1011</i>
Project Number: <i>46194304</i>	Station Number: <i>TX-04</i>
Date: <i>10/26/11</i>	Well Diameter: <i>2"</i>
Weather: <i>overcast 50"</i>	Screen Interval:
Samplers: <i>D Sews</i>	Measuring Point: <i>TOC</i>
Purge Method: <i>peristaltic pump</i>	Depth to water: <i>11.47</i>
Sample Method: <i>"</i>	Depth to bottom: <i>17.95</i>
Tubing Type: <i>1/8" poly</i>	Depth to NAPL:
Pump Intake Depth: <i>16</i>	NAPL thickness:

Water Disposal/quantity: <i>OWS</i>	Meter Information:	Calibration
QA/QC Samples:	Model	Date
Duplicate:	Temp.: <i>4.51</i>	<i>10/26/11</i>
Replicate:	pH:	
MS/MSD:	Conductivity:	
Blank:	ORP	

Containers:	Analysis	Type	No. of Primary	No. of MS/MSD	Comments:
	<i>TPH-A</i>				<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">↓</div> <div style="text-align: center;">↓</div> </div>
	<i>TPH-D</i>				
	<i>BTEX</i>				

Field Parameters	Units	0 Minutes	3 Minutes	6 Minutes	9 Minutes	12 Minutes	15 Minutes	18 Minutes
Temperature	<i>°C</i>	<i>14.78</i>	<i>14.63</i>	<i>14.65</i>	<i>14.79</i>	<i>14.84</i>	<i>14.86</i>	
pH		<i>8.36</i>	<i>8.55</i>	<i>8.56</i>	<i>8.51</i>	<i>8.49</i>	<i>8.48</i>	
Conductivity	<i>µS/cm</i>	<i>307</i>	<i>305</i>	<i>301</i>	<i>299</i>	<i>297</i>	<i>296</i>	
ORP	<i>mV</i>	<i>-84.7</i>	<i>-111.3</i>	<i>-118.1</i>	<i>-118.4</i>	<i>-118.6</i>	<i>-118.8</i>	
DO	<i>mg/L</i>	<i>11.77</i>	<i>4.25</i>	<i>2.91</i>	<i>2.53</i>	<i>2.49</i>	<i>2.45</i>	
Turbidity	<i>NTU</i>							
Time		<i>16.21</i>	<i>16.24</i>	<i>16.27</i>	<i>15.70</i>	<i>16.30</i>	<i>16.33</i>	<i>16.36^{00.6}</i>
Water Level		<i>18.00</i>	<i>18.01</i>	<i>18.02</i>	<i>18.04</i>	<i>18.06</i>	<i>18.08</i>	
Flow Rate	<i>100 ml/min</i>	<i>200</i>	<i>200</i>	<i>200</i>	<i>200</i>	<i>200</i>	<i>200</i>	

Field Parameters	Units	Minutes	Minutes	Minutes	Minutes	Minutes	Minutes	Sample
Temperature								
pH								
Conductivity								
ORP								
DO								
Turbidity								
Time								
Water Level								
Flow Rate								

110 16 40

GROUNDWATER SAMPLING DATA SHEET

Project Name: <i>Shell / Harbor Island</i>	Sample Number: <i>TX-06A-1011</i>
Project Number: <i>46194304</i>	Station Number: <i>TX-06A</i>
Date: <i>10/25/11</i>	Well Diameter: <i>2"</i>
Weather: <i>foggy, 40°</i>	Screen Interval:
Samplers: <i>Blex</i>	Measuring Point: <i>TOC</i>
Purge Method: <i>peristaltic pump</i>	Depth to water: <i>5.40</i>
Sample Method: <i>" "</i>	Depth to bottom: <i>14.60</i>
Tubing Type: <i>1/8" poly</i>	Depth to NAPL:
Pump Intake Depth: <i>12'</i>	NAPL thickness:

Water Disposal/quantity: <i>OWS</i>	Meter Information:	Calibration
QA/QC Samples:	Model	Date
Duplicate:	Temp.: <i>451</i>	<i>10/25/11</i>
Replicate:	pH:	
MS/MSD:	Conductivity:	
Blank:	ORP	

Containers:	Analysis	Type	No. of Primary	No. of MS/MSD	Comments:
<i>Blex, TPH-G</i>					<div style="font-size: 2em;">✓</div>
<i>TPH-D</i>					

Field Parameters	Units	0 Minutes	3 Minutes	6 Minutes	9 Minutes	12 Minutes	15 Minutes	18 Minutes
Temperature	<i>°C</i>	9.99	9.99	9.99		9.98	9.98	9.98
pH		8.83	8.78	8.43		8.43	8.43	8.42
Conductivity	<i>µS/cm</i>	888	878	972		1568	1570	1575
ORP	<i>mV</i>	-75.2	-75.9			-82.9	-84.7	-86.8
DO	<i>mg/L</i>	21.70	15.22	12.94		12.24	12.20	12.19
Turbidity	<i>NTU</i>							2.31
Time		0705	0708	0711	0714	0717	0720	0723
Water Level		5.42	5.43	5.44		5.46	5.47	5.48
Flow Rate	<i>ml/min</i>	100	100	100		100		

Field Parameters	Units	Minutes	Minutes	Minutes	Minutes	Minutes	Minutes	Sample
Temperature								
pH								
Conductivity								
ORP								
DO								
Turbidity								
Time								
Water Level								<i>0725</i>
Flow Rate								



1501 4th Avenue, Suite 1400
Seattle, Washington 98101
T: (206) 438-2700
F: (206) 438-2699

Daily Field Report

Date: 10/25/11 Job No: 46194304
Project: Shell/ Harbor Island GW Sampling
Location: _____
Owner: _____ Contractor: _____
Technician: Drew Page: _____ of: _____

Weather: foggy, 40°

0630	on site set up at TX-06A
0725	collected sample # (TX-06A-1011)
0800	checked in @ terminal office
0810	Set up at shoreline manifold
0915	sample # (MW-214-1011)
0945	duplicate (MW-214-D-1011)
1010	sample # (MW-213-1011)
1140	Sample # (MW-112A-1011)
1200	Eat lunch
1215	back at work
1300	Sample # (MW-105-1011)
1405	Sample # (MW-111-1011)
1500	Sample # (MW-104-1011)
1550	Sample # (MW-05-1011)
1616	Leaving site for office
1645	at office tidying up samples for mailing tomorrow
1730	leave office

11 hrs.



1501 4th Avenue, Suite 1400
 Seattle, Washington 98101
 T: (206) 438-2700
 F: (206) 438-2699

Daily Field Report

Date: 10/26/11 Job No: 46194304
 Project: Shell / Harbor Island
 Location: _____
 Owner: _____ Contractor: _____
 Technician: Stew
 Page: _____ of: _____

Weather: foggy 40°

0600	at office preparing samples for mailing
0730	check in at site
0830	Sample # (MW-206A-1011)
0900	Setting up to sample MW-201 + MW-202 Have to carry equipment into containment area of North Tank Farm
1010	Sample # (MW-201-1011)
1200	Sample # (MW-202-1011) Dale of Major Drilling on site, to review drilling locations
1300	Set up on MW-203, vehicle parked on TX-034
1330	Sample # (MW-203-1014)
1415	Leaving site for FedEx to mail off
1440	Dropped NA parameter samples
1440	Dropped samples @ FedEx, called lab to give them a heads up. Left message with front desk. Vincent the PM was not in.
1505	See Beckon site, setting up at MW-102
1545	Sample # (MW-102-1011)
1710	Sample # MW-102 TX-04-1011
1720	Leaving site after disposing of purge water into AWS and checking out at office

1640

10 hrs

Shell Harbor Island Terminal Monthly O & M

Field Personnel:	DAVE LEWIS		
Project Number:	46194268	Arrival Time:	0830
Date:	12/12/11	Departure Time:	0930
		Weather:	fog, 40°

Well ID	Time	DTP (ft)	DTW (ft)	Product Thickness (ft)	Odor?	Sheen?	Sock Wt (oz)	2nd Sock Wt (oz)	Rotate sock?	Change sock?
MW-204	0910	—	9.35	—	—	NO	—	—	NO	NO
MW-208	0841	—	5.60	—	—	NO	—	—	NO	NO
MW-210	0848	6.54	6.82	.28	Strong	YES	45	—	NO	NO
MW-211	0845	—	5.92	—	—	NO	55	—	NO	NO
MW-212	0843	—	5.37	—	—	YES	57	—	NO	NO

Note: 2nd sock wt. is the wt. after the current sock is rotated or the wt. of a new sock to be installed in the well

Tide Level H : M J L

Comments and Well Maintenance Issues:

Did not change absorbent socks at request of Project Manager for all lower production wells in affected.

<p>interface probe</p> <p>trash bag</p> <p>nitrile gloves</p> <p>decon equipment</p>	<p>sock scale</p> <p>clean socks</p> <p>PPE (safety boots, hard hat, safety glasses, gloves and safety vest)</p>
<p>METAL BUCKET</p> <p>FLASHLIGHT</p> <p>TOOLS</p>	

ENVIRONMENTAL WELL, REMEDIATION COMPOUND, and SITE INSPECTION FORM

ADDRESS 2555 13th AVE SW
 CITY & STATE Seattle, WA

COST CENTER # 30003611
 DATE 12/12/11

Well ID	Observations Upon Arrival					Well Pad Condition	Detailed Explanation of Maintenance Recommended and Performed	Note Repairs Made	Repair Date and PM Initials
	Manway Cover, Type, Size, & Condition	Well Cap Type & Condition	Well Lock Condition (if present)	Well Pad Condition	Well Pad Condition				
MW-204	no comment	2" endcap	none	none	none				
MW-206	bolts stripped	2" Twist lock	frozen	OK					
MW-210	Bolt hole broken	2" Twist lock	frozen	OK					
MW-211	bolts missing	4" Twist lock	none	OK					
MW-212	bolts missing	4" Twist lock	none	none					
On-site Drinking Water Well									
Remediation Compound	Type and Condition of Enclosure	Condition of Area Inside Enclosure	Equipment Condition	Emergency Contact info					
OK	chain link			Visible					
Number of Drums On-site	Drum Condition	Labeled Correctly and Writing Legible	Drums Scheduled for Pickup	Drums Located to Min Business Interference					
0	OK								

*Groundwater monitoring well covers must be painted in accordance with applicable regulations.

All environmental wells and the remediation compound were in good condition, locked, and secured upon my departure (unless otherwise noted above).

Field Personnel Signature

APPENDIX D

Data Validation & Laboratory Analytical Reports

Shell – Semi-Annual Groundwater Monitoring – Harbor Island

Data Review

The data quality review of the 12 primary groundwater samples, one field duplicate groundwater samples and one trip blank collected on May 23, 2011 and May 24, 2011 at the Harbor Island site in Seattle, Washington has been completed. Samples were submitted to Accutest Laboratories of San Jose, California. The samples submitted were analyzed for one or more of the following: benzene, toluene, ethylbenzene, and xylene (BTEX; EPA Method 8260B); gasoline-range petroleum hydrocarbons (NWTPH-Gx); diesel-range petroleum hydrocarbons (NWTPH-Dx); base neutrals and acids- PAHs (EPA Method 8270C); and total lead (EPA Method 6010B).

The review included the analytical data presented in Accutest report C16255. The data were reviewed based on *USEPA Contract Laboratory Program National Functional Guidelines (NFGs) for Organic Data Review*, June 2008, *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review*, January 2010, and laboratory quality control criteria. Items reviewed included: chain-of-custody (COC) records, hold times, surrogate recoveries, matrix spike and matrix spike duplicate (MS/MSD) results, laboratory control and laboratory control duplicate (LCS/LCSD) results, laboratory duplicate results, field duplicate results, method blank results and trip blank results. Qualifiers assigned as a result of the review are discussed below. No data qualifiers were assigned to sample results during this data review.

The following criteria were evaluated during the review:

- COC Records – Acceptable
- Temperature – Acceptable
- Preservation – Acceptable
- Hold Times – Acceptable
- Trip Blanks – Acceptable
- Method Blanks – Acceptable
- Surrogates – Acceptable
- Laboratory Control Samples (LCS/LCSD) – Acceptable
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) – Acceptable
- Field Duplicate – Sample MW-214D-0511 (C16255-11) was submitted as a field duplicate of primary sample MW-214-0511 (C16255-10). Relative percent difference (RPD) calculations were performed on the field duplicate sample pair results when the sample results were greater than five times the method reporting limit. All RPDs for duplicate pairs were within the control limit of 20%.
- Reporting Limits – The laboratory reported all detections between the MDL and

Shell – Semi-Annual Groundwater Monitoring – Harbor Island

MRL as estimated and flagged the results ‘J’. Additional qualifiers were not added during the data review process. Reporting limits in a few instances were elevated due to the dilutions, no qualifications of the data is necessary.

Overall Assessment of Data

The completeness of the analytical reports for this groundwater monitoring event is 100%. The usefulness of the data is based on the USEPA guidance documents referenced in the introduction of this report. Upon consideration of the information presented above, the data are considered usable. The data qualifiers assigned by the laboratory are shown on the laboratory reports.

Data Qualifier Definitions

- U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
 - J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
 - UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
 - R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria.
- DNR Do Not Report. Another result is available that is more reliable.

References

- USEPA 2008a. U.S. Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Organic Data Review. June 2008.
- USEPA 2010. U.S. Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Superfund Inorganic Data Review. January 2010.

Technical Report for

Shell Oil Products

URSOPR: Shell/Harbor Island

46194268

Accutest Job Number: C16255

Sampling Dates: 05/23/11 - 05/24/11

Report to:

URS Corporation
111 SW Columbia, Suite 1500
Portland, OR 97201-5850
brian_pletcher@urscorp.com

ATTN: Brian Pletcher

Total number of pages in report: 69



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

Laurie Glantz-Murphy
Laboratory Director

Client Service contact: Simon Hague 408-588-0200

Certifications: CA (08258CA) AZ (AZ0762) DoD/ISO/IEC 17025:2005 (L2242)

This report shall not be reproduced, except in its entirety, without the written approval of Accutest Laboratories.

Test results relate only to samples analyzed.

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Sample Summary

Shell Oil Products

Job No: C16255

URSOP: Shell/Harbor Island
Project No: 46194268

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
C16255-1	05/23/11	10:35 DL	05/26/11	AQ	Ground Water	MW-202-0511
C16255-2	05/23/11	12:05 DL	05/26/11	AQ	Ground Water	TX-03A-0511
C16255-3	05/23/11	12:15 DL	05/26/11	AQ	Ground Water	MW-203-0511
C16255-4	05/23/11	13:40 DL	05/26/11	AQ	Ground Water	MW-104-0511
C16255-5	05/23/11	13:45 DL	05/26/11	AQ	Ground Water	MW-05-0511
C16255-6	05/23/11	14:45 DL	05/26/11	AQ	Ground Water	MW-111-0511
C16255-7	05/23/11	15:45 DL	05/26/11	AQ	Ground Water	SH-04-0511
C16255-8	05/23/11	16:00 DL	05/26/11	AQ	Ground Water	TX-04-0511
C16255-9	05/24/11	09:15 DL	05/26/11	AQ	Ground Water	MW-213-0511
C16255-10	05/24/11	09:25 DL	05/26/11	AQ	Ground Water	MW-214-0511
C16255-11	05/24/11	09:15 DL	05/26/11	AQ	Ground Water	MW-214D-0511
C16255-12	05/24/11	11:10 DL	05/26/11	AQ	Ground Water	MW-112A-0511
C16255-13	05/24/11	12:30 DL	05/26/11	AQ	Ground Water	TES-MW-1-0511



Sample Summary (continued)

Shell Oil Products

Job No: C16255

URSOP: Shell/Harbor Island
Project No: 46194268

Sample Number	Collected		Matrix			Client Sample ID
	Date	Time By	Received	Code	Type	
C16255-14	05/24/11	00:00 DL	05/26/11	AQ	Trip Blank Water	TRIP BLANK

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID: MW-202-0511	
Lab Sample ID: C16255-1	Date Sampled: 05/23/11
Matrix: AQ - Ground Water	Date Received: 05/26/11
Method: NWTPH-GX	Percent Solids: n/a
Project: URSORP: Shell/Harbor Island	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	JK19998.D	10	06/03/11	TT	n/a	n/a	GJK836
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Northwest TPH-Gx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Gasoline)	3.50	2.0	0.50	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
98-08-8	aaa-Trifluorotoluene	99%		50-150%
460-00-4	4-Bromofluorobenzene	99%		50-150%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-202-0511		
Lab Sample ID: C16255-1		Date Sampled: 05/23/11
Matrix: AQ - Ground Water		Date Received: 05/26/11
Method: NWTPH-DX SW846 3510C		Percent Solids: n/a
Project: URSORP: Shell/Harbor Island		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	HH13406.D	1	06/02/11	JH	05/27/11	OP3956	GHH487
Run #2							

Run #	Initial Volume	Final Volume
Run #1	1030 ml	1.0 ml
Run #2		

Northwest TPH-Dx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Diesel)	1.84	0.097	0.049	mg/l	
	TPH (Motor Oil)	ND	0.19	0.097	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
630-01-3	Hexacosane	79%		50-150%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: TX-03A-0511	Date Sampled: 05/23/11
Lab Sample ID: C16255-2	Date Received: 05/26/11
Matrix: AQ - Ground Water	Percent Solids: n/a
Method: SW846 8260B	
Project: URSORP: Shell/Harbor Island	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	Q2022.D	50	05/27/11	BD	n/a	n/a	VQ70
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	1780	50	15	ug/l	
108-88-3	Toluene	ND	50	25	ug/l	
100-41-4	Ethylbenzene	44.9	50	15	ug/l	J
1330-20-7	Xylene (total)	ND	100	35	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	111%		60-130%
2037-26-5	Toluene-D8	101%		60-130%
460-00-4	4-Bromofluorobenzene	107%		60-130%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: TX-03A-0511	Date Sampled: 05/23/11
Lab Sample ID: C16255-2	Date Received: 05/26/11
Matrix: AQ - Ground Water	Percent Solids: n/a
Method: NWTPH-GX	
Project: URSORP: Shell/Harbor Island	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	JK19999.D	20	06/03/11	TT	n/a	n/a	GJK836
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Northwest TPH-Gx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Gasoline)	7.53	4.0	1.0	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
98-08-8	aaa-Trifluorotoluene	101%		50-150%
460-00-4	4-Bromofluorobenzene	103%		50-150%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-203-0511	
Lab Sample ID: C16255-3	Date Sampled: 05/23/11
Matrix: AQ - Ground Water	Date Received: 05/26/11
Method: NWTPH-GX	Percent Solids: n/a
Project: URSORP: Shell/Harbor Island	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	JK20000.D	2	06/03/11	TT	n/a	n/a	GJK836
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Northwest TPH-Gx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Gasoline)	0.333	0.40	0.10	mg/l	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
98-08-8	aaa-Trifluorotoluene	98%		50-150%
460-00-4	4-Bromofluorobenzene	99%		50-150%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-203-0511	
Lab Sample ID: C16255-3	Date Sampled: 05/23/11
Matrix: AQ - Ground Water	Date Received: 05/26/11
Method: NWTPH-DX SW846 3510C	Percent Solids: n/a
Project: URSORP: Shell/Harbor Island	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	HH13407.D	1	06/02/11	JH	05/27/11	OP3956	GHH487
Run #2							

Run #	Initial Volume	Final Volume
Run #1	1020 ml	1.0 ml
Run #2		

Northwest TPH-Dx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Diesel)	0.0854	0.098	0.049	mg/l	J
	TPH (Motor Oil)	0.314	0.20	0.098	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
630-01-3	Hexacosane	76%		50-150%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-104-0511		Date Sampled: 05/23/11
Lab Sample ID: C16255-4		Date Received: 05/26/11
Matrix: AQ - Ground Water		Percent Solids: n/a
Method: SW846 8260B		
Project: URSORP: Shell/Harbor Island		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	Q2024.D	2	05/27/11	BD	n/a	n/a	VQ70
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	2.0	0.60	ug/l	
108-88-3	Toluene	3.1	2.0	1.0	ug/l	
100-41-4	Ethylbenzene	104	2.0	0.60	ug/l	
1330-20-7	Xylene (total)	1.8	4.0	1.4	ug/l	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	109%		60-130%
2037-26-5	Toluene-D8	95%		60-130%
460-00-4	4-Bromofluorobenzene	106%		60-130%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-104-0511	Date Sampled: 05/23/11
Lab Sample ID: C16255-4	Date Received: 05/26/11
Matrix: AQ - Ground Water	Percent Solids: n/a
Method: NWTPH-GX	
Project: URSORP: Shell/Harbor Island	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	JK20001.D	10	06/03/11	TT	n/a	n/a	GJK836
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Northwest TPH-Gx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Gasoline)	4.44	2.0	0.50	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
98-08-8	aaa-Trifluorotoluene	97%		50-150%
460-00-4	4-Bromofluorobenzene	120%		50-150%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-104-0511	Date Sampled: 05/23/11
Lab Sample ID: C16255-4	Date Received: 05/26/11
Matrix: AQ - Ground Water	Percent Solids: n/a
Method: NWTTPH-DX SW846 3510C	
Project: URSORP: Shell/Harbor Island	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	HH13408.D	1	06/02/11	JH	05/27/11	OP3956	GHH487
Run #2							

Run #	Initial Volume	Final Volume
Run #1	1030 ml	1.0 ml
Run #2		

Northwest TPH-Dx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Diesel)	0.448	0.097	0.049	mg/l	
	TPH (Motor Oil)	ND	0.19	0.097	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
630-01-3	Hexacosane	77%		50-150%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-104-0511	Date Sampled: 05/23/11
Lab Sample ID: C16255-4	Date Received: 05/26/11
Matrix: AQ - Ground Water	Percent Solids: n/a
Project: URSORP: Shell/Harbor Island	

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Lead	< 10	10	ug/l	1	05/27/11	05/31/11 RS	SW846 6010B ¹	SW3010A ²

(1) Instrument QC Batch: MA1913

(2) Prep QC Batch: MP3547

RL = Reporting Limit

Report of Analysis

Client Sample ID: MW-05-0511	
Lab Sample ID: C16255-5	Date Sampled: 05/23/11
Matrix: AQ - Ground Water	Date Received: 05/26/11
Method: SW846 8260B	Percent Solids: n/a
Project: URSORP: Shell/Harbor Island	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	Q2012.D	1	05/27/11	BD	n/a	n/a	VQ70
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.30	ug/l	
108-88-3	Toluene	ND	1.0	0.50	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.30	ug/l	
1330-20-7	Xylene (total)	ND	2.0	0.70	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	108%		60-130%
2037-26-5	Toluene-D8	98%		60-130%
460-00-4	4-Bromofluorobenzene	103%		60-130%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-05-0511	
Lab Sample ID: C16255-5	Date Sampled: 05/23/11
Matrix: AQ - Ground Water	Date Received: 05/26/11
Method: NWTPH-GX	Percent Solids: n/a
Project: URSORP: Shell/Harbor Island	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	JK20002.D	1	06/03/11	TT	n/a	n/a	GJK836
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Northwest TPH-Gx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Gasoline)	0.0744	0.20	0.050	mg/l	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
98-08-8	aaa-Trifluorotoluene	96%		50-150%
460-00-4	4-Bromofluorobenzene	98%		50-150%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-111-0511	
Lab Sample ID: C16255-6	Date Sampled: 05/23/11
Matrix: AQ - Ground Water	Date Received: 05/26/11
Method: SW846 8260B	Percent Solids: n/a
Project: URSORP: Shell/Harbor Island	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	Q2013.D	1	05/27/11	BD	n/a	n/a	VQ70
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	0.64	1.0	0.30	ug/l	J
108-88-3	Toluene	ND	1.0	0.50	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.30	ug/l	
1330-20-7	Xylene (total)	ND	2.0	0.70	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	106%		60-130%
2037-26-5	Toluene-D8	100%		60-130%
460-00-4	4-Bromofluorobenzene	104%		60-130%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-111-0511	
Lab Sample ID: C16255-6	Date Sampled: 05/23/11
Matrix: AQ - Ground Water	Date Received: 05/26/11
Method: NWTPH-GX	Percent Solids: n/a
Project: URSORP: Shell/Harbor Island	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	JK20004.D	1	06/03/11	TT	n/a	n/a	GJK836
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Northwest TPH-Gx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Gasoline)	ND	0.20	0.050	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
98-08-8	aaa-Trifluorotoluene	98%		50-150%
460-00-4	4-Bromofluorobenzene	96%		50-150%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: SH-04-0511	
Lab Sample ID: C16255-7	Date Sampled: 05/23/11
Matrix: AQ - Ground Water	Date Received: 05/26/11
Method: SW846 8260B	Percent Solids: n/a
Project: URSORP: Shell/Harbor Island	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	Q2023.D	10	05/27/11	BD	n/a	n/a	VQ70
Run #2							

	Purge Volume
Run #1	10.0 ml
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	655	10	3.0	ug/l	
108-88-3	Toluene	14.5	10	5.0	ug/l	
100-41-4	Ethylbenzene	151	10	3.0	ug/l	
1330-20-7	Xylene (total)	34.0	20	7.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	109%		60-130%
2037-26-5	Toluene-D8	79%		60-130%
460-00-4	4-Bromofluorobenzene	97%		60-130%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: SH-04-0511	Date Sampled: 05/23/11
Lab Sample ID: C16255-7	Date Received: 05/26/11
Matrix: AQ - Ground Water	Percent Solids: n/a
Method: NWTPH-GX	
Project: URSORP: Shell/Harbor Island	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	JK20008.D	10	06/03/11	TT	n/a	n/a	GJK836
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Northwest TPH-Gx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Gasoline)	5.40	2.0	0.50	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
98-08-8	aaa-Trifluorotoluene	95%		50-150%
460-00-4	4-Bromofluorobenzene	106%		50-150%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: SH-04-0511	Date Sampled: 05/23/11
Lab Sample ID: C16255-7	Date Received: 05/26/11
Matrix: AQ - Ground Water	Percent Solids: n/a
Method: NWTPH-DX SW846 3510C	
Project: URSORP: Shell/Harbor Island	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	HH13409.D	1	06/02/11	JH	05/27/11	OP3956	GHH487
Run #2							

Run #	Initial Volume	Final Volume
Run #1	1040 ml	1.0 ml
Run #2		

Northwest TPH-Dx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Diesel)	1.84	0.096	0.048	mg/l	
	TPH (Motor Oil)	0.130	0.19	0.096	mg/l	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
630-01-3	Hexacosane	70%		50-150%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: TX-04-0511	Date Sampled: 05/23/11
Lab Sample ID: C16255-8	Date Received: 05/26/11
Matrix: AQ - Ground Water	Percent Solids: n/a
Method: SW846 8260B	
Project: URSORP: Shell/Harbor Island	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	Q2014.D	1	05/27/11	BD	n/a	n/a	VQ70
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.30	ug/l	
108-88-3	Toluene	ND	1.0	0.50	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.30	ug/l	
1330-20-7	Xylene (total)	ND	2.0	0.70	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	108%		60-130%
2037-26-5	Toluene-D8	96%		60-130%
460-00-4	4-Bromofluorobenzene	104%		60-130%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: TX-04-0511	
Lab Sample ID: C16255-8	Date Sampled: 05/23/11
Matrix: AQ - Ground Water	Date Received: 05/26/11
Method: NWTPH-GX	Percent Solids: n/a
Project: URSORP: Shell/Harbor Island	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	JK20009.D	1	06/03/11	TT	n/a	n/a	GJK836
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Northwest TPH-Gx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Gasoline)	0.0554	0.20	0.050	mg/l	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
98-08-8	aaa-Trifluorotoluene	91%		50-150%
460-00-4	4-Bromofluorobenzene	93%		50-150%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-213-0511	Date Sampled: 05/24/11
Lab Sample ID: C16255-9	Date Received: 05/26/11
Matrix: AQ - Ground Water	Percent Solids: n/a
Method: SW846 8260B	
Project: URSORP: Shell/Harbor Island	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	Q2015.D	1	05/27/11	BD	n/a	n/a	VQ70
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.30	ug/l	
108-88-3	Toluene	ND	1.0	0.50	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.30	ug/l	
1330-20-7	Xylene (total)	ND	2.0	0.70	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	110%		60-130%
2037-26-5	Toluene-D8	102%		60-130%
460-00-4	4-Bromofluorobenzene	105%		60-130%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-213-0511	
Lab Sample ID: C16255-9	Date Sampled: 05/24/11
Matrix: AQ - Ground Water	Date Received: 05/26/11
Method: SW846 8270C BY SIM SW846 3510C	Percent Solids: n/a
Project: URSORP: Shell/Harbor Island	

Run #1	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	X16676.D	1	05/27/11	MT	05/27/11	OP3957	EX757
Run #2							

Run #1	Initial Volume	Final Volume
Run #1	1000 ml	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	1.0	0.25	ug/l	
208-96-8	Acenaphthylene	ND	1.0	0.25	ug/l	
120-12-7	Anthracene	ND	1.0	0.25	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.10	0.030	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.10	0.030	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.10	0.030	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.10	0.030	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.10	0.030	ug/l	
218-01-9	Chrysene	ND	0.10	0.030	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.10	0.030	ug/l	
206-44-0	Fluoranthene	ND	1.0	0.25	ug/l	
86-73-7	Fluorene	ND	1.0	0.25	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.10	0.030	ug/l	
90-12-0	1-Methylnaphthalene	ND	1.0	0.25	ug/l	
91-57-6	2-Methylnaphthalene	ND	1.0	0.25	ug/l	
91-20-3	Naphthalene	ND	1.0	0.25	ug/l	
85-01-8	Phenanthrene	ND	1.0	0.25	ug/l	
129-00-0	Pyrene	ND	1.0	0.25	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	94%		25-100%
321-60-8	2-Fluorobiphenyl	90%		25-106%
1718-51-0	Terphenyl-d14	94%		35-130%

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-213-0511	
Lab Sample ID: C16255-9	Date Sampled: 05/24/11
Matrix: AQ - Ground Water	Date Received: 05/26/11
Method: NWTPH-GX	Percent Solids: n/a
Project: URSORP: Shell/Harbor Island	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	JK20010.D	1	06/03/11	TT	n/a	n/a	GJK836
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Northwest TPH-Gx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Gasoline)	ND	0.20	0.050	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
98-08-8	aaa-Trifluorotoluene	95%		50-150%
460-00-4	4-Bromofluorobenzene	95%		50-150%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-213-0511	
Lab Sample ID: C16255-9	Date Sampled: 05/24/11
Matrix: AQ - Ground Water	Date Received: 05/26/11
Method: NWTPH-DX SW846 3510C	Percent Solids: n/a
Project: URSORP: Shell/Harbor Island	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	HH13410.D	1	06/02/11	JH	05/27/11	OP3956	GHH487
Run #2							

Run #	Initial Volume	Final Volume
Run #1	1020 ml	1.0 ml
Run #2		

Northwest TPH-Dx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Diesel)	ND	0.098	0.049	mg/l	
	TPH (Motor Oil)	ND	0.20	0.098	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
630-01-3	Hexacosane	83%		50-150%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-214-0511	Date Sampled: 05/24/11
Lab Sample ID: C16255-10	Date Received: 05/26/11
Matrix: AQ - Ground Water	Percent Solids: n/a
Method: SW846 8260B	
Project: URSORP: Shell/Harbor Island	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	Q2018.D	1	05/27/11	BD	n/a	n/a	VQ70
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.30	ug/l	
108-88-3	Toluene	ND	1.0	0.50	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.30	ug/l	
1330-20-7	Xylene (total)	ND	2.0	0.70	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	105%		60-130%
2037-26-5	Toluene-D8	101%		60-130%
460-00-4	4-Bromofluorobenzene	102%		60-130%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-214-0511	Date Sampled:	05/24/11
Lab Sample ID:	C16255-10	Date Received:	05/26/11
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	SW846 8270C BY SIM SW846 3510C		
Project:	URSOP: Shell/Harbor Island		

Run #1	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	X16677.D	1	05/27/11	MT	05/27/11	OP3957	EX757
Run #2							

Run #1	Initial Volume	Final Volume
Run #1	1030 ml	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	0.97	0.24	ug/l	
208-96-8	Acenaphthylene	ND	0.97	0.24	ug/l	
120-12-7	Anthracene	ND	0.97	0.24	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.097	0.029	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.097	0.029	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.097	0.029	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.097	0.029	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.097	0.029	ug/l	
218-01-9	Chrysene	ND	0.097	0.029	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.097	0.029	ug/l	
206-44-0	Fluoranthene	ND	0.97	0.24	ug/l	
86-73-7	Fluorene	ND	0.97	0.24	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.097	0.029	ug/l	
90-12-0	1-Methylnaphthalene	ND	0.97	0.24	ug/l	
91-57-6	2-Methylnaphthalene	ND	0.97	0.24	ug/l	
91-20-3	Naphthalene	ND	0.97	0.24	ug/l	
85-01-8	Phenanthrene	ND	0.97	0.24	ug/l	
129-00-0	Pyrene	ND	0.97	0.24	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	71%		25-100%
321-60-8	2-Fluorobiphenyl	57%		25-106%
1718-51-0	Terphenyl-d14	71%		35-130%

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-214-0511	
Lab Sample ID: C16255-10	Date Sampled: 05/24/11
Matrix: AQ - Ground Water	Date Received: 05/26/11
Method: NWTPH-GX	Percent Solids: n/a
Project: URSORP: Shell/Harbor Island	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	JK20011.D	1	06/03/11	TT	n/a	n/a	GJK836
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Northwest TPH-Gx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Gasoline)	ND	0.20	0.050	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
98-08-8	aaa-Trifluorotoluene	96%		50-150%
460-00-4	4-Bromofluorobenzene	95%		50-150%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-214-0511		
Lab Sample ID: C16255-10		Date Sampled: 05/24/11
Matrix: AQ - Ground Water		Date Received: 05/26/11
Method: NWTPH-DX SW846 3510C		Percent Solids: n/a
Project: URSORP: Shell/Harbor Island		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	HH13411.D	1	06/02/11	JH	05/27/11	OP3956	GHH487
Run #2							

	Initial Volume	Final Volume
Run #1	1030 ml	1.0 ml
Run #2		

Northwest TPH-Dx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Diesel)	0.127	0.097	0.049	mg/l	
	TPH (Motor Oil)	ND	0.19	0.097	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
630-01-3	Hexacosane	80%		50-150%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-214D-0511	Date Sampled: 05/24/11
Lab Sample ID: C16255-11	Date Received: 05/26/11
Matrix: AQ - Ground Water	Percent Solids: n/a
Method: SW846 8260B	
Project: URSORP: Shell/Harbor Island	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	Q2019.D	1	05/27/11	BD	n/a	n/a	VQ70
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.30	ug/l	
108-88-3	Toluene	ND	1.0	0.50	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.30	ug/l	
1330-20-7	Xylene (total)	ND	2.0	0.70	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	108%		60-130%
2037-26-5	Toluene-D8	101%		60-130%
460-00-4	4-Bromofluorobenzene	101%		60-130%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-214D-0511	Date Sampled: 05/24/11
Lab Sample ID: C16255-11	Date Received: 05/26/11
Matrix: AQ - Ground Water	Percent Solids: n/a
Method: NWTPH-GX	
Project: URSORP: Shell/Harbor Island	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	JK20012.D	1	06/03/11	TT	n/a	n/a	GJK836
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Northwest TPH-Gx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Gasoline)	ND	0.20	0.050	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
98-08-8	aaa-Trifluorotoluene	97%		50-150%
460-00-4	4-Bromofluorobenzene	99%		50-150%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-214D-0511	Date Sampled: 05/24/11
Lab Sample ID: C16255-11	Date Received: 05/26/11
Matrix: AQ - Ground Water	Percent Solids: n/a
Method: NWTPH-DX SW846 3510C	
Project: URSORP: Shell/Harbor Island	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	HH13412.D	1	06/02/11	JH	05/27/11	OP3956	GHH487
Run #2							

Run #	Initial Volume	Final Volume
Run #1	1030 ml	1.0 ml
Run #2		

Northwest TPH-Dx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Diesel)	0.128	0.097	0.049	mg/l	
	TPH (Motor Oil)	ND	0.19	0.097	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
630-01-3	Hexacosane	79%		50-150%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-112A-0511	Date Sampled: 05/24/11
Lab Sample ID: C16255-12	Date Received: 05/26/11
Matrix: AQ - Ground Water	Percent Solids: n/a
Method: SW846 8260B	
Project: URSORP: Shell/Harbor Island	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	Q2020.D	1	05/27/11	BD	n/a	n/a	VQ70
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	0.41	1.0	0.30	ug/l	J
108-88-3	Toluene	ND	1.0	0.50	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.30	ug/l	
1330-20-7	Xylene (total)	ND	2.0	0.70	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	111%		60-130%
2037-26-5	Toluene-D8	88%		60-130%
460-00-4	4-Bromofluorobenzene	93%		60-130%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-112A-0511	
Lab Sample ID: C16255-12	Date Sampled: 05/24/11
Matrix: AQ - Ground Water	Date Received: 05/26/11
Method: NWTPH-GX	Percent Solids: n/a
Project: URSORP: Shell/Harbor Island	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	JK20013.D	1	06/03/11	TT	n/a	n/a	GJK836
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Northwest TPH-Gx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Gasoline)	0.129	0.20	0.050	mg/l	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
98-08-8	aaa-Trifluorotoluene	96%		50-150%
460-00-4	4-Bromofluorobenzene	98%		50-150%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: TES-MW-1-0511	Date Sampled: 05/24/11
Lab Sample ID: C16255-13	Date Received: 05/26/11
Matrix: AQ - Ground Water	Percent Solids: n/a
Method: SW846 8260B	
Project: URSORP: Shell/Harbor Island	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	Q2021.D	1	05/27/11	BD	n/a	n/a	VQ70
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.30	ug/l	
108-88-3	Toluene	ND	1.0	0.50	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.30	ug/l	
1330-20-7	Xylene (total)	ND	2.0	0.70	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	108%		60-130%
2037-26-5	Toluene-D8	93%		60-130%
460-00-4	4-Bromofluorobenzene	101%		60-130%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: TES-MW-1-0511	Date Sampled: 05/24/11
Lab Sample ID: C16255-13	Date Received: 05/26/11
Matrix: AQ - Ground Water	Percent Solids: n/a
Method: NWTPH-GX	
Project: URSORP: Shell/Harbor Island	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	JK20014.D	1	06/03/11	TT	n/a	n/a	GJK836
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Northwest TPH-Gx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Gasoline)	ND	0.20	0.050	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
98-08-8	aaa-Trifluorotoluene	97%		50-150%
460-00-4	4-Bromofluorobenzene	99%		50-150%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: TRIP BLANK		
Lab Sample ID: C16255-14		Date Sampled: 05/24/11
Matrix: AQ - Trip Blank Water		Date Received: 05/26/11
Method: SW846 8260B		Percent Solids: n/a
Project: URSORP: Shell/Harbor Island		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	Q2011.D	1	05/27/11	BD	n/a	n/a	VQ70
Run #2							

	Purge Volume
Run #1	10.0 ml
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.30	ug/l	
108-88-3	Toluene	ND	1.0	0.50	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.30	ug/l	
1330-20-7	Xylene (total)	ND	2.0	0.70	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	106%		60-130%
2037-26-5	Toluene-D8	100%		60-130%
460-00-4	4-Bromofluorobenzene	100%		60-130%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	TRIP BLANK	Date Sampled:	05/24/11
Lab Sample ID:	C16255-14	Date Received:	05/26/11
Matrix:	AQ - Trip Blank Water	Percent Solids:	n/a
Method:	NWTPH-GX		
Project:	URSOP: Shell/Harbor Island		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	JK20016.D	1	06/03/11	TT	n/a	n/a	GJK836
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Northwest TPH-Gx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Gasoline)	ND	0.20	0.050	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
98-08-8	aaa-Trifluorotoluene	96%		50-150%
460-00-4	4-Bromofluorobenzene	98%		50-150%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

URS Chain of Custody

URS Corporation
1501 4th Avenue, Suite 1400
Seattle, WA 98101-1616
206.438.2700

Contact: Brian Pletcher / URS PORTLAND, OR
Phone No.: 503-887-7258

Installation ID		Job No.		Analytical Methods		Shipping Date		Remarks	
SHELL/HARBOR ISLAND		46194268		NWTPH-6X BITEX NWTPH-DX PAHs		URS		Indicate Any Condition That Would Affect Sample Analysis Indicate Samples Containing Quantities for MS/MSD Analysis	
Sample Number	Date (mm/dd/yy)	Time (24 Hr.)	Matrix Type	Sample Type	6wa/s	4wa/s	6wa/s	LAB ID:	Remarks
MW-214D-0511	5/24/11	0915	lt-20		X	X	X	10	-11 -10 5 DAY TAT
MW-112A-0511	"	1110	"		X	X		6	-12
TES-MW-1-0511	"	1230	"		X	X		6	-13
TRIP BLANK					X	X		3	-14
NUMBER OF BOTTLES PER ANALYTICAL METHODS									
									Coolers
									① 5.6 - 0.5 = 5.1°C
									② 6.8 - 0.5 = 6.3°C
									③ 3.3 - 0.5 = 2.8°C
Preservation: A = HCL to pH < 2; B = HNO ₃ to pH < 2; C = H ₂ SO ₄ to pH < 2; D = NaOH to pH < 12; E = Other (specify)									
Relinquished by Sampler: (Signature) Dave Lewis		Date 5/25/11	Time 0800	Received by: (Signature) FedEx		Laboratory Name: ACCUTEST NORTHERN CA			
Relinquished by: (Signature) FedEx		Date 5/26/11	Time 910	Received by: (Signature) Jim Mung		Laboratory Contract No.:			
Relinquished by: (Signature)		Date	Time	Received by Lab: (Signature)		Samples Disposed by:		Date	Time
Matrix Types: A - Air; PR - Product; SD - Sediment; SL - Soil; TI - Tissue WR - Water Distribution: White = Accompanies Shipment; Canary = Lab Copy; Pink = Field Copy; Goldenrod = URS Sample Control Copy									
Sample Types Types: ER - Equipment Rinsate; ES - Environmental Sample; FB - Field Blank; TB - Trip Blank									

GC/MS Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: C16255
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VQ70-MB	Q2009.D	1	05/27/11	BD	n/a	n/a	VQ70

The QC reported here applies to the following samples:

Method: SW846 8260B

C16255-2, C16255-4, C16255-5, C16255-6, C16255-7, C16255-8, C16255-9, C16255-10, C16255-11, C16255-12, C16255-13, C16255-14

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.30	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.30	ug/l	
108-88-3	Toluene	ND	1.0	0.50	ug/l	
1330-20-7	Xylene (total)	ND	2.0	0.70	ug/l	

CAS No.	Surrogate Recoveries	Limits	
1868-53-7	Dibromofluoromethane	101%	60-130%
2037-26-5	Toluene-D8	100%	60-130%
460-00-4	4-Bromofluorobenzene	100%	60-130%

Blank Spike Summary

Job Number: C16255
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VQ70-BS1	Q2010.D	1	05/27/11	BD	n/a	n/a	VQ70

The QC reported here applies to the following samples: **Method:** SW846 8260B

C16255-2, C16255-4, C16255-5, C16255-6, C16255-7, C16255-8, C16255-9, C16255-10, C16255-11, C16255-12, C16255-13, C16255-14

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
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CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	106%	60-130%
2037-26-5	Toluene-D8	102%	60-130%
460-00-4	4-Bromofluorobenzene	105%	60-130%

4.2.1
4

Blank Spike/Blank Spike Duplicate Summary

Job Number: C16255
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VQ70-BS	Q2005.D	1	05/27/11	BD	n/a	n/a	VQ70
VQ70-BSD	Q2007.D	1	05/27/11	BD	n/a	n/a	VQ70

The QC reported here applies to the following samples:

Method: SW846 8260B

C16255-2, C16255-4, C16255-5, C16255-6, C16255-7, C16255-8, C16255-9, C16255-10, C16255-11, C16255-12, C16255-13, C16255-14

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	BSD ug/l	BSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	20	24.5	123	24.9	125	2	60-130/30
100-41-4	Ethylbenzene	20	23.9	120	24.7	124	3	60-130/30
108-88-3	Toluene	20	22.7	114	23.4	117	3	60-130/30
1330-20-7	Xylene (total)	60	70.2	117	73.0	122	4	60-130/30

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
1868-53-7	Dibromofluoromethane	108%	110%	60-130%
2037-26-5	Toluene-D8	98%	99%	60-130%
460-00-4	4-Bromofluorobenzene	100%	102%	60-130%

4.3.1
4

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: C16255
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
C16255-6MS	Q2016.D	1	05/27/11	BD	n/a	n/a	VQ70
C16255-6MSD	Q2017.D	1	05/27/11	BD	n/a	n/a	VQ70
C16255-6	Q2013.D	1	05/27/11	BD	n/a	n/a	VQ70

The QC reported here applies to the following samples:

Method: SW846 8260B

C16255-2, C16255-4, C16255-5, C16255-6, C16255-7, C16255-8, C16255-9, C16255-10, C16255-11, C16255-12, C16255-13, C16255-14

CAS No.	Compound	C16255-6 ug/l	Spike Q	ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	0.64	J	20	23.9	116	23.5	114	2	60-130/25
100-41-4	Ethylbenzene	ND		20	22.3	112	21.9	110	2	60-130/25
108-88-3	Toluene	ND		20	21.1	106	21.0	105	0	60-130/25
1330-20-7	Xylene (total)	ND		60	60.6	101	59.8	100	1	60-130/25

CAS No.	Surrogate Recoveries	MS	MSD	C16255-6	Limits
1868-53-7	Dibromofluoromethane	112%	104%	106%	60-130%
2037-26-5	Toluene-D8	96%	97%	100%	60-130%
460-00-4	4-Bromofluorobenzene	102%	101%	104%	60-130%

4.4.1
4

GC/MS Semi-volatiles

5

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: C16255
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP3957-MB	X16673.D	1	05/27/11	MT	05/27/11	OP3957	EX757

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

C16255-9, C16255-10, C16255-11

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	1.0	0.25	ug/l	
208-96-8	Acenaphthylene	ND	1.0	0.25	ug/l	
120-12-7	Anthracene	ND	1.0	0.25	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.10	0.030	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.10	0.030	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.10	0.030	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.10	0.030	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.10	0.030	ug/l	
218-01-9	Chrysene	ND	0.10	0.030	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.10	0.030	ug/l	
206-44-0	Fluoranthene	ND	1.0	0.25	ug/l	
86-73-7	Fluorene	ND	1.0	0.25	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.10	0.030	ug/l	
90-12-0	1-Methylnaphthalene	ND	1.0	0.25	ug/l	
91-57-6	2-Methylnaphthalene	ND	1.0	0.25	ug/l	
91-20-3	Naphthalene	ND	1.0	0.25	ug/l	
85-01-8	Phenanthrene	ND	1.0	0.25	ug/l	
129-00-0	Pyrene	ND	1.0	0.25	ug/l	

CAS No.	Surrogate Recoveries	Limits	
4165-60-0	Nitrobenzene-d5	101%* a	25-100%
321-60-8	2-Fluorobiphenyl	84%	25-106%
1718-51-0	Terphenyl-d14	91%	35-130%

(a) Outside laboratory control limits (high bias).

Blank Spike/Blank Spike Duplicate Summary

Job Number: C16255
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP3957-BS	X16674.D	1	05/27/11	MT	05/27/11	OP3957	EX757
OP3957-BSD	X16675.D	1	05/27/11	MT	05/27/11	OP3957	EX757

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

C16255-9, C16255-10, C16255-11

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	BSD ug/l	BSD %	RPD	Limits Rec/RPD
83-32-9	Acenaphthene	5	3.9	78	4.3	86	10	25-130/30
208-96-8	Acenaphthylene	5	4.0	80	4.3	86	7	30-122/30
120-12-7	Anthracene	5	4.1	82	4.3	86	5	39-128/30
56-55-3	Benzo(a)anthracene	5	4.2	84	4.4	88	5	35-132/30
50-32-8	Benzo(a)pyrene	5	4.2	84	4.4	88	5	44-136/30
205-99-2	Benzo(b)fluoranthene	5	4.5	90	4.7	94	4	41-134/30
191-24-2	Benzo(g,h,i)perylene	5	4.2	84	4.6	92	9	30-134/30
207-08-9	Benzo(k)fluoranthene	5	4.4	88	4.5	90	2	40-134/30
218-01-9	Chrysene	5	4.2	84	4.4	88	5	39-134/30
53-70-3	Dibenzo(a,h)anthracene	5	4.5	90	4.9	98	9	33-137/30
206-44-0	Fluoranthene	5	4.2	84	4.4	88	5	40-129/30
86-73-7	Fluorene	5	4.1	82	4.4	88	7	32-125/30
193-39-5	Indeno(1,2,3-cd)pyrene	5	4.4	88	4.8	96	9	33-137/30
90-12-0	1-Methylnaphthalene	5	3.9	78	4.3	86	10	27-124/30
91-57-6	2-Methylnaphthalene	5	3.9	78	4.4	88	12	28-120/30
91-20-3	Naphthalene	5	3.8	76	4.2	84	10	28-122/30
85-01-8	Phenanthrene	5	4.1	82	4.3	86	5	38-128/30
129-00-0	Pyrene	5	4.2	84	4.2	84	0	35-126/30

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
4165-60-0	Nitrobenzene-d5	92%	98%	25-100%
321-60-8	2-Fluorobiphenyl	96%	97%	25-106%
1718-51-0	Terphenyl-d14	103%	98%	35-130%

5.2.1
5

GC Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: C16255
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GJK836-MB	JK19997.D	1	06/03/11	TT	n/a	n/a	GJK836

The QC reported here applies to the following samples:

Method: NWTPH-GX

C16255-1, C16255-2, C16255-3, C16255-4, C16255-5, C16255-6, C16255-7, C16255-8, C16255-9, C16255-10, C16255-11, C16255-12, C16255-13, C16255-14

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Gasoline)	ND	0.20	0.050	mg/l	

CAS No.	Surrogate Recoveries	Limits	
98-08-8	aaa-Trifluorotoluene	98%	50-150%
460-00-4	4-Bromofluorobenzene	95%	50-150%

Blank Spike/Blank Spike Duplicate Summary

Job Number: C16255
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GJK836-BS	JK19995.D	1	06/03/11	TT	n/a	n/a	GJK836
GJK836-BSD	JK19996.D	1	06/03/11	TT	n/a	n/a	GJK836

The QC reported here applies to the following samples: Method: NWTPH-GX

C16255-1, C16255-2, C16255-3, C16255-4, C16255-5, C16255-6, C16255-7, C16255-8, C16255-9, C16255-10, C16255-11, C16255-12, C16255-13, C16255-14

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	BSD mg/l	BSD %	RPD	Limits Rec/RPD
	TPH (Gasoline)	0.4	0.388	97	0.390	98	1	60-140/30

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
98-08-8	aaa-Trifluorotoluene	104%	104%	50-150%
460-00-4	4-Bromofluorobenzene	105%	102%	50-150%

6.2.1

6

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: C16255
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
C16255-6MS	JK20005.D	1	06/03/11	TT	n/a	n/a	GJK836
C16255-6MSD	JK20006.D	1	06/03/11	TT	n/a	n/a	GJK836
C16255-6	JK20004.D	1	06/03/11	TT	n/a	n/a	GJK836

The QC reported here applies to the following samples:

Method: NWTPH-GX

C16255-1, C16255-2, C16255-3, C16255-4, C16255-5, C16255-6, C16255-7, C16255-8, C16255-9, C16255-10, C16255-11, C16255-12, C16255-13, C16255-14

CAS No.	Compound	C16255-6 mg/l	Spike Q mg/l	MS mg/l	MS %	MSD mg/l	MSD %	RPD	Limits Rec/RPD
	TPH (Gasoline)	ND	0.4	0.372	93	0.381	95	2	60-140/20

CAS No.	Surrogate Recoveries	MS	MSD	C16255-6	Limits
98-08-8	aaa-Trifluorotoluene	100%	99%	98%	50-150%
460-00-4	4-Bromofluorobenzene	98%	98%	96%	50-150%

6.3.1

6

Duplicate Summary

Job Number: C16255
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
C16255-5DUP	JK20003.D	1	06/03/11	TT	n/a	n/a	GJK836
C16255-5	JK20002.D	1	06/03/11	TT	n/a	n/a	GJK836

The QC reported here applies to the following samples:

Method: NWTPH-GX

C16255-5

CAS No.	Compound	C16255-5 mg/l	DUP Q	DUP mg/l	Q	RPD	Limits
	TPH (Gasoline)	0.0744	J	0.0682	J	9	20

CAS No.	Surrogate Recoveries	DUP	C16255-5	Limits
98-08-8	aaa-Trifluorotoluene	99%	96%	50-150%
460-00-4	4-Bromofluorobenzene	101%	98%	50-150%

Duplicate Summary

Job Number: C16255
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
C16255-13DUP	JK20015.D	1	06/03/11	TT	n/a	n/a	GJK836
C16255-13	JK20014.D	1	06/03/11	TT	n/a	n/a	GJK836

The QC reported here applies to the following samples:

Method: NWTPH-GX

C16255-1, C16255-2, C16255-3, C16255-4, C16255-6, C16255-7, C16255-8, C16255-9, C16255-10, C16255-11, C16255-12, C16255-13, C16255-14

CAS No.	Compound	C16255-13 mg/l	DUP Q	C16255-13 mg/l	Q	RPD	Limits
	TPH (Gasoline)	ND		ND		nc	20

CAS No.	Surrogate Recoveries	DUP	C16255-13	Limits
98-08-8	aaa-Trifluorotoluene	95%	97%	50-150%
460-00-4	4-Bromofluorobenzene	97%	99%	50-150%

GC Semi-volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: C16255
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP3956-MB	HH13403.D	1	06/02/11	JH	05/27/11	OP3956	GHH487

The QC reported here applies to the following samples:

Method: NWTPH-DX

C16255-1, C16255-3, C16255-4, C16255-7, C16255-9, C16255-10, C16255-11

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Diesel)	ND	0.10	0.050	mg/l	
	TPH (Motor Oil)	ND	0.20	0.10	mg/l	

CAS No.	Surrogate Recoveries	Limits
630-01-3	Hexacosane	60% 50-150%

7.1.1
7

Blank Spike/Blank Spike Duplicate Summary

Job Number: C16255
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP3956-BS	HH13404.D	1	06/02/11	JH	05/27/11	OP3956	GHH487
OP3956-BSD	HH13405.D	1	06/02/11	JH	05/27/11	OP3956	GHH487

The QC reported here applies to the following samples: Method: NWTPH-DX

C16255-1, C16255-3, C16255-4, C16255-7, C16255-9, C16255-10, C16255-11

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	BSD mg/l	BSD %	RPD	Limits Rec/RPD
	TPH (Diesel)	1	0.700	70	0.712	71	2	45-140/30
	TPH (Motor Oil)	1	0.773	77	0.771	77	0	45-140/30

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
630-01-3	Hexacosane	80%	79%	50-150%

7.2.1
7

Metals Analysis

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: C16255
Account: SHELLWIC - Shell Oil Products
Project: URSORP: Shell/Harbor Island

QC Batch ID: MP3547
Matrix Type: AQUEOUS

Methods: SW846 6010B
Units: ug/l

Prep Date: 05/27/11

Metal	RL	IDL	MDL	MB raw	final
Aluminum	200	13	8.5		
Antimony	6.0	.7	.51		
Arsenic	10	.7	.65		
Barium	200	.4	.35		
Beryllium	5.0	.2	.12		
Boron	100	.9	.64		
Cadmium	2.0	.2	.15		
Calcium	5000	7.1	12		
Chromium	10	.3	.41		
Cobalt	5.0	.2	.3		
Copper	10	1.2	3		
Iron	200	6.4	12		
Lead	10	.7	.85	0.0	<10
Magnesium	5000	27	36		
Manganese	15	.1	1.3		
Molybdenum	20	.2	.22		
Nickel	5.0	.2	.12		
Potassium	10000	18	44		
Selenium	10	1.8	2.2		
Silicon	100	1.2	6.9		
Silver	5.0	.3	.47		
Sodium	10000	15	23		
Strontium	10	.2	.24		
Thallium	10	.5	.54		
Tin	50	.2	.7		
Titanium	10	.4	.34		
Vanadium	10	.3	.3		
Zinc	20	.3	4.2		

Associated samples MP3547: C16255-4

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

8.1.1
8

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: C16255
 Account: SHELLWIC - Shell Oil Products
 Project: URSORP: Shell/Harbor Island

QC Batch ID: MP3547
 Matrix Type: AQUEOUS

Methods: SW846 6010B
 Units: ug/l

Prep Date: 05/27/11

Metal	C16243-1 Original MS	SpikeLot MPIR4	% Rec	QC Limits
Aluminum	anr			
Antimony				
Arsenic	anr			
Barium	anr			
Beryllium				
Boron	anr			
Cadmium	anr			
Calcium	anr			
Chromium	anr			
Cobalt				
Copper	anr			
Iron	anr			
Lead	3.3	494	500	98.1 75-125
Magnesium	anr			
Manganese	anr			
Molybdenum	anr			
Nickel	anr			
Potassium	anr			
Selenium	anr			
Silicon				
Silver	anr			
Sodium	anr			
Strontium				
Thallium				
Tin				
Titanium				
Vanadium				
Zinc	anr			

Associated samples MP3547: C16255-4

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (N) Matrix Spike Rec. outside of QC limits
 (anr) Analyte not requested

8.12
8

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: C16255
 Account: SHELLWIC - Shell Oil Products
 Project: URSORP: Shell/Harbor Island

QC Batch ID: MP3547
 Matrix Type: AQUEOUS

Methods: SW846 6010B
 Units: ug/l

Prep Date: 05/27/11

Metal	C16243-1 Original MSD	SpikeLot MPIR4	% Rec	MSD RPD	QC Limit
Aluminum	anr				
Antimony					
Arsenic	anr				
Barium	anr				
Beryllium					
Boron	anr				
Cadmium	anr				
Calcium	anr				
Chromium	anr				
Cobalt					
Copper	anr				
Iron	anr				
Lead	3.3	487	500	96.7	1.4 20
Magnesium	anr				
Manganese	anr				
Molybdenum	anr				
Nickel	anr				
Potassium	anr				
Selenium	anr				
Silicon					
Silver	anr				
Sodium	anr				
Strontium					
Thallium					
Tin					
Titanium					
Vanadium					
Zinc	anr				

Associated samples MP3547: C16255-4

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (N) Matrix Spike Rec. outside of QC limits
 (anr) Analyte not requested

8.12
8

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: C16255
 Account: SHELLWIC - Shell Oil Products
 Project: URSORP: Shell/Harbor Island

QC Batch ID: MP3547
 Matrix Type: AQUEOUS

Methods: SW846 6010B
 Units: ug/l

Prep Date: 05/27/11

Metal	BSP Result	Spikelot MPIR4	% Rec	QC Limits
Aluminum	anr			
Antimony				
Arsenic	anr			
Barium	anr			
Beryllium				
Boron	anr			
Cadmium	anr			
Calcium	anr			
Chromium	anr			
Cobalt				
Copper	anr			
Iron	anr			
Lead	485	500	97.0	80-120
Magnesium	anr			
Manganese	anr			
Molybdenum	anr			
Nickel	anr			
Potassium	anr			
Selenium	anr			
Silicon				
Silver	anr			
Sodium	anr			
Strontium				
Thallium				
Tin				
Titanium				
Vanadium				
Zinc	anr			

Associated samples MP3547: C16255-4

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (anr) Analyte not requested

8.1.3
8

SERIAL DILUTION RESULTS SUMMARY

Login Number: C16255
 Account: SHELLWIC - Shell Oil Products
 Project: URSORP: Shell/Harbor Island

QC Batch ID: MP3547
 Matrix Type: AQUEOUS

Methods: SW846 6010B
 Units: ug/l

Prep Date: 05/27/11

Metal	C16243-1 Original	SDL 1:5	%DIF	QC Limits
Aluminum	anr			
Antimony				
Arsenic	anr			
Barium	anr			
Beryllium				
Boron	anr			
Cadmium	anr			
Calcium	anr			
Chromium	anr			
Cobalt				
Copper	anr			
Iron	anr			
Lead	3.30	0.00	100.0(a)	0-10
Magnesium	anr			
Manganese	anr			
Molybdenum	anr			
Nickel	anr			
Potassium	anr			
Selenium	anr			
Silicon				
Silver	anr			
Sodium	anr			
Strontium				
Thallium				
Tin				
Titanium				
Vanadium				
Zinc	anr			

Associated samples MP3547: C16255-4

Results < IDL are shown as zero for calculation purposes

(*) Outside of QC limits

(anr) Analyte not requested

(a) Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

8.1.4
8

Technical Report for

Shell Oil Products

URSOPR: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

46194304

Accutest Job Number: C18642

Sampling Date: 10/26/11

Report to:

URS Corporation
111 SW Columbia, Suite 1500
Portland, OR 97201-5850
brian_pletcher@urscorp.com

ATTN: Brian Pletcher

Total number of pages in report: **62**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

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Client Service contact: Laurie Glantz-Murphy 408-588-0200

Certifications: CA (08258CA) AZ (AZ0762) DoD/ISO/IEC 17025:2005 (L2242)

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Test results relate only to samples analyzed.

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Sample Summary

Shell Oil Products

Job No: C18642

URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA
 Project No: 46194304

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
C18642-1	10/26/11	00:00 DL	10/27/11	AQ	Ground Water	TRIP BLANK
C18642-2	10/26/11	08:30 DL	10/27/11	AQ	Ground Water	MW-206A-1011
C18642-3	10/26/11	10:10 DL	10/27/11	AQ	Ground Water	MW-201-1011
C18642-4	10/26/11	12:00 DL	10/27/11	AQ	Ground Water	MW-202-1011
C18642-5	10/26/11	13:30 DL	10/27/11	AQ	Ground Water	MW-203-1011

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID: TRIP BLANK		Date Sampled: 10/26/11
Lab Sample ID: C18642-1		Date Received: 10/27/11
Matrix: AQ - Ground Water		Percent Solids: n/a
Method: SW846 8260B		
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	Q4945.D	1	11/03/11	TN	n/a	n/a	VQ176
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.30	ug/l	
108-88-3	Toluene	ND	1.0	0.50	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.30	ug/l	
1330-20-7	Xylene (total)	ND	2.0	0.70	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	87%		60-130%
2037-26-5	Toluene-D8	106%		60-130%
460-00-4	4-Bromofluorobenzene	96%		60-130%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: TRIP BLANK		Date Sampled: 10/26/11
Lab Sample ID: C18642-1		Date Received: 10/27/11
Matrix: AQ - Ground Water		Percent Solids: n/a
Method: NWTPH-GX		
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	JK23419.D	1	10/31/11	TT	n/a	n/a	GJK962
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Northwest TPH-Gx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Gasoline)	ND	0.20	0.050	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
98-08-8	aaa-Trifluorotoluene	96%		50-150%
460-00-4	4-Bromofluorobenzene	101%		50-150%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-206A-1011		Date Sampled: 10/26/11
Lab Sample ID: C18642-2		Date Received: 10/27/11
Matrix: AQ - Ground Water		Percent Solids: n/a
Method: SW846 8260B		
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	Q4955.D	1	11/03/11	TN	n/a	n/a	VQ176
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.30	ug/l	
108-88-3	Toluene	ND	1.0	0.50	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.30	ug/l	
1330-20-7	Xylene (total)	ND	2.0	0.70	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	74%		60-130%
2037-26-5	Toluene-D8	107%		60-130%
460-00-4	4-Bromofluorobenzene	93%		60-130%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-206A-1011		Date Sampled: 10/26/11
Lab Sample ID: C18642-2		Date Received: 10/27/11
Matrix: AQ - Ground Water		Percent Solids: n/a
Method: NWTPH-GX		
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	JK23423.D	1	10/31/11	TT	n/a	n/a	GJK962
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Northwest TPH-Gx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Gasoline)	ND	0.20	0.050	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
98-08-8	aaa-Trifluorotoluene	99%		50-150%
460-00-4	4-Bromofluorobenzene	103%		50-150%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-206A-1011		
Lab Sample ID: C18642-2		Date Sampled: 10/26/11
Matrix: AQ - Ground Water		Date Received: 10/27/11
Method: NWTPH-DX SW846 3510C		Percent Solids: n/a
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	HH18239.D	1	10/28/11	JH	10/28/11	OP4804	GHH596
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	1.0 ml
Run #2		

Northwest TPH-Dx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Diesel)	0.141	0.10	0.050	mg/l	
	TPH (Motor Oil)	ND	0.20	0.10	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
630-01-3	Hexacosane	77%		50-150%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-201-1011		Date Sampled: 10/26/11
Lab Sample ID: C18642-3		Date Received: 10/27/11
Matrix: AQ - Ground Water		Percent Solids: n/a
Method: SW846 8260B		
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	Q4956.D	1	11/03/11	TN	n/a	n/a	VQ176
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.30	ug/l	
108-88-3	Toluene	ND	1.0	0.50	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.30	ug/l	
1330-20-7	Xylene (total)	ND	2.0	0.70	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	68%		60-130%
2037-26-5	Toluene-D8	111%		60-130%
460-00-4	4-Bromofluorobenzene	93%		60-130%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-201-1011		
Lab Sample ID: C18642-3		Date Sampled: 10/26/11
Matrix: AQ - Ground Water		Date Received: 10/27/11
Method: NWTPH-GX		Percent Solids: n/a
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	JK23425.D	1	11/01/11	TT	n/a	n/a	GJK962
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Northwest TPH-Gx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Gasoline)	0.0899	0.20	0.050	mg/l	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
98-08-8	aaa-Trifluorotoluene	103%		50-150%
460-00-4	4-Bromofluorobenzene	123%		50-150%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-201-1011		
Lab Sample ID: C18642-3		Date Sampled: 10/26/11
Matrix: AQ - Ground Water		Date Received: 10/27/11
Method: NWTPH-DX SW846 3510C		Percent Solids: n/a
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	HH18240.D	1	10/28/11	JH	10/28/11	OP4804	GHH596
Run #2							

	Initial Volume	Final Volume
Run #1	950 ml	1.0 ml
Run #2		

Northwest TPH-Dx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Diesel)	1.46	0.11	0.053	mg/l	
	TPH (Motor Oil)	0.181	0.21	0.11	mg/l	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
630-01-3	Hexacosane	74%		50-150%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-202-1011	
Lab Sample ID: C18642-4	Date Sampled: 10/26/11
Matrix: AQ - Ground Water	Date Received: 10/27/11
Method: RSK-175	Percent Solids: n/a
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	II54377.D	5	10/31/11	ANJ	n/a	n/a	N:GII2642
Run #2							

CAS No.	Compound	Result	RL	MDL	Units	Q
74-82-8	Methane	6080	0.55	0.11	ug/l	
124-38-9	Carbon Dioxide	21300	250	9.1	ug/l	

(a) Analysis performed at Accutest Laboratories, Dayton, NJ.

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-202-1011		Date Sampled: 10/26/11
Lab Sample ID: C18642-4		Date Received: 10/27/11
Matrix: AQ - Ground Water		Percent Solids: n/a
Method: NWTPH-GX		
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	JK23371.D	20	10/28/11	TT	n/a	n/a	GJK960
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Northwest TPH-Gx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Gasoline)	4.30	4.0	1.0	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
98-08-8	aaa-Trifluorotoluene	97%		50-150%
460-00-4	4-Bromofluorobenzene	105%		50-150%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-202-1011		Date Sampled: 10/26/11
Lab Sample ID: C18642-4		Date Received: 10/27/11
Matrix: AQ - Ground Water		Percent Solids: n/a
Method: NWTPH-DX SW846 3510C		
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	HH18241.D	1	10/28/11	JH	10/28/11	OP4804	GHH596
Run #2							

Run #	Initial Volume	Final Volume
Run #1	950 ml	1.0 ml
Run #2		

Northwest TPH-Dx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Diesel)	1.02	0.11	0.053	mg/l	
	TPH (Motor Oil)	ND	0.21	0.11	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
630-01-3	Hexacosane	84%		50-150%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-202-1011		
Lab Sample ID: C18642-4		Date Sampled: 10/26/11
Matrix: AQ - Ground Water		Date Received: 10/27/11
		Percent Solids: n/a
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	7140	5000	ug/l	1	10/31/11	10/31/11 RS	SW846 6010B ¹	SW3010A ²
Iron	27400	200	ug/l	1	10/31/11	10/31/11 RS	SW846 6010B ¹	SW3010A ²
Magnesium	6690	5000	ug/l	1	10/31/11	10/31/11 RS	SW846 6010B ¹	SW3010A ²

(1) Instrument QC Batch: MA2166

(2) Prep QC Batch: MP4144

RL = Reporting Limit

Report of Analysis

Client Sample ID: MW-202-1011	Date Sampled: 10/26/11
Lab Sample ID: C18642-4	Date Received: 10/27/11
Matrix: AQ - Ground Water	Percent Solids: n/a
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA	

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO ₃	84.0	5.0	mg/l	1	10/28/11	AC	SM18 2320B
Hardness, Total as CaCO ₃ ^a	45.4	33	mg/l	1	10/31/11 19:40	RS	SW846 6010B/SM 2340B
Iron, Ferrous	8.5	2.5	mg/l	25	10/27/11 11:29	EB	SM18 3500FED
Sulfate	< 0.50	0.50	mg/l	1	10/28/11 12:46	RL	EPA 300/SW846 9056A

(a) Calculated as: (Calcium * 2.497) + (Magnesium * 4.118)

RL = Reporting Limit

Report of Analysis

Client Sample ID: MW-203-1011		Date Sampled: 10/26/11
Lab Sample ID: C18642-5		Date Received: 10/27/11
Matrix: AQ - Ground Water		Percent Solids: n/a
Method: RSK-175		
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	II54378.D	1	10/31/11	ANJ	n/a	n/a	N:GII2642
Run #2 ^a	II54379.D	5	10/31/11	ANJ	n/a	n/a	N:GII2642

CAS No.	Compound	Result	RL	MDL	Units	Q
74-82-8	Methane	701	0.11	0.022	ug/l	
124-38-9	Carbon Dioxide	26200 ^b	250	9.1	ug/l	

(a) Analysis performed at Accutest Laboratories, Dayton, NJ.

(b) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-203-1011		Date Sampled: 10/26/11
Lab Sample ID: C18642-5		Date Received: 10/27/11
Matrix: AQ - Ground Water		Percent Solids: n/a
Method: NWTPH-GX		
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	JK23373.D	4	10/28/11	TT	n/a	n/a	GJK960
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Northwest TPH-Gx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Gasoline)	1.38	0.80	0.20	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
98-08-8	aaa-Trifluorotoluene	99%		50-150%
460-00-4	4-Bromofluorobenzene	109%		50-150%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-203-1011		Date Sampled: 10/26/11
Lab Sample ID: C18642-5		Date Received: 10/27/11
Matrix: AQ - Ground Water		Percent Solids: n/a
Method: NWTPH-DX SW846 3510C		
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	HH18242.D	1	10/29/11	JH	10/28/11	OP4804	GHH596
Run #2							

Run #	Initial Volume	Final Volume
Run #1	900 ml	1.0 ml
Run #2		

Northwest TPH-Dx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Diesel)	0.262	0.11	0.056	mg/l	
	TPH (Motor Oil)	0.118	0.22	0.11	mg/l	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
630-01-3	Hexacosane	81%		50-150%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-203-1011	
Lab Sample ID: C18642-5	Date Sampled: 10/26/11
Matrix: AQ - Ground Water	Date Received: 10/27/11
	Percent Solids: n/a
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA	

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	48000	5000	ug/l	1	10/31/11	10/31/11 RS	SW846 6010B ¹	SW3010A ²
Iron	28100	200	ug/l	1	10/31/11	10/31/11 RS	SW846 6010B ¹	SW3010A ²
Magnesium	6440	5000	ug/l	1	10/31/11	10/31/11 RS	SW846 6010B ¹	SW3010A ²

(1) Instrument QC Batch: MA2166

(2) Prep QC Batch: MP4144

RL = Reporting Limit

Report of Analysis

Client Sample ID: MW-203-1011	Date Sampled: 10/26/11
Lab Sample ID: C18642-5	Date Received: 10/27/11
Matrix: AQ - Ground Water	Percent Solids: n/a
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA	

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO ₃	180	5.0	mg/l	1	10/28/11	AC	SM18 2320B
Hardness, Total as CaCO ₃ ^a	146	33	mg/l	1	10/31/11 19:47	RS	SW846 6010B/SM 2340B
Iron, Ferrous	8.8	5.0	mg/l	50	10/27/11 11:49	EB	SM18 3500FED
Sulfate	< 0.50	0.50	mg/l	1	10/28/11 13:03	RL	EPA 300/SW846 9056A

(a) Calculated as: (Calcium * 2.497) + (Magnesium * 4.118)

RL = Reporting Limit

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

GC/MS Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: C18642
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VQ176-MB	Q4943.D	1	11/03/11	TN	n/a	n/a	VQ176

The QC reported here applies to the following samples:

Method: SW846 8260B

C18642-1, C18642-2, C18642-3

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.30	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.30	ug/l	
108-88-3	Toluene	ND	1.0	0.50	ug/l	
1330-20-7	Xylene (total)	ND	2.0	0.70	ug/l	

CAS No.	Surrogate Recoveries	Limits	
1868-53-7	Dibromofluoromethane	84%	60-130%
2037-26-5	Toluene-D8	107%	60-130%
460-00-4	4-Bromofluorobenzene	95%	60-130%

Blank Spike/Blank Spike Duplicate Summary

Job Number: C18642
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VQ176-BS	Q4940.D	1	11/03/11	TN	n/a	n/a	VQ176
VQ176-BSD	Q4941.D	1	11/03/11	TN	n/a	n/a	VQ176

The QC reported here applies to the following samples:

Method: SW846 8260B

C18642-1, C18642-2, C18642-3

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	BSD ug/l	BSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	20	20.2	101	20.8	104	3	60-130/30
100-41-4	Ethylbenzene	20	23.0	115	23.4	117	2	60-130/30
108-88-3	Toluene	20	22.2	111	22.5	113	1	60-130/30
1330-20-7	Xylene (total)	60	68.5	114	69.4	116	1	60-130/30

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
1868-53-7	Dibromofluoromethane	82%	83%	60-130%
2037-26-5	Toluene-D8	106%	106%	60-130%
460-00-4	4-Bromofluorobenzene	92%	94%	60-130%

4.2.1
4

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: C18642
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
C18646-1MS	Q4959.D	1	11/04/11	TN	n/a	n/a	VQ176
C18646-1MSD	Q4960.D	1	11/04/11	TN	n/a	n/a	VQ176
C18646-1	Q4947.D	1	11/03/11	TN	n/a	n/a	VQ176

The QC reported here applies to the following samples:

Method: SW846 8260B

C18642-1, C18642-2, C18642-3

CAS No.	Compound	C18646-1 ug/l	Spike Q ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	ND	20	15.3	77	16.0	80	4	60-130/25
100-41-4	Ethylbenzene	ND	20	14.5	73	15.3	77	5	60-130/25
108-88-3	Toluene	ND	20	14.4	72	15.3	77	6	60-130/25
1330-20-7	Xylene (total)	ND	60	26.0	43* a	28.4	47* a	9	60-130/25



CAS No.	Surrogate Recoveries	MS	MSD	C18646-1	Limits
1868-53-7	Dibromofluoromethane	68%	68%	86%	60-130%
2037-26-5	Toluene-D8	104%	104%	100%	60-130%
460-00-4	4-Bromofluorobenzene	91%	89%	96%	60-130%

(a) Outside laboratory control limits.

4.3.1
4

GC Volatiles

5

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: C18642
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GJK960-MB	JK23358.D	1	10/27/11	TT	n/a	n/a	GJK960

The QC reported here applies to the following samples:

Method: NWTPH-GX

C18642-4, C18642-5

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Gasoline)	ND	0.20	0.050	mg/l	

CAS No.	Surrogate Recoveries	Limits	
98-08-8	aaa-Trifluorotoluene	97%	50-150%
460-00-4	4-Bromofluorobenzene	104%	50-150%

Method Blank Summary

Job Number: C18642
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GJK962-MB	JK23418.D	1	10/31/11	TT	n/a	n/a	GJK962

The QC reported here applies to the following samples:

Method: NWTPH-GX

C18642-1, C18642-2, C18642-3

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Gasoline)	ND	0.20	0.050	mg/l	

CAS No.	Surrogate Recoveries	Limits	
98-08-8	aaa-Trifluorotoluene	102%	50-150%
460-00-4	4-Bromofluorobenzene	107%	50-150%

Blank Spike/Blank Spike Duplicate Summary

Job Number: C18642
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GJK960-BS	JK23356.D	1	10/27/11	TT	n/a	n/a	GJK960
GJK960-BSD	JK23357.D	1	10/27/11	TT	n/a	n/a	GJK960

The QC reported here applies to the following samples:

Method: NWTPH-GX

C18642-4, C18642-5

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	BSD mg/l	BSD %	RPD	Limits Rec/RPD
	TPH (Gasoline)	0.4	0.408	102	0.406	102	0	60-140/30

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
98-08-8	aaa-Trifluorotoluene	91%	94%	50-150%
460-00-4	4-Bromofluorobenzene	103%	105%	50-150%

Blank Spike/Blank Spike Duplicate Summary

Job Number: C18642
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GJK962-BS	JK23416.D	1	10/31/11	TT	n/a	n/a	GJK962
GJK962-BSD	JK23417.D	1	10/31/11	TT	n/a	n/a	GJK962

The QC reported here applies to the following samples:

Method: NWTPH-GX

C18642-1, C18642-2, C18642-3

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	BSD mg/l	BSD %	RPD	Limits Rec/RPD
	TPH (Gasoline)	0.4	0.416	104	0.416	104	0	60-140/30

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
98-08-8	aaa-Trifluorotoluene	95%	96%	50-150%
460-00-4	4-Bromofluorobenzene	102%	104%	50-150%

5.2.2
5

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: C18642
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
C18565-1MS	JK23369.D	1	10/28/11	TT	n/a	n/a	GJK960
C18565-1MSD	JK23370.D	1	10/28/11	TT	n/a	n/a	GJK960
C18565-1	JK23359.D	1	10/27/11	TT	n/a	n/a	GJK960

The QC reported here applies to the following samples:

Method: NWTPH-GX

C18642-4, C18642-5

CAS No.	Compound	C18565-1 mg/l	Spike Q mg/l	MS mg/l	MS %	MSD mg/l	MSD %	RPD	Limits Rec/RPD
	TPH (Gasoline)	ND	0.4	0.411	103	0.405	101	1	60-140/20

CAS No.	Surrogate Recoveries	MS	MSD	C18565-1	Limits
98-08-8	aaa-Trifluorotoluene	96%	95%	98%	50-150%
460-00-4	4-Bromofluorobenzene	105%	106%	107%	50-150%

5.3.1
5

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: C18642
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
C18666-2MS	JK23439.D	1	11/01/11	TT	n/a	n/a	GJK962
C18666-2MSD	JK23440.D	1	11/01/11	TT	n/a	n/a	GJK962
C18666-2	JK23437.D	1	11/01/11	TT	n/a	n/a	GJK962

The QC reported here applies to the following samples:

Method: NWTPH-GX

C18642-1, C18642-2, C18642-3

CAS No.	Compound	C18666-2 mg/l	Spike Q mg/l	MS mg/l	MS %	MSD mg/l	MSD %	RPD	Limits Rec/RPD
	TPH (Gasoline)	ND	0.4	0.445	111	0.428	107	4	60-140/20

CAS No.	Surrogate Recoveries	MS	MSD	C18666-2	Limits
98-08-8	aaa-Trifluorotoluene	95%	92%	97%	50-150%
460-00-4	4-Bromofluorobenzene	103%	100%	103%	50-150%

5.3.2
5

Duplicate Summary

Job Number: C18642
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
C18565-2DUP	JK23361.D	1	10/27/11	TT	n/a	n/a	GJK960
C18565-2	JK23360.D	1	10/27/11	TT	n/a	n/a	GJK960

The QC reported here applies to the following samples:

Method: NWTPH-GX

C18642-4, C18642-5

CAS No.	Compound	C18565-2 mg/l	DUP Q	mg/l	Q	RPD	Limits
	TPH (Gasoline)	ND		ND		nc	20

CAS No.	Surrogate Recoveries	DUP	C18565-2	Limits
98-08-8	aaa-Trifluorotoluene	99%	99%	50-150%
460-00-4	4-Bromofluorobenzene	107%	107%	50-150%

5.4.1
5

Duplicate Summary

Job Number: C18642
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
C18642-2DUP	JK23424.D	1	10/31/11	TT	n/a	n/a	GJK962
C18642-2	JK23423.D	1	10/31/11	TT	n/a	n/a	GJK962

The QC reported here applies to the following samples:

Method: NWTPH-GX

C18642-1, C18642-2, C18642-3

CAS No.	Compound	C18642-2 mg/l	DUP Q	mg/l	Q	RPD	Limits
	TPH (Gasoline)	ND		ND		nc	20

CAS No.	Surrogate Recoveries	DUP	C18642-2	Limits
98-08-8	aaa-Trifluorotoluene	100%	99%	50-150%
460-00-4	4-Bromofluorobenzene	104%	103%	50-150%

5.4.2
5

GC Semi-volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: C18642
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP4804-MB	HH18221.D	1	10/28/11	JH	10/28/11	OP4804	GHH596

The QC reported here applies to the following samples:

Method: NWTPH-DX

C18642-2, C18642-3, C18642-4, C18642-5

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Diesel)	ND	0.10	0.050	mg/l	
	TPH (Motor Oil)	ND	0.20	0.10	mg/l	

CAS No.	Surrogate Recoveries	Limits
630-01-3	Hexacosane	82% 50-150%

Blank Spike/Blank Spike Duplicate Summary

Job Number: C18642
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP4804-BS	HH18222.D	1	10/28/11	JH	10/28/11	OP4804	GHH596
OP4804-BSD	HH18223.D	1	10/28/11	JH	10/28/11	OP4804	GHH596

The QC reported here applies to the following samples:

Method: NWTPH-DX

C18642-2, C18642-3, C18642-4, C18642-5

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	BSD mg/l	BSD %	RPD	Limits Rec/RPD
	TPH (Diesel)	1	0.836	84	0.796	80	5	45-140/30
	TPH (Motor Oil)	1	0.779	78	0.796	80	2	45-140/30

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
630-01-3	Hexacosane	84%	87%	50-150%

6.2.1
6

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: C18642
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP4804-MS	HH18261.D	1	10/29/11	JH	10/28/11	OP4804	GHH596
OP4804-MSD	HH18262.D	1	10/29/11	JH	10/28/11	OP4804	GHH596
C18646-8	HH18253.D	1	10/29/11	JH	10/28/11	OP4804	GHH596

The QC reported here applies to the following samples:

Method: NWTPH-DX

C18642-2, C18642-3, C18642-4, C18642-5

CAS No.	Compound	C18646-8 mg/l	Spike Q mg/l	MS mg/l	MS %	MSD mg/l	MSD %	RPD	Limits Rec/RPD
	TPH (Diesel)	0.122	2	1.63	75	1.48	68	10	45-140/25
	TPH (Motor Oil)	ND	2	1.68	84	1.59	80	6	45-140/25

CAS No.	Surrogate Recoveries	MS	MSD	C18646-8	Limits
630-01-3	Hexacosane	91%	85%	93%	50-150%

6.3.1
6

Duplicate Summary

Job Number: C18642
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP4804-DUP2	HH18258.D	1	10/29/11	JH	10/28/11	OP4804	GHH596
C18646-5	HH18250.D	1	10/29/11	JH	10/28/11	OP4804	GHH596

The QC reported here applies to the following samples:

Method: NWTPH-DX

C18642-2, C18642-3, C18642-4, C18642-5

CAS No.	Compound	C18646-5 mg/l	DUP Q mg/l	Q RPD	Limits
	TPH (Diesel)	ND	ND	nc	25
	TPH (Motor Oil)	ND	ND	nc	25

CAS No.	Surrogate Recoveries	DUP	C18646-5	Limits
630-01-3	Hexacosane	83%	82%	50-150%

Metals Analysis

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: C18642
Account: SHELLWIC - Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

QC Batch ID: MP4144
Matrix Type: AQUEOUS

Methods: SW846 6010B
Units: ug/l

Prep Date: 10/31/11

Metal	RL	IDL	MDL	MB raw	final
Aluminum	200	13	8.5		
Antimony	6.0	.7	.51		
Arsenic	10	.7	.65		
Barium	200	.4	.35		
Beryllium	5.0	.2	.12		
Boron	100	.9	.64		
Cadmium	2.0	.2	.15		
Calcium	5000	7.1	12	276	<5000
Chromium	10	.3	.41		
Cobalt	5.0	.2	.3		
Copper	10	1.2	3		
Iron	200	6.4	12	0.60	<200
Lead	10	.7	.85		
Magnesium	5000	27	36	20.4	<5000
Manganese	15	.1	1.3		
Molybdenum	20	.2	.22		
Nickel	5.0	.2	.12		
Potassium	10000	18	44		
Selenium	10	1.8	2.2		
Silicon	100	1.2	6.9		
Silver	5.0	.3	.47		
Sodium	10000	15	23		
Strontium	10	.2	.24		
Thallium	10	.5	.54		
Tin	50	.2	.7		
Titanium	10	.4	.34		
Vanadium	10	.3	.3		
Zinc	20	.3	4.2		

Associated samples MP4144: C18642-4, C18642-5

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

7.1.1
7

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: C18642
 Account: SHELLWIC - Shell Oil Products
 Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

QC Batch ID: MP4144
 Matrix Type: AQUEOUS

Methods: SW846 6010B
 Units: ug/l

Prep Date: 10/31/11

Metal	C18603-1 Original MS		SpikeLot MPIR4	% Rec	QC Limits
Aluminum	anr				
Antimony	anr				
Arsenic	anr				
Barium	anr				
Beryllium	anr				
Boron	anr				
Cadmium	anr				
Calcium	50700	55700	5000	100.0	75-125
Chromium	anr				
Cobalt	anr				
Copper	anr				
Iron	0.0	505	500	101.0	75-125
Lead	anr				
Magnesium	21600	26600	5000	100.0	75-125
Manganese	anr				
Molybdenum	anr				
Nickel	anr				
Potassium					
Selenium	anr				
Silicon					
Silver	anr				
Sodium					
Strontium					
Thallium	anr				
Tin					
Titanium					
Vanadium	anr				
Zinc	anr				

Associated samples MP4144: C18642-4, C18642-5

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (N) Matrix Spike Rec. outside of QC limits
 (anr) Analyte not requested

7.1.2
7

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: C18642
 Account: SHELLWIC - Shell Oil Products
 Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

QC Batch ID: MP4144
 Matrix Type: AQUEOUS

Methods: SW846 6010B
 Units: ug/l

Prep Date: 10/31/11

Metal	C18603-1 Original MSD	SpikeLot MPIR4	% Rec	MSD RPD	QC Limit	
Aluminum	anr					
Antimony	anr					
Arsenic	anr					
Barium	anr					
Beryllium	anr					
Boron	anr					
Cadmium	anr					
Calcium	50700	56400	5000	114.0	1.2	20
Chromium	anr					
Cobalt	anr					
Copper	anr					
Iron	0.0	503	500	100.6	0.4	20
Lead	anr					
Magnesium	21600	26900	5000	106.0	1.1	20
Manganese	anr					
Molybdenum	anr					
Nickel	anr					
Potassium						
Selenium	anr					
Silicon						
Silver	anr					
Sodium						
Strontium						
Thallium	anr					
Tin						
Titanium						
Vanadium	anr					
Zinc	anr					

Associated samples MP4144: C18642-4, C18642-5

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (N) Matrix Spike Rec. outside of QC limits
 (anr) Analyte not requested

7.1.2
7

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: C18642
 Account: SHELLWIC - Shell Oil Products
 Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

QC Batch ID: MP4144
 Matrix Type: AQUEOUS

Methods: SW846 6010B
 Units: ug/l

Prep Date: 10/31/11

Metal	BSP Result	Spikelot MPIR4	% Rec	QC Limits
Aluminum	anr			
Antimony	anr			
Arsenic	anr			
Barium	anr			
Beryllium	anr			
Boron	anr			
Cadmium	anr			
Calcium	5320	5000	106.4	80-120
Chromium	anr			
Cobalt	anr			
Copper	anr			
Iron	501	500	100.2	80-120
Lead	anr			
Magnesium	4880	5000	97.6	80-120
Manganese	anr			
Molybdenum	anr			
Nickel	anr			
Potassium				
Selenium	anr			
Silicon				
Silver	anr			
Sodium				
Strontium				
Thallium	anr			
Tin				
Titanium				
Vanadium	anr			
Zinc	anr			

Associated samples MP4144: C18642-4, C18642-5

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (anr) Analyte not requested

7.1.3
7

SERIAL DILUTION RESULTS SUMMARY

Login Number: C18642
 Account: SHELLWIC - Shell Oil Products
 Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

QC Batch ID: MP4144
 Matrix Type: AQUEOUS

Methods: SW846 6010B
 Units: ug/l

Prep Date: 10/31/11

Metal	C18603-1 Original	SDL 1:5	%DIF	QC Limits
Aluminum	anr			
Antimony	anr			
Arsenic	anr			
Barium	anr			
Beryllium	anr			
Boron	anr			
Cadmium	anr			
Calcium	50700	56900	12.4*(a)	0-10
Chromium	anr			
Cobalt	anr			
Copper	anr			
Iron	0.00	0.00	NC	0-10
Lead	anr			
Magnesium	21600	24800	14.6*(a)	0-10
Manganese	anr			
Molybdenum	anr			
Nickel	anr			
Potassium				
Selenium	anr			
Silicon				
Silver	anr			
Sodium				
Strontium				
Thallium	anr			
Tin				
Titanium				
Vanadium	anr			
Zinc	anr			

Associated samples MP4144: C18642-4, C18642-5

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (anr) Analyte not requested
 (a) Serial dilution indicates possible matrix interference.

7.1.4
7

General Chemistry

QC Data Summaries

Includes the following where applicable:

- Method Blank and Blank Spike Summaries
- Duplicate Summaries
- Matrix Spike Summaries

METHOD BLANK AND SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: C18642
Account: SHELLWIC - Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Alkalinity, Total as CaCO3	GN6903	5.0	1.6	mg/l	250	264	105.6	75-125%
Chloride	GP3163/GN6932	0.50	0.0	mg/l	5	4.56	91.2	90-110%
Fluoride	GP3163/GN6932	0.10	0.022	mg/l	5	4.69	93.8	90-110%
Iron, Ferrous	GN6921	0.10	0.0	mg/l	0.5	0.52	104.5	75-125%
Sulfate	GP3163/GN6932	0.50	0.0	mg/l	5	4.50	90.0	90-110%

Associated Samples:

Batch GN6903: C18642-4, C18642-5

Batch GN6921: C18642-4, C18642-5

Batch GP3163: C18642-4, C18642-5

(*) Outside of QC limits

BLANK SPIKE DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: C18642
Account: SHELLWIC - Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Analyte	Batch ID	Units	Spike Amount	BSD Result	RPD	QC Limit
Alkalinity, Total as CaCO3	GN6903	mg/l	250	264	0.0	
Chloride	GP3163/GN6932	mg/l	5	4.62	1.3	25%
Fluoride	GP3163/GN6932	mg/l	5	4.63	1.3	25%
Iron, Ferrous	GN6921	mg/l	0.5	0.53	1.0	25%
Sulfate	GP3163/GN6932	mg/l	5	4.51	0.2	25%

Associated Samples:

Batch GN6903: C18642-4, C18642-5

Batch GN6921: C18642-4, C18642-5

Batch GP3163: C18642-4, C18642-5

(*) Outside of QC limits

DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: C18642
Account: SHELLWIC - Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Alkalinity, Total as CaCO3	GN6903	C18636-1	mg/l	470	470	0.0	0-25%

Associated Samples:

Batch GN6903: C18642-4, C18642-5

(*) Outside of QC limits



MATRIX SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: C18642
Account: SHELLWIC - Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Fluoride	GP3163/GN6932	C18623-1	mg/l	13.4	20	28.0	73.0N(a)	80-120%
Iron, Ferrous	GN6921	C18642-5	mg/l	8.8	25	31.0	88.7	75-125%

Associated Samples:

Batch GN6921: C18642-4, C18642-5

Batch GP3163: C18642-4, C18642-5

(*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(a) Spike recovery indicates possible matrix interference.

MATRIX SPIKE DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: C18642
Account: SHELLWIC - Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MSD Result	RPD	QC Limit
Fluoride	GP3163/GN6932	C18623-1	mg/l	13.4	20	26.6	5.1N(a)	25.8
Iron, Ferrous	GN6921	C18642-5	mg/l	8.8	25	30.6	1.3	25.8



Associated Samples:

Batch GN6921: C18642-4, C18642-5

Batch GP3163: C18642-4, C18642-5

(*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(a) Spike recovery indicates possible matrix interference.

8.5

8

Misc. Forms

Custody Documents and Other Forms

(Accutest New Jersey)

Includes the following where applicable:

- Chain of Custody

Subcontract Chain of Custody

Subcontract Lab: Accutest New Jersey
Date Sent: 10/27/11
Date Due: 11/10/11

Project Name: SHELLWIC3981
Project Location:

Accutest Lab Number	Customer Sample Name/Field Point ID	Matrix	Method	Collect Date	Collect Time
C18642-4		GW	RSK 175 *VRSK175CO2 (carbon dioxide) *VRSK175CH4 (METHANE)	10/26/11	12:00
C18642-5		GW	*VRSK175CO2 (carbon dioxide) *VRSK175CH4 (METHANE)	10/26/11	12:00

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Comments: 3-vials w/HCL (RSK-CH4); 3-vials unpreserved (CO2).

Relinquished By: <i>Elvin</i>	Received By: FedEx	Date: 10/27/11	Time: 15:00
Relinquished By: FedEx 7953 4547 4495	Received By: <i>[Signature]</i>	Date: 10-28-11	Time: 1600

2.0°e

Accutest Laboratories Sample Receipt Summary

Accutest Job Number C18642

Client:

Date / Time Received: 10/28/2011

Project:

No. Coolers: 1

Airbill #'s:

Delivery Method:

Cooler Security

Y or N

Y or N

- | | | | | | |
|---------------------------|-------------------------------------|--------------------------|-----------------------|-------------------------------------|--------------------------|
| 1. Custody Seals Present: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 3. COC Present: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Custody Seals Intact: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 4. Smpl Dates/Time OK | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

Cooler Temperature

Y or N

- | | | |
|------------------------------|-------------------------------------|--------------------------|
| 1. Temp criteria achieved: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Cooler temp verification: | IR Gun | |
| 3. Cooler media: | Ice (Bag) | |

Quality Control Preservation

Y or N

N/A

- | | | | |
|---------------------------------|-------------------------------------|-------------------------------------|--------------------------|
| 1. Trip Blank present / cooler: | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Trip Blank listed on COC: | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Samples preserved properly: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| 4. VOCs headspace free: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Sample Integrity - Documentation

Y or N

- | | | |
|--|-------------------------------------|--------------------------|
| 1. Sample labels present on bottles: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Container labeling complete: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Sample container label / COC agree: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

Sample Integrity - Condition

Y or N

- | | | |
|----------------------------------|-------------------------------------|--------------------------|
| 1. Sample recvd within HT: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. All containers accounted for: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Condition of sample: | Intact | |

Sample Integrity - Instructions

Y or N

N/A

- | | | | |
|---|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. Analysis requested is clear: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| 2. Bottles received for unspecified tests | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| 3. Sufficient volume recvd for analysis: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| 4. Compositing instructions clear: | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 5. Filtering instructions clear: | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

Comments

GC Volatiles

QC Data Summaries

(Accutest New Jersey)

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: C18642

Account: ALNCA Accutest Northern California, Inc.

Project: SHELLWIC: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GII2642-MB	II54364.D	1	10/31/11	TCH	n/a	n/a	GII2642

The QC reported here applies to the following samples:

Method: RSK-175

C18642-4, C18642-5

CAS No.	Compound	Result	RL	MDL	Units	Q
74-82-8	Methane	ND	0.11	0.022	ug/l	
124-38-9	Carbon Dioxide	ND	50	1.8	ug/l	

10.1.1
10

Laboratory Control Sample Summary

Job Number: C18642
Account: ALNCA Accutest Northern California, Inc.
Project: SHELLWIC: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GII2642-LCS	II54362.D	1	10/31/11	TCH	n/a	n/a	GII2642

The QC reported here applies to the following samples:

Method: RSK-175

C18642-4, C18642-5

CAS No.	Compound	Spike ug/l	LCS ug/l	LCS %	Limits
74-82-8	Methane	100	103	103	59-134
124-38-9	Carbon Dioxide	100	106	106	66-114

Duplicate Summary

Job Number: C18642
Account: ALNCA Accutest Northern California, Inc.
Project: SHELLWIC: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JA90421-4DUP	II54372.D	1	10/31/11	TCH	n/a	n/a	GII2642
JA90421-4	II54371.D	1	10/31/11	TCH	n/a	n/a	GII2642

The QC reported here applies to the following samples: Method: RSK-175

C18642-4, C18642-5

CAS No.	Compound	JA90421-4 ug/l	DUP Q ug/l	Q RPD	Limits
74-82-8	Methane	1.3	1.3	0	14
124-38-9	Carbon Dioxide	1440	1460	1	12

Technical Report for

Shell Oil Products

URSOPR: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

46194304

Accutest Job Number: C18646

Sampling Dates: 10/11/11 - 10/25/11

Report to:

URS Corporation
111 SW Columbia, Suite 1500
Portland, OR 97201-5850
brian_pletcher@urscorp.com

ATTN: Brian Pletcher

Total number of pages in report: **67**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

Kesavalu M. Bagawandoss,
Ph.D., J.D., Lab Director

Client Service contact: Vincent Vancil 408-588-0200

Certifications: CA (08258CA) AZ (AZ0762) DoD/ISO/IEC 17025:2005 (L2242)

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Test results relate only to samples analyzed.

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Sample Summary

Shell Oil Products

Job No: C18646

URSOPR: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA
 Project No: 46194304

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
C18646-1	10/25/11	07:25 DL	10/27/11	AQ	Ground Water	TX-06A-1011
C18646-2	10/11/11	00:00 DL	10/27/11	AQ	Ground Water	TRIP BLANK
C18646-3	10/25/11	09:15 DL	10/27/11	AQ	Ground Water	MW-214-1011
C18646-4	10/25/11	09:45 DL	10/27/11	AQ	Ground Water	MW-214D-1011
C18646-5	10/25/11	10:10 DL	10/27/11	AQ	Ground Water	MW-213-1011
C18646-6	10/25/11	11:40 DL	10/27/11	AQ	Ground Water	MW-112A-1011
C18646-7	10/25/11	13:00 DL	10/27/11	AQ	Ground Water	MW-105-1011
C18646-8	10/25/11	14:05 DL	10/27/11	AQ	Ground Water	MW-111-1011
C18646-9	10/25/11	15:00 DL	10/27/11	AQ	Ground Water	MW-104-1011
C18646-10	10/25/11	15:50 DL	10/27/11	AQ	Ground Water	MW-05-1011

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID: TX-06A-1011		Date Sampled: 10/25/11
Lab Sample ID: C18646-1		Date Received: 10/27/11
Matrix: AQ - Ground Water		Percent Solids: n/a
Method: SW846 8260B		
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	Q4947.D	1	11/03/11	TN	n/a	n/a	VQ176
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.30	ug/l	
108-88-3	Toluene	ND	1.0	0.50	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.30	ug/l	
1330-20-7	Xylene (total)	ND	2.0	0.70	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	86%		60-130%
2037-26-5	Toluene-D8	100%		60-130%
460-00-4	4-Bromofluorobenzene	96%		60-130%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: TX-06A-1011		
Lab Sample ID: C18646-1		Date Sampled: 10/25/11
Matrix: AQ - Ground Water		Date Received: 10/27/11
Method: NWTPH-GX		Percent Solids: n/a
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	JK23559.D	1	11/04/11	TT	n/a	n/a	GJK967
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Northwest TPH-Gx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Gasoline)	0.0519	0.20	0.050	mg/l	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
98-08-8	aaa-Trifluorotoluene	100%		50-150%
460-00-4	4-Bromofluorobenzene	104%		50-150%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: TX-06A-1011		Date Sampled: 10/25/11
Lab Sample ID: C18646-1		Date Received: 10/27/11
Matrix: AQ - Ground Water		Percent Solids: n/a
Method: NWTPH-DX SW846 3510C		
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	HH18247.D	1	10/29/11	JH	10/28/11	OP4804	GHH596
Run #2							

Run #	Initial Volume	Final Volume
Run #1	950 ml	1.0 ml
Run #2		

Northwest TPH-Dx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Diesel)	0.499	0.11	0.053	mg/l	
	TPH (Motor Oil)	ND	0.21	0.11	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
630-01-3	Hexacosane	86%		50-150%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: TRIP BLANK		Date Sampled: 10/11/11
Lab Sample ID: C18646-2		Date Received: 10/27/11
Matrix: AQ - Ground Water		Percent Solids: n/a
Method: SW846 8260B		
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	Q4944.D	1	11/03/11	TN	n/a	n/a	VQ176
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.30	ug/l	
108-88-3	Toluene	ND	1.0	0.50	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.30	ug/l	
1330-20-7	Xylene (total)	ND	2.0	0.70	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	86%		60-130%
2037-26-5	Toluene-D8	106%		60-130%
460-00-4	4-Bromofluorobenzene	96%		60-130%

(a) Sample received outside the holding time.

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: TRIP BLANK		Date Sampled: 10/11/11
Lab Sample ID: C18646-2		Date Received: 10/27/11
Matrix: AQ - Ground Water		Percent Solids: n/a
Method: NWTPH-GX		
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	JK23420.D	1	10/31/11	TT	n/a	n/a	GJK962
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Northwest TPH-Gx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Gasoline)	ND	0.20	0.050	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
98-08-8	aaa-Trifluorotoluene	100%		50-150%
460-00-4	4-Bromofluorobenzene	105%		50-150%

(a) Sample received outside the holding time.

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-214-1011		Date Sampled: 10/25/11
Lab Sample ID: C18646-3		Date Received: 10/27/11
Matrix: AQ - Ground Water		Percent Solids: n/a
Method: SW846 8260B		
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	Q4948.D	1	11/03/11	TN	n/a	n/a	VQ176
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.30	ug/l	
108-88-3	Toluene	ND	1.0	0.50	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.30	ug/l	
1330-20-7	Xylene (total)	ND	2.0	0.70	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	79%		60-130%
2037-26-5	Toluene-D8	111%		60-130%
460-00-4	4-Bromofluorobenzene	95%		60-130%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-214-1011		Date Sampled: 10/25/11
Lab Sample ID: C18646-3		Date Received: 10/27/11
Matrix: AQ - Ground Water		Percent Solids: n/a
Method: SW846 8270C BY SIM SW846 3510C		
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

Run #1	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	X20202.D	1	10/31/11	LB	10/31/11	OP4814	EX900
Run #2							

Run #1	Initial Volume	Final Volume
Run #1	1000 ml	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	1.0	0.25	ug/l	
208-96-8	Acenaphthylene	ND	1.0	0.25	ug/l	
120-12-7	Anthracene	ND	1.0	0.25	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.10	0.030	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.10	0.030	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.10	0.030	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.10	0.030	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.10	0.030	ug/l	
218-01-9	Chrysene	ND	0.10	0.030	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.10	0.030	ug/l	
206-44-0	Fluoranthene	ND	1.0	0.25	ug/l	
86-73-7	Fluorene	ND	1.0	0.25	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.10	0.030	ug/l	
90-12-0	1-Methylnaphthalene	ND	1.0	0.25	ug/l	
91-57-6	2-Methylnaphthalene	ND	1.0	0.25	ug/l	
91-20-3	Naphthalene	ND	1.0	0.25	ug/l	
85-01-8	Phenanthrene	ND	1.0	0.25	ug/l	
129-00-0	Pyrene	ND	1.0	0.25	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	75%		25-100%
321-60-8	2-Fluorobiphenyl	70%		25-106%
1718-51-0	Terphenyl-d14	72%		35-130%

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-214-1011		
Lab Sample ID: C18646-3		Date Sampled: 10/25/11
Matrix: AQ - Ground Water		Date Received: 10/27/11
Method: NWTPH-GX		Percent Solids: n/a
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	JK23561.D	1	11/04/11	TT	n/a	n/a	GJK967
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Northwest TPH-Gx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Gasoline)	ND	0.20	0.050	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
98-08-8	aaa-Trifluorotoluene	98%		50-150%
460-00-4	4-Bromofluorobenzene	104%		50-150%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-214-1011		Date Sampled: 10/25/11
Lab Sample ID: C18646-3		Date Received: 10/27/11
Matrix: AQ - Ground Water		Percent Solids: n/a
Method: NWTPH-DX SW846 3510C		
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	HH18248.D	1	10/29/11	JH	10/28/11	OP4804	GHH596
Run #2							

Run #	Initial Volume	Final Volume
Run #1	950 ml	1.0 ml
Run #2		

Northwest TPH-Dx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Diesel)	0.126	0.11	0.053	mg/l	
	TPH (Motor Oil)	ND	0.21	0.11	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
630-01-3	Hexacosane	75%		50-150%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-214D-1011		
Lab Sample ID: C18646-4		Date Sampled: 10/25/11
Matrix: AQ - Ground Water		Date Received: 10/27/11
Method: SW846 8260B		Percent Solids: n/a
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	Q4949.D	1	11/03/11	TN	n/a	n/a	VQ176
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.30	ug/l	
108-88-3	Toluene	ND	1.0	0.50	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.30	ug/l	
1330-20-7	Xylene (total)	ND	2.0	0.70	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	66%		60-130%
2037-26-5	Toluene-D8	118%		60-130%
460-00-4	4-Bromofluorobenzene	93%		60-130%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-214D-1011	Date Sampled:	10/25/11
Lab Sample ID:	C18646-4	Date Received:	10/27/11
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	SW846 8270C BY SIM SW846 3510C		
Project:	URSOP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	X20203.D	1	10/31/11	LB	10/31/11	OP4814	EX900
Run #2							

Run #	Initial Volume	Final Volume
Run #1	1000 ml	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	1.0	0.25	ug/l	
208-96-8	Acenaphthylene	ND	1.0	0.25	ug/l	
120-12-7	Anthracene	ND	1.0	0.25	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.10	0.030	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.10	0.030	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.10	0.030	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.10	0.030	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.10	0.030	ug/l	
218-01-9	Chrysene	ND	0.10	0.030	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.10	0.030	ug/l	
206-44-0	Fluoranthene	ND	1.0	0.25	ug/l	
86-73-7	Fluorene	ND	1.0	0.25	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.10	0.030	ug/l	
90-12-0	1-Methylnaphthalene	ND	1.0	0.25	ug/l	
91-57-6	2-Methylnaphthalene	ND	1.0	0.25	ug/l	
91-20-3	Naphthalene	ND	1.0	0.25	ug/l	
85-01-8	Phenanthrene	ND	1.0	0.25	ug/l	
129-00-0	Pyrene	ND	1.0	0.25	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	73%		25-100%
321-60-8	2-Fluorobiphenyl	65%		25-106%
1718-51-0	Terphenyl-d14	64%		35-130%

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-214D-1011		
Lab Sample ID: C18646-4		Date Sampled: 10/25/11
Matrix: AQ - Ground Water		Date Received: 10/27/11
Method: NWTPH-GX		Percent Solids: n/a
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	JK23562.D	1	11/04/11	TT	n/a	n/a	GJK967
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Northwest TPH-Gx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Gasoline)	ND	0.20	0.050	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
98-08-8	aaa-Trifluorotoluene	101%		50-150%
460-00-4	4-Bromofluorobenzene	106%		50-150%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-214D-1011		
Lab Sample ID: C18646-4		Date Sampled: 10/25/11
Matrix: AQ - Ground Water		Date Received: 10/27/11
Method: NWTPH-DX SW846 3510C		Percent Solids: n/a
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	HH18249.D	1	10/29/11	JH	10/28/11	OP4804	GHH596
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	1.0 ml
Run #2		

Northwest TPH-Dx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Diesel)	0.151	0.10	0.050	mg/l	
	TPH (Motor Oil)	ND	0.20	0.10	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
630-01-3	Hexacosane	75%		50-150%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-213-1011		
Lab Sample ID: C18646-5		Date Sampled: 10/25/11
Matrix: AQ - Ground Water		Date Received: 10/27/11
Method: SW846 8260B		Percent Solids: n/a
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	Q4950.D	1	11/03/11	TN	n/a	n/a	VQ176
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.30	ug/l	
108-88-3	Toluene	ND	1.0	0.50	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.30	ug/l	
1330-20-7	Xylene (total)	ND	2.0	0.70	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	63%		60-130%
2037-26-5	Toluene-D8	119%		60-130%
460-00-4	4-Bromofluorobenzene	90%		60-130%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-213-1011		
Lab Sample ID: C18646-5		Date Sampled: 10/25/11
Matrix: AQ - Ground Water		Date Received: 10/27/11
Method: SW846 8270C BY SIM SW846 3510C		Percent Solids: n/a
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	X20204.D	1	10/31/11	LB	10/31/11	OP4814	EX900
Run #2							

Run #	Initial Volume	Final Volume
Run #1	1000 ml	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	1.0	0.25	ug/l	
208-96-8	Acenaphthylene	ND	1.0	0.25	ug/l	
120-12-7	Anthracene	ND	1.0	0.25	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.10	0.030	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.10	0.030	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.10	0.030	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.10	0.030	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.10	0.030	ug/l	
218-01-9	Chrysene	ND	0.10	0.030	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.10	0.030	ug/l	
206-44-0	Fluoranthene	ND	1.0	0.25	ug/l	
86-73-7	Fluorene	ND	1.0	0.25	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.10	0.030	ug/l	
90-12-0	1-Methylnaphthalene	ND	1.0	0.25	ug/l	
91-57-6	2-Methylnaphthalene	ND	1.0	0.25	ug/l	
91-20-3	Naphthalene	ND	1.0	0.25	ug/l	
85-01-8	Phenanthrene	ND	1.0	0.25	ug/l	
129-00-0	Pyrene	ND	1.0	0.25	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	87%		25-100%
321-60-8	2-Fluorobiphenyl	74%		25-106%
1718-51-0	Terphenyl-d14	71%		35-130%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-213-1011		Date Sampled: 10/25/11
Lab Sample ID: C18646-5		Date Received: 10/27/11
Matrix: AQ - Ground Water		Percent Solids: n/a
Method: NWTPH-GX		
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	JK23430.D	1	11/01/11	TT	n/a	n/a	GJK962
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Northwest TPH-Gx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Gasoline)	ND	0.20	0.050	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
98-08-8	aaa-Trifluorotoluene	98%		50-150%
460-00-4	4-Bromofluorobenzene	103%		50-150%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-213-1011		
Lab Sample ID: C18646-5		Date Sampled: 10/25/11
Matrix: AQ - Ground Water		Date Received: 10/27/11
Method: NWTPH-DX SW846 3510C		Percent Solids: n/a
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	HH18250.D	1	10/29/11	JH	10/28/11	OP4804	GHH596
Run #2							

	Initial Volume	Final Volume
Run #1	950 ml	1.0 ml
Run #2		

Northwest TPH-Dx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Diesel)	ND	0.11	0.053	mg/l	
	TPH (Motor Oil)	ND	0.21	0.11	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
630-01-3	Hexacosane	82%		50-150%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-112A-1011		Date Sampled: 10/25/11
Lab Sample ID: C18646-6		Date Received: 10/27/11
Matrix: AQ - Ground Water		Percent Solids: n/a
Method: SW846 8260B		
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	Q4951.D	1	11/03/11	TN	n/a	n/a	VQ176
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	5.5	1.0	0.30	ug/l	
108-88-3	Toluene	ND	1.0	0.50	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.30	ug/l	
1330-20-7	Xylene (total)	ND	2.0	0.70	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	65%		60-130%
2037-26-5	Toluene-D8	110%		60-130%
460-00-4	4-Bromofluorobenzene	93%		60-130%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-112A-1011		Date Sampled: 10/25/11
Lab Sample ID: C18646-6		Date Received: 10/27/11
Matrix: AQ - Ground Water		Percent Solids: n/a
Method: NWTPH-GX		
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	JK23431.D	1	11/01/11	TT	n/a	n/a	GJK962
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Northwest TPH-Gx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Gasoline)	0.292	0.20	0.050	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
98-08-8	aaa-Trifluorotoluene	100%		50-150%
460-00-4	4-Bromofluorobenzene	109%		50-150%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-112A-1011		Date Sampled: 10/25/11
Lab Sample ID: C18646-6		Date Received: 10/27/11
Matrix: AQ - Ground Water		Percent Solids: n/a
Method: NWTPH-DX SW846 3510C		
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	HH18251.D	1	10/29/11	JH	10/28/11	OP4804	GHH596
Run #2							

Run #	Initial Volume	Final Volume
Run #1	1000 ml	1.0 ml
Run #2		

Northwest TPH-Dx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Diesel)	0.200	0.10	0.050	mg/l	
	TPH (Motor Oil)	ND	0.20	0.10	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
630-01-3	Hexacosane	74%		50-150%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-105-1011		Date Sampled: 10/25/11
Lab Sample ID: C18646-7		Date Received: 10/27/11
Matrix: AQ - Ground Water		Percent Solids: n/a
Method: SW846 8260B		
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	Q4952.D	1	11/03/11	TN	n/a	n/a	VQ176
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.30	ug/l	
108-88-3	Toluene	ND	1.0	0.50	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.30	ug/l	
1330-20-7	Xylene (total)	ND	2.0	0.70	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	73%		60-130%
2037-26-5	Toluene-D8	100%		60-130%
460-00-4	4-Bromofluorobenzene	92%		60-130%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-105-1011		Date Sampled: 10/25/11
Lab Sample ID: C18646-7		Date Received: 10/27/11
Matrix: AQ - Ground Water		Percent Solids: n/a
Method: NWTPH-GX		
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	JK23432.D	1	11/01/11	TT	n/a	n/a	GJK962
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Northwest TPH-Gx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Gasoline)	ND	0.20	0.050	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
98-08-8	aaa-Trifluorotoluene	98%		50-150%
460-00-4	4-Bromofluorobenzene	103%		50-150%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-105-1011		Date Sampled: 10/25/11
Lab Sample ID: C18646-7		Date Received: 10/27/11
Matrix: AQ - Ground Water		Percent Solids: n/a
Method: NWTPH-DX SW846 3510C		
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	HH18252.D	1	10/29/11	JH	10/28/11	OP4804	GHH596
Run #2							

Run #	Initial Volume	Final Volume
Run #1	1000 ml	1.0 ml
Run #2		

Northwest TPH-Dx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Diesel)	0.253	0.10	0.050	mg/l	
	TPH (Motor Oil)	ND	0.20	0.10	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
630-01-3	Hexacosane	96%		50-150%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-105-1011	Date Sampled: 10/25/11
Lab Sample ID: C18646-7	Date Received: 10/27/11
Matrix: AQ - Ground Water	Percent Solids: n/a
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA	

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Lead	< 10	10	ug/l	1	10/31/11	10/31/11 RS	SW846 6010B ¹	SW3010A ²

(1) Instrument QC Batch: MA2166

(2) Prep QC Batch: MP4144

RL = Reporting Limit

Report of Analysis

Client Sample ID: MW-111-1011		Date Sampled: 10/25/11
Lab Sample ID: C18646-8		Date Received: 10/27/11
Matrix: AQ - Ground Water		Percent Solids: n/a
Method: SW846 8260B		
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	Q4953.D	1	11/03/11	TN	n/a	n/a	VQ176
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	0.94	1.0	0.30	ug/l	J
108-88-3	Toluene	ND	1.0	0.50	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.30	ug/l	
1330-20-7	Xylene (total)	ND	2.0	0.70	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	72%		60-130%
2037-26-5	Toluene-D8	103%		60-130%
460-00-4	4-Bromofluorobenzene	94%		60-130%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-111-1011		
Lab Sample ID: C18646-8		Date Sampled: 10/25/11
Matrix: AQ - Ground Water		Date Received: 10/27/11
Method: NWTPH-GX		Percent Solids: n/a
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	JK23433.D	1	11/01/11	TT	n/a	n/a	GJK962
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Northwest TPH-Gx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Gasoline)	ND	0.20	0.050	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
98-08-8	aaa-Trifluorotoluene	97%		50-150%
460-00-4	4-Bromofluorobenzene	103%		50-150%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-111-1011		Date Sampled: 10/25/11
Lab Sample ID: C18646-8		Date Received: 10/27/11
Matrix: AQ - Ground Water		Percent Solids: n/a
Method: NWTPH-DX SW846 3510C		
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	HH18253.D	1	10/29/11	JH	10/28/11	OP4804	GHH596
Run #2							

Run #	Initial Volume	Final Volume
Run #1	1000 ml	1.0 ml
Run #2		

Northwest TPH-Dx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Diesel)	0.122	0.10	0.050	mg/l	
	TPH (Motor Oil)	ND	0.20	0.10	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
630-01-3	Hexacosane	93%		50-150%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-104-1011		Date Sampled: 10/25/11
Lab Sample ID: C18646-9		Date Received: 10/27/11
Matrix: AQ - Ground Water		Percent Solids: n/a
Method: NWTPH-GX		
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	JK23434.D	10	11/01/11	TT	n/a	n/a	GJK962
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Northwest TPH-Gx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Gasoline)	3.38	2.0	0.50	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
98-08-8	aaa-Trifluorotoluene	99%		50-150%
460-00-4	4-Bromofluorobenzene	121%		50-150%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-104-1011		Date Sampled: 10/25/11
Lab Sample ID: C18646-9		Date Received: 10/27/11
Matrix: AQ - Ground Water		Percent Solids: n/a
Method: NWTPH-DX SW846 3510C		
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	HH18254.D	1	10/29/11	JH	10/28/11	OP4804	GHH596
Run #2							

Run #	Initial Volume	Final Volume
Run #1	1000 ml	1.0 ml
Run #2		

Northwest TPH-Dx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Diesel)	0.413	0.10	0.050	mg/l	
	TPH (Motor Oil)	ND	0.20	0.10	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
630-01-3	Hexacosane	83%		50-150%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-104-1011	Date Sampled: 10/25/11
Lab Sample ID: C18646-9	Date Received: 10/27/11
Matrix: AQ - Ground Water	Percent Solids: n/a
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA	

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Lead	< 10	10	ug/l	1	10/31/11	10/31/11 RS	SW846 6010B ¹	SW3010A ²

(1) Instrument QC Batch: MA2166

(2) Prep QC Batch: MP4144

RL = Reporting Limit

Report of Analysis

Client Sample ID: MW-05-1011		Date Sampled: 10/25/11
Lab Sample ID: C18646-10		Date Received: 10/27/11
Matrix: AQ - Ground Water		Percent Solids: n/a
Method: SW846 8260B		
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	Q4954.D	1	11/03/11	TN	n/a	n/a	VQ176
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.30	ug/l	
108-88-3	Toluene	ND	1.0	0.50	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.30	ug/l	
1330-20-7	Xylene (total)	ND	2.0	0.70	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	76%		60-130%
2037-26-5	Toluene-D8	101%		60-130%
460-00-4	4-Bromofluorobenzene	94%		60-130%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-05-1011		
Lab Sample ID: C18646-10		Date Sampled: 10/25/11
Matrix: AQ - Ground Water		Date Received: 10/27/11
Method: NWTPH-GX		Percent Solids: n/a
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	JK23435.D	1	11/01/11	TT	n/a	n/a	GJK962
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Northwest TPH-Gx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Gasoline)	0.115	0.20	0.050	mg/l	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
98-08-8	aaa-Trifluorotoluene	98%		50-150%
460-00-4	4-Bromofluorobenzene	102%		50-150%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-05-1011		Date Sampled: 10/25/11
Lab Sample ID: C18646-10		Date Received: 10/27/11
Matrix: AQ - Ground Water		Percent Solids: n/a
Method: NWTPH-DX SW846 3510C		
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	HH18255.D	1	10/29/11	JH	10/28/11	OP4804	GHH596
Run #2							

Run #	Initial Volume	Final Volume
Run #1	1050 ml	1.0 ml
Run #2		

Northwest TPH-Dx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Diesel)	ND	0.095	0.048	mg/l	
	TPH (Motor Oil)	ND	0.19	0.095	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
630-01-3	Hexacosane	86%		50-150%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

CHAIN OF CUSTODY

2105 Lundy Ave, San Jose, CA 95131
 (408) 588-0200 FAX: (408) 588-0201

SHELLwic 3981

FED-EX Tracking #		Bottle Order Control #	
Accutest Quote #		Accutest NC Job # : C C18646	
Client / Reporting Information		Project Information	
Company Name: URS	Project Name: SHELL/HARBOR ISLAND		
Address: 1501 4th 111 SW COLUMBIA	Street: 2555 13th Av. SW		
City: PORTLAND OR	City: SEATTLE WA		
Project Contact: BRIAN PLETCHER	Project #: 46194304		
Phone #: 503-222-7200	EMAIL: brian.pletcher@urscorp.com		
Samplers Name: DAVE LEWIS	Client Purchase Order #		
Collection		Requested Analysis	
Sample ID / Field Point / Point of Collection	Date	Time	Sampled by
1 TX-06A-1011	10/25/11	0725	DL
2 TRIP BLANK	10/25/11	-	DL
3 MW-214-1011	10/25/11	0915	
4 MW-214D-1011		0945	
5 MW-213-1011	11	1010	
6 MW-112A-1011	11	1140	
7 MW-105-1011	11	1300	
8 MW-111-1011	11	1405	
9 MW-104-1011	11	1500	
10 MW-05-1011	11	1550	
Turnaround Time (Business days)		Data Deliverable Information	
<input checked="checked" type="checkbox"/> Standard TAT 15 Business Days <input type="checkbox"/> 10 Day (Workload dependent) <input type="checkbox"/> 5 Day (Workload dependent) <input type="checkbox"/> 3 Day (125% markup) <input type="checkbox"/> 2 Day (150% markup) <input type="checkbox"/> 1 Day (200% markup) <input type="checkbox"/> Same Day (300% markup)		<input type="checkbox"/> Commercial "A" - Results only <input type="checkbox"/> Commercial "B" - Results with QC summaries <input type="checkbox"/> Commercial "B+" - Results, QC, and chromatograms <input type="checkbox"/> FULLT1 - Level 4 data package <input type="checkbox"/> EDF for Geotracker <input type="checkbox"/> EDD Format Provide EDF Global ID Provide EDF Logcode:	
Emergency T/A data available VIA Lablink		Comments / Remarks 24 hr. Hold Time on Ferrrous Iron SILICA-GEL CLEAN-UP ON NWTPT-DX 3-coolers $5.4 - 0.1 = 5.3C$ $8.4 - 0.1 = 8.3C$ $4.6 - 0.1 = 4.5C$	
Sample Custody must be documented below each time sample change possession, including courier delivery.			
Relinquished by Sampler: 1 Dave Lewis	Date Time: 10/25/11 0630	Received By: 1 [Signature]	Date Time: 10/27/11 0945
Relinquished by:	Date Time:	Received By:	Date Time:
3		4	
5		5	
Custody Seal #	Appropriate Bottle / Pres. Y / N	Headspace Y / N	On Ice <input checked="checked" type="checkbox"/> N
	Labels match Coc? Y / N	Separate Receiving Check List used: Y / N	Cooler Temp. _____ °C

C18646: Chain of Custody

Page 1 of 2

Review Chain of Custody

Chain of Custody is to be complete and legible.

- ✓ Are these regulatory (NPDES) samples? GWA (Yes) / No
- ✓ Is pH requested? Yes / (No)
- Was Client informed that hold time is 15 min? Yes / No Continue Yes / No
- Was ortho-Phosphate filtered with in 15 min? Yes / No Continue Yes / No
- ✓ Are sample within hold time? (Yes) / No
- Are sample in danger of exceeding hold-time Yes / (No)
- ✓ Existing Client? (Yes) No (Yes) / No Existing Project? (Yes) / No
- If No: Is Report to info complete and legible, including;
 - deliverable □ Name □ Address □ phone □ e-mail
- Is Bill to info complete and legible, including;
 - PO# □ Credit card □ Contact □ address □ phone □ e-mail
- Is Contact and/or Project Manager identified, including;
 - phone □ e-mail
 - Project name / number
- ✓ Special requirements? Yes / (No)
- ✓ Sample IDs / date & time of collection provided? (Yes) / No
- ✓ Is Matrix listed and correct? (Yes) / No
- ✓ Analyses listed, we do, or client has authorized a subcontract? (Yes) / No
- ✓ Chain is signed and dated by both client and sample custodian? (Yes) / No
- ✓ TAT requested available? (Yes) / No Approved by PM

Review Coolers:

- ✓ Were all Coolers temperatures measured at ≤6°C? (Yes) / No
 - If cooler is outside the ≤6°C; note down the affected bottles in that cooler on the left
 - ✓ Are samples on Ice? (Yes) / No
- Note that ANC does NOT accept evidentiary samples. (We do not lock refrigerators)

- ✓ Shipment Received Method FedEx
- ✓ Custody Seals: Present: (Yes) / No If Yes; Unbroken: (Yes) / No

Review of Sample Bottles: If you answer no, explain to the side

- ✓ Chain matches bottle labels? (Yes) / No ✓ Sample bottle intact? (Yes) / No
- ✓ Is there enough sample volume in proper bottle for requested analyses? (Yes) / No
- ✓ Proper Preservatives? (Yes) / No
- Check pH on preserved samples except 1664, 625, 827D and VOAs; make notes on left.
- ✓ Headspace-VOAs? Greater than 6mm in diameter Yes / (No)
List sample ID and affected container

Client Sample ID	pH Check	Other Comments/Issues
		882705MPHLS
		→ Informed by Brian P via
		Phone (EES) 10/31/11

Non-Compliance issues and discrepancies on the COC are forwarded to Project Management



31
3

GC/MS Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: C18646
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VQ176-MB	Q4943.D	1	11/03/11	TN	n/a	n/a	VQ176

The QC reported here applies to the following samples:

Method: SW846 8260B

C18646-1, C18646-2, C18646-3, C18646-4, C18646-5, C18646-6, C18646-7, C18646-8, C18646-10

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.30	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.30	ug/l	
108-88-3	Toluene	ND	1.0	0.50	ug/l	
1330-20-7	Xylene (total)	ND	2.0	0.70	ug/l	

CAS No.	Surrogate Recoveries	Limits	
1868-53-7	Dibromofluoromethane	84%	60-130%
2037-26-5	Toluene-D8	107%	60-130%
460-00-4	4-Bromofluorobenzene	95%	60-130%

Blank Spike/Blank Spike Duplicate Summary

Job Number: C18646
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VQ176-BS	Q4940.D	1	11/03/11	TN	n/a	n/a	VQ176
VQ176-BSD	Q4941.D	1	11/03/11	TN	n/a	n/a	VQ176

The QC reported here applies to the following samples: **Method:** SW846 8260B

C18646-1, C18646-2, C18646-3, C18646-4, C18646-5, C18646-6, C18646-7, C18646-8, C18646-10

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	BSD ug/l	BSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	20	20.2	101	20.8	104	3	60-130/30
100-41-4	Ethylbenzene	20	23.0	115	23.4	117	2	60-130/30
108-88-3	Toluene	20	22.2	111	22.5	113	1	60-130/30
1330-20-7	Xylene (total)	60	68.5	114	69.4	116	1	60-130/30

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
1868-53-7	Dibromofluoromethane	82%	83%	60-130%
2037-26-5	Toluene-D8	106%	106%	60-130%
460-00-4	4-Bromofluorobenzene	92%	94%	60-130%

4.2.1
4

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: C18646
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
C18646-1MS	Q4959.D	1	11/04/11	TN	n/a	n/a	VQ176
C18646-1MSD	Q4960.D	1	11/04/11	TN	n/a	n/a	VQ176
C18646-1	Q4947.D	1	11/03/11	TN	n/a	n/a	VQ176

The QC reported here applies to the following samples: **Method:** SW846 8260B

C18646-1, C18646-2, C18646-3, C18646-4, C18646-5, C18646-6, C18646-7, C18646-8, C18646-10

CAS No.	Compound	C18646-1 ug/l	Spike Q ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	ND	20	15.3	77	16.0	80	4	60-130/25
100-41-4	Ethylbenzene	ND	20	14.5	73	15.3	77	5	60-130/25
108-88-3	Toluene	ND	20	14.4	72	15.3	77	6	60-130/25
1330-20-7	Xylene (total)	ND	60	26.0	43* a	28.4	47* a	9	60-130/25

CAS No.	Surrogate Recoveries	MS	MSD	C18646-1	Limits
1868-53-7	Dibromofluoromethane	68%	68%	86%	60-130%
2037-26-5	Toluene-D8	104%	104%	100%	60-130%
460-00-4	4-Bromofluorobenzene	91%	89%	96%	60-130%

(a) Outside laboratory control limits.

4.3.1
4

GC/MS Semi-volatiles

5

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: C18646
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP4814-MB	X20199.D	1	10/31/11	LB	10/31/11	OP4814	EX900

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

C18646-3, C18646-4, C18646-5

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	1.0	0.25	ug/l	
208-96-8	Acenaphthylene	ND	1.0	0.25	ug/l	
120-12-7	Anthracene	ND	1.0	0.25	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.10	0.030	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.10	0.030	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.10	0.030	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.10	0.030	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.10	0.030	ug/l	
218-01-9	Chrysene	ND	0.10	0.030	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.10	0.030	ug/l	
206-44-0	Fluoranthene	ND	1.0	0.25	ug/l	
86-73-7	Fluorene	ND	1.0	0.25	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.10	0.030	ug/l	
90-12-0	1-Methylnaphthalene	ND	1.0	0.25	ug/l	
91-57-6	2-Methylnaphthalene	ND	1.0	0.25	ug/l	
91-20-3	Naphthalene	ND	1.0	0.25	ug/l	
85-01-8	Phenanthrene	ND	1.0	0.25	ug/l	
129-00-0	Pyrene	ND	1.0	0.25	ug/l	

CAS No.	Surrogate Recoveries	Limits	
4165-60-0	Nitrobenzene-d5	100%	25-100%
321-60-8	2-Fluorobiphenyl	97%	25-106%
1718-51-0	Terphenyl-d14	108%	35-130%

5.1.1
5

Blank Spike/Blank Spike Duplicate Summary

Job Number: C18646
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP4814-BS	X20200.D	1	10/31/11	LB	10/31/11	OP4814	EX900
OP4814-BSD	X20201.D	1	10/31/11	LB	10/31/11	OP4814	EX900

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

C18646-3, C18646-4, C18646-5

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	BSD ug/l	BSD %	RPD	Limits Rec/RPD
83-32-9	Acenaphthene	5	4.0	80	4.2	84	5	25-130/30
208-96-8	Acenaphthylene	5	4.1	82	4.3	86	5	30-122/30
120-12-7	Anthracene	5	4.5	90	4.7	94	4	39-128/30
56-55-3	Benzo(a)anthracene	5	4.6	92	4.6	92	0	35-132/30
50-32-8	Benzo(a)pyrene	5	4.9	98	4.8	96	2	44-136/30
205-99-2	Benzo(b)fluoranthene	5	4.8	96	4.9	98	2	41-134/30
191-24-2	Benzo(g,h,i)perylene	5	4.0	80	4.1	82	2	30-134/30
207-08-9	Benzo(k)fluoranthene	5	4.9	98	5.0	100	2	40-134/30
218-01-9	Chrysene	5	4.5	90	4.6	92	2	39-134/30
53-70-3	Dibenzo(a,h)anthracene	5	4.2	84	4.2	84	0	33-137/30
206-44-0	Fluoranthene	5	4.5	90	4.6	92	2	40-129/30
86-73-7	Fluorene	5	4.3	86	4.4	88	2	32-125/30
193-39-5	Indeno(1,2,3-cd)pyrene	5	4.2	84	4.3	86	2	33-137/30
90-12-0	1-Methylnaphthalene	5	3.6	72	3.8	76	5	27-124/30
91-57-6	2-Methylnaphthalene	5	3.8	76	4.0	80	5	28-120/30
91-20-3	Naphthalene	5	3.6	72	3.8	76	5	28-122/30
85-01-8	Phenanthrene	5	4.3	86	4.5	90	5	38-128/30
129-00-0	Pyrene	5	4.7	94	4.8	96	2	35-126/30

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
4165-60-0	Nitrobenzene-d5	101%* a	101%* a	25-106%
321-60-8	2-Fluorobiphenyl	98%	96%	25-106%
1718-51-0	Terphenyl-d14	105%	102%	35-130%

(a) Outside laboratory control limits (high bias).

5.2.1
5

GC Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: C18646
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GJK962-MB	JK23418.D	1	10/31/11	TT	n/a	n/a	GJK962

The QC reported here applies to the following samples:

Method: NWTPH-GX

C18646-2, C18646-5, C18646-6, C18646-7, C18646-8, C18646-9, C18646-10

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Gasoline)	ND	0.20	0.050	mg/l	

CAS No.	Surrogate Recoveries	Limits
98-08-8	aaa-Trifluorotoluene	102% 50-150%
460-00-4	4-Bromofluorobenzene	107% 50-150%

Method Blank Summary

Job Number: C18646
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GJK967-MB	JK23557.D	1	11/04/11	TT	n/a	n/a	GJK967

The QC reported here applies to the following samples:

Method: NWTPH-GX

C18646-1, C18646-3, C18646-4

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Gasoline)	ND	0.20	0.050	mg/l	

CAS No.	Surrogate Recoveries	Limits	
98-08-8	aaa-Trifluorotoluene	89%	50-150%
460-00-4	4-Bromofluorobenzene	92%	50-150%

Blank Spike/Blank Spike Duplicate Summary

Job Number: C18646
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GJK962-BS	JK23416.D	1	10/31/11	TT	n/a	n/a	GJK962
GJK962-BSD	JK23417.D	1	10/31/11	TT	n/a	n/a	GJK962

The QC reported here applies to the following samples: Method: NWTPH-GX

C18646-2, C18646-5, C18646-6, C18646-7, C18646-8, C18646-9, C18646-10

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	BSD mg/l	BSD %	RPD	Limits Rec/RPD
	TPH (Gasoline)	0.4	0.416	104	0.416	104	0	60-140/30

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
98-08-8	aaa-Trifluorotoluene	95%	96%	50-150%
460-00-4	4-Bromofluorobenzene	102%	104%	50-150%

6.2.1
6

Blank Spike/Blank Spike Duplicate Summary

Job Number: C18646
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GJK967-BS	JK23555.D	1	11/04/11	TT	n/a	n/a	GJK967
GJK967-BSD	JK23556.D	1	11/04/11	TT	n/a	n/a	GJK967

The QC reported here applies to the following samples:

Method: NWTPH-GX

C18646-1, C18646-3, C18646-4

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	BSD mg/l	BSD %	RPD	Limits Rec/RPD
	TPH (Gasoline)	0.4	0.418	105	0.414	104	1	60-140/30

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
98-08-8	aaa-Trifluorotoluene	91%	90%	50-150%
460-00-4	4-Bromofluorobenzene	98%	100%	50-150%

6.2.2
6

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: C18646
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
C18666-2MS	JK23439.D	1	11/01/11	TT	n/a	n/a	GJK962
C18666-2MSD	JK23440.D	1	11/01/11	TT	n/a	n/a	GJK962
C18666-2	JK23437.D	1	11/01/11	TT	n/a	n/a	GJK962

The QC reported here applies to the following samples: Method: NWTPH-GX

C18646-2, C18646-5, C18646-6, C18646-7, C18646-8, C18646-9, C18646-10

CAS No.	Compound	C18666-2 mg/l	Spike Q mg/l	MS mg/l	MS %	MSD mg/l	MSD %	RPD	Limits Rec/RPD
	TPH (Gasoline)	ND	0.4	0.445	111	0.428	107	4	60-140/20

CAS No.	Surrogate Recoveries	MS	MSD	C18666-2	Limits
98-08-8	aaa-Trifluorotoluene	95%	92%	97%	50-150%
460-00-4	4-Bromofluorobenzene	103%	100%	103%	50-150%

6.3.1

6

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: C18646
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
C18644-3MS	JK23580.D	1	11/05/11	TT	n/a	n/a	GJK967
C18644-3MSD	JK23581.D	1	11/05/11	TT	n/a	n/a	GJK967
C18644-3	JK23571.D	1	11/04/11	TT	n/a	n/a	GJK967

The QC reported here applies to the following samples:

Method: NWTPH-GX

C18646-1, C18646-3, C18646-4

CAS No.	Compound	C18644-3 mg/l	Spike Q mg/l	MS mg/l	MS %	MSD mg/l	MSD %	RPD	Limits Rec/RPD
	TPH (Gasoline)	ND	0.4	0.427	107	0.409	102	4	60-140/20

CAS No.	Surrogate Recoveries	MS	MSD	C18644-3	Limits
98-08-8	aaa-Trifluorotoluene	96%	93%	100%	50-150%
460-00-4	4-Bromofluorobenzene	102%	100%	104%	50-150%

6.3.2
6

Duplicate Summary

Job Number: C18646
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
C18646-10DUP	JK23436.D	1	11/01/11	TT	n/a	n/a	GJK962
C18646-10	JK23435.D	1	11/01/11	TT	n/a	n/a	GJK962

The QC reported here applies to the following samples: Method: NWTPH-GX

C18646-2, C18646-5, C18646-6, C18646-7, C18646-8, C18646-9, C18646-10

CAS No.	Compound	C18646-10 mg/l	DUP Q	C18646-10 mg/l	DUP Q	RPD	Limits
	TPH (Gasoline)	0.115	J	0.112	J	3	20

CAS No.	Surrogate Recoveries	DUP	C18646-10	Limits
98-08-8	aaa-Trifluorotoluene	95%	98%	50-150%
460-00-4	4-Bromofluorobenzene	99%	102%	50-150%

6.4.1

6

Duplicate Summary


Job Number: C18646
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
C18646-1DUP	JK23560.D	1	11/04/11	TT	n/a	n/a	GJK967
C18646-1	JK23559.D	1	11/04/11	TT	n/a	n/a	GJK967

The QC reported here applies to the following samples:

Method: NWTPH-GX

C18646-1, C18646-3, C18646-4

CAS No.	Compound	C18646-1 mg/l	DUP Q	mg/l	Q	RPD	Limits
	TPH (Gasoline)	0.0519	J	ND		200* a	20 

CAS No.	Surrogate Recoveries	DUP	C18646-1	Limits
98-08-8	aaa-Trifluorotoluene	102%	100%	50-150%
460-00-4	4-Bromofluorobenzene	105%	104%	50-150%

(a) High RPD due to low concentration of hits.

GC Semi-volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: C18646
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP4804-MB	HH18221.D	1	10/28/11	JH	10/28/11	OP4804	GHH596

The QC reported here applies to the following samples: **Method:** NWTPH-DX

C18646-1, C18646-3, C18646-4, C18646-5, C18646-6, C18646-7, C18646-8, C18646-9, C18646-10

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Diesel)	ND	0.10	0.050	mg/l	
	TPH (Motor Oil)	ND	0.20	0.10	mg/l	

CAS No.	Surrogate Recoveries	Limits
630-01-3	Hexacosane	82% 50-150%

7.1.1
7

Blank Spike/Blank Spike Duplicate Summary

Job Number: C18646
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP4804-BS	HH18222.D	1	10/28/11	JH	10/28/11	OP4804	GHH596
OP4804-BSD	HH18223.D	1	10/28/11	JH	10/28/11	OP4804	GHH596

The QC reported here applies to the following samples: Method: NWTPH-DX

C18646-1, C18646-3, C18646-4, C18646-5, C18646-6, C18646-7, C18646-8, C18646-9, C18646-10

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	BSD mg/l	BSD %	RPD	Limits Rec/RPD
	TPH (Diesel)	1	0.836	84	0.796	80	5	45-140/30
	TPH (Motor Oil)	1	0.779	78	0.796	80	2	45-140/30

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
630-01-3	Hexacosane	84%	87%	50-150%

7.2.1
7

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: C18646
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP4804-MS	HH18261.D	1	10/29/11	JH	10/28/11	OP4804	GHH596
OP4804-MSD	HH18262.D	1	10/29/11	JH	10/28/11	OP4804	GHH596
C18646-8	HH18253.D	1	10/29/11	JH	10/28/11	OP4804	GHH596

The QC reported here applies to the following samples: Method: NWTPH-DX

C18646-1, C18646-3, C18646-4, C18646-5, C18646-6, C18646-7, C18646-8, C18646-9, C18646-10

CAS No.	Compound	C18646-8 mg/l	Spike Q mg/l	MS mg/l	MS %	MSD mg/l	MSD %	RPD	Limits Rec/RPD
	TPH (Diesel)	0.122	2	1.63	75	1.48	68	10	45-140/25
	TPH (Motor Oil)	ND	2	1.68	84	1.59	80	6	45-140/25

CAS No.	Surrogate Recoveries	MS	MSD	C18646-8	Limits
630-01-3	Hexacosane	91%	85%	93%	50-150%

7.3.1

7

Duplicate Summary

Job Number: C18646
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP4804-DUP2	HH18258.D	1	10/29/11	JH	10/28/11	OP4804	GHH596
C18646-5	HH18250.D	1	10/29/11	JH	10/28/11	OP4804	GHH596

The QC reported here applies to the following samples: Method: NWTPH-DX

C18646-1, C18646-3, C18646-4, C18646-5, C18646-6, C18646-7, C18646-8, C18646-9, C18646-10

CAS No.	Compound	C18646-5 mg/l	DUP Q mg/l	Q RPD	Limits
	TPH (Diesel)	ND	ND	nc	25
	TPH (Motor Oil)	ND	ND	nc	25

CAS No.	Surrogate Recoveries	DUP	C18646-5	Limits
630-01-3	Hexacosane	83%	82%	50-150%

7.4.1

7

Metals Analysis

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: C18646
Account: SHELLWIC - Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

QC Batch ID: MP4144
Matrix Type: AQUEOUS

Methods: SW846 6010B
Units: ug/l

Prep Date: 10/31/11

Metal	RL	IDL	MDL	MB raw	final
Aluminum	200	13	8.5		
Antimony	6.0	.7	.51		
Arsenic	10	.7	.65		
Barium	200	.4	.35		
Beryllium	5.0	.2	.12		
Boron	100	.9	.64		
Cadmium	2.0	.2	.15		
Calcium	5000	7.1	12		
Chromium	10	.3	.41		
Cobalt	5.0	.2	.3		
Copper	10	1.2	3		
Iron	200	6.4	12		
Lead	10	.7	.85	-0.60	<10
Magnesium	5000	27	36		
Manganese	15	.1	1.3		
Molybdenum	20	.2	.22		
Nickel	5.0	.2	.12		
Potassium	10000	18	44		
Selenium	10	1.8	2.2		
Silicon	100	1.2	6.9		
Silver	5.0	.3	.47		
Sodium	10000	15	23		
Strontium	10	.2	.24		
Thallium	10	.5	.54		
Tin	50	.2	.7		
Titanium	10	.4	.34		
Vanadium	10	.3	.3		
Zinc	20	.3	4.2		

Associated samples MP4144: C18646-7, C18646-9

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

8.1.1
8

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: C18646
 Account: SHELLWIC - Shell Oil Products
 Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

QC Batch ID: MP4144
 Matrix Type: AQUEOUS

Methods: SW846 6010B
 Units: ug/l

Prep Date: 10/31/11

Metal	C18603-1 Original MS	Spike MPIR4	lot % Rec	QC Limits
Aluminum	anr			
Antimony	anr			
Arsenic	anr			
Barium	anr			
Beryllium	anr			
Boron	anr			
Cadmium	anr			
Calcium	anr			
Chromium	anr			
Cobalt	anr			
Copper	anr			
Iron	anr			
Lead	3.0	497	500	98.8 75-125
Magnesium	anr			
Manganese	anr			
Molybdenum	anr			
Nickel	anr			
Potassium				
Selenium	anr			
Silicon				
Silver	anr			
Sodium				
Strontium				
Thallium	anr			
Tin				
Titanium				
Vanadium	anr			
Zinc	anr			

Associated samples MP4144: C18646-7, C18646-9

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (N) Matrix Spike Rec. outside of QC limits
 (anr) Analyte not requested

8.12
8

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: C18646
 Account: SHELLWIC - Shell Oil Products
 Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

QC Batch ID: MP4144
 Matrix Type: AQUEOUS

Methods: SW846 6010B
 Units: ug/l

Prep Date: 10/31/11

Metal	C18603-1 Original MSD	SpikeLot MPIR4	% Rec	MSD RPD	QC Limit	
Aluminum	anr					
Antimony	anr					
Arsenic	anr					
Barium	anr					
Beryllium	anr					
Boron	anr					
Cadmium	anr					
Calcium	anr					
Chromium	anr					
Cobalt	anr					
Copper	anr					
Iron	anr					
Lead	3.0	500	500	99.4	0.6	20
Magnesium	anr					
Manganese	anr					
Molybdenum	anr					
Nickel	anr					
Potassium						
Selenium	anr					
Silicon						
Silver	anr					
Sodium						
Strontium						
Thallium	anr					
Tin						
Titanium						
Vanadium	anr					
Zinc	anr					

Associated samples MP4144: C18646-7, C18646-9

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (N) Matrix Spike Rec. outside of QC limits
 (anr) Analyte not requested

8.12
8

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: C18646
 Account: SHELLWIC - Shell Oil Products
 Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

QC Batch ID: MP4144
 Matrix Type: AQUEOUS

Methods: SW846 6010B
 Units: ug/l

Prep Date: 10/31/11

Metal	BSP Result	Spikelot MPIR4	% Rec	QC Limits
Aluminum	anr			
Antimony	anr			
Arsenic	anr			
Barium	anr			
Beryllium	anr			
Boron	anr			
Cadmium	anr			
Calcium	anr			
Chromium	anr			
Cobalt	anr			
Copper	anr			
Iron	anr			
Lead	483	500	96.6	80-120
Magnesium	anr			
Manganese	anr			
Molybdenum	anr			
Nickel	anr			
Potassium				
Selenium	anr			
Silicon				
Silver	anr			
Sodium				
Strontium				
Thallium	anr			
Tin				
Titanium				
Vanadium	anr			
Zinc	anr			

Associated samples MP4144: C18646-7, C18646-9

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (anr) Analyte not requested

8.1.3
8

SERIAL DILUTION RESULTS SUMMARY

Login Number: C18646
 Account: SHELLWIC - Shell Oil Products
 Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

QC Batch ID: MP4144
 Matrix Type: AQUEOUS

Methods: SW846 6010B
 Units: ug/l

Prep Date: 10/31/11

Metal	C18603-1 Original	SDL 1:5	%DIF	QC Limits
Aluminum	anr			
Antimony	anr			
Arsenic	anr			
Barium	anr			
Beryllium	anr			
Boron	anr			
Cadmium	anr			
Calcium	anr			
Chromium	anr			
Cobalt	anr			
Copper	anr			
Iron	anr			
Lead	3.00	0.00	100.0(a)	0-10
Magnesium	anr			
Manganese	anr			
Molybdenum	anr			
Nickel	anr			
Potassium				
Selenium	anr			
Silicon				
Silver	anr			
Sodium				
Strontium				
Thallium	anr			
Tin				
Titanium				
Vanadium	anr			
Zinc	anr			

Associated samples MP4144: C18646-7, C18646-9

Results < IDL are shown as zero for calculation purposes

(*) Outside of QC limits

(anr) Analyte not requested

(a) Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

8.1.4
8

Technical Report for

Shell Oil Products

URSOPR: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

46194304

Accutest Job Number: C18666

Sampling Dates: 10/11/11 - 10/27/11

Report to:

URS Corporation
111 SW Columbia, Suite 1500
Portland, OR 97201-5850
brian_pletcher@urscorp.com

ATTN: Brian Pletcher

Total number of pages in report: **76**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

Kesavalu M. Bagawandoss,
Ph.D., J.D., Lab Director

Client Service contact: Laurie Glantz-Murphy 408-588-0200

Certifications: CA (08258CA) AZ (AZ0762) DoD/ISO/IEC 17025:2005 (L2242)

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Test results relate only to samples analyzed.

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Sample Summary

Shell Oil Products

Job No: C18666

URSOPR: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA
 Project No: 46194304

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
C18666-1	10/11/11	00:00 DL	10/28/11	AQ	Trip Blank Water	TRIP BLANK
C18666-2	10/26/11	15:45 DL	10/28/11	AQ	Ground Water	MW-102-1011
C18666-3	10/26/11	16:40 DL	10/28/11	AQ	Ground Water	TX-04-1011
C18666-4	10/27/11	07:00 DL	10/28/11	AQ	Ground Water	SH-04-1011
C18666-5	10/27/11	08:50 DL	10/28/11	AQ	Ground Water	MW-101-1011
C18666-6	10/27/11	09:35 DL	10/28/11	AQ	Ground Water	TES-MW1-1011
C18666-7	10/27/11	11:20 DL	10/28/11	AQ	Ground Water	MW-204-1011
C18666-8	10/27/11	13:30 DL	10/28/11	AQ	Ground Water	TX-03A-1011

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID: TRIP BLANK		
Lab Sample ID: C18666-1		Date Sampled: 10/11/11
Matrix: AQ - Trip Blank Water		Date Received: 10/28/11
Method: SW846 8260B		Percent Solids: n/a
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	Q4946.D	1	11/03/11	TN	n/a	n/a	VQ176
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.30	ug/l	
108-88-3	Toluene	ND	1.0	0.50	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.30	ug/l	
1330-20-7	Xylene (total)	ND	2.0	0.70	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	86%		60-130%
2037-26-5	Toluene-D8	106%		60-130%
460-00-4	4-Bromofluorobenzene	96%		60-130%

(a) Sample received outside the holding time.

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	TRIP BLANK	Date Sampled:	10/11/11
Lab Sample ID:	C18666-1	Date Received:	10/28/11
Matrix:	AQ - Trip Blank Water	Percent Solids:	n/a
Method:	NWTPH-GX		
Project:	URSOP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	JK23421.D	1	10/31/11	TT	n/a	n/a	GJK962
Run #2							

	Purge Volume
Run #1	10.0 ml
Run #2	

Northwest TPH-Gx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Gasoline)	ND	0.20	0.050	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
98-08-8	aaa-Trifluorotoluene	99%		50-150%
460-00-4	4-Bromofluorobenzene	104%		50-150%

(a) Sample received outside the holding time.

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-102-1011		Date Sampled: 10/26/11
Lab Sample ID: C18666-2		Date Received: 10/28/11
Matrix: AQ - Ground Water		Percent Solids: n/a
Method: SW846 8260B		
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	Q4957.D	1	11/04/11	TN	n/a	n/a	VQ176
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.30	ug/l	
108-88-3	Toluene	ND	1.0	0.50	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.30	ug/l	
1330-20-7	Xylene (total)	ND	2.0	0.70	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	68%		60-130%
2037-26-5	Toluene-D8	111%		60-130%
460-00-4	4-Bromofluorobenzene	94%		60-130%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-102-1011	
Lab Sample ID: C18666-2	Date Sampled: 10/26/11
Matrix: AQ - Ground Water	Date Received: 10/28/11
Method: NWTPH-GX	Percent Solids: n/a
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	JK23437.D	1	11/01/11	TT	n/a	n/a	GJK962
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Northwest TPH-Gx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Gasoline)	ND	0.20	0.050	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
98-08-8	aaa-Trifluorotoluene	97%		50-150%
460-00-4	4-Bromofluorobenzene	103%		50-150%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-102-1011		Date Sampled: 10/26/11
Lab Sample ID: C18666-2		Date Received: 10/28/11
Matrix: AQ - Ground Water		Percent Solids: n/a
Method: NWTPH-DX SW846 3510C		
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	HH18308.D	1	11/01/11	JH	10/31/11	OP4811	GHH598
Run #2							

Run #	Initial Volume	Final Volume
Run #1	1000 ml	1.0 ml
Run #2		

Northwest TPH-Dx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Diesel)	0.113	0.10	0.050	mg/l	
	TPH (Motor Oil)	ND	0.20	0.10	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
630-01-3	Hexacosane	72%		50-150%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: TX-04-1011		
Lab Sample ID: C18666-3		Date Sampled: 10/26/11
Matrix: AQ - Ground Water		Date Received: 10/28/11
Method: SW846 8260B		Percent Solids: n/a
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	Q4958.D	1	11/04/11	TN	n/a	n/a	VQ176
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.30	ug/l	
108-88-3	Toluene	ND	1.0	0.50	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.30	ug/l	
1330-20-7	Xylene (total)	ND	2.0	0.70	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	65%		60-130%
2037-26-5	Toluene-D8	106%		60-130%
460-00-4	4-Bromofluorobenzene	94%		60-130%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: TX-04-1011		
Lab Sample ID: C18666-3		Date Sampled: 10/26/11
Matrix: AQ - Ground Water		Date Received: 10/28/11
Method: NWTPH-GX		Percent Solids: n/a
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	JK23438.D	1	11/01/11	TT	n/a	n/a	GJK962
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Northwest TPH-Gx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Gasoline)	ND	0.20	0.050	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
98-08-8	aaa-Trifluorotoluene	95%		50-150%
460-00-4	4-Bromofluorobenzene	100%		50-150%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: TX-04-1011		Date Sampled: 10/26/11
Lab Sample ID: C18666-3		Date Received: 10/28/11
Matrix: AQ - Ground Water		Percent Solids: n/a
Method: NWTPH-DX SW846 3510C		
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	HH18309.D	1	11/01/11	JH	10/31/11	OP4811	GHH598
Run #2							

Run #	Initial Volume	Final Volume
Run #1	1000 ml	1.0 ml
Run #2		

Northwest TPH-Dx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Diesel)	0.0966	0.10	0.050	mg/l	J
	TPH (Motor Oil)	ND	0.20	0.10	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
630-01-3	Hexacosane	78%		50-150%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: SH-04-1011		Date Sampled: 10/27/11
Lab Sample ID: C18666-4		Date Received: 10/28/11
Matrix: AQ - Ground Water		Percent Solids: n/a
Method: SW846 8260B		
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R5733.D	10	11/07/11	BD	n/a	n/a	VR201
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	393	10	3.0	ug/l	
108-88-3	Toluene	20.0	10	5.0	ug/l	
100-41-4	Ethylbenzene	92.6	10	3.0	ug/l	
1330-20-7	Xylene (total)	27.9	20	7.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	84%		60-130%
2037-26-5	Toluene-D8	103%		60-130%
460-00-4	4-Bromofluorobenzene	94%		60-130%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: SH-04-1011		
Lab Sample ID: C18666-4		Date Sampled: 10/27/11
Matrix: AQ - Ground Water		Date Received: 10/28/11
Method: NWTPH-GX		Percent Solids: n/a
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	JK23734.D	10	11/09/11	TT	n/a	n/a	GJK974
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Northwest TPH-Gx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Gasoline)	5.35	2.0	0.50	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
98-08-8	aaa-Trifluorotoluene	104%		50-150%
460-00-4	4-Bromofluorobenzene	114%		50-150%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: SH-04-1011		Date Sampled: 10/27/11
Lab Sample ID: C18666-4		Date Received: 10/28/11
Matrix: AQ - Ground Water		Percent Solids: n/a
Method: NWTPH-DX SW846 3510C		
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	HH18310.D	1	11/01/11	JH	10/31/11	OP4811	GHH598
Run #2							

Run #	Initial Volume	Final Volume
Run #1	1050 ml	1.0 ml
Run #2		

Northwest TPH-Dx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Diesel)	1.22	0.095	0.048	mg/l	
	TPH (Motor Oil)	ND	0.19	0.095	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
630-01-3	Hexacosane	83%		50-150%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-101-1011		Date Sampled: 10/27/11
Lab Sample ID: C18666-5		Date Received: 10/28/11
Matrix: AQ - Ground Water		Percent Solids: n/a
Method: SW846 8260B		
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R5728.D	1	11/07/11	BD	n/a	n/a	VR201
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.30	ug/l	
108-88-3	Toluene	ND	1.0	0.50	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.30	ug/l	
1330-20-7	Xylene (total)	ND	2.0	0.70	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	86%		60-130%
2037-26-5	Toluene-D8	99%		60-130%
460-00-4	4-Bromofluorobenzene	94%		60-130%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-101-1011		Date Sampled: 10/27/11
Lab Sample ID: C18666-5		Date Received: 10/28/11
Matrix: AQ - Ground Water		Percent Solids: n/a
Method: NWTPH-GX		
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	JK23735.D	1	11/09/11	TT	n/a	n/a	GJK974
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Northwest TPH-Gx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Gasoline)	0.0936	0.20	0.050	mg/l	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
98-08-8	aaa-Trifluorotoluene	106%		50-150%
460-00-4	4-Bromofluorobenzene	107%		50-150%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-101-1011		
Lab Sample ID: C18666-5		Date Sampled: 10/27/11
Matrix: AQ - Ground Water		Date Received: 10/28/11
Method: NWTPH-DX SW846 3510C		Percent Solids: n/a
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	HH18311.D	1	11/01/11	JH	10/31/11	OP4811	GHH598
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	1.0 ml
Run #2		

Northwest TPH-Dx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Diesel)	ND	0.10	0.050	mg/l	
	TPH (Motor Oil)	ND	0.20	0.10	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
630-01-3	Hexacosane	79%		50-150%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: TES-MW1-1011		Date Sampled: 10/27/11
Lab Sample ID: C18666-6		Date Received: 10/28/11
Matrix: AQ - Ground Water		Percent Solids: n/a
Method: SW846 8260B		
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R5729.D	1	11/07/11	BD	n/a	n/a	VR201
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.30	ug/l	
108-88-3	Toluene	ND	1.0	0.50	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.30	ug/l	
1330-20-7	Xylene (total)	ND	2.0	0.70	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	87%		60-130%
2037-26-5	Toluene-D8	102%		60-130%
460-00-4	4-Bromofluorobenzene	93%		60-130%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: TES-MW1-1011		Date Sampled: 10/27/11
Lab Sample ID: C18666-6		Date Received: 10/28/11
Matrix: AQ - Ground Water		Percent Solids: n/a
Method: NWTPH-GX		
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	JK23566.D	1	11/04/11	TT	n/a	n/a	GJK967
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Northwest TPH-Gx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Gasoline)	ND	0.20	0.050	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
98-08-8	aaa-Trifluorotoluene	100%		50-150%
460-00-4	4-Bromofluorobenzene	105%		50-150%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: TES-MW1-1011		Date Sampled: 10/27/11
Lab Sample ID: C18666-6		Date Received: 10/28/11
Matrix: AQ - Ground Water		Percent Solids: n/a
Method: NWTPH-DX SW846 3510C		
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	HH18312.D	1	11/01/11	JH	10/31/11	OP4811	GHH598
Run #2							

Run #	Initial Volume	Final Volume
Run #1	1000 ml	1.0 ml
Run #2		

Northwest TPH-Dx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Diesel)	ND	0.10	0.050	mg/l	
	TPH (Motor Oil)	ND	0.20	0.10	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
630-01-3	Hexacosane	82%		50-150%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-204-1011	Date Sampled:	10/27/11
Lab Sample ID:	C18666-7	Date Received:	10/28/11
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	SW846 8260B		
Project:	URSOP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R5730.D	1	11/07/11	BD	n/a	n/a	VR201
Run #2							

	Purge Volume
Run #1	10.0 ml
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.30	ug/l	
108-88-3	Toluene	ND	1.0	0.50	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.30	ug/l	
1330-20-7	Xylene (total)	ND	2.0	0.70	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	86%		60-130%
2037-26-5	Toluene-D8	100%		60-130%
460-00-4	4-Bromofluorobenzene	94%		60-130%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-204-1011		Date Sampled: 10/27/11
Lab Sample ID: C18666-7		Date Received: 10/28/11
Matrix: AQ - Ground Water		Percent Solids: n/a
Method: NWTPH-GX		
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	JK23567.D	1	11/04/11	TT	n/a	n/a	GJK967
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Northwest TPH-Gx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Gasoline)	0.0660	0.20	0.050	mg/l	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
98-08-8	aaa-Trifluorotoluene	104%		50-150%
460-00-4	4-Bromofluorobenzene	110%		50-150%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-204-1011		
Lab Sample ID: C18666-7		Date Sampled: 10/27/11
Matrix: AQ - Ground Water		Date Received: 10/28/11
Method: NWTPH-DX SW846 3510C		Percent Solids: n/a
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	HH18313.D	1	11/01/11	JH	10/31/11	OP4811	GHH598
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	1.0 ml
Run #2		

Northwest TPH-Dx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Diesel)	0.599	0.10	0.050	mg/l	
	TPH (Motor Oil)	ND	0.20	0.10	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
630-01-3	Hexacosane	86%		50-150%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: TX-03A-1011		Date Sampled: 10/27/11
Lab Sample ID: C18666-8		Date Received: 10/28/11
Matrix: AQ - Ground Water		Percent Solids: n/a
Method: SW846 8260B		
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R5734.D	100	11/07/11	BD	n/a	n/a	VR201
Run #2							

	Purge Volume
Run #1	10.0 ml
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	3440	100	30	ug/l	
108-88-3	Toluene	71.2	100	50	ug/l	J
100-41-4	Ethylbenzene	147	100	30	ug/l	
1330-20-7	Xylene (total)	111	200	70	ug/l	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	85%		60-130%
2037-26-5	Toluene-D8	105%		60-130%
460-00-4	4-Bromofluorobenzene	94%		60-130%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: TX-03A-1011	
Lab Sample ID: C18666-8	Date Sampled: 10/27/11
Matrix: AQ - Ground Water	Date Received: 10/28/11
Method: RSK-175	Percent Solids: n/a
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	II54436.D	1	11/02/11	ANJ	n/a	n/a	N:GII2644
Run #2 ^a	II54437.D	5	11/02/11	ANJ	n/a	n/a	N:GII2644

CAS No.	Compound	Result	RL	MDL	Units	Q
74-82-8	Methane	12200 ^b	0.55	0.11	ug/l	
124-38-9	Carbon Dioxide	9290	50	1.8	ug/l	

(a) Analysis performed at Accutest Laboratories, Dayton, NJ.

(b) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: TX-03A-1011		Date Sampled: 10/27/11
Lab Sample ID: C18666-8		Date Received: 10/28/11
Matrix: AQ - Ground Water		Percent Solids: n/a
Method: NWTPH-GX		
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	JK23422.D	10	10/31/11	TT	n/a	n/a	GJK962
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

Northwest TPH-Gx

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Gasoline)	8.51	2.0	0.50	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
98-08-8	aaa-Trifluorotoluene	98%		50-150%
460-00-4	4-Bromofluorobenzene	110%		50-150%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: TX-03A-1011		
Lab Sample ID: C18666-8		Date Sampled: 10/27/11
Matrix: AQ - Ground Water		Date Received: 10/28/11
		Percent Solids: n/a
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA		

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	38700	5000	ug/l	1	11/01/11	11/02/11 RS	SW846 6010B ¹	SW3010A ²
Iron	30800	200	ug/l	1	11/01/11	11/02/11 RS	SW846 6010B ¹	SW3010A ²
Magnesium	24100	5000	ug/l	1	11/01/11	11/02/11 RS	SW846 6010B ¹	SW3010A ²

(1) Instrument QC Batch: MA2171

(2) Prep QC Batch: MP4151

RL = Reporting Limit

Report of Analysis

Client Sample ID: TX-03A-1011	Date Sampled: 10/27/11
Lab Sample ID: C18666-8	Date Received: 10/28/11
Matrix: AQ - Ground Water	Percent Solids: n/a
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA	

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO ₃	247	5.0	mg/l	1	10/31/11	AC	SM18 2320B
Hardness, Total as CaCO ₃ ^a	196	33	mg/l	1	11/02/11 05:45	RS	SW846 6010B/SM 2340B
Iron, Ferrous	20.3	10	mg/l	100	10/28/11 12:46	EB	SM18 3500FED
Sulfate	< 0.50	0.50	mg/l	1	11/04/11 17:53	RL	EPA 300/SW846 9056A

(a) Calculated as: (Calcium * 2.497) + (Magnesium * 4.118)

RL = Reporting Limit

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody



CHAIN OF CUSTODY

2105 Lundy Ave, San Jose, CA 95131
 (408) 588-0200 FAX: (408) 588-0201

SHELLWIC3981

FED-EX Tracking #		Bottle Order Control #	
Accutest Quote #		Accutest NC Job # C18666	
Client / Reporting Information		Project Information	
Company Name: URS		Project Name: SHELL/HARBOR ISLAND	
Address: 111 SW Columbia		Street: 2555 13th AV. SW	
City: Portland OR		City: SEATTLE WA	
Project Contact: Brian Pletcher		Project #: 46194304	
Phone #: 503-222-7200		EMAIL: brian.pletcher@urscorp.com	
Samplers Name: DAVE LEWIS 206-321-3064		Client Purchase Order #	
Requested Analysis		Matrix Codes	
MWTPH-GX BTEX (82608) MWTPH-DX C-PAH TOTAL LEAD HARDNESS/TOTAL FR ALKALINITY/SULFATE CO2 FERROUS IRON METHANE		WW- Wastewater GW- Ground Water SW- Surface Water SO- Soil OI- Oil WP- Wipe LIQ- Non-aqueous Liquid AIR DW- Drinking Water (Perchlorate Only)	
Accutest Sample ID		LAB USE ONLY	
Sample ID / Field Point / Point of Collection		Date	
Date		Time	
Sampled by		Matrix	
# of bottles		# of bottles	
D		NO3H	
NH4		NH4	
ASDA		ASDA	
NONE		NONE	
NH4SO4		NH4SO4	
ASDA		ASDA	
ENCORE		ENCORE	
Turnaround Time (Business days)		Data Deliverable Information	
<input checked="" type="checkbox"/> Standard TAT 15 Business Days <input type="checkbox"/> 10 Day (Workload dependent) <input type="checkbox"/> 5 Day (Workload dependent) <input type="checkbox"/> 3 Day (125% markup) <input type="checkbox"/> 2 Day (150% markup) <input type="checkbox"/> 1 Day (200% markup) <input type="checkbox"/> Same Day (300% markup)		<input type="checkbox"/> Commercial "A" - Results only <input checked="" type="checkbox"/> Commercial "B" - Results with QC summaries <input type="checkbox"/> Commercial "B+" - Results, QC, and chromatograms <input type="checkbox"/> FULT1 - Level 4 data package <input type="checkbox"/> EDF for Geotracker <input type="checkbox"/> EDD Format Provide EDF Global ID Provide EDF Logcode:	
Emergency TA data available VIA Lablink		Comments / Remarks	
Sample Custody must be documented below each time samples change possession, including courier delivery.		24 hr. hold time on ferrous iron SILICA GEL CLEAN UP ON MWTPH-DX	
Relinquished by Sampler:	Date Time:	Received By:	Date Time:
1 Dave Lewis	10/27/11 1500	1 FedEx	10-28-11 9:55
Relinquished by:	Date Time:	Received By:	Date Time:
3		4	
Relinquished by:	Date Time:	Received By:	Date Time:
5		5	
Custody Seal #	Appropriate Bottle / Pres	Headspace	On Ice
	Y/N	Y/N	Y/N
Labels match Coc?	Separate Receiving Check List used:		
Y/N	Y/N		

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C18666: Chain of Custody

Page 1 of 2

Review Chain of Custody

Chain of Custody is to be complete and legible.

- Are these regulatory (NPDES) samples? -GWA? Yes/No
Is pH requested? Yes/No
Was Client informed that hold time is 15 min? Yes/No
Was ortho-Phosphate filtered with in 15 min? Yes/No
Are sample within hold time? Yes/No
Are sample in danger of exceeding hold-time? Yes/No
Existing Client? Yes/No Existing Project? Yes/No
If No: Is Report to info complete and legible, including:
deliverable Name Address phone e-mail
Is Bill to info complete and legible, including:
PO# Credit card Contact address phone e-mail
Is Contact and/or Project Manager identified, including:
phone e-mail
Project name / number
Special requirements? Yes/No
Sample IDs / date & time of collection provided? Yes/No
Is Matrix listed and correct? Yes/No
Analyses listed, we do, or client has authorized a subcontract? Yes/No
Chain is signed and dated by both client and sample custodian? Yes/No
TAT requested available? Yes/No Approved by PM

Table with 3 columns: Client Sample ID, pH Check, Other Comments/Issues. Row 1: -18, pH 7.2, metals hardness.

Review Coolers:

- Were all Coolers temperatures measured at <=6°C? Yes/No
If cooler is outside the <=6°C; note down the affected bottles in that cooler on the left
Are samples on ice? Yes/No
Note that ANC does NOT accept evidentiary samples. (We do not lock refrigerators)

- Shipment Received Method FedEx
Custody Seals: Present: Yes/No If Yes; Unbroken: Yes/No

Review of Sample Bottles: If you answer no, explain to the side

- Chain matches bottle labels? Yes/No Sample bottle intact? Yes/No
Is there enough sample volume in proper bottle for requested analyses? Yes/No
Proper Preservatives? Yes/No
Check pH on preserved samples except 1664, 625, 8270 and VOAs; make notes on left.
Headspace-VOAs? Greater than 6mm in diameter List sample ID and affected container Yes/No

Non-Compliance issues and discrepancies on the COC are forwarded to Project Management

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GC/MS Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: C18666
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VQ176-MB	Q4943.D	1	11/03/11	TN	n/a	n/a	VQ176

The QC reported here applies to the following samples:

Method: SW846 8260B

C18666-1, C18666-2, C18666-3

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.30	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.30	ug/l	
108-88-3	Toluene	ND	1.0	0.50	ug/l	
1330-20-7	Xylene (total)	ND	2.0	0.70	ug/l	

CAS No.	Surrogate Recoveries	Limits	
1868-53-7	Dibromofluoromethane	84%	60-130%
2037-26-5	Toluene-D8	107%	60-130%
460-00-4	4-Bromofluorobenzene	95%	60-130%

Method Blank Summary

Job Number: C18666
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VR201-MB	R5718.D	1	11/07/11	BD	n/a	n/a	VR201

The QC reported here applies to the following samples:

Method: SW846 8260B

C18666-4, C18666-5, C18666-6, C18666-7, C18666-8

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.30	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.30	ug/l	
108-88-3	Toluene	ND	1.0	0.50	ug/l	
1330-20-7	Xylene (total)	ND	2.0	0.70	ug/l	

CAS No.	Surrogate Recoveries	Limits	
1868-53-7	Dibromofluoromethane	87%	60-130%
2037-26-5	Toluene-D8	102%	60-130%
460-00-4	4-Bromofluorobenzene	93%	60-130%

Blank Spike/Blank Spike Duplicate Summary

Job Number: C18666
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VQ176-BS	Q4940.D	1	11/03/11	TN	n/a	n/a	VQ176
VQ176-BSD	Q4941.D	1	11/03/11	TN	n/a	n/a	VQ176

The QC reported here applies to the following samples:

Method: SW846 8260B

C18666-1, C18666-2, C18666-3

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	BSD ug/l	BSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	20	20.2	101	20.8	104	3	60-130/30
100-41-4	Ethylbenzene	20	23.0	115	23.4	117	2	60-130/30
108-88-3	Toluene	20	22.2	111	22.5	113	1	60-130/30
1330-20-7	Xylene (total)	60	68.5	114	69.4	116	1	60-130/30

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
1868-53-7	Dibromofluoromethane	82%	83%	60-130%
2037-26-5	Toluene-D8	106%	106%	60-130%
460-00-4	4-Bromofluorobenzene	92%	94%	60-130%

4.2.1
4

Blank Spike/Blank Spike Duplicate Summary

Job Number: C18666
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VR201-BS	R5715.D	1	11/07/11	BD	n/a	n/a	VR201
VR201-BSD	R5716.D	1	11/07/11	BD	n/a	n/a	VR201

The QC reported here applies to the following samples:

Method: SW846 8260B

C18666-4, C18666-5, C18666-6, C18666-7, C18666-8

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	BSD ug/l	BSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	20	17.6	88	17.9	90	2	60-130/30
100-41-4	Ethylbenzene	20	19.6	98	20.0	100	2	60-130/30
108-88-3	Toluene	20	18.9	95	19.2	96	2	60-130/30
1330-20-7	Xylene (total)	60	58.4	97	59.8	100	2	60-130/30

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
1868-53-7	Dibromofluoromethane	89%	90%	60-130%
2037-26-5	Toluene-D8	101%	101%	60-130%
460-00-4	4-Bromofluorobenzene	93%	94%	60-130%

4.2.2
4

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: C18666
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
C18646-1MS	Q4959.D	1	11/04/11	TN	n/a	n/a	VQ176
C18646-1MSD	Q4960.D	1	11/04/11	TN	n/a	n/a	VQ176
C18646-1	Q4947.D	1	11/03/11	TN	n/a	n/a	VQ176

The QC reported here applies to the following samples:

Method: SW846 8260B

C18666-1, C18666-2, C18666-3

CAS No.	Compound	C18646-1 ug/l	Spike Q ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	ND	20	15.3	77	16.0	80	4	60-130/25
100-41-4	Ethylbenzene	ND	20	14.5	73	15.3	77	5	60-130/25
108-88-3	Toluene	ND	20	14.4	72	15.3	77	6	60-130/25
1330-20-7	Xylene (total)	ND	60	26.0	43* a	28.4	47* a	9	60-130/25

CAS No.	Surrogate Recoveries	MS	MSD	C18646-1	Limits
1868-53-7	Dibromofluoromethane	68%	68%	86%	60-130%
2037-26-5	Toluene-D8	104%	104%	100%	60-130%
460-00-4	4-Bromofluorobenzene	91%	89%	96%	60-130%

(a) Outside laboratory control limits.

4.3.1
4

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: C18666
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
C18666-6MS	R5737.D	1	11/07/11	BD	n/a	n/a	VR201
C18666-6MSD	R5738.D	1	11/07/11	BD	n/a	n/a	VR201
C18666-6	R5729.D	1	11/07/11	BD	n/a	n/a	VR201

The QC reported here applies to the following samples:

Method: SW846 8260B

C18666-4, C18666-5, C18666-6, C18666-7, C18666-8

CAS No.	Compound	C18666-6 ug/l	Spike Q ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	ND	20	16.9	85	16.9	85	0	60-130/25
100-41-4	Ethylbenzene	ND	20	19.0	95	19.0	95	0	60-130/25
108-88-3	Toluene	ND	20	18.4	92	18.5	93	1	60-130/25
1330-20-7	Xylene (total)	ND	60	52.5	88	52.6	88	0	60-130/25

CAS No.	Surrogate Recoveries	MS	MSD	C18666-6	Limits
1868-53-7	Dibromofluoromethane	85%	87%	87%	60-130%
2037-26-5	Toluene-D8	102%	103%	102%	60-130%
460-00-4	4-Bromofluorobenzene	92%	94%	93%	60-130%

4.3.2
4

GC Volatiles

5

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: C18666
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GJK962-MB	JK23418.D	1	10/31/11	TT	n/a	n/a	GJK962

The QC reported here applies to the following samples:

Method: NWTPH-GX

C18666-1, C18666-2, C18666-3, C18666-8

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Gasoline)	ND	0.20	0.050	mg/l	

CAS No.	Surrogate Recoveries	Limits	
98-08-8	aaa-Trifluorotoluene	102%	50-150%
460-00-4	4-Bromofluorobenzene	107%	50-150%

Method Blank Summary

Job Number: C18666
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GJK967-MB	JK23557.D	1	11/04/11	TT	n/a	n/a	GJK967

The QC reported here applies to the following samples:

Method: NWTPH-GX

C18666-6, C18666-7

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Gasoline)	ND	0.20	0.050	mg/l	

CAS No.	Surrogate Recoveries	Limits	
98-08-8	aaa-Trifluorotoluene	89%	50-150%
460-00-4	4-Bromofluorobenzene	92%	50-150%

Method Blank Summary

Job Number: C18666
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GJK974-MB	JK23733.D	1	11/09/11	TT	n/a	n/a	GJK974

The QC reported here applies to the following samples:

Method: NWTPH-GX

C18666-4, C18666-5

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Gasoline)	ND	0.20	0.050	mg/l	

CAS No.	Surrogate Recoveries	Limits
98-08-8	aaa-Trifluorotoluene	112% 50-150%
460-00-4	4-Bromofluorobenzene	106% 50-150%

Blank Spike/Blank Spike Duplicate Summary

Job Number: C18666
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GJK962-BS	JK23416.D	1	10/31/11	TT	n/a	n/a	GJK962
GJK962-BSD	JK23417.D	1	10/31/11	TT	n/a	n/a	GJK962

The QC reported here applies to the following samples: Method: NWTPH-GX

C18666-1, C18666-2, C18666-3, C18666-8

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	BSD mg/l	BSD %	RPD	Limits Rec/RPD
	TPH (Gasoline)	0.4	0.416	104	0.416	104	0	60-140/30

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
98-08-8	aaa-Trifluorotoluene	95%	96%	50-150%
460-00-4	4-Bromofluorobenzene	102%	104%	50-150%

5.2.1
5

Blank Spike/Blank Spike Duplicate Summary

Job Number: C18666
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GJK967-BS	JK23555.D	1	11/04/11	TT	n/a	n/a	GJK967
GJK967-BSD	JK23556.D	1	11/04/11	TT	n/a	n/a	GJK967

The QC reported here applies to the following samples:

Method: NWTPH-GX

C18666-6, C18666-7

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	BSD mg/l	BSD %	RPD	Limits Rec/RPD
	TPH (Gasoline)	0.4	0.418	105	0.414	104	1	60-140/30

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
98-08-8	aaa-Trifluorotoluene	91%	90%	50-150%
460-00-4	4-Bromofluorobenzene	98%	100%	50-150%

5.2.2
5

Blank Spike/Blank Spike Duplicate Summary

Job Number: C18666
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GJK974-BS	JK23731.D	1	11/09/11	TT	n/a	n/a	GJK974
GJK974-BSD	JK23732.D	1	11/09/11	TT	n/a	n/a	GJK974

The QC reported here applies to the following samples:

Method: NWTPH-GX

C18666-4, C18666-5

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	BSD mg/l	BSD %	RPD	Limits Rec/RPD
	TPH (Gasoline)	0.4	0.447	112	0.464	116	4	60-140/30

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
98-08-8	aaa-Trifluorotoluene	97%	92%	50-150%
460-00-4	4-Bromofluorobenzene	99%	93%	50-150%

5.2.3
5

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: C18666
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
C18666-2MS	JK23439.D	1	11/01/11	TT	n/a	n/a	GJK962
C18666-2MSD	JK23440.D	1	11/01/11	TT	n/a	n/a	GJK962
C18666-2	JK23437.D	1	11/01/11	TT	n/a	n/a	GJK962

The QC reported here applies to the following samples: Method: NWTPH-GX

C18666-1, C18666-2, C18666-3, C18666-8

CAS No.	Compound	C18666-2 mg/l	Spike Q mg/l	MS mg/l	MS %	MSD mg/l	MSD %	RPD	Limits Rec/RPD
	TPH (Gasoline)	ND	0.4	0.445	111	0.428	107	4	60-140/20

CAS No.	Surrogate Recoveries	MS	MSD	C18666-2	Limits
98-08-8	aaa-Trifluorotoluene	95%	92%	97%	50-150%
460-00-4	4-Bromofluorobenzene	103%	100%	103%	50-150%

5.3.1
5

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: C18666
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
C18644-3MS	JK23580.D	1	11/05/11	TT	n/a	n/a	GJK967
C18644-3MSD	JK23581.D	1	11/05/11	TT	n/a	n/a	GJK967
C18644-3	JK23571.D	1	11/04/11	TT	n/a	n/a	GJK967

The QC reported here applies to the following samples:

Method: NWTPH-GX

C18666-6, C18666-7

CAS No.	Compound	C18644-3 mg/l	Spike Q mg/l	MS mg/l	MS %	MSD mg/l	MSD %	RPD	Limits Rec/RPD
	TPH (Gasoline)	ND	0.4	0.427	107	0.409	102	4	60-140/20

CAS No.	Surrogate Recoveries	MS	MSD	C18644-3	Limits
98-08-8	aaa-Trifluorotoluene	96%	93%	100%	50-150%
460-00-4	4-Bromofluorobenzene	102%	100%	104%	50-150%

5.3.2
5

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: C18666
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
C18749-4MS	JK23755.D	1	11/10/11	TT	n/a	n/a	GJK974
C18749-4MSD	JK23756.D	1	11/10/11	TT	n/a	n/a	GJK974
C18749-4	JK23747.D	1	11/10/11	TT	n/a	n/a	GJK974

The QC reported here applies to the following samples:

Method: NWTPH-GX

C18666-4, C18666-5

CAS No.	Compound	C18749-4 mg/l	Spike Q mg/l	MS mg/l	MS %	MSD mg/l	MSD %	RPD	Limits Rec/RPD
	TPH (Gasoline)	ND	0.4	0.425	106	0.423	106	0	60-140/20

CAS No.	Surrogate Recoveries	MS	MSD	C18749-4	Limits
98-08-8	aaa-Trifluorotoluene	99%	98%	107%	50-150%
460-00-4	4-Bromofluorobenzene	99%	100%	103%	50-150%

5.3.3
5

Duplicate Summary

Job Number: C18666
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
C18642-2DUP	JK23424.D	1	10/31/11	TT	n/a	n/a	GJK962
C18642-2	JK23423.D	1	10/31/11	TT	n/a	n/a	GJK962

The QC reported here applies to the following samples:

Method: NWTPH-GX

C18666-1, C18666-2, C18666-3, C18666-8

CAS No.	Compound	C18642-2 mg/l	DUP Q	mg/l	Q	RPD	Limits
	TPH (Gasoline)	ND		ND		nc	20

CAS No.	Surrogate Recoveries	DUP	C18642-2	Limits
98-08-8	aaa-Trifluorotoluene	100%	99%	50-150%
460-00-4	4-Bromofluorobenzene	104%	103%	50-150%

5.4.1
5

Duplicate Summary

Job Number: C18666
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
C18646-1DUP	JK23560.D	1	11/04/11	TT	n/a	n/a	GJK967
C18646-1	JK23559.D	1	11/04/11	TT	n/a	n/a	GJK967

The QC reported here applies to the following samples:

Method: NWTPH-GX

C18666-6, C18666-7

CAS No.	Compound	C18646-1 mg/l	DUP Q	DUP mg/l	Q	RPD	Limits
	TPH (Gasoline)	0.0519	J	ND		200* ^a	20



CAS No.	Surrogate Recoveries	DUP	C18646-1	Limits
98-08-8	aaa-Trifluorotoluene	102%	100%	50-150%
460-00-4	4-Bromofluorobenzene	105%	104%	50-150%

(a) High RPD due to low concentration of hits.

5.4.2
5

Duplicate Summary

Job Number: C18666
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
C18723-8DUP	JK23740.D	1	11/10/11	TT	n/a	n/a	GJK974
C18723-8	JK23739.D	1	11/10/11	TT	n/a	n/a	GJK974

The QC reported here applies to the following samples:

Method: NWTPH-GX

C18666-4, C18666-5

CAS No.	Compound	C18723-8 mg/l	DUP Q mg/l	Q RPD	Limits
	TPH (Gasoline)	0.228	0.245	7	20

CAS No.	Surrogate Recoveries	DUP	C18723-8	Limits
98-08-8	aaa-Trifluorotoluene	109%	108%	50-150%
460-00-4	4-Bromofluorobenzene	106%	106%	50-150%

5.4.3
5

GC Semi-volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: C18666
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP4811-MB	HH18305.D	1	11/01/11	JH	10/31/11	OP4811	GHH598

The QC reported here applies to the following samples:

Method: NWTPH-DX

C18666-2, C18666-3, C18666-4, C18666-5, C18666-6, C18666-7

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (Diesel)	ND	0.10	0.050	mg/l	
	TPH (Motor Oil)	ND	0.20	0.10	mg/l	

CAS No.	Surrogate Recoveries	Limits
630-01-3	Hexacosane	77% 50-150%

Blank Spike/Blank Spike Duplicate Summary

Job Number: C18666
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP4811-BS	HH18306.D	1	11/01/11	JH	10/31/11	OP4811	GHH598
OP4811-BSD	HH18307.D	1	11/01/11	JH	10/31/11	OP4811	GHH598

The QC reported here applies to the following samples:

Method: NWTPH-DX

C18666-2, C18666-3, C18666-4, C18666-5, C18666-6, C18666-7

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	BSD mg/l	BSD %	RPD	Limits Rec/RPD
	TPH (Diesel)	1	0.704	70	0.772	77	9	45-140/30
	TPH (Motor Oil)	1	0.797	80	0.820	82	3	45-140/30

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
630-01-3	Hexacosane	81%	87%	50-150%

6.2.1

6

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: C18666
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP4811-MS	HH18316.D	1	11/01/11	JH	10/31/11	OP4811	GHH598
OP4811-MSD	HH18317.D	1	11/01/11	JH	10/31/11	OP4811	GHH598
C18666-2	HH18308.D	1	11/01/11	JH	10/31/11	OP4811	GHH598

The QC reported here applies to the following samples:

Method: NWTPH-DX

C18666-2, C18666-3, C18666-4, C18666-5, C18666-6, C18666-7

CAS No.	Compound	C18666-2 mg/l	Spike Q mg/l	MS mg/l	MS %	MSD mg/l	MSD %	RPD	Limits Rec/RPD
	TPH (Diesel)	0.113	2	1.68	78	1.60	74	5	45-140/25
	TPH (Motor Oil)	ND	2	1.58	79	1.61	81	2	45-140/25

CAS No.	Surrogate Recoveries	MS	MSD	C18666-2	Limits
630-01-3	Hexacosane	82%	82%	72%	50-150%

6.3.1
6

Duplicate Summary

Job Number: C18666
Account: SHELLWIC Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP4811-DUP1	HH18314.D	1	11/01/11	JH	10/31/11	OP4811	GHH598
C18666-7	HH18313.D	1	11/01/11	JH	10/31/11	OP4811	GHH598

The QC reported here applies to the following samples:

Method: NWTPH-DX

C18666-2, C18666-3, C18666-4, C18666-5, C18666-6, C18666-7

CAS No.	Compound	C18666-7 mg/l	DUP Q mg/l	Q RPD	Limits
	TPH (Diesel)	0.599	0.418	36*	25
	TPH (Motor Oil)	ND	ND	nc	25

CAS No.	Surrogate Recoveries	DUP	C18666-7	Limits
630-01-3	Hexacosane	75%	86%	50-150%

Metals Analysis

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: C18666
Account: SHELLWIC - Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

QC Batch ID: MP4151
Matrix Type: AQUEOUS

Methods: SW846 6010B
Units: ug/l

Prep Date: 11/01/11

Metal	RL	IDL	MDL	MB raw	final
Aluminum	200	13	8.5		
Antimony	6.0	.7	.51		
Arsenic	10	.7	.65		
Barium	200	.4	.35		
Beryllium	5.0	.2	.12		
Boron	100	.9	.64		
Cadmium	2.0	.2	.15		
Calcium	5000	7.1	12	121	<5000
Chromium	10	.3	.41		
Cobalt	5.0	.2	.3		
Copper	10	1.2	3		
Iron	200	6.4	12	2.8	<200
Lead	10	.7	.85		
Magnesium	5000	27	36	3.0	<5000
Manganese	15	.1	1.3		
Molybdenum	20	.2	.22		
Nickel	5.0	.2	.12		
Potassium	10000	18	44		
Selenium	10	1.8	2.2		
Silicon	100	1.2	6.9		
Silver	5.0	.3	.47		
Sodium	10000	15	23		
Strontium	10	.2	.24		
Thallium	10	.5	.54		
Tin	50	.2	.7		
Titanium	10	.4	.34		
Vanadium	10	.3	.3		
Zinc	20	.3	4.2		

Associated samples MP4151: C18666-8

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: C18666
 Account: SHELLWIC - Shell Oil Products
 Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

QC Batch ID: MP4151
 Matrix Type: AQUEOUS

Methods: SW846 6010B
 Units: ug/l

Prep Date: 11/01/11

Metal	C18699-1 Original MS	SpikeLot MPIR4	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic				
Barium				
Beryllium				
Boron				
Cadmium	anr			
Calcium	20700	25100	5000	88.0 75-125
Chromium	anr			
Cobalt				
Copper	anr			
Iron	655	1110	500	91.0 75-125
Lead	anr			
Magnesium	8970	13700	5000	94.6 75-125
Manganese	anr			
Molybdenum				
Nickel	anr			
Potassium				
Selenium				
Silicon				
Silver	anr			
Sodium	anr			
Strontium				
Thallium				
Tin				
Titanium				
Vanadium				
Zinc	anr			

Associated samples MP4151: C18666-8

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (N) Matrix Spike Rec. outside of QC limits
 (anr) Analyte not requested

7.1.2
7

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: C18666
 Account: SHELLWIC - Shell Oil Products
 Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

QC Batch ID: MP4151
 Matrix Type: AQUEOUS

Methods: SW846 6010B
 Units: ug/l

Prep Date: 11/01/11

Metal	C18699-1 Original MSD	SpikeLot MPIR4	% Rec	MSD RPD	QC Limit	
Aluminum						
Antimony						
Arsenic						
Barium						
Beryllium						
Boron						
Cadmium	anr					
Calcium	20700	25400	5000	94.0	1.2	20
Chromium	anr					
Cobalt						
Copper	anr					
Iron	655	1180	500	105.0	6.1	20
Lead	anr					
Magnesium	8970	13900	5000	98.6	1.4	20
Manganese	anr					
Molybdenum						
Nickel	anr					
Potassium						
Selenium						
Silicon						
Silver	anr					
Sodium	anr					
Strontium						
Thallium						
Tin						
Titanium						
Vanadium						
Zinc	anr					

Associated samples MP4151: C18666-8

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (N) Matrix Spike Rec. outside of QC limits
 (anr) Analyte not requested

7.1.2
7

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: C18666
 Account: SHELLWIC - Shell Oil Products
 Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

QC Batch ID: MP4151
 Matrix Type: AQUEOUS

Methods: SW846 6010B
 Units: ug/l

Prep Date: 11/01/11

Metal	BSP Result	Spikelot MPIR4	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic				
Barium				
Beryllium				
Boron				
Cadmium	anr			
Calcium	5270	5000	105.4	80-120
Chromium	anr			
Cobalt				
Copper	anr			
Iron	493	500	98.6	80-120
Lead	anr			
Magnesium	5120	5000	102.4	80-120
Manganese	anr			
Molybdenum				
Nickel	anr			
Potassium				
Selenium				
Silicon				
Silver	anr			
Sodium	anr			
Strontium				
Thallium				
Tin				
Titanium				
Vanadium				
Zinc	anr			

Associated samples MP4151: C18666-8

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (anr) Analyte not requested

7.1.3
7

SERIAL DILUTION RESULTS SUMMARY

Login Number: C18666
 Account: SHELLWIC - Shell Oil Products
 Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

QC Batch ID: MP4151
 Matrix Type: AQUEOUS

Methods: SW846 6010B
 Units: ug/l

Prep Date: 11/01/11

Metal	C18699-1 Original	SDL 1:5	%DIF	QC Limits
Aluminum				
Antimony				
Arsenic				
Barium				
Beryllium				
Boron				
Cadmium	anr			
Calcium	20700	21200	2.4	0-10
Chromium	anr			
Cobalt				
Copper	anr			
Iron	655	672	2.7	0-10
Lead	anr			
Magnesium	8970	9170	2.2	0-10
Manganese	anr			
Molybdenum				
Nickel	anr			
Potassium				
Selenium				
Silicon				
Silver	anr			
Sodium	anr			
Strontium				
Thallium				
Tin				
Titanium				
Vanadium				
Zinc	anr			

Associated samples MP4151: C18666-8

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (anr) Analyte not requested

7.1.4
7

General Chemistry

QC Data Summaries

Includes the following where applicable:

- Method Blank and Blank Spike Summaries
- Duplicate Summaries
- Matrix Spike Summaries

METHOD BLANK AND SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: C18666
Account: SHELLWIC - Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Alkalinity, Total as CaCO3	GN6918	5.0	1.8	mg/l	250	260	104.0	75-125%
Iron, Ferrous	GN6922	0.10	0.0	mg/l	0.5	0.51	101.4	75-125%
Nitrogen, Nitrate	GP3181/GN6981	0.10	0.0	mg/l	5	4.77	95.4	90-110%
Sulfate	GP3181/GN6981	0.50	0.0	mg/l	5	4.72	94.4	90-110%

Associated Samples:

Batch GN6918: C18666-8

Batch GN6922: C18666-8

Batch GP3181: C18666-8

(*) Outside of QC limits

BLANK SPIKE DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: C18666
Account: SHELLWIC - Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Analyte	Batch ID	Units	Spike Amount	BSD Result	RPD	QC Limit
Alkalinity, Total as CaCO3	GN6918	mg/l	250	272	4.5	
Iron, Ferrous	GN6922	mg/l	0.5	0.51	1.0	25%
Nitrogen, Nitrate	GP3181/GN6981	mg/l	5	4.77	0.0	25%
Sulfate	GP3181/GN6981	mg/l	5	4.73	0.2	25%

Associated Samples:
Batch GN6918: C18666-8
Batch GN6922: C18666-8
Batch GP3181: C18666-8
(*) Outside of QC limits

8.2
8

DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: C18666
Account: SHELLWIC - Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Alkalinity, Total as CaCO3	GN6918	C18637-1	mg/l	435	442	1.5	0-25%

Associated Samples:
Batch GN6918: C18666-8
(*) Outside of QC limits



MATRIX SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: C18666
Account: SHELLWIC - Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Iron, Ferrous	GN6922	C18666-8	mg/l	20.3	50	70.3	100.1	75-125%
Nitrogen, Nitrate	GP3181/GN6981	C18760-1	mg/l	18.6	20	39.0	102.0	80-120%
Sulfate	GP3181/GN6981	C18760-1	mg/l	43.5	20	62.1	93.0	80-120%

Associated Samples:

Batch GN6922: C18666-8

Batch GP3181: C18666-8

(*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

8.4

8

MATRIX SPIKE DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: C18666
Account: SHELLWIC - Shell Oil Products
Project: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MSD Result	RPD	QC Limit
Iron, Ferrous	GN6922	C18666-8	mg/l	20.3	50	70.8	0.7	25%
Nitrogen, Nitrate	GP3181/GN6981	C18760-1	mg/l	18.6	20	39.1	0.3	
Sulfate	GP3181/GN6981	C18760-1	mg/l	43.5	20	62.2	0.2	

Associated Samples:

Batch GN6922: C18666-8

Batch GP3181: C18666-8

(*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

Misc. Forms

Custody Documents and Other Forms

(Accutest New Jersey)

Includes the following where applicable:

- Chain of Custody



Accutest ID and PO#: C18666

2105 Lundy Avenue, San Jose, CA 95131 Phone: (408)588-0200 Fax: (408)588-0201

Subcontract Chain of Custody

Subcontract Lab: Accutest New Jersey

Date Sent: 10/31/11

Date Due: 11/11/11

Project Name: SHELLWIC3981

Project Location:

Accutest Lab Number	Customer Sample Name/Field Point ID	Matrix	Method	Collect Date	Collect Time
C18666-8		GW	RSK175 *VRSK175CO2 (carbon dioxide) *VRSK175CH4 (METHANE)	10/27/11	13:30

2201

Comments: 3-vials w/HCL (RSK-CH4); 3-vials unpreserved (CO2).

Relinquished By: <i>Elvink</i>	Received By: FedEx	Date: 10/31/11	Time: 15:00
Relinquished By: FedEx	Received By: <i>[Signature]</i>	Date: 11/1/11	Time: 09:00

TAK # 7976 85128621
3.0'

Accutest Laboratories Sample Receipt Summary

Accutest Job Number C18666

Client:

Date / Time Received: 11/1/2011

Project:

No. Coolers: 1

Airbill #'s:

Delivery Method:

Cooler Security

Y or N

Y or N

- | | | | | | |
|---------------------------|-------------------------------------|--------------------------|-----------------------|-------------------------------------|--------------------------|
| 1. Custody Seals Present: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 3. COC Present: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Custody Seals Intact: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 4. Smpl Dates/Time OK | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

Cooler Temperature

Y or N

- | | | |
|------------------------------|-------------------------------------|--------------------------|
| 1. Temp criteria achieved: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Cooler temp verification: | IR Gun | |
| 3. Cooler media: | Ice (Bag) | |

Quality Control Preservation

Y or N

N/A

- | | | | |
|---------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. Trip Blank present / cooler: | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Trip Blank listed on COC: | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Samples preserved properly: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| 4. VOCs headspace free: | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

Sample Integrity - Documentation

Y or N

- | | | |
|--|-------------------------------------|--------------------------|
| 1. Sample labels present on bottles: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Container labeling complete: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Sample container label / COC agree: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

Sample Integrity - Condition

Y or N

- | | | |
|----------------------------------|-------------------------------------|--------------------------|
| 1. Sample recvd within HT: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. All containers accounted for: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Condition of sample: | Intact | |

Sample Integrity - Instructions

Y or N N/A

- | | | | |
|---|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. Analysis requested is clear: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| 2. Bottles received for unspecified tests | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| 3. Sufficient volume recvd for analysis: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| 4. Compositing instructions clear: | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 5. Filtering instructions clear: | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

Comments

GC Volatiles

QC Data Summaries

(Accutest New Jersey)

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: C18666
Account: ALNCA Accutest Northern California, Inc.
Project: SHELLWIC: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GII2644-MB	II54416.D	1	11/02/11	TCH	n/a	n/a	GII2644

The QC reported here applies to the following samples:

Method: RSK-175

C18666-8

CAS No.	Compound	Result	RL	MDL	Units	Q
74-82-8	Methane	ND	0.11	0.022	ug/l	
124-38-9	Carbon Dioxide	ND	50	1.8	ug/l	

10.1.1
10

Laboratory Control Sample Summary

Job Number: C18666
Account: ALNCA Accutest Northern California, Inc.
Project: SHELLWIC: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GII2644-LCS	II54414.D	1	11/02/11	TCH	n/a	n/a	GII2644

The QC reported here applies to the following samples:

Method: RSK-175

C18666-8

CAS No.	Compound	Spike ug/l	LCS ug/l	LCS %	Limits
74-82-8	Methane	100	108	108	59-134
124-38-9	Carbon Dioxide	100	111	111	66-114

Duplicate Summary

Job Number: C18666
Account: ALNCA Accutest Northern California, Inc.
Project: SHELLWIC: URSORP: Shell/Harbor Island - 2555 13th Ave SW., Seattle, WA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
C18556-11DUP	I154418.D	1	11/02/11	TCH	n/a	n/a	GII2644
C18556-11	I154417.D	1	11/02/11	TCH	n/a	n/a	GII2644

The QC reported here applies to the following samples:

Method: RSK-175

C18666-8

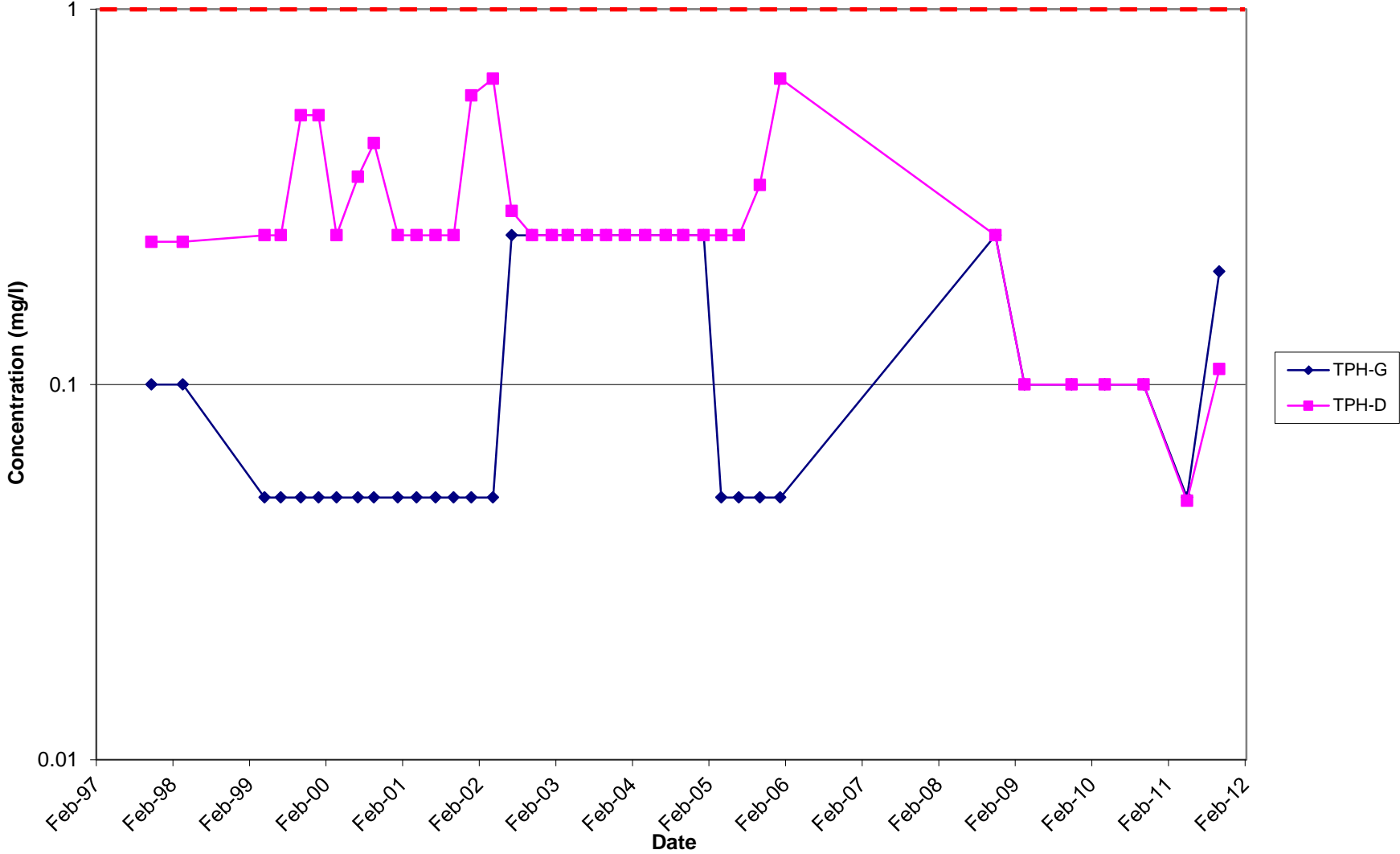
CAS No.	Compound	C18556-11 ug/l	DUP Q	ug/l	Q	RPD	Limits
74-82-8	Methane	1110		1090		2	14
124-38-9	Carbon Dioxide	26100	E	26100	E	0	12

10.3.1
10

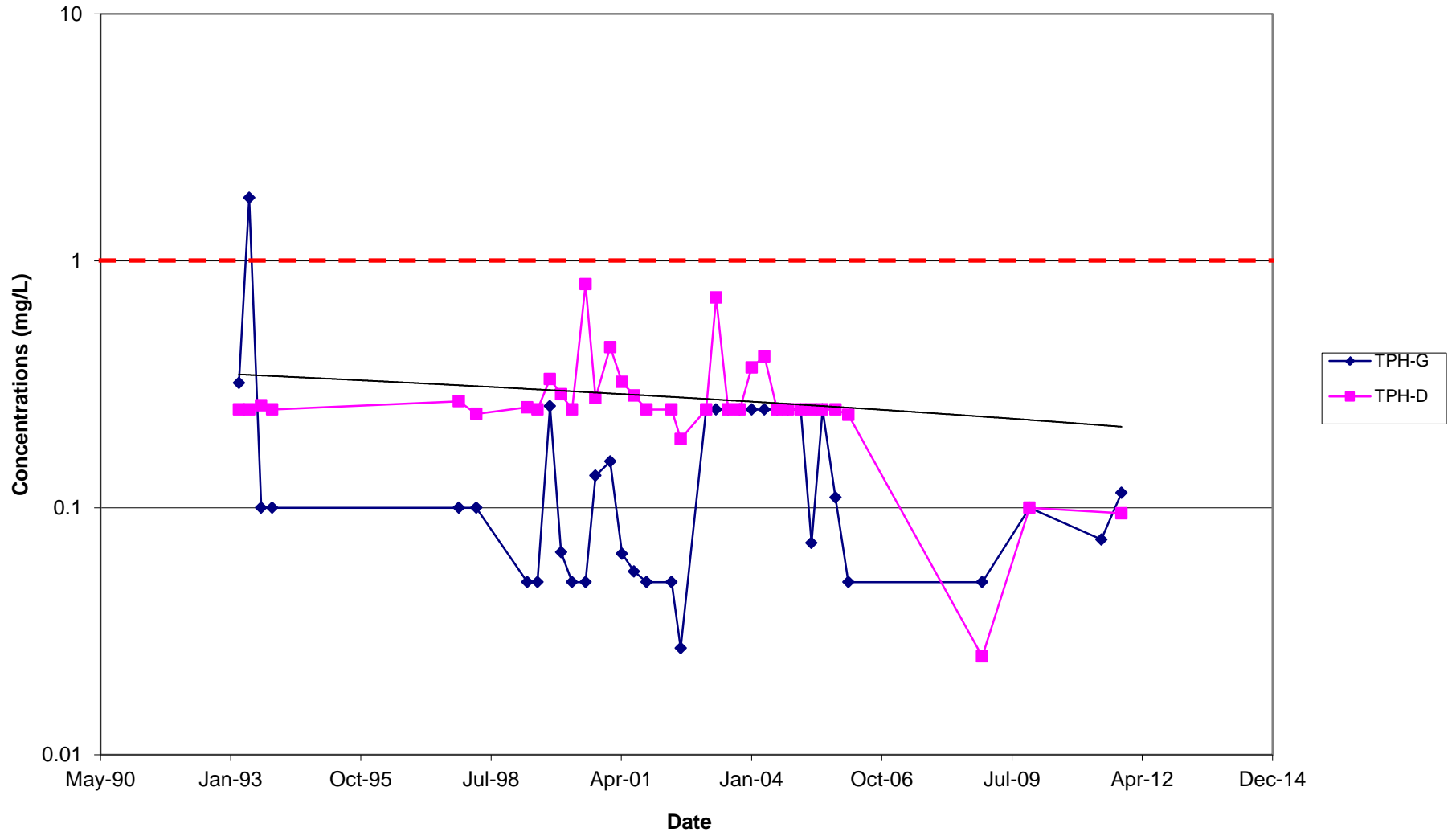
APPENDIX E

Time Series Concentration Plots

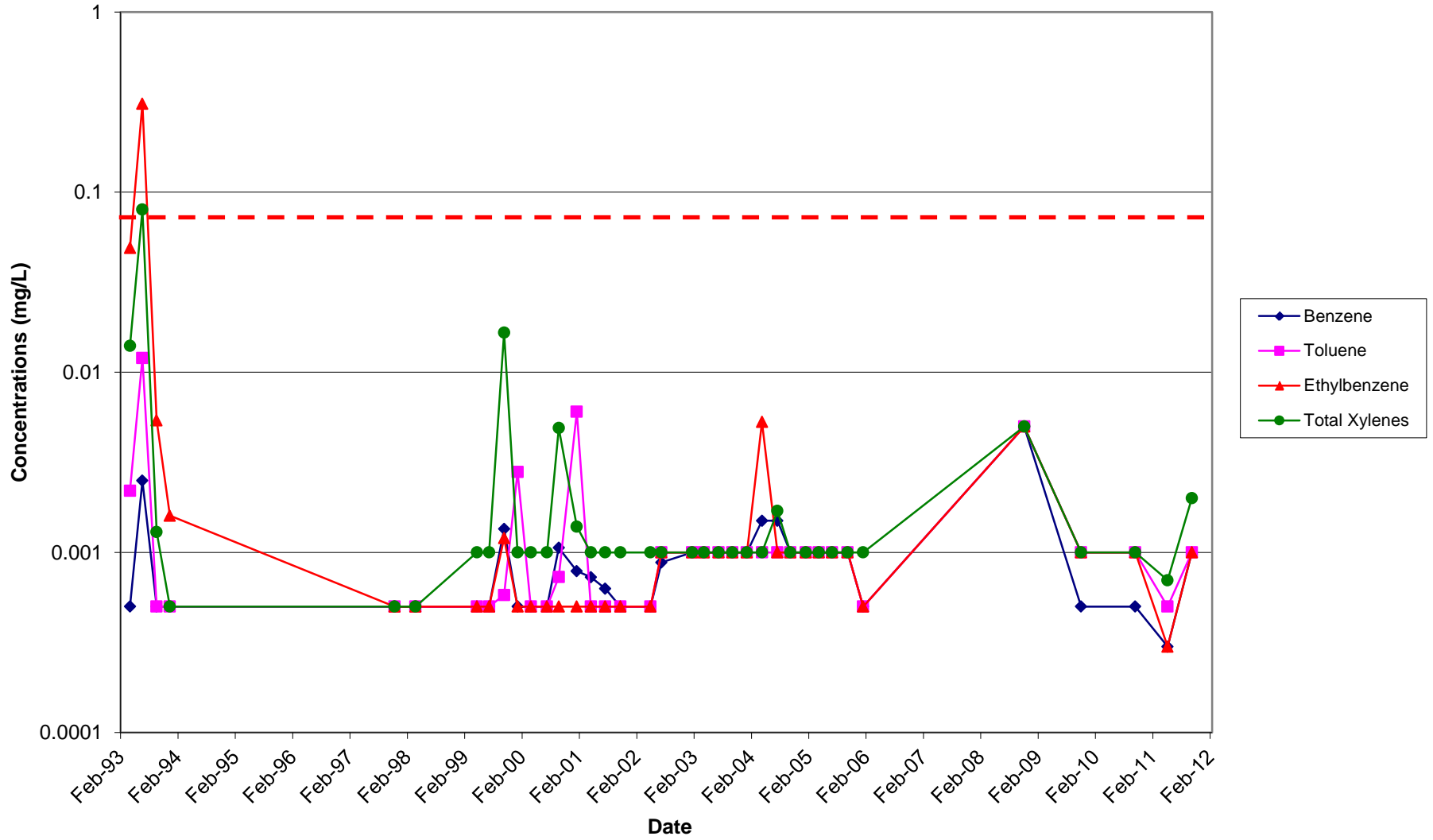
MW-213 Groundwater TPH Concentrations



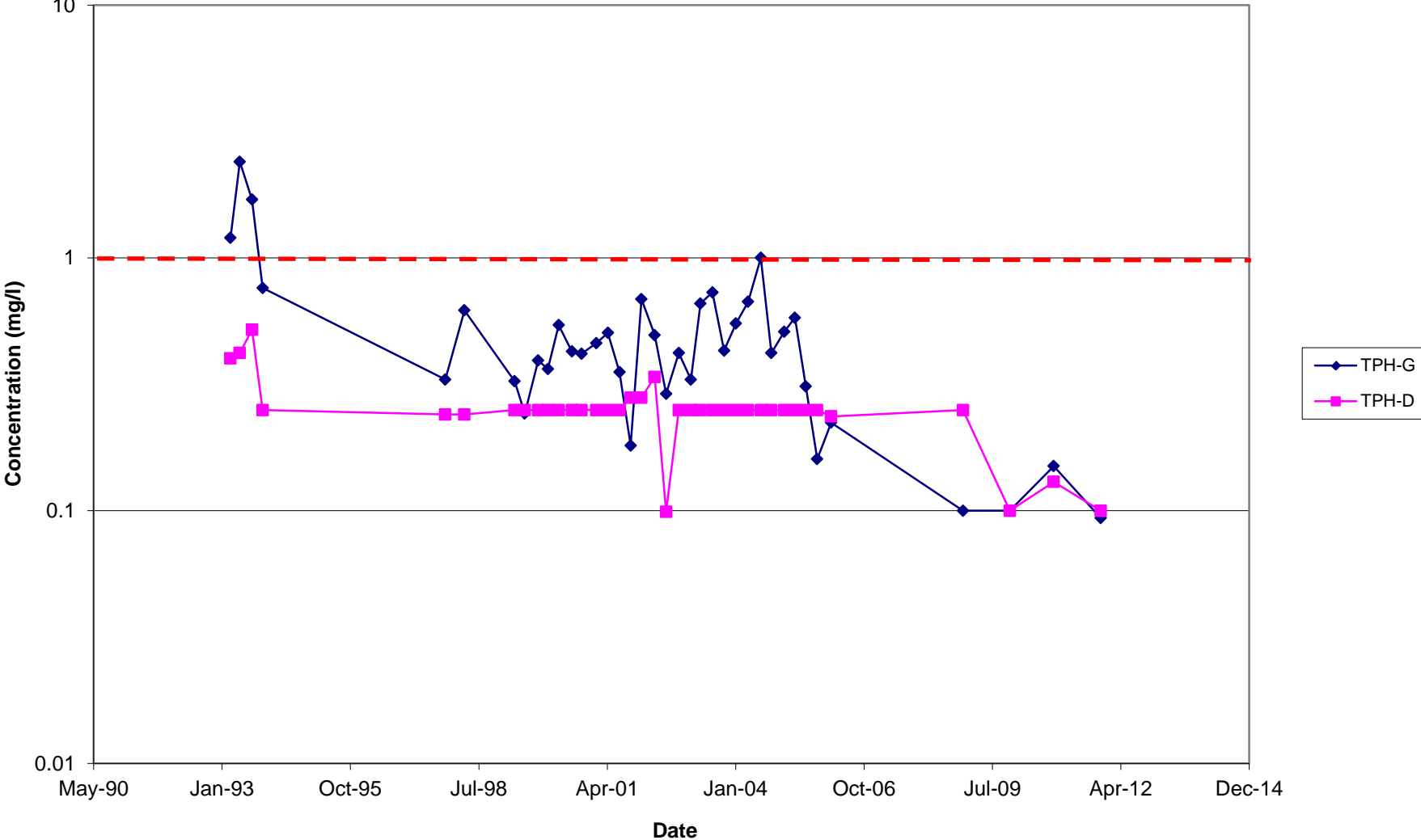
MW-05 Groundwater TPH Concentrations



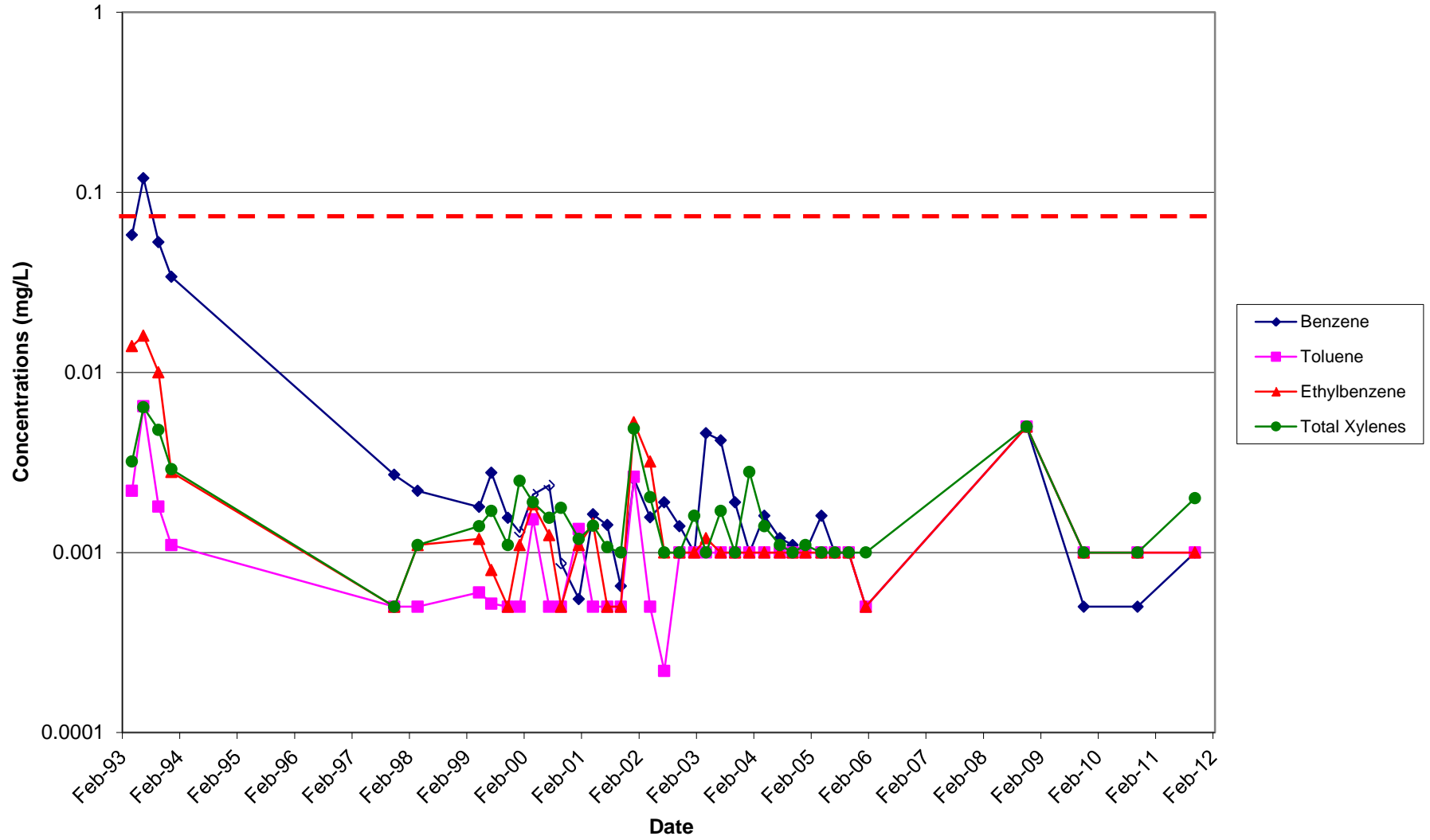
MW-05 Groundwater BTEX Concentrations



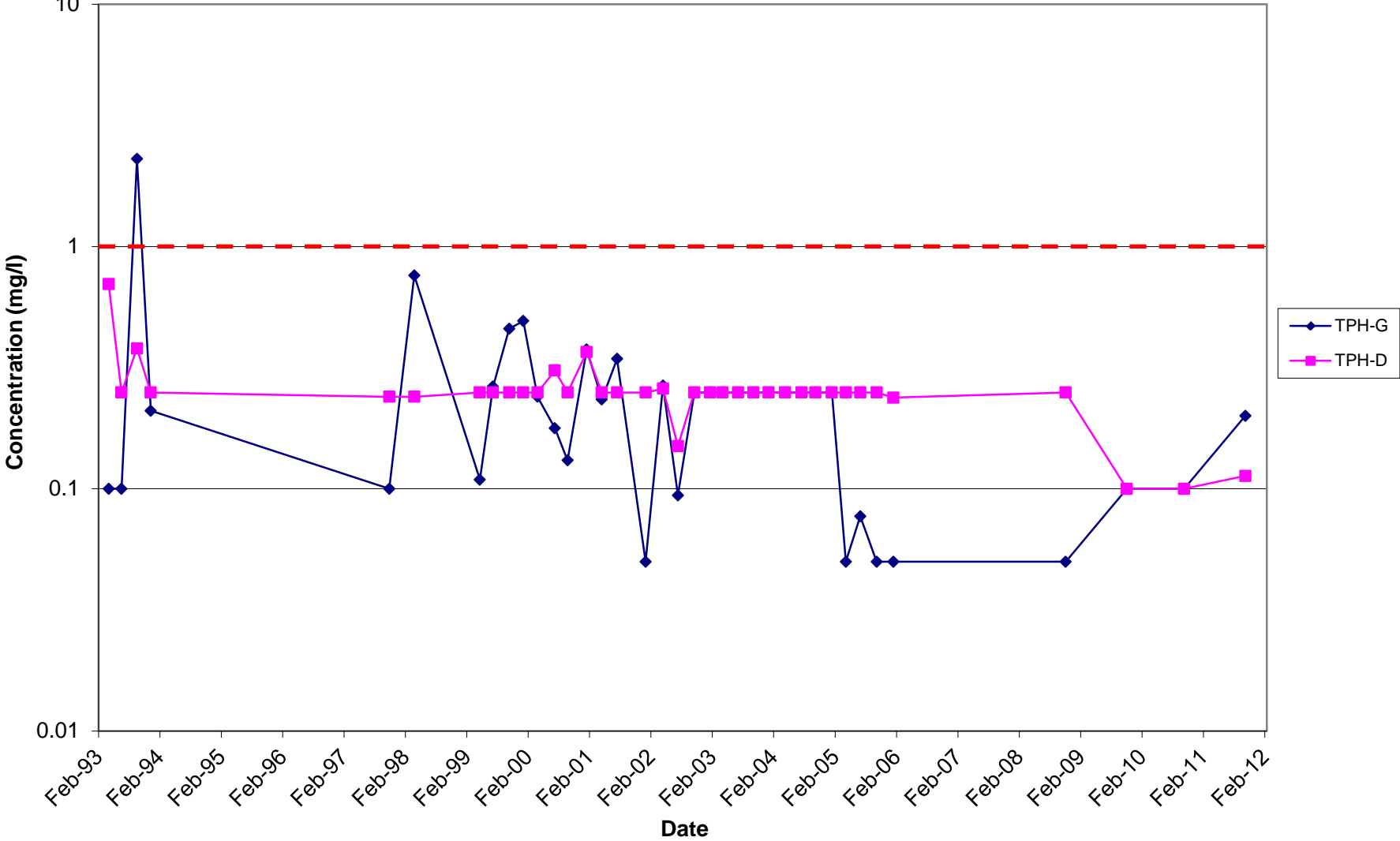
MW-101 Groundwater TPH Concentrations



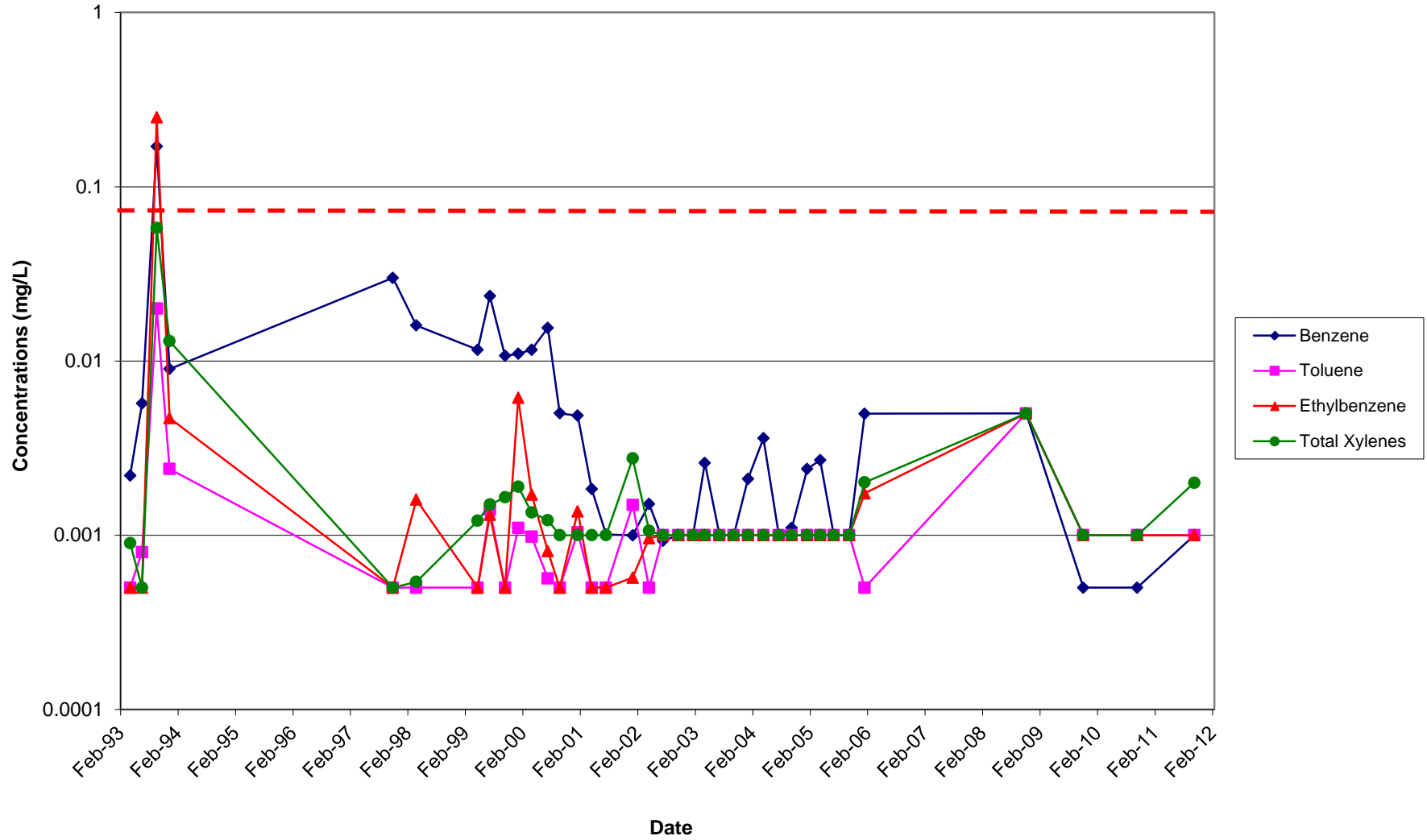
MW-101 Groundwater BTEX Concentrations



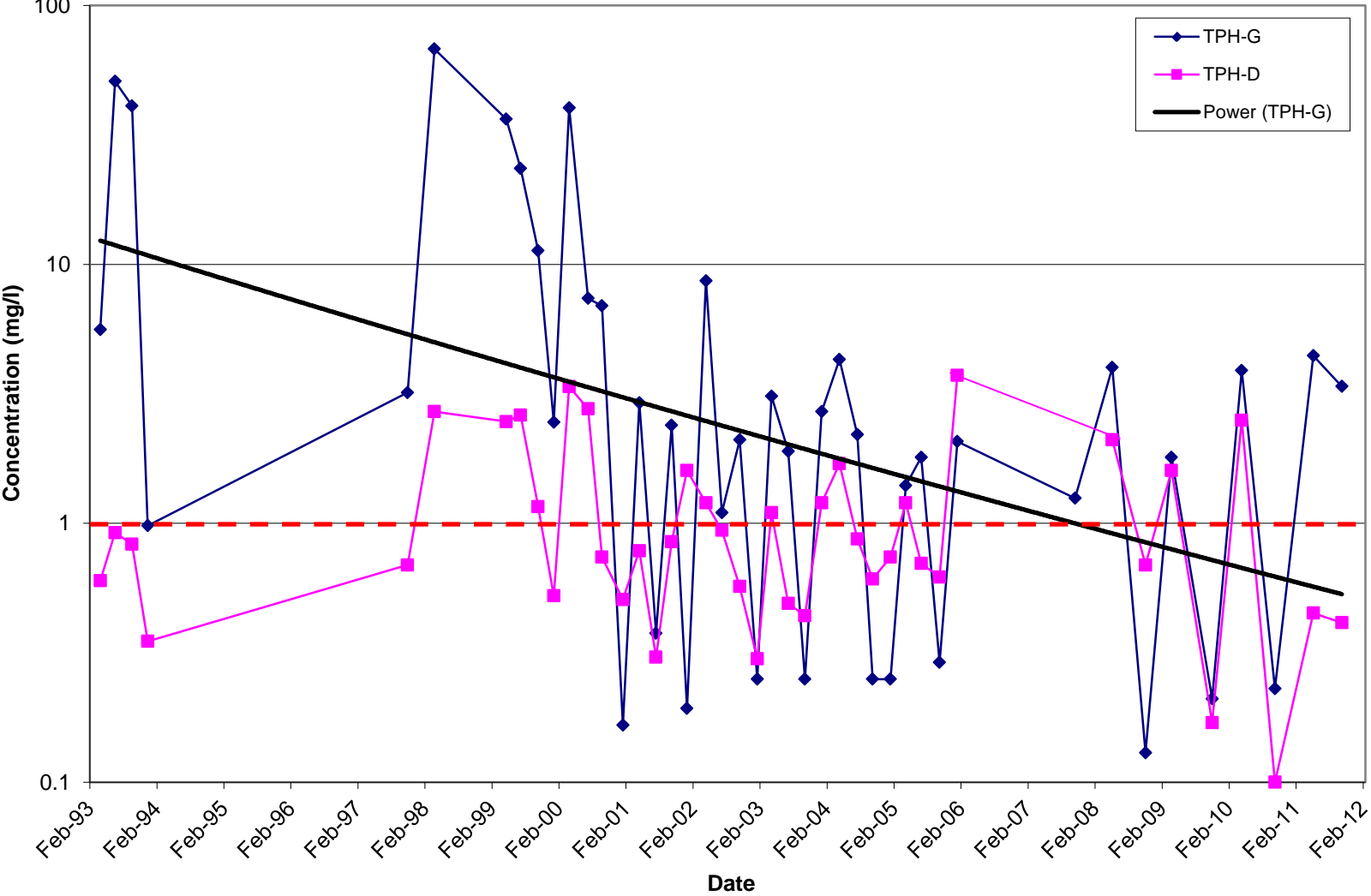
MW-102 Groundwater TPH Concentrations



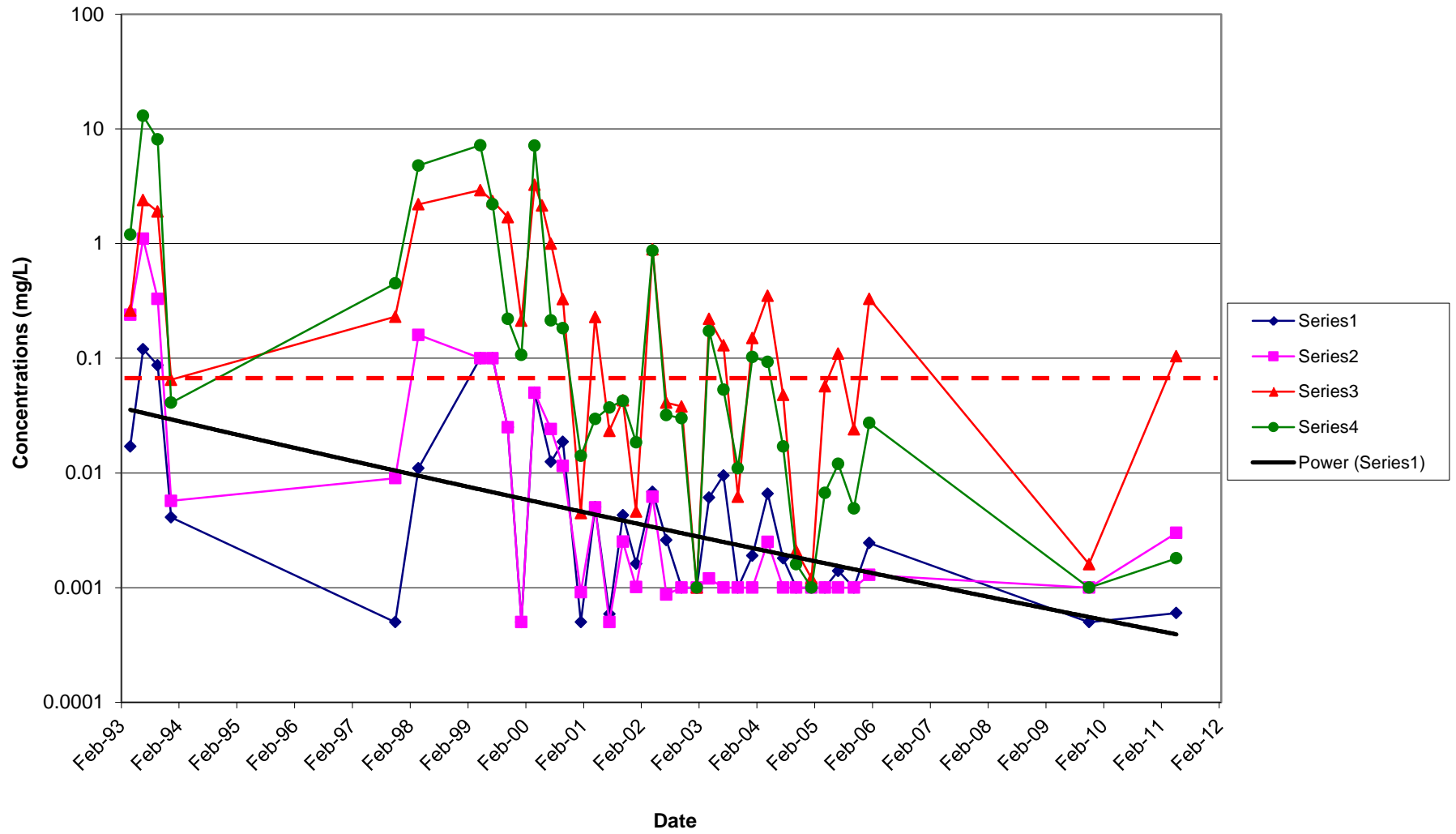
MW-102 Groundwater BTEX Concentrations



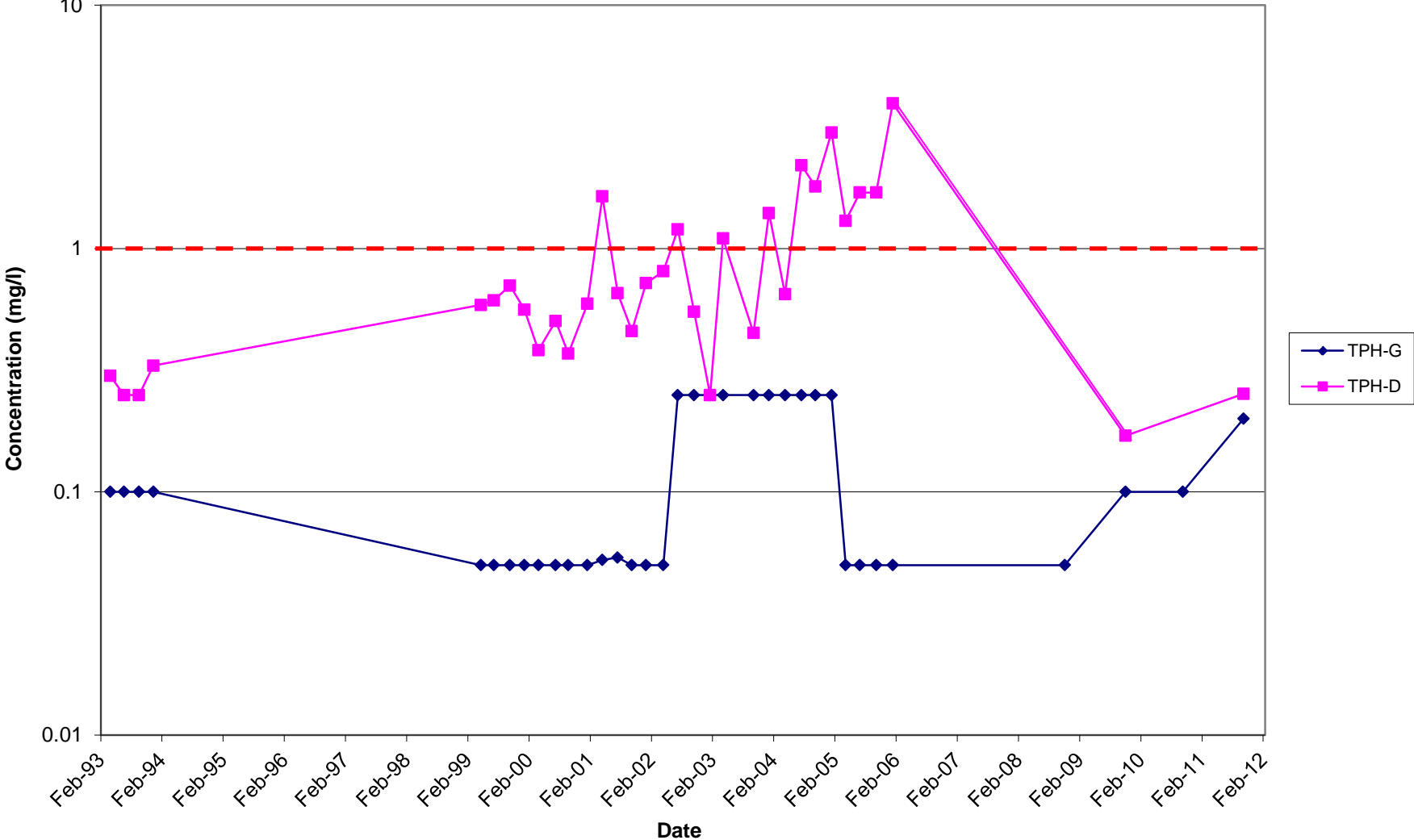
MW-104 Groundwater TPH Concentrations



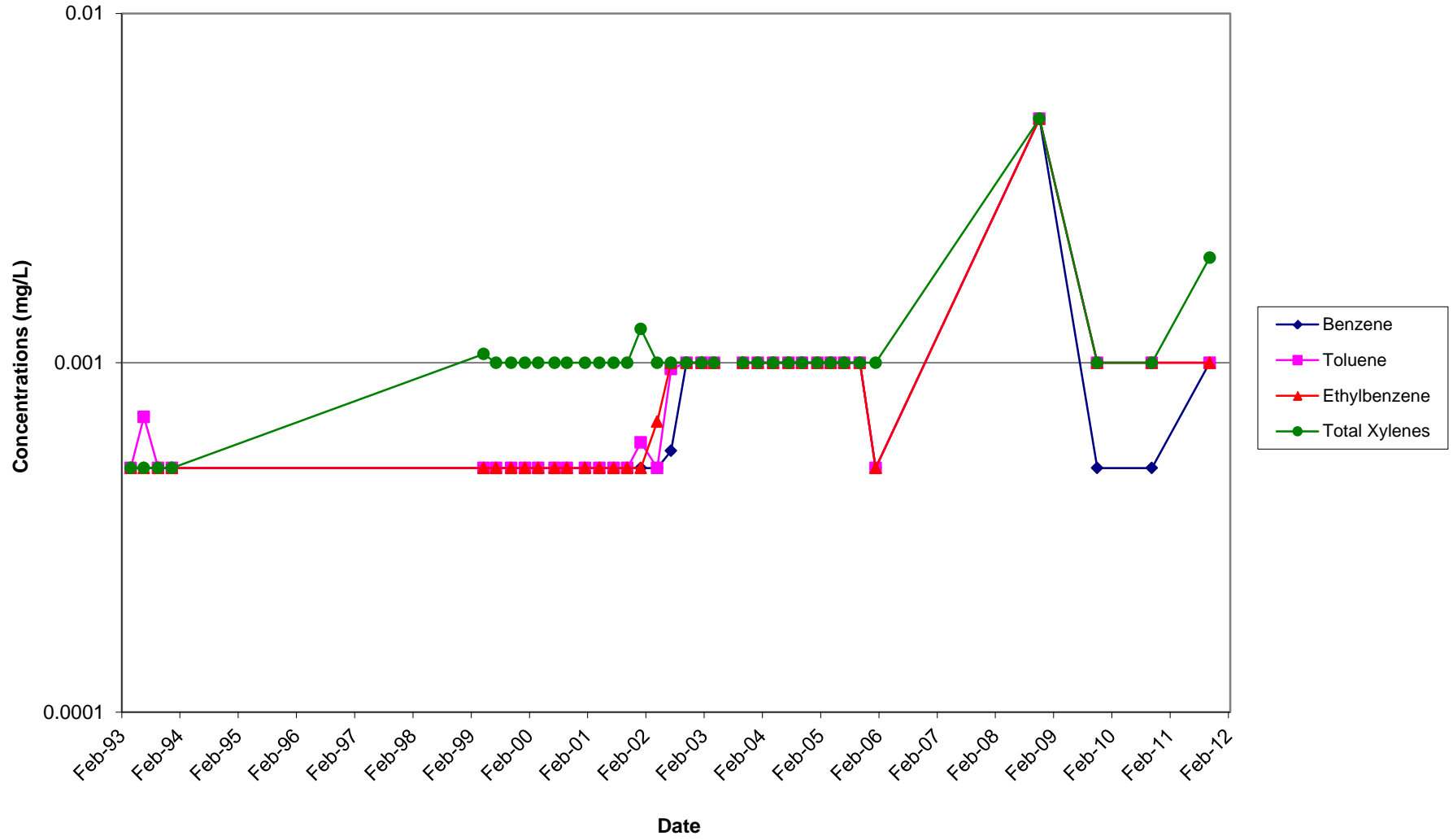
MW-104 Groundwater BTEX Concentrations



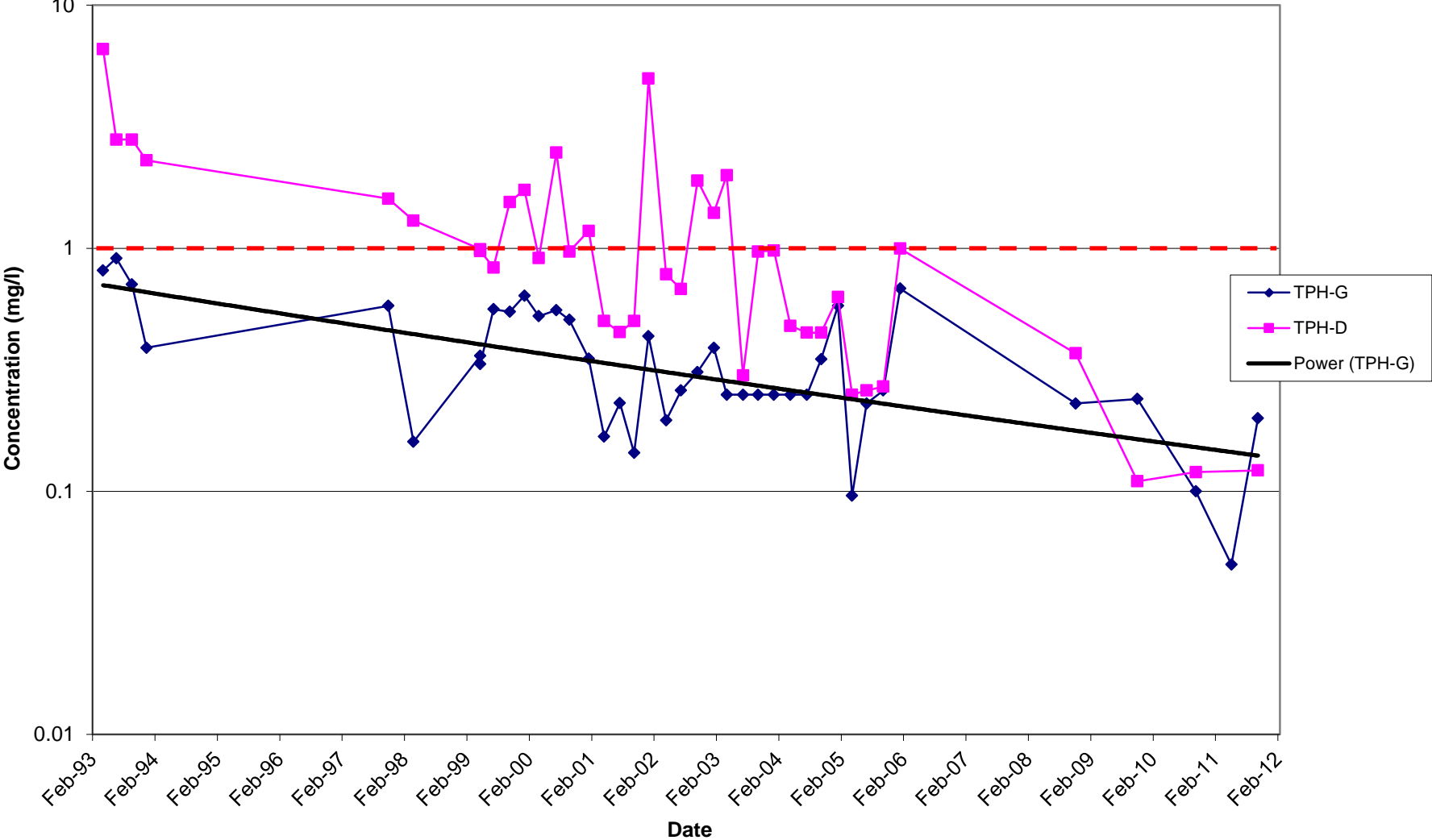
MW-105 Groundwater TPH Concentrations



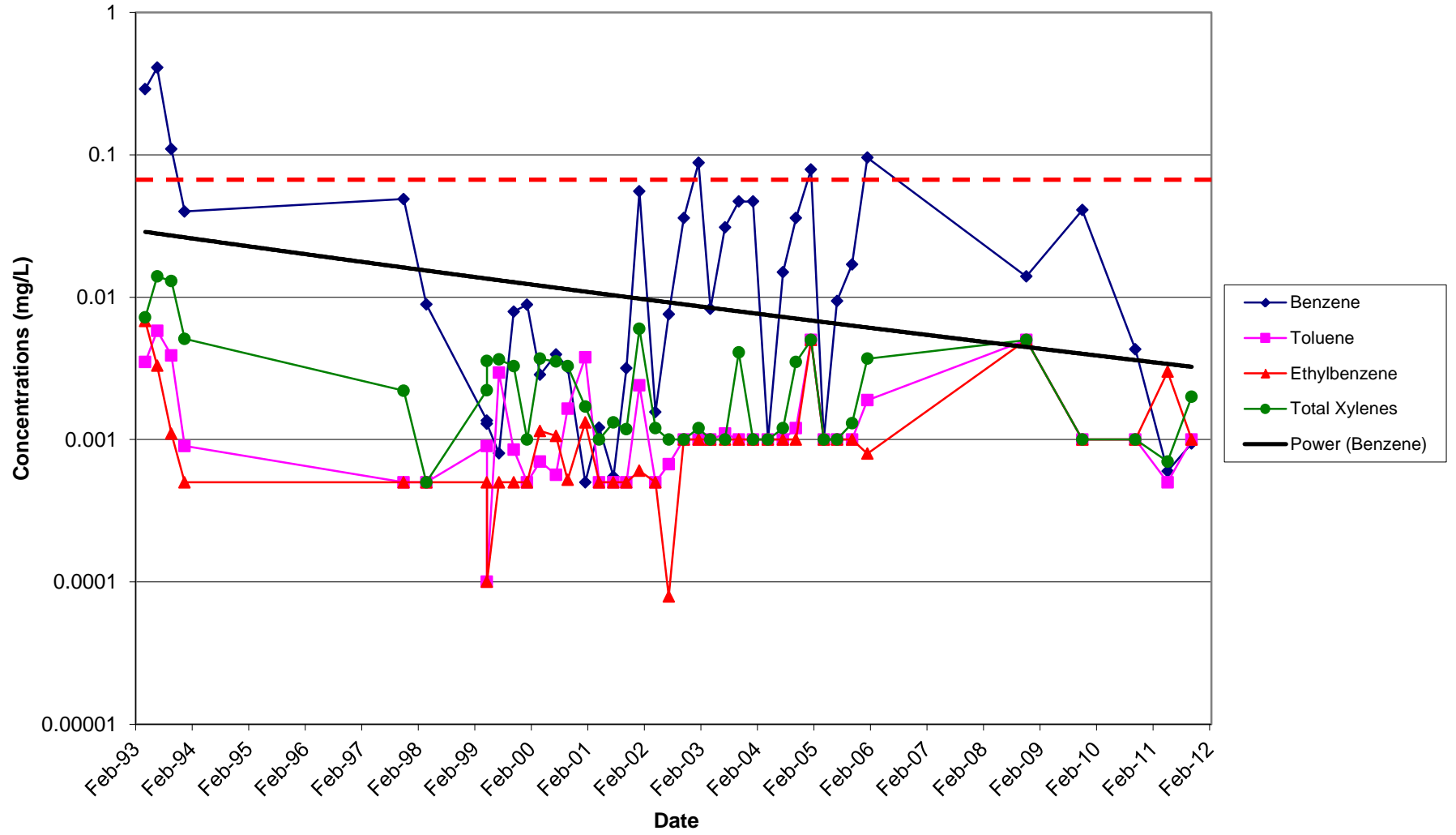
MW-105 Groundwater BTEX Concentrations



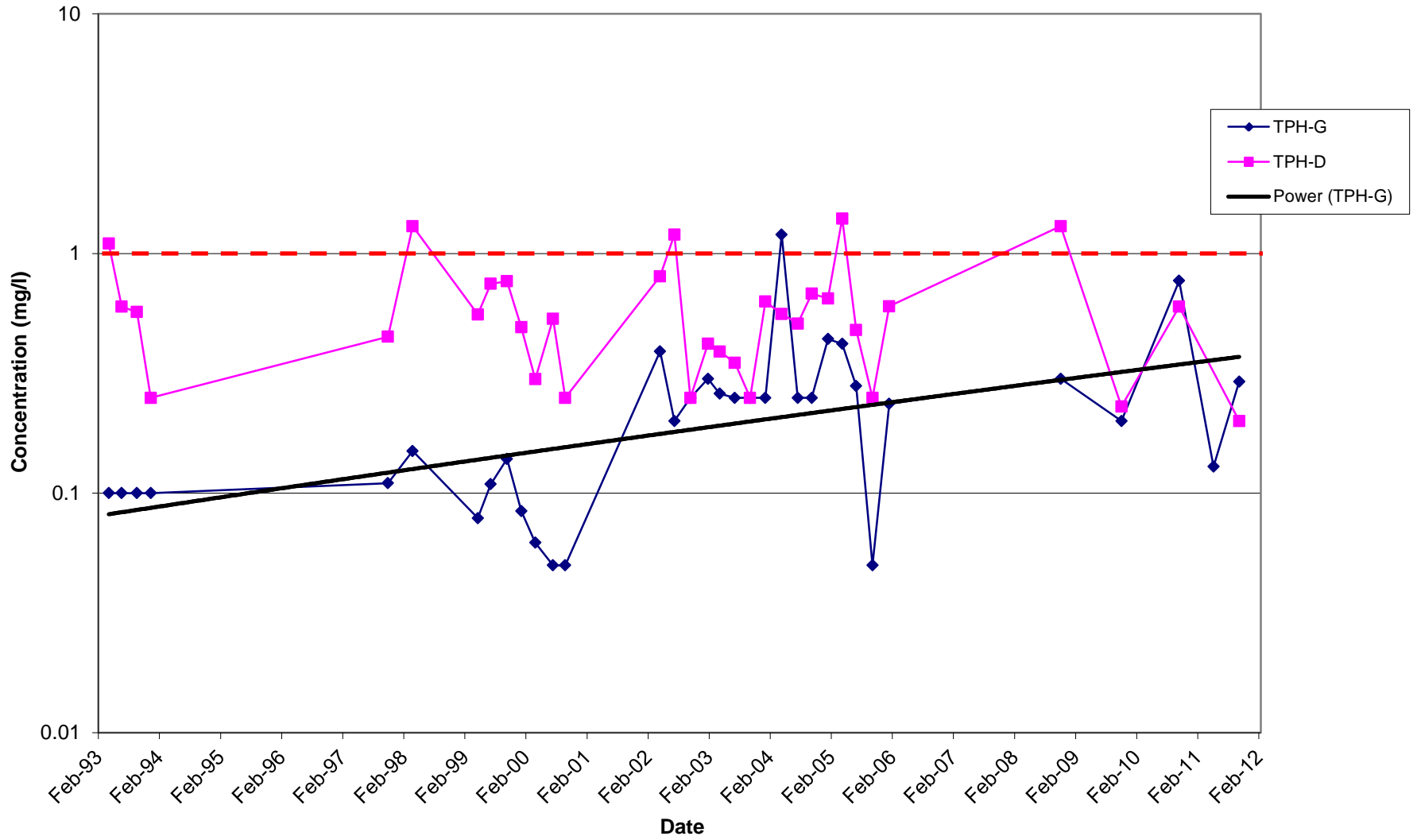
MW-11 Groundwater TPH Concentrations



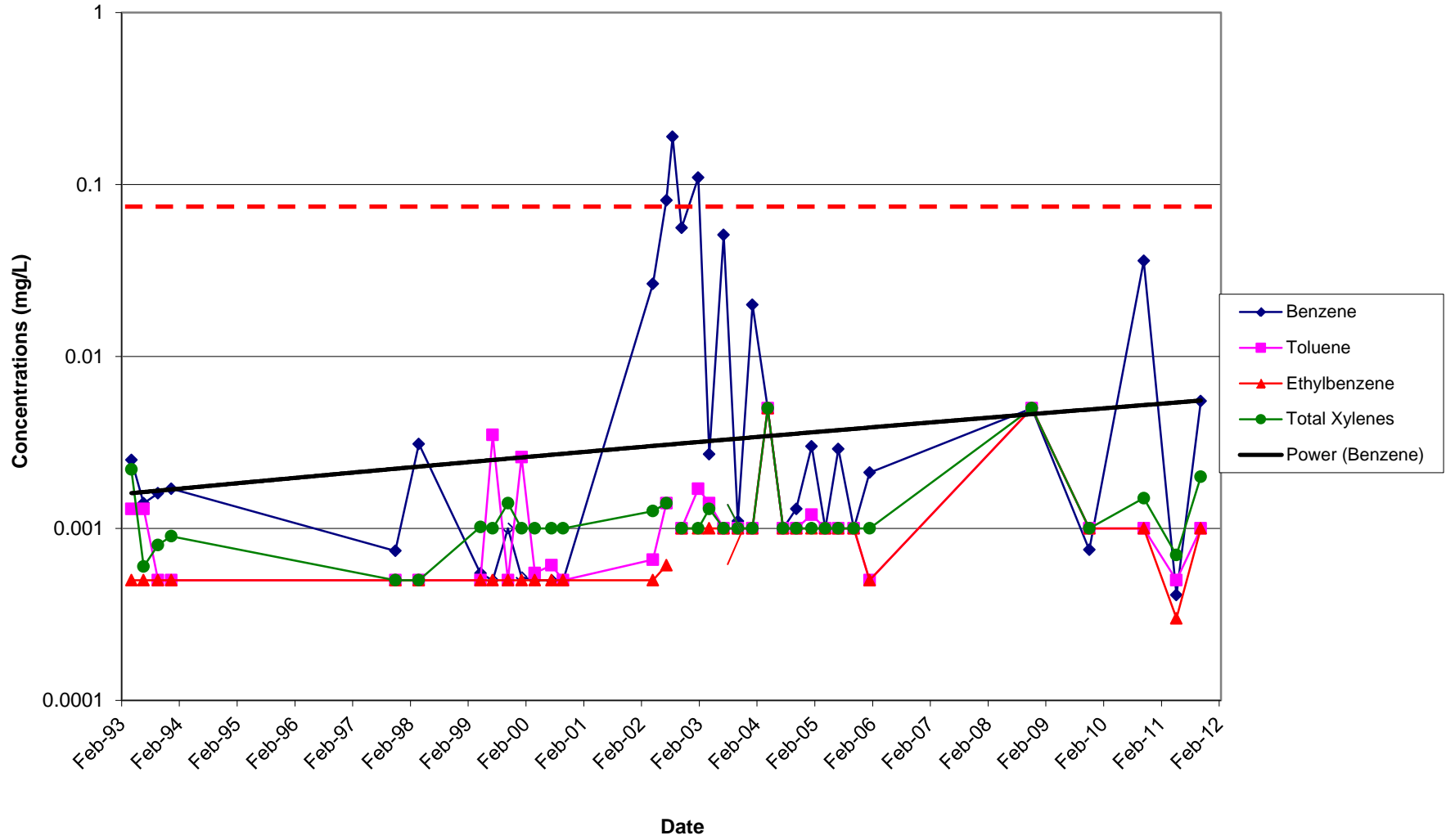
MW-111 Groundwater BTEX Concentrations



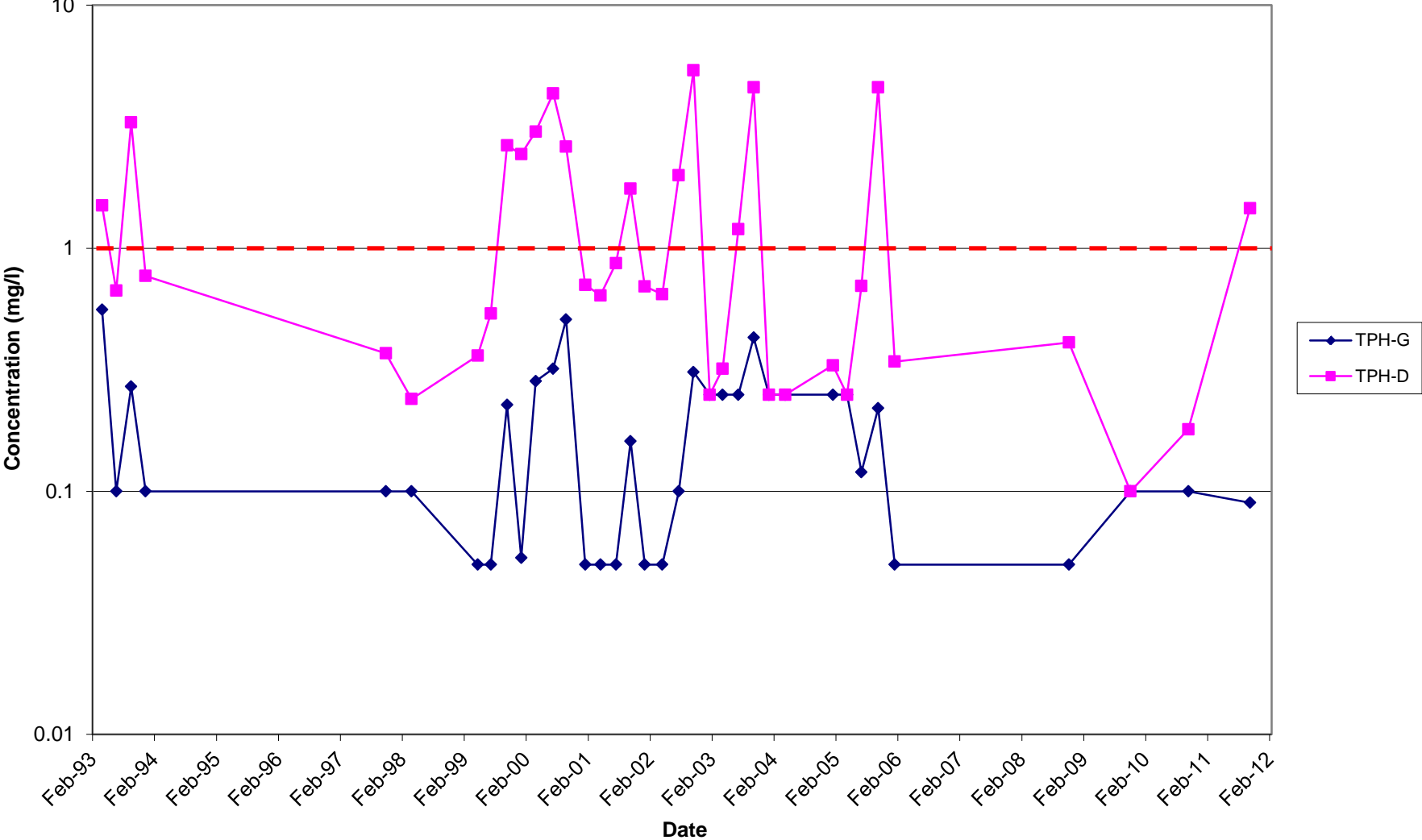
MW-112/MW-112A Groundwater TPH Concentrations



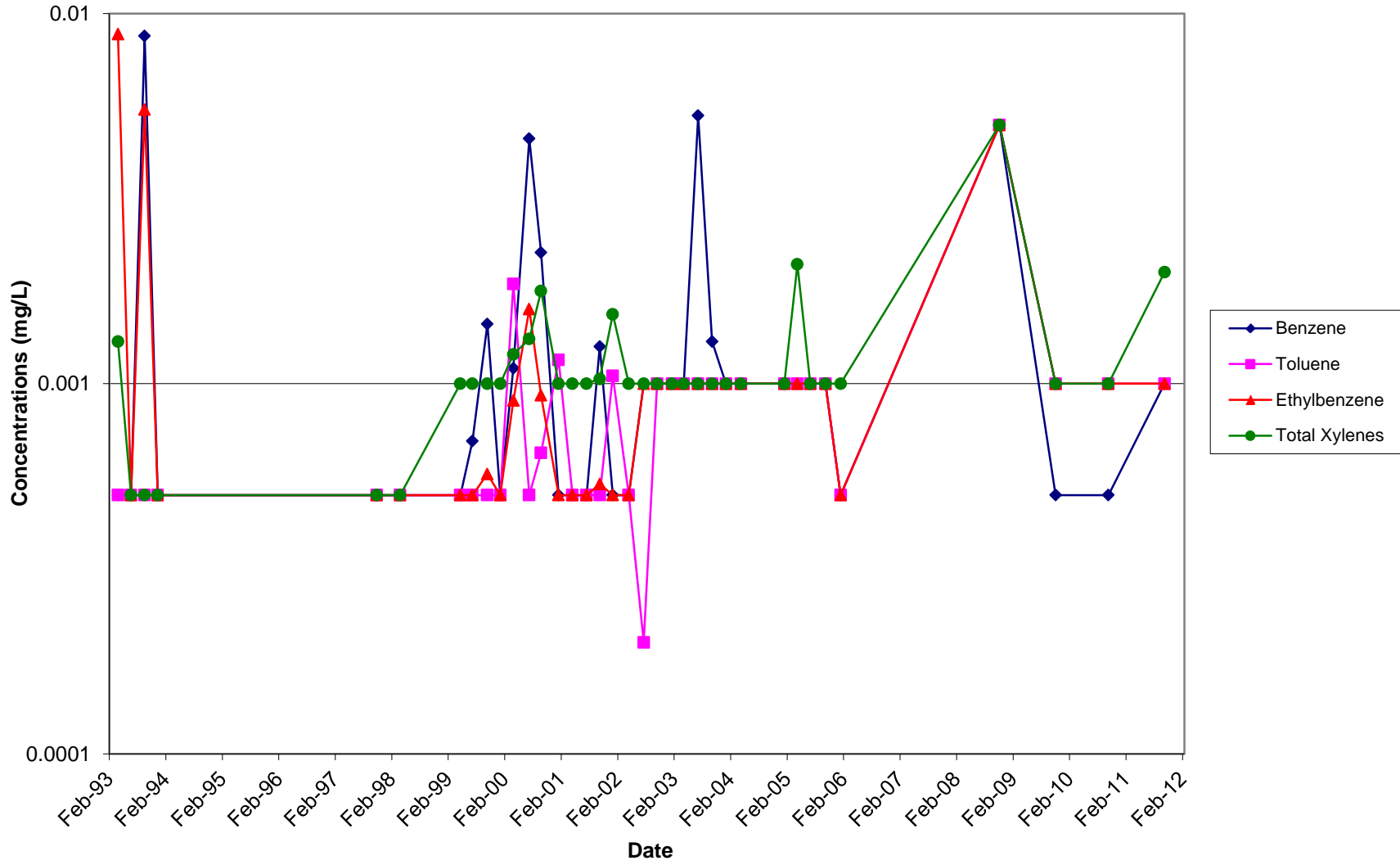
MW-112 Groundwater BTEX Concentrations



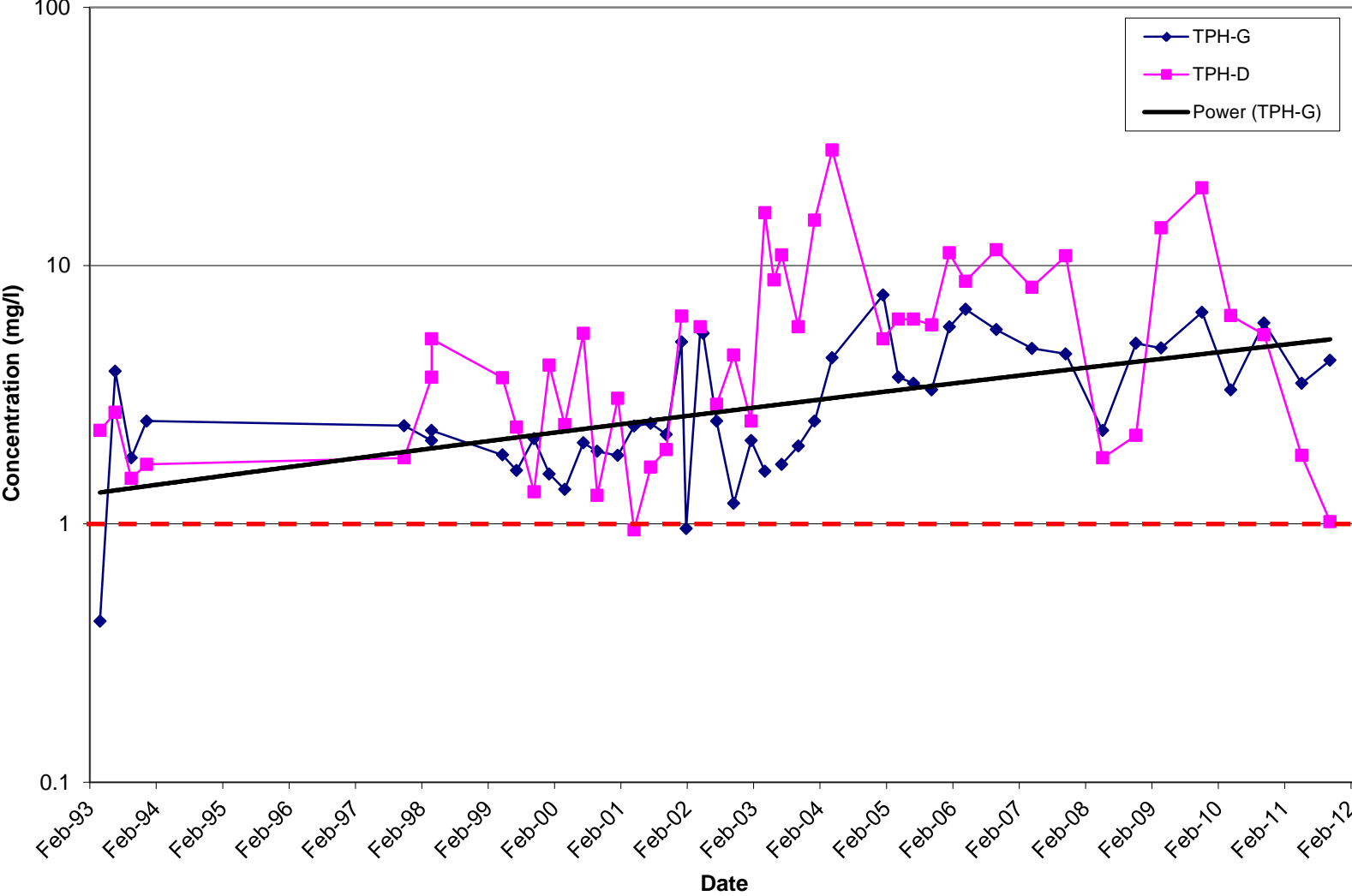
MW-201 Groundwater TPH Concentrations



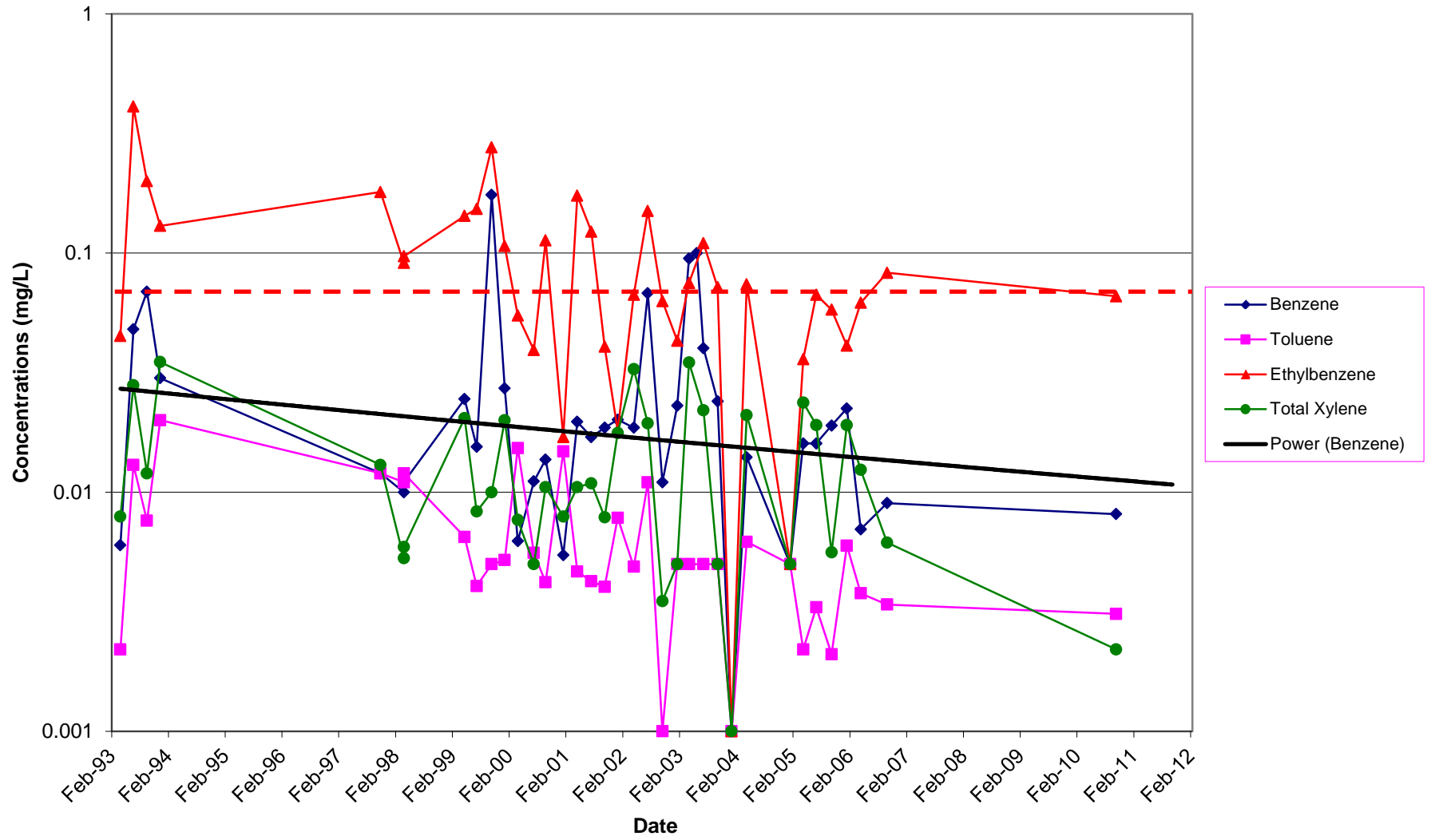
MW-201 Groundwater BTEX Concentrations



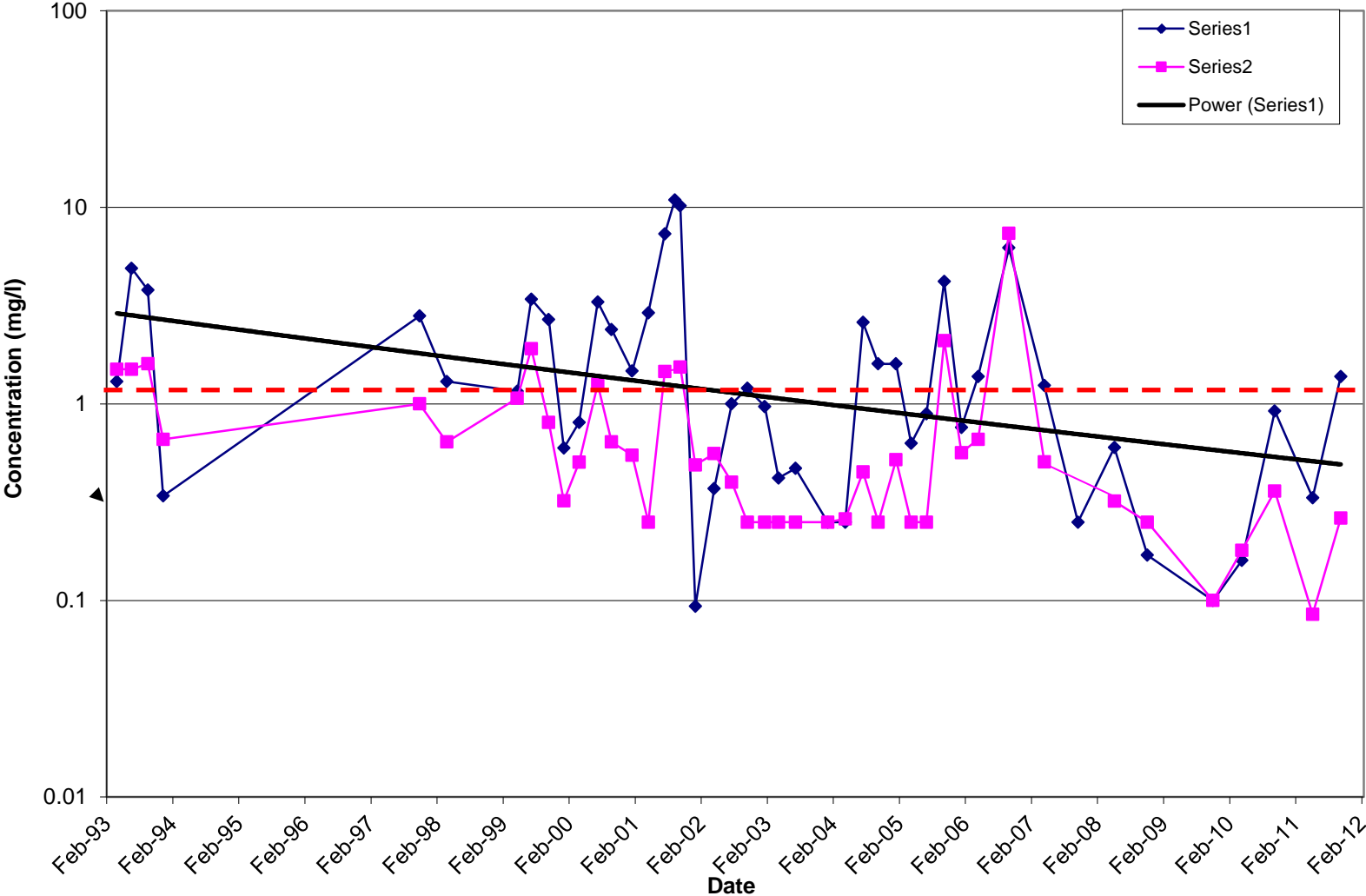
MW-202 Groundwater TPH Concentrations



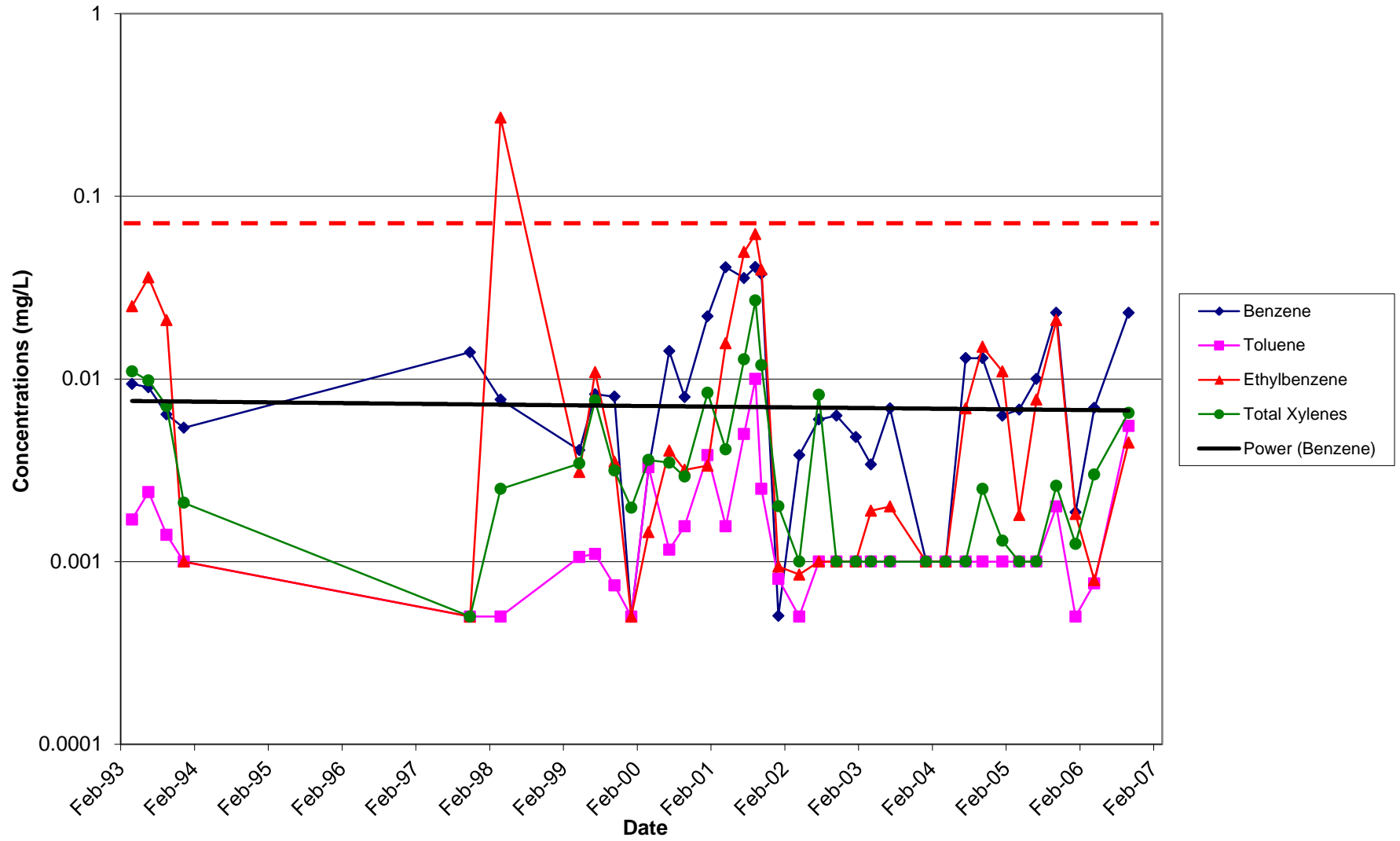
MW-202 Groundwater BTEX Concentrations



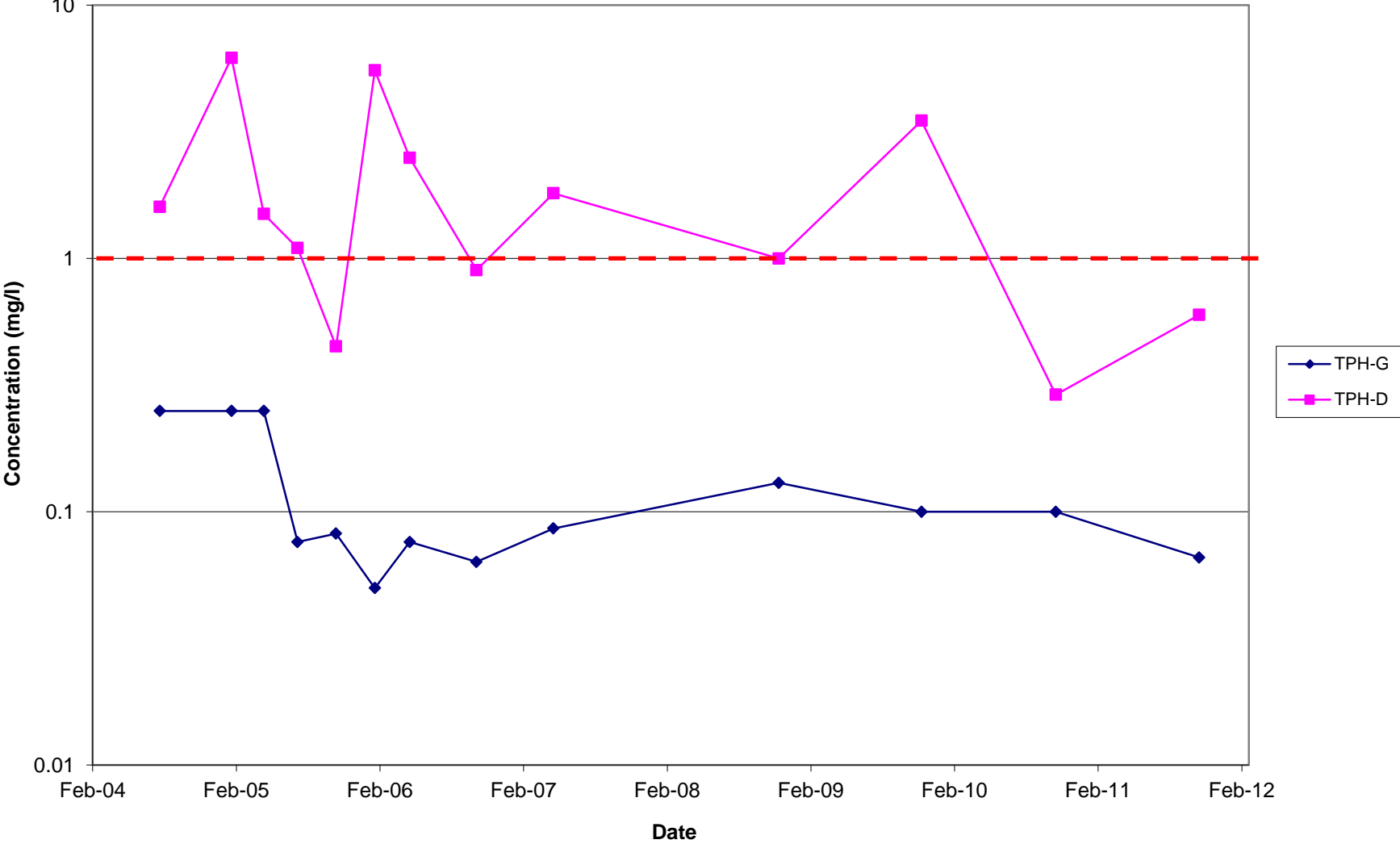
MW-203 Groundwater TPH Concentrations



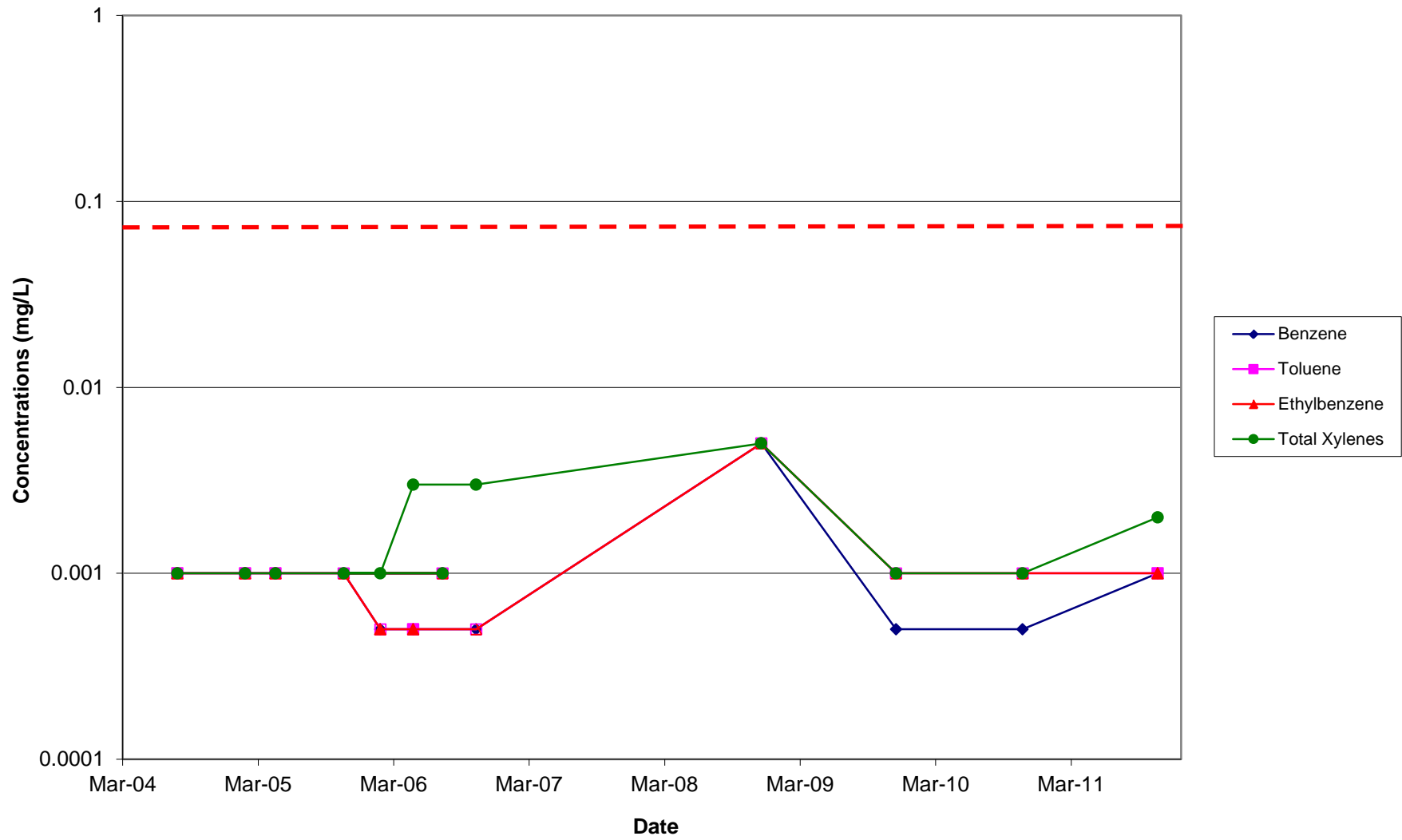
MW-203 Groundwater BTEX Concentrations



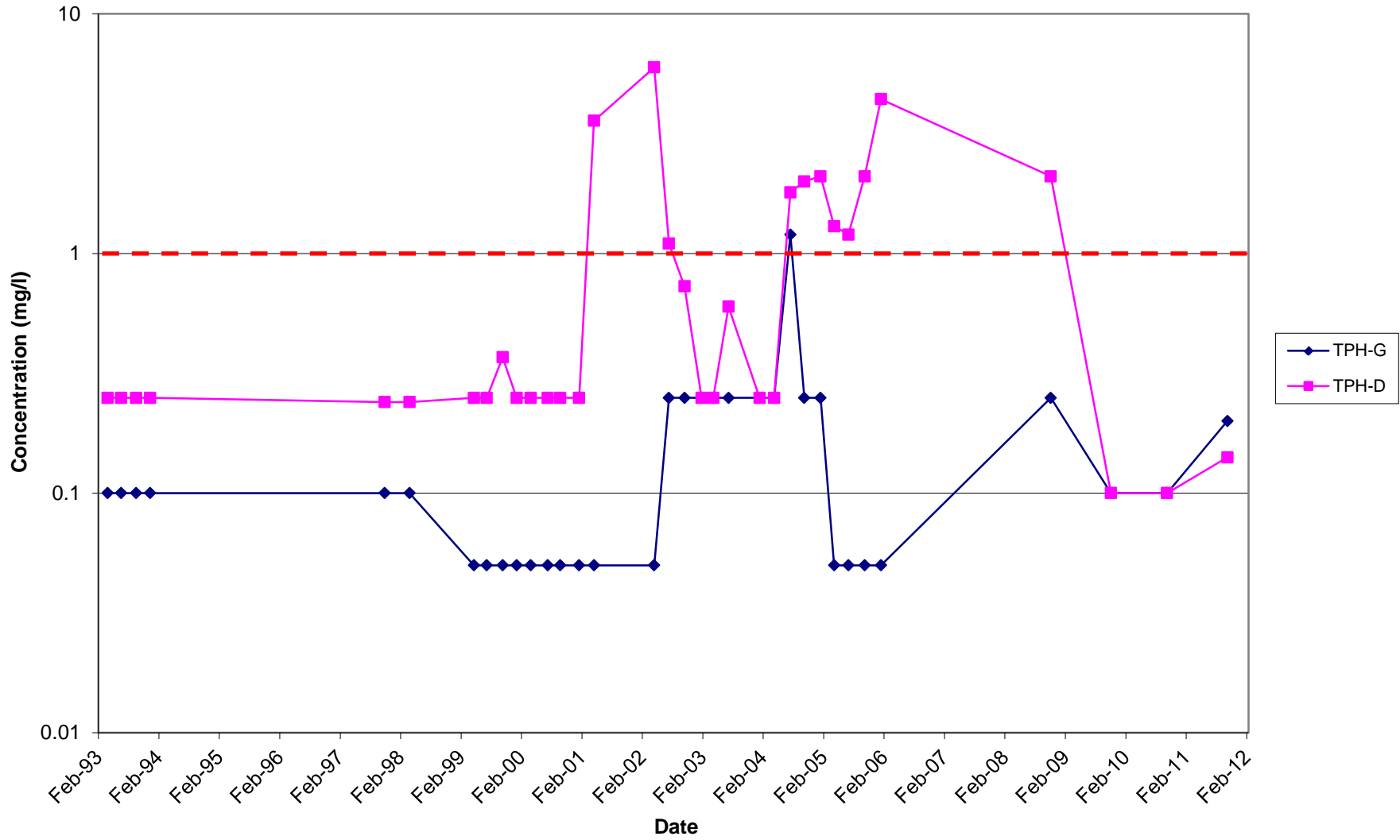
MW-204 Groundwater TPH Concentrations



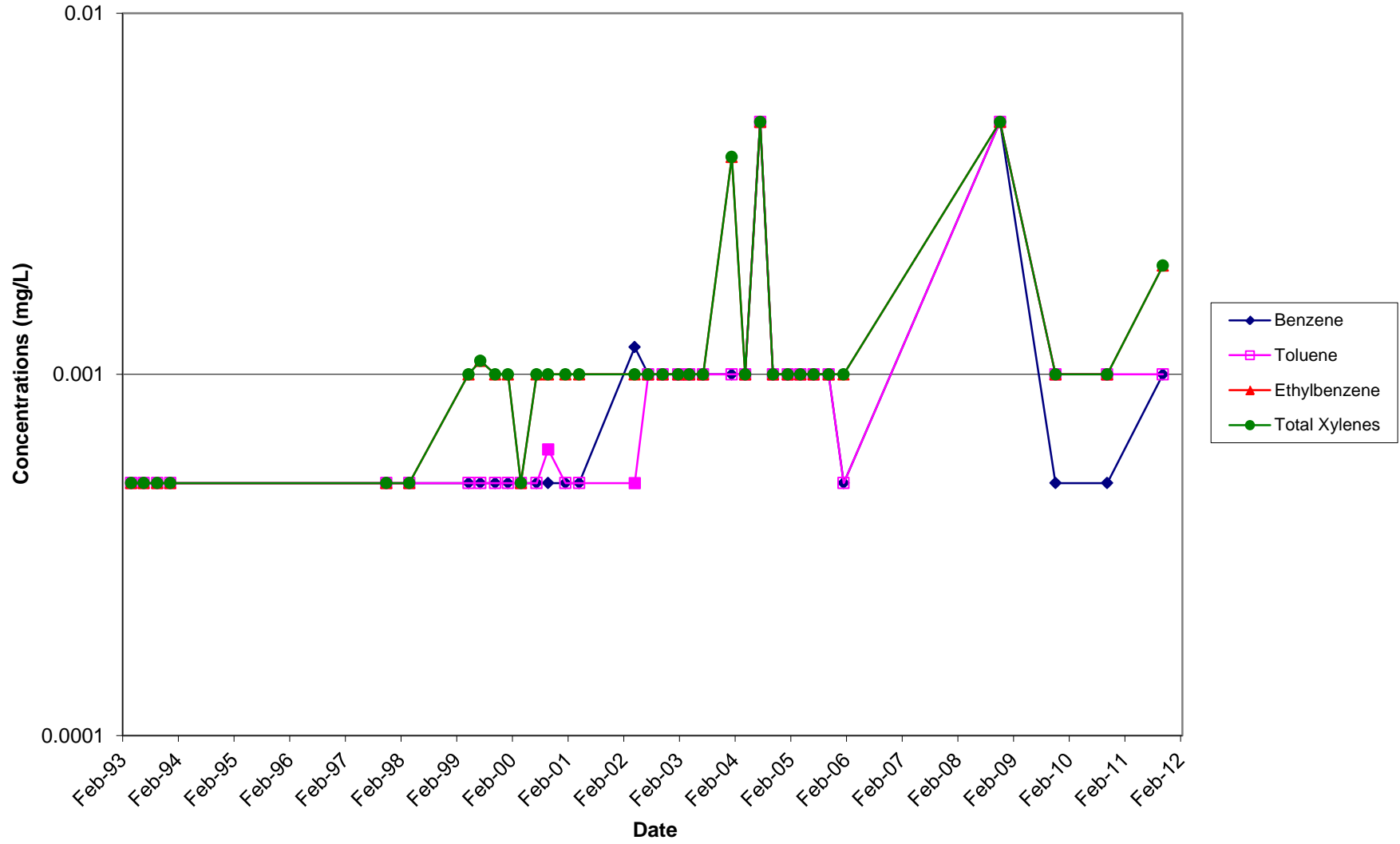
MW-204 Groundwater BTEX Concentrations



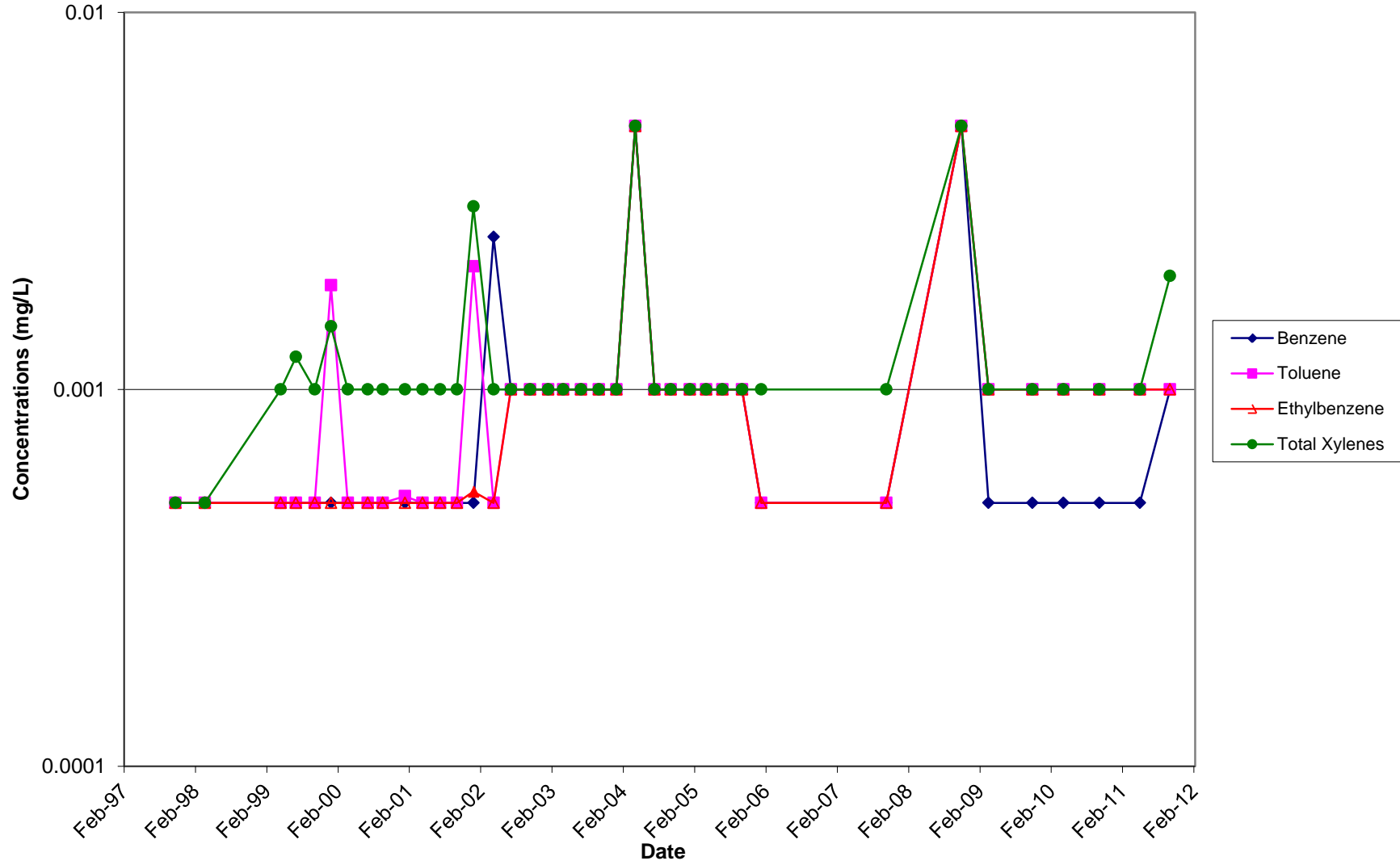
MW-206/MW-206A Groundwater TPH Concentrations



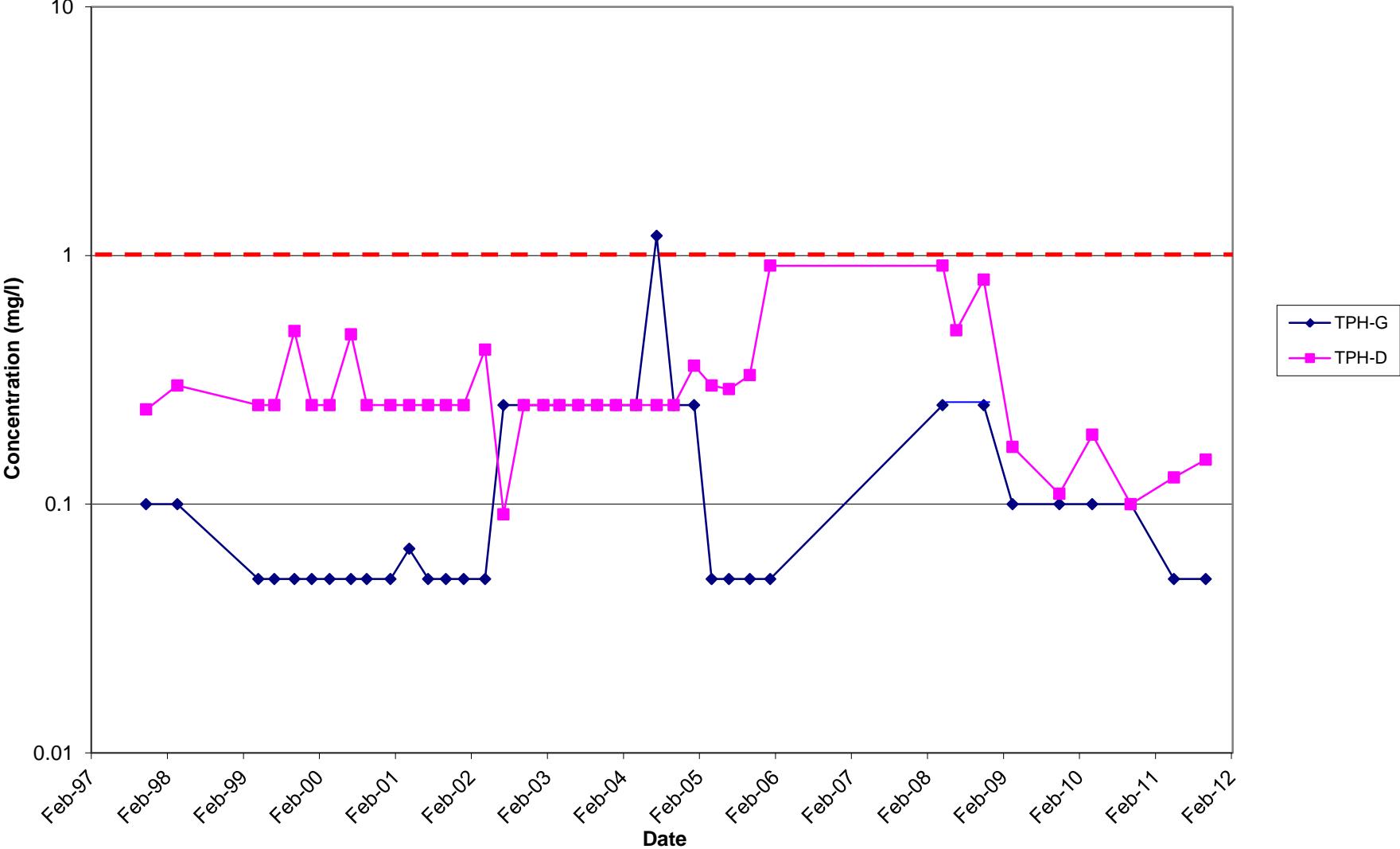
MW-206/MW-206A Groundwater BTEX Concentrations



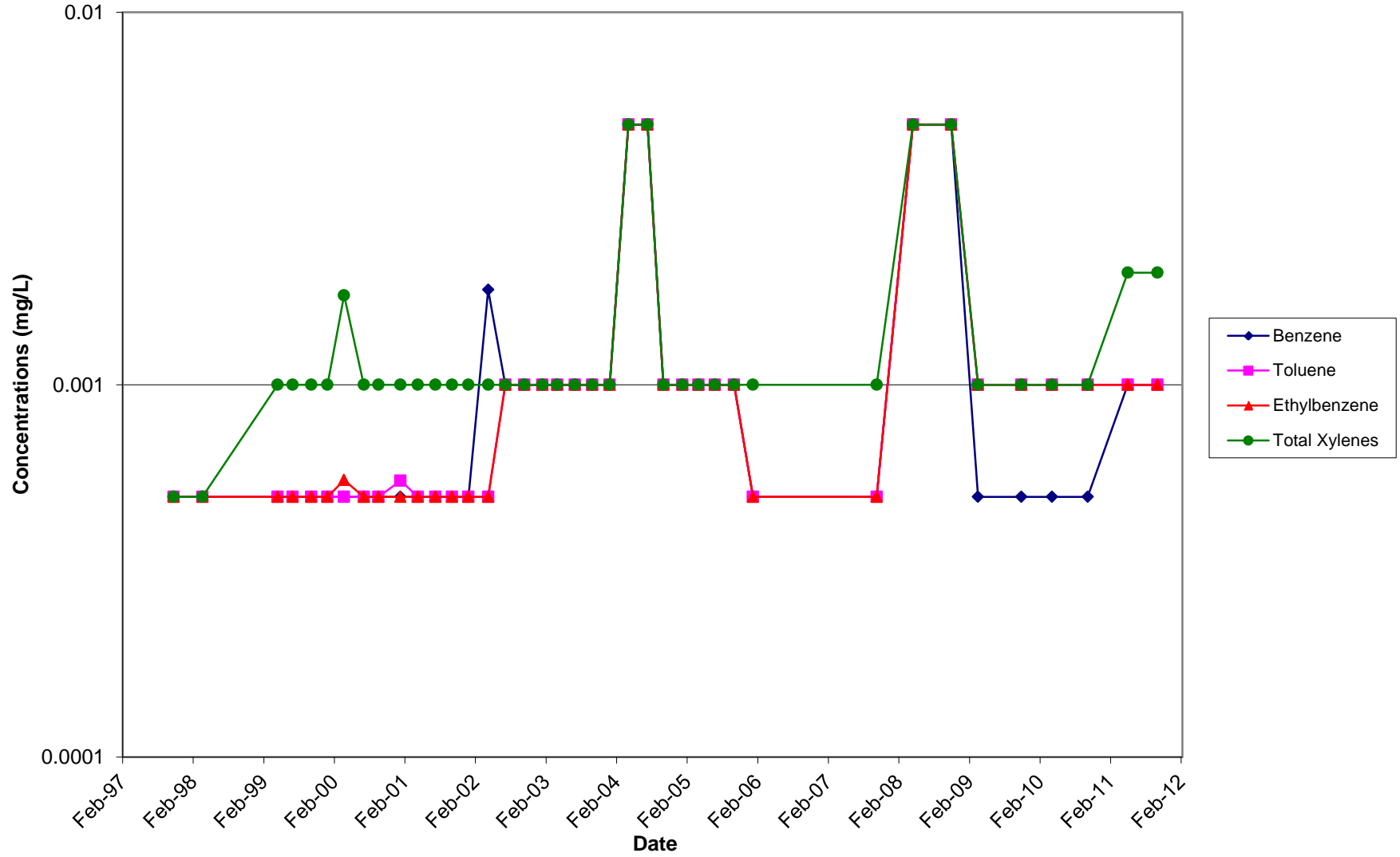
MW-213 Groundwater BTEX Concentrations



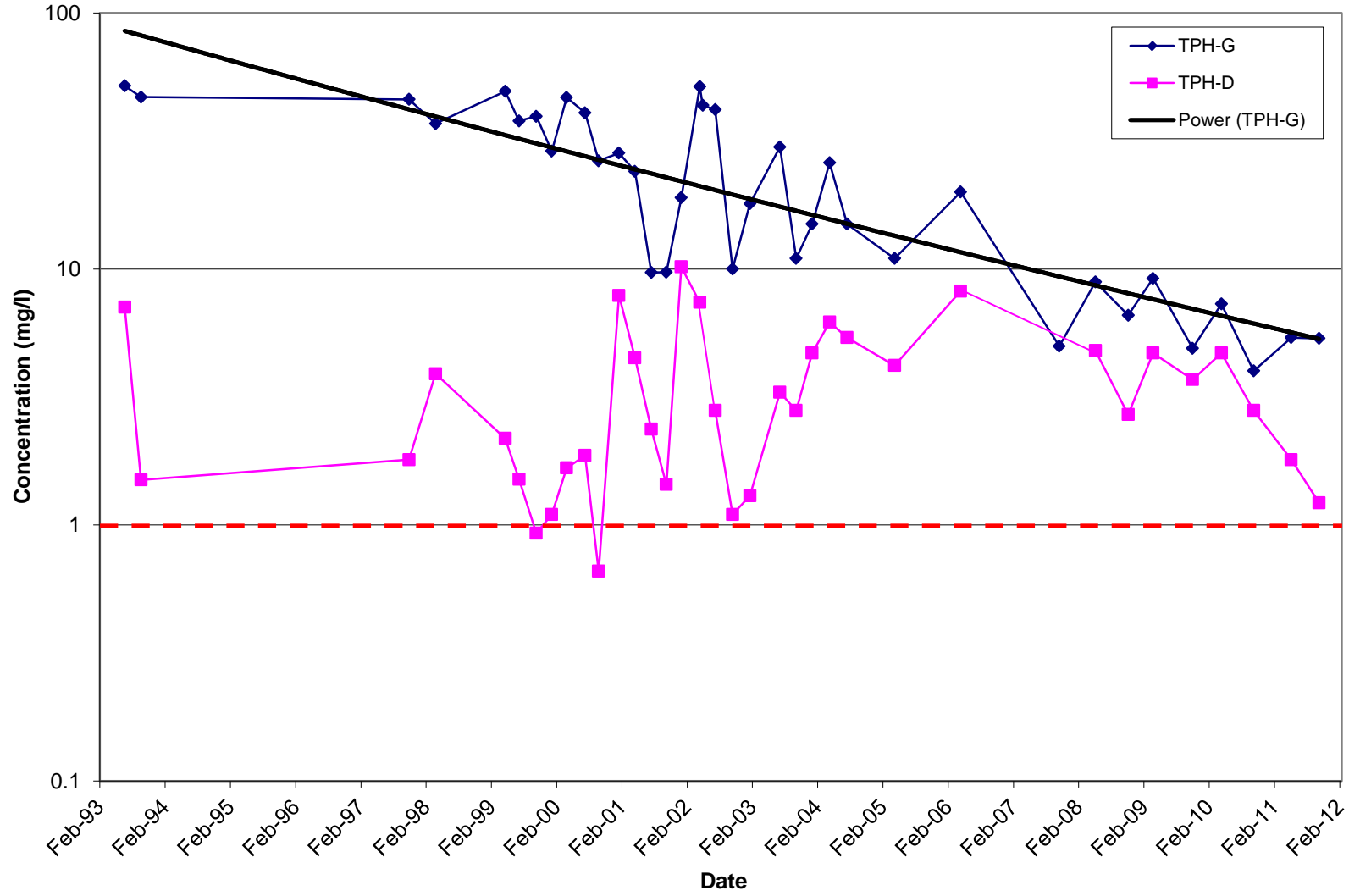
MW-214 Groundwater TPH Concentrations



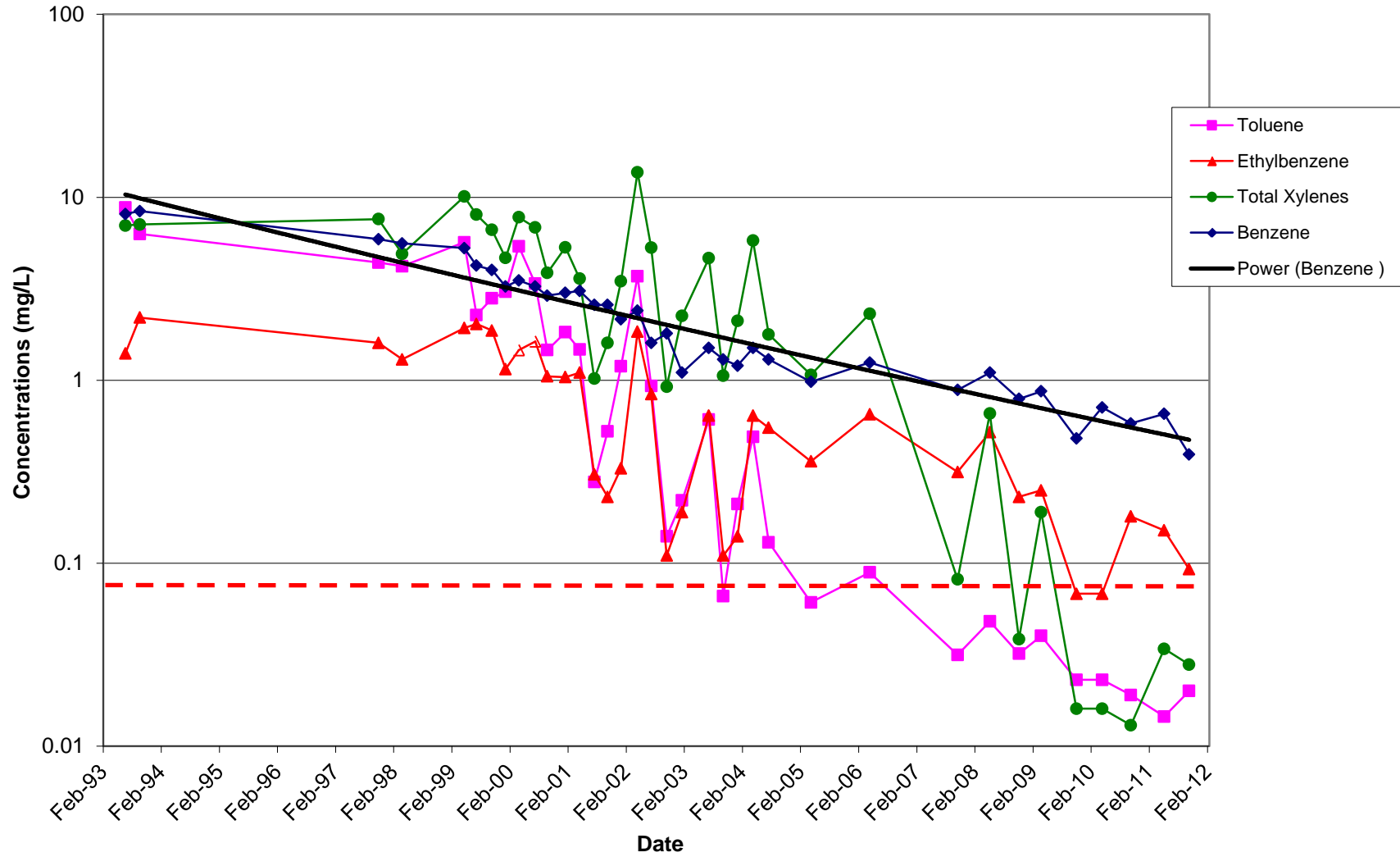
MW-214 Groundwater BTEX Concentrations



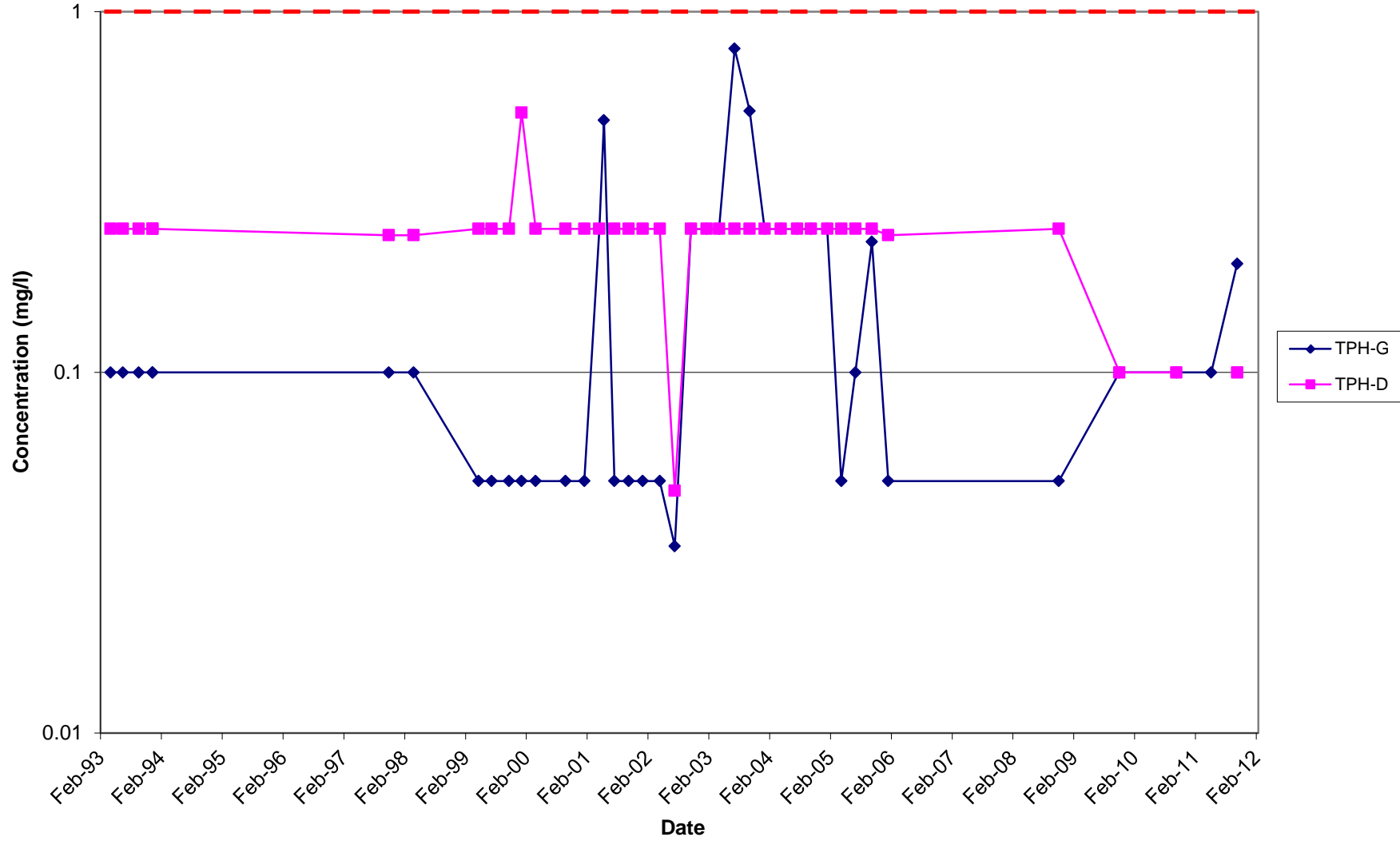
SH-04 Groundwater TPH Concentrations



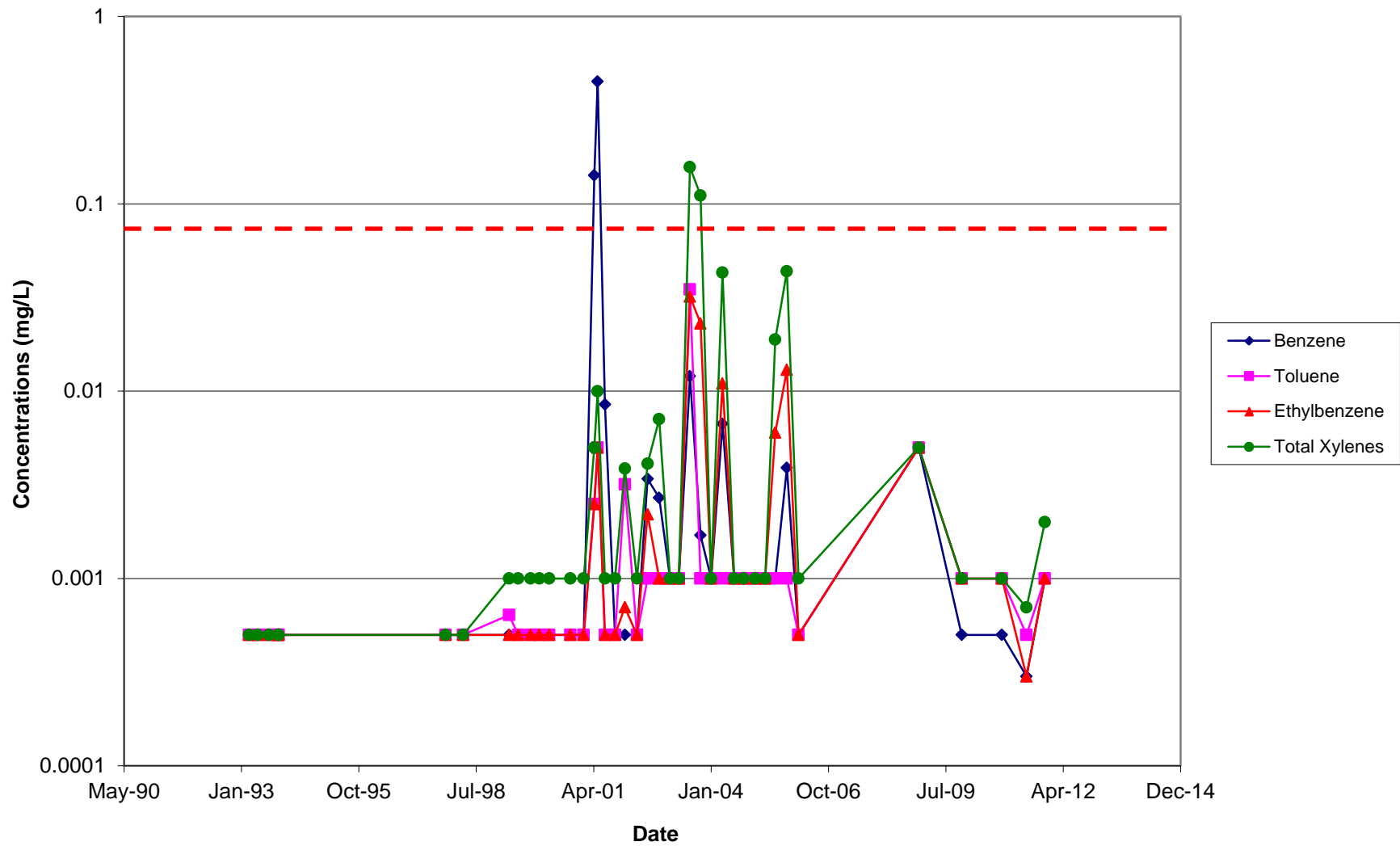
SH-04 Groundwater BTEX Concentrations



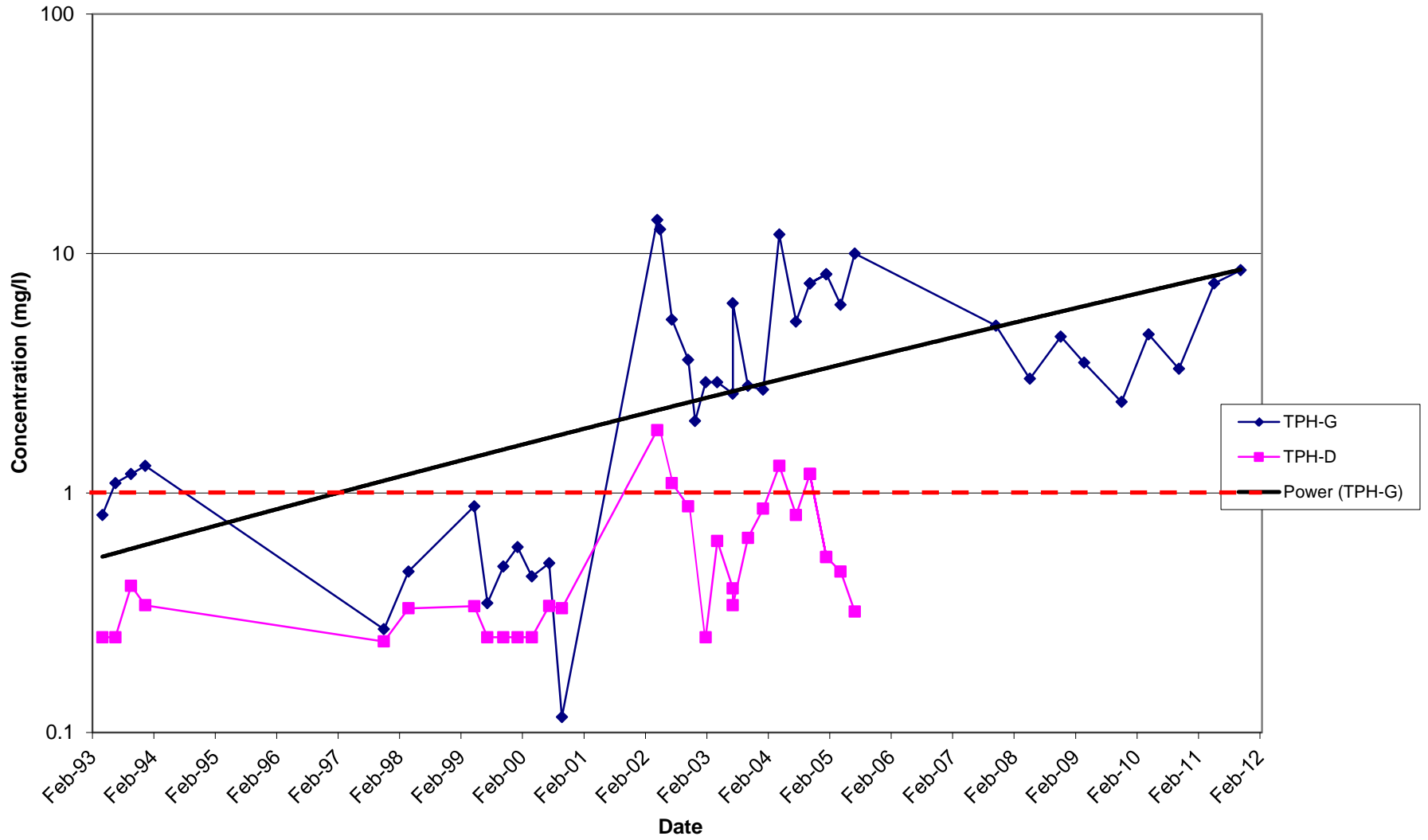
TES-MW-1 Groundwater TPH Concentrations



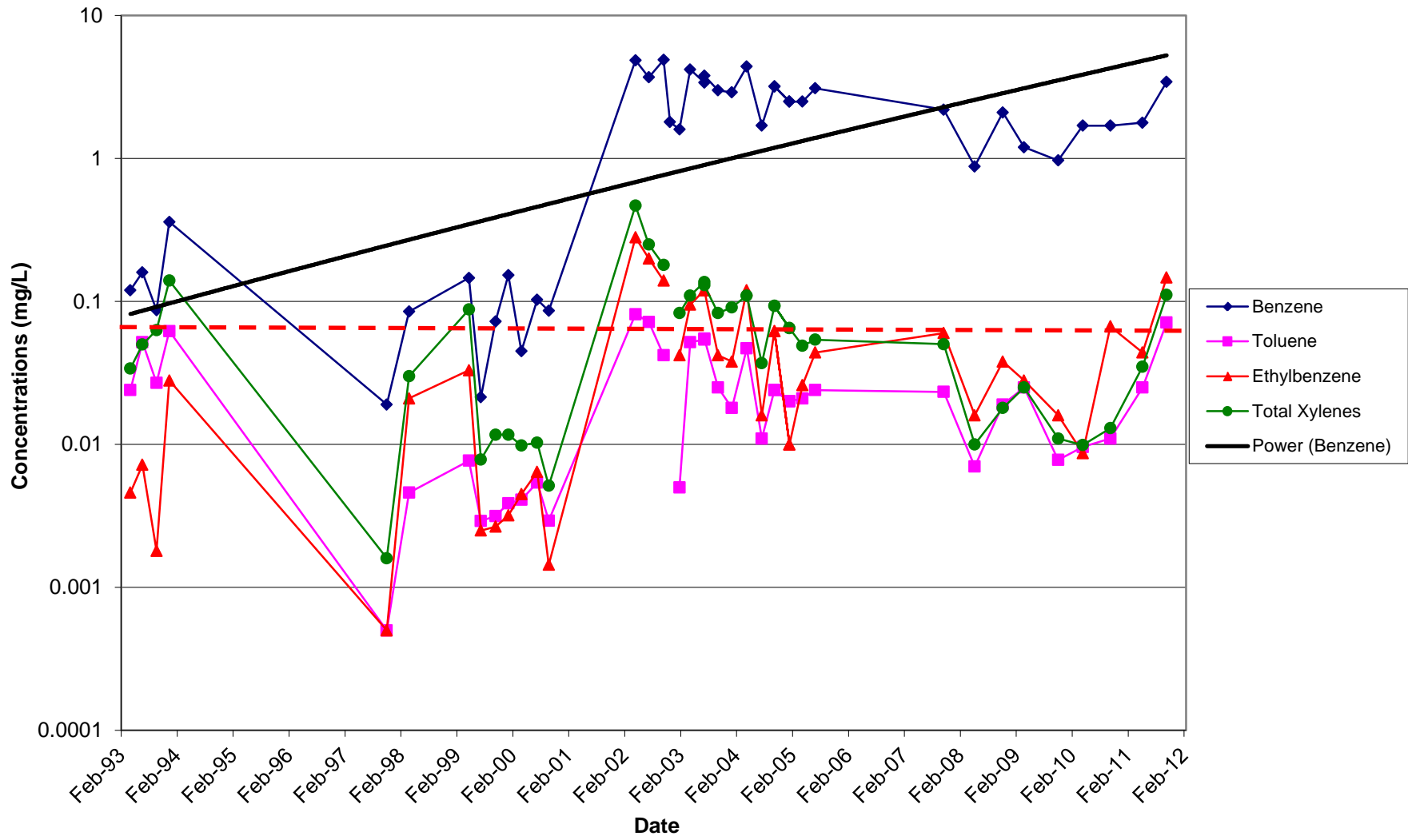
TES-MW-1 Groundwater BTEX Concentrations



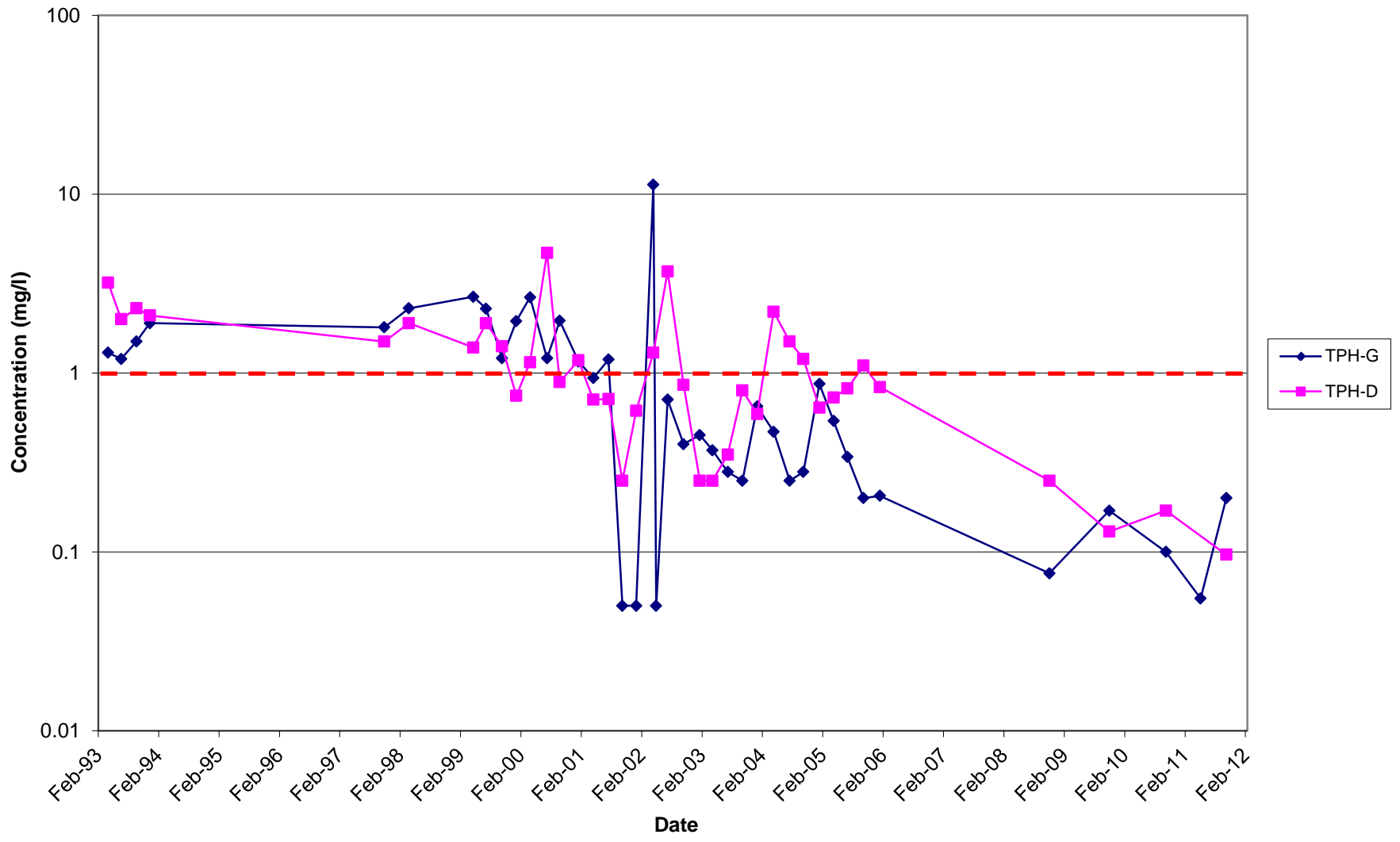
TX-03/TX-03A Groundwater TPH Concentrations



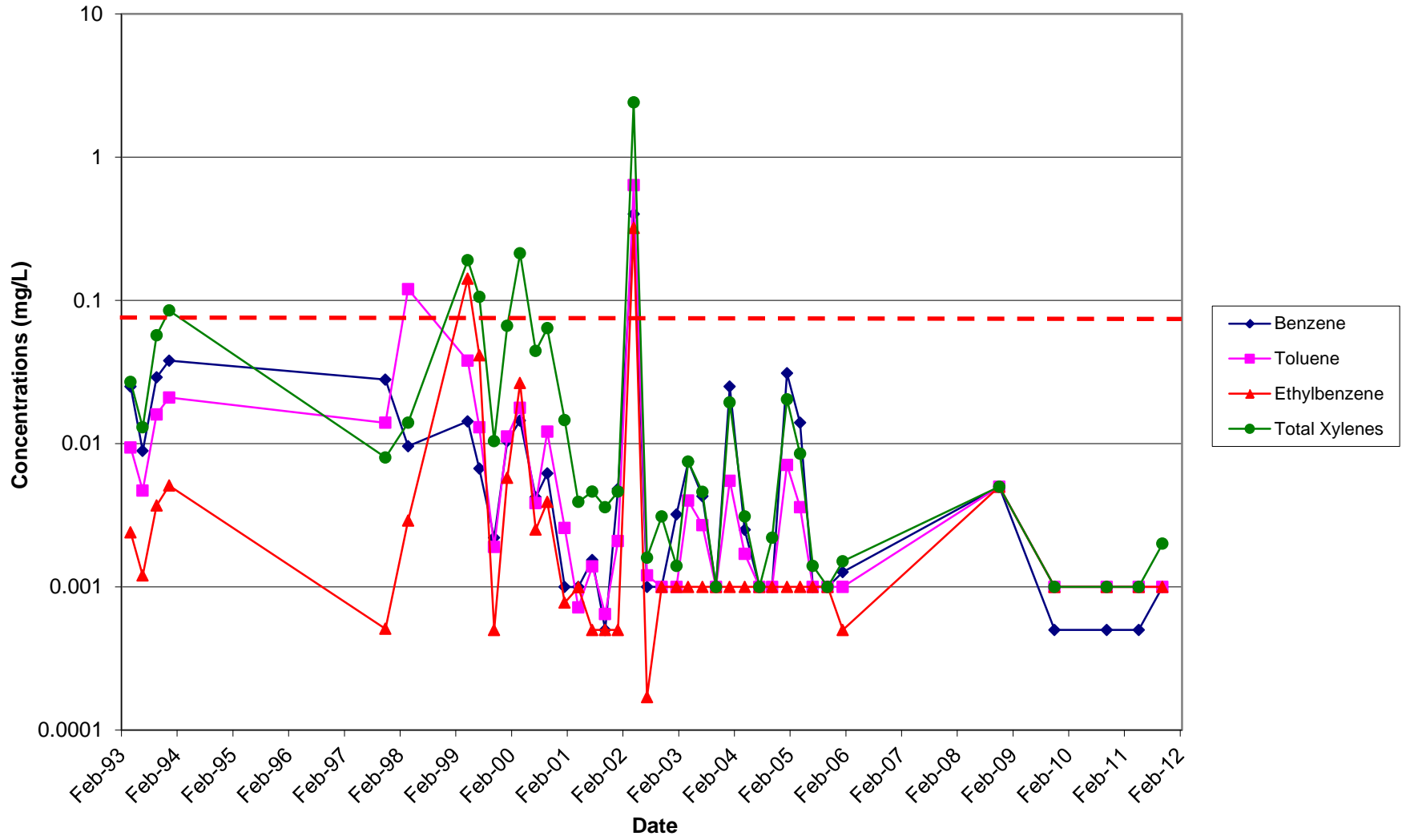
TX-03/TX-03A Groundwater BTEX Concentrations



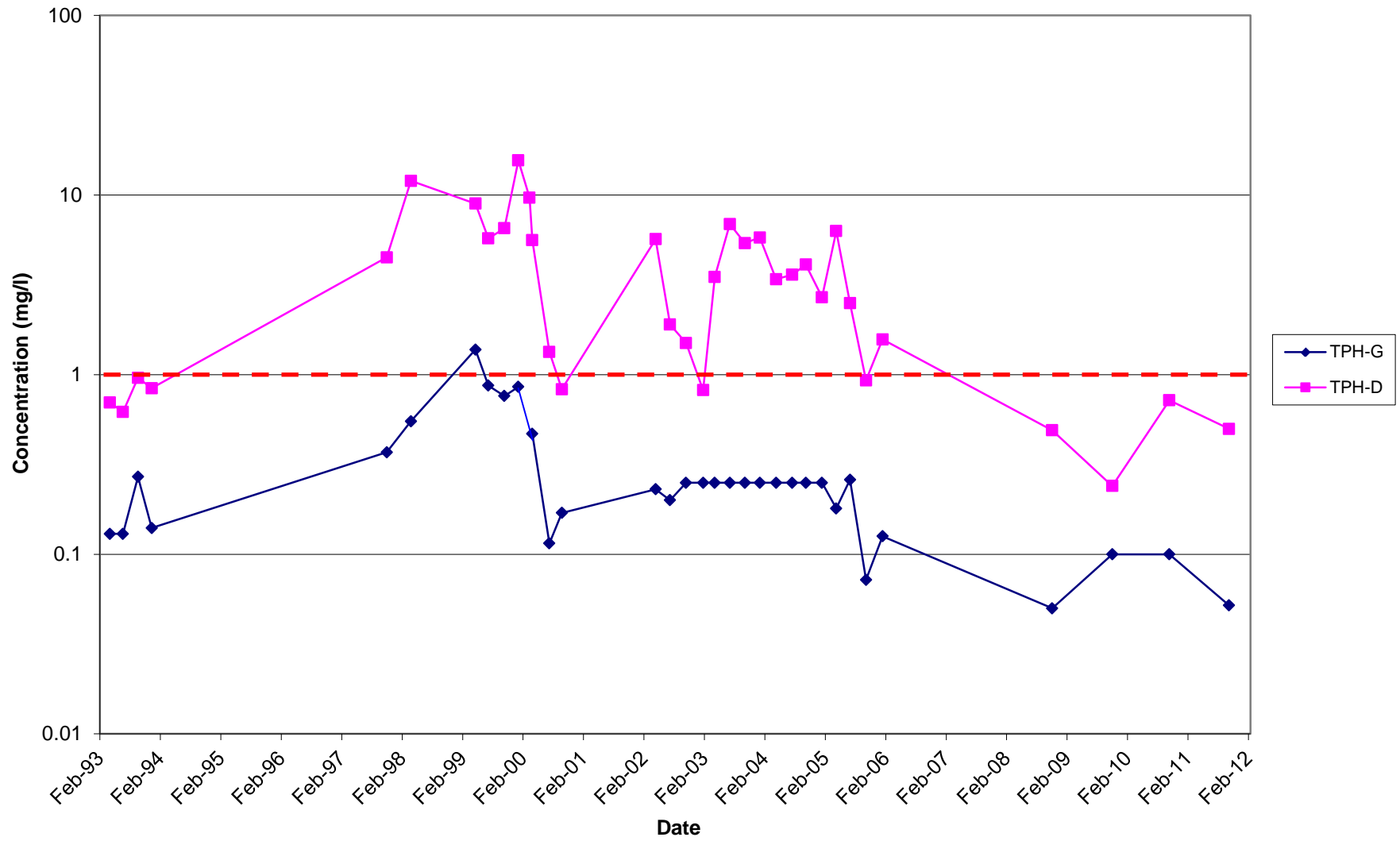
TX-04 Groundwater TPH Concentrations



TX-04 Groundwater BTEX Concentrations



TX-06/TX-06A Groundwater TPH Concentrations



TX-06/TX-06A Groundwater BTEX Concentrations

