

## **JULY 2015 PROGRESS REPORT**

### **WHIDBEY MARINE & AUTO SUPPLY SITE FREELAND, WASHINGTON**

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October 9, 2015

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## TABLE OF CONTENTS

<b>ACRONYMS AND ABBREVIATIONS.....</b>	<b>iii</b>
<b>1.0 INTRODUCTION.....</b>	<b>1-1</b>
<b>2.0 GROUNDWATER MONITORING AND SAMPLING.....</b>	<b>2-1</b>
2.1 FIELD METHODS .....	2-1
2.2 ANALYTICAL METHODS .....	2-1
2.3 GROUNDWATER MONITORING RESULTS .....	2-2
2.3.1 Groundwater Elevation .....	2-2
2.3.2 Analytical Results .....	2-2
2.3.3 LNAPL Monitoring .....	2-4
<b>3.0 SUMMARY AND DISCUSSION .....</b>	<b>3-1</b>
3.1 GROUNDWATER CONCENTRATION TRENDS.....	3-1
3.1.1 Perched Zone Monitoring Wells .....	3-1
3.1.2 Sea Level Aquifer Monitoring Wells.....	3-3
3.2 LNAPL MONITORING .....	3-4
3.3 RECOMMENDATIONS .....	3-5



## **FIGURES**

- Figure 1 *Site Vicinity Map*
- Figure 2 *Aerial Photograph Showing Monitoring Well Locations*
- Figure 3 *Site Plan Showing July 2015 Groundwater Elevation Contours and TPH and BTEX Concentrations in Groundwater-Perched Groundwater Zone*
- Figure 4 *Aerial Photograph Showing July 2015 Groundwater Elevation Contours and TPH and BTEX Concentrations in Groundwater Sea Level Aquifer*

## **TABLES**

- Table 1 *Groundwater Elevation Data*
- Table 2 *Summary of Laboratory Analytical Results for TPH and BTEX in Groundwater*

## **APPENDIX**

- Appendix A *Laboratory Analytical Report*



## ACRONYMS AND ABBREVIATIONS

BTEX	benzene, toluene, ethylbenzene, and xylenes
DRO	total petroleum hydrocarbons as diesel-range organics
Ecology	Washington State Department of Ecology
Farallon	Farallon Consulting, L.L.C.
GRO	total petroleum hydrocarbons as gasoline-range organics
LNAPL	light nonaqueous-phase liquid
MTCA	Washington State Model Toxics Control Act Cleanup Regulation
ORO	total petroleum hydrocarbons as oil-range organics
Site	the area on and down-gradient of the Whidbey Marine & Auto Supply facility where concentrations of petroleum hydrocarbon constituents in soil and/or groundwater exceed MTCA cleanup levels as a result of a release from the Whidbey Marine & Auto Supply facility



## EXECUTIVE SUMMARY

Farallon Consulting, L.L.C. (Farallon) has prepared this progress report to document the results of groundwater monitoring and sampling activities conducted in July 2015 at the Whidbey Marine & Auto Supply Site in Freeland, Washington. Periodic monitoring activities conducted from April through June 2015 also are discussed, including measurement of depth to groundwater in selected monitoring wells and measurement of the thickness of light nonaqueous-phase liquid (LNAPL) in monitoring well MW-9. LNAPL removal activities conducted at the Whidbey Marine & Auto Supply Site during the reporting period are also discussed in this progress report.

The Site is defined as the area on and down-gradient of the Whidbey Marine & Auto Supply facility where concentrations of petroleum hydrocarbon constituents in soil and/or groundwater exceed Washington State Model Toxics Control Act Cleanup Regulation (MTCA) cleanup levels as a result of a release from the Whidbey Marine & Auto Supply facility. Groundwater monitoring has been ongoing since December 2005 to assess the nature and extent of a release of unleaded gasoline at the Site.

Two groundwater zones are present at the Site: the Perched Groundwater Zone at approximately 55 feet below ground surface and the Sea Level Aquifer at approximately 100 to 105 feet below ground surface. Groundwater monitoring conducted at the Site on July 20 and 21, 2015 included measuring the depth to groundwater and collecting groundwater samples from four Perched Groundwater Zone and six Sea Level Aquifer monitoring wells. The groundwater flow direction determined from the July 2015 water level measurements was southwest in the Perched Groundwater Zone and southeast in the Sea Level Aquifer. These flow directions are consistent with those determined during previous monitoring events.

Total petroleum hydrocarbons as oil-range organics were detected at a concentration exceeding the MTCA Method A cleanup level in the groundwater sample collected from Perched Groundwater Zone monitoring well MW-2. Total petroleum hydrocarbons as gasoline-range organics (GRO) and as diesel-range organics (DRO) and benzene were detected at concentrations exceeding MTCA Method A cleanup levels in the groundwater samples collected from Perched Groundwater Zone monitoring well MW-4. Benzene was the only constituent detected at a concentration exceeding the MTCA Method A cleanup level in the groundwater sample collected from Perched Groundwater Zone monitoring well MW-6. GRO and benzene were detected at concentrations exceeding MTCA Method A cleanup levels in the groundwater sample collected from Perched Groundwater Zone monitoring well MW-8. In general, the concentrations of GRO and benzene, toluene, ethylbenzene, and xylenes detected in groundwater samples collected from the Perched Zone monitoring wells during the July 2015 monitoring event were the lowest detected to date.



None of the constituents analyzed for was detected at concentrations exceeding MTCA Method A cleanup levels in the groundwater samples collected from Sea Level Aquifer monitoring wells MW-11 and MW-14 through MW-16.

DRO, GRO, toluene, ethylbenzene, and xylenes were detected at concentrations exceeding MTCA Method A cleanup levels in groundwater samples collected from Sea Level Aquifer monitoring wells MW-12 and MW-13. Benzene also was detected at a concentration exceeding the MTCA Method A cleanup level in the groundwater sample collected from monitoring well MW-13.

The highest concentrations of GRO, benzene, toluene, ethylbenzene, and xylenes over the past year have been detected in groundwater samples collected from Sea Level Aquifer monitoring well MW-13. None of the constituents analyzed for was detected at concentrations exceeding laboratory reporting limits in the groundwater samples collected from monitoring well MW-11 during the last two monitoring events. In five rounds of sampling conducted since December 2013, none of the constituents analyzed for has been detected in groundwater samples collected from monitoring wells MW-15 or MW-16, the two Site monitoring wells farthest down-gradient in the Sea Level Aquifer. During the July 2015 monitoring event, toluene was detected in the sample collected from monitoring well MW-14; however, the concentration was significantly less than the MTCA cleanup level.

LNAPL was detected only once in monitoring well MW-9 during last three periodic LNAPL monitoring and removal events conducted at the Site between April 30 and July 20, 2015. Continued periodic monitoring of groundwater conditions is recommended to assess the distribution of contaminants of concern and evaluate whether implementation of alternative methods for removal of LNAPL from monitoring well MW-9 is warranted. Additional details of the recent groundwater monitoring and sampling activities at the Site are provided herein.



## 1.0 INTRODUCTION

Farallon Consulting, L.L.C. (Farallon) has prepared this progress report to document the status of the cleanup action for the release of gasoline from the underground storage tank system at the former Whidbey Marine & Auto Supply facility at 1689 Main Street in Freeland, Washington (Figure 1). The Site is defined as the area on and down-gradient of the Whidbey Marine & Auto Supply facility where concentrations of petroleum hydrocarbon constituents in soil and/or groundwater exceed Washington State Model Toxics Control Act Cleanup Regulation (MTCA) cleanup levels as a result of a release from the Whidbey Marine & Auto Supply facility. The cleanup action at the Site is being conducted under the Washington State Department of Ecology (Ecology) Voluntary Cleanup Program and in accordance with the provisions of MTCA, as established in Chapter 173-340 of the Washington Administrative Code. The Site has been assigned Voluntary Cleanup Program Identification No. NW1529 by Ecology.

This progress report presents the results of the Site-wide groundwater monitoring and sampling activities conducted in July 2015. The work was conducted in accordance with the technical memorandum regarding Scope of Work for 2015 Cleanup Action Activities, Whidbey Marine & Auto Supply Site, Freeland Washington dated January 14, 2015, prepared by Farallon (2015 Scope of Work). Periodic monitoring activities conducted from April through June 2015 also are discussed, including measurement of depth to groundwater in selected monitoring wells, measurement of the thickness of light nonaqueous-phase liquid (LNAPL) in monitoring well MW-9, and LNAPL removal activities.

The report is organized as follows:

- Section 2 describes the July 2015 groundwater monitoring and sampling activities and results, and the periodic LNAPL monitoring and removal activities conducted between April and July 2015; and
- Section 3 presents a summary and discussion of the groundwater monitoring activities, and recommendations for additional work.



## **2.0 GROUNDWATER MONITORING AND SAMPLING**

Two groundwater zones are present at the Site: the Perched Groundwater Zone at approximately 55 feet below ground surface and the Sea Level Aquifer at approximately 100 to 105 feet below ground surface. The groundwater monitoring conducted at the Site on July 20 and 21, 2015 included measuring the depth to groundwater at the monitoring wells at the Site, and collecting groundwater samples from Perched Groundwater Zone monitoring wells MW-2, MW-4, MW-6, and MW-8, and from Sea Level Aquifer monitoring wells MW-11 through MW-16 (Figure 2). The work was conducted in accordance with the 2015 Scope of Work. Details of the field activities and the results for the July 2015 monitoring and sampling event are presented below.

### **2.1 FIELD METHODS**

Prior to sampling, Farallon measured the depth to groundwater in each monitoring well using an electronic water-level indicator. The monitoring wells were opened, and the water levels were allowed to equilibrate prior to measurement. The groundwater level in each monitoring well was measured to the surveyed reference point on the top of the well casing to derive the groundwater elevation at each location to an accuracy of 0.01 foot. An oil-water interface probe was used to measure the depth to water and the potential thickness of LNAPL in monitoring wells MW-7, MW-9, MW-12, and MW-13. The oil-water interface probe was not used in the other monitoring wells at the Site to minimize the potential for cross-contamination of groundwater.

Monitoring well MW-2 was sampled using a dedicated disposable 0.75-inch-diameter polyethylene bailer to bypass a blockage caused by broken tubing in the well. The remainder of the monitoring wells were sampled using a bladder pump and dedicated disposable bladders. During groundwater purging for the monitoring wells sampled with the bladder pump, field measurements were collected for pH, temperature, specific conductivity, dissolved oxygen, and oxidation-reduction potential using Horiba Model U5000 or YSI Model MPS 556 water-quality analyzers equipped with flow-through cells. Groundwater was purged at a flow rate of approximately 200 milliliters per minute, where feasible. Groundwater samples were collected after the pH, temperature, and specific conductivity parameters stabilized. Stabilization was defined for pH as a change of  $\pm 0.1$  pH unit between readings for three consecutive measurements, and for temperature and specific conductivity as a relative percent difference of less than 3 percent. With the exception of monitoring well MW-2, groundwater samples were collected by pumping groundwater directly from each well through dedicated polyethylene tubing into laboratory-prepared containers. The groundwater samples were labeled, placed on ice, and transported in accordance with chain-of-custody protocols to ALS Environmental laboratories in Everett, Washington for analysis.

### **2.2 ANALYTICAL METHODS**

The groundwater samples were analyzed for total petroleum hydrocarbons as gasoline-range organics (GRO) by Northwest Method NWTPH-Gx, and for benzene, toluene, ethylbenzene, and





xylenes (BTEX) by U.S. Environmental Protection Agency Method 8021B. The groundwater samples collected from monitoring wells MW-2, MW-4, MW-12, and MW-13 also were analyzed for total petroleum hydrocarbons as diesel-range organics (DRO) and as oil-range organics (ORO) by Northwest Method NWTPH-Dx.

## **2.3 GROUNDWATER MONITORING RESULTS**

Table 1 presents a summary of the groundwater elevation data for the Site. Table 2 presents groundwater analytical results for DRO, ORO, GRO, and BTEX for the July 2015 and previous monitoring events, along with a comparison to corresponding MTCA Method A cleanup levels. A copy of the laboratory analytical report for the July 2015 groundwater monitoring event is provided in Appendix A.

### **2.3.1 Groundwater Elevation**

Groundwater elevations measured in the Perched Groundwater Zone at the Site on July 20, 2015 ranged from 66.14 feet above mean sea level (msl) in monitoring well MW-1 to 59.33 feet msl in monitoring well MW-6 (Table 1). The corresponding depths to groundwater measured below the top of the well casings were 50.50 and 57.23 feet for monitoring wells MW-1 and MW-6, respectively. Groundwater elevation contours for the Perched Groundwater Zone based on the water levels measured on July 20, 2015 are shown on Figure 3. The general groundwater flow direction in the Perched Groundwater Zone at the Site is west, with a hydraulic gradient of approximately 0.02 foot per foot in the eastern portion of the former Whidbey Marine & Auto Supply facility, and a considerably steeper gradient of 0.11 foot per foot to the west (Figure 3).

Groundwater elevations measured in the Sea Level Aquifer at the Site on July 20, 2015 ranged from 12.66 feet msl in monitoring well MW-10 to 12.15 feet msl in monitoring well MW-16 (Table 1). The corresponding depths to groundwater measured below the top of the well casings were 100.79 and 104.77 feet for monitoring wells MW-10 and MW-16, respectively. Groundwater elevation contours for the Sea Level Aquifer based on the water levels measured on July 20, 2015 are shown on Figure 4. The general groundwater flow direction in the Sea Level Aquifer at the Site was southeast based on the July 20, 2015 measurements, with a gradient of 0.001 foot per foot (Figure 3).

### **2.3.2 Analytical Results**

The groundwater analytical results for the Perched Groundwater Zone and the Sea Level Aquifer for the July 2015 monitoring event are presented in Table 2 and on Figures 3 and 4, respectively. The results are summarized below.

#### **2.3.2.1 Perched Zone Monitoring Wells**

The analytical results for the Perched Zone monitoring wells sampled during the July 2015 monitoring event at the Site are as follows:



- **Monitoring Well MW-2:** ORO was detected at a concentration exceeding the MTCA Method A cleanup level in the groundwater sample collected from monitoring well MW-2. DRO was not detected at a concentration exceeding laboratory reporting limits in the groundwater samples collected during the July 2015 monitoring event; however, the laboratory reporting limit of 1,000 micrograms per liter for the DRO analysis exceeded the MTCA Method A cleanup level of 500 micrograms per liter. The elevated laboratory reporting limit was due to required dilutions for the analyses as a result of the concentration of ORO in the sample. GRO, toluene, ethylbenzene, and xylenes were not detected at concentrations exceeding laboratory reporting limits in the groundwater samples collected. Benzene was detected at a concentration exceeding laboratory reporting limits but less than the MTCA Method A cleanup level. The laboratory report for the July 2015 monitoring event noted that the chromatogram indicated that the sample likely contained an unidentified oil-range product and that the diesel result was biased high due to overlap from the oil range.
- **Monitoring Well MW-4:** DRO, GRO, and benzene were detected at concentrations exceeding MTCA Method A cleanup levels in the groundwater samples collected. The laboratory report for the July 2015 monitoring event noted that the chromatogram indicated that the sample likely contained highly weathered gasoline and an unidentified oil-range product, and that the diesel result was biased high due to overlap from the gasoline range.
- **Monitoring Well MW-6:** Benzene was the only constituent detected at a concentration exceeding MTCA Method A cleanup levels in the groundwater samples collected. The laboratory report for the July 2015 monitoring event noted that the chromatogram indicated that the sample likely contained highly weathered gasoline.
- **Monitoring Well MW-8:** GRO and benzene were the only constituents detected at concentrations exceeding MTCA Method A cleanup levels in the groundwater samples collected. The laboratory report for the July 2015 monitoring event noted that the chromatogram indicated that the sample likely contained highly weathered gasoline.

#### 2.3.2.2 Sea Level Aquifer Monitoring Wells

The analytical results for the Sea Level Aquifer monitoring wells sampled during the July 2014 monitoring event at the Site are as follows:

- **Monitoring Wells MW-11, MW-15, and MW-16:** None of the constituents analyzed for was detected at concentrations at or exceeding laboratory reporting limits in the groundwater samples collected.
- **Monitoring Well MW-12:** DRO, GRO, toluene, ethylbenzene, and xylenes were detected at concentrations exceeding MTCA Method A cleanup levels in the



groundwater samples collected. The laboratory reporting limit for benzene also exceeded the MTCA Method A cleanup level. The laboratory report for the July 2015 monitoring event noted that the chromatogram indicated that the sample likely contained highly weathered gasoline, weathered diesel, and an unidentified oil-range product, and that the diesel result was biased high due to overlap from the gasoline range.

- **Monitoring Well MW-13:** DRO, GRO, and each of the BTEX constituents were detected at concentrations exceeding MTCA Method A cleanup levels in the groundwater samples collected. The laboratory report for the July 2015 monitoring event noted that the chromatogram indicated that the sample likely contained lightly weathered gasoline and weathered diesel, and that the diesel result was biased high due to overlap from the gasoline range.
- **Monitoring Well MW-14:** None of the constituents analyzed for was detected at concentrations exceeding MTCA Method A cleanup levels in the groundwater samples collected. Toluene was the only constituent detected at a concentration exceeding the laboratory reporting limit in the groundwater samples collected; however, the concentration was significantly less than the MTCA Method A cleanup level.

### 2.3.3 LNAPL Monitoring

Farallon initiated LNAPL monitoring and removal activities following the discovery of LNAPL in monitoring well MW-9 in September 2013. LNAPL monitoring was conducted at monitoring well MW-9 on April 30 and June 5, 2015 and during the July 2015 groundwater monitoring and sampling event. LNAPL was not detected during the April 30, 2015 monitoring event. A hydrophobic petroleum-sorbent sock that had previously been placed in the monitoring well appeared free of LNAPL. The sock was not replaced following gauging during the April 2015 monitoring event to allow an evaluation of LNAPL accumulation without the influence of the sock sorption.

Approximately 0.05 foot of LNAPL was measured in monitoring well MW-9 during the June 5, 2015 monitoring event. Approximately 2 gallons of groundwater and LNAPL were bailed from monitoring well MW-9 following gauging during the June 2015 monitoring event. A hydrophobic petroleum-sorbent sock was not placed in the well following bailing to allow further evaluation of LNAPL accumulation.

LNAPL was not detected with the oil-water interface in monitoring well MW-9 on July 20, 2015. A disposable bailer was used to remove groundwater from the upper water column well for visual observation. A thin, discontinuous layer of LNAPL was observed. A hydrophobic petroleum-sorbent sock was not placed in the well during the July 2015 monitoring event to allow further evaluation of LNAPL accumulation. The removed groundwater and LNAPL were placed into a drum in the fenced and locked remediation compound area behind the former Whidbey Marine & Auto Supply facility. Monitoring wells MW-7, MW-12, and MW-13 were



gauged for the presence of LNAPL on July 20, 2015 and LNAPL was not detected in these wells.



### **3.0 SUMMARY AND DISCUSSION**

This section presents a summary of analytical results and a general discussion of trends in contaminant concentrations for monitoring wells sampled during the July 2015 monitoring event. Also included are recommendations for additional work at the Site.

#### **3.1 GROUNDWATER CONCENTRATION TRENDS**

##### **3.1.1 Perched Zone Monitoring Wells**

The concentrations of GRO and BTEX continue to attenuate in the groundwater samples collected from the Perched Zone monitoring wells. In general, the concentrations of GRO and BTEX detected in groundwater samples collected from the Perched Zone monitoring wells during the July 2015 monitoring event were the lowest detected to date. Additional discussion of contaminant trends in the Perched Zone monitoring wells is provided below, by monitoring well.

###### **3.1.1.1 Monitoring Well MW-1**

Monitoring well MW-1 was not sampled during the July 2015 monitoring event. None of the constituents analyzed for has been detected at concentrations exceeding MTCA Method A cleanup levels in groundwater samples obtained from monitoring well MW-1 since January 2007. Prior operation of the soil vapor extraction system at the Site appears to have successfully reduced the contaminant mass flux from vadose zone soil to groundwater in the area of monitoring well MW-1. Monitoring well MW-1 was plumbed to the soil vapor extraction system.

###### **3.1.1.2 Monitoring Well MW-2**

Prior to the July 2015 monitoring event, monitoring well MW-2 had not been sampled since March 2014 due to the presence of an obstruction in the well. GRO and BTEX have been detected at concentrations less than MTCA Method A cleanup levels in groundwater samples collected from monitoring well MW-2 since March 2011. The prior chemical oxidant injection activities appear to have significantly reduced GRO and BTEX concentrations in groundwater near this monitoring well.

DRO and ORO were detected at concentrations exceeding MTCA Method A cleanup levels in groundwater samples collected during the December 2013 monitoring event. DRO or ORO had not been analyzed for in groundwater samples collected from this or the other Perched Groundwater Zone monitoring wells prior to the December 2013 monitoring event. ORO was detected also in groundwater samples collected from monitoring well MW-2 during the March 2014 and July 2015 monitoring events. DRO was not detected at a concentration exceeding laboratory reporting limits during the March 2014 or July 2015 monitoring events; however, reporting limits exceeded the MTCA Method A cleanup level.



The source of ORO detected in groundwater samples collected from monitoring well MW-2 is unknown, but appears anomalous given the lack of detections in adjacent Perched Groundwater Zone monitoring wells. The laboratory report narratives for July 2014 and July 2015 noted that the chromatograms indicated that the samples contained an unidentified oil-range product.

#### **3.1.1.3 Monitoring Well MW-3**

Monitoring well MW-3 was not sampled during the July 2015 monitoring event. None of the constituents analyzed for has been detected at concentrations exceeding laboratory reporting limits or MTCA Method A cleanup levels in groundwater samples collected from monitoring well MW-3 since the well was installed in 2005.

#### **3.1.1.4 Monitoring Well MW-4**

After a significant reduction in GRO and xylene concentrations following completion of the in-situ chemical oxidant injections in 2011, these constituents rebounded to the pre-injection magnitude of concentrations by the December 2013 monitoring event. GRO, ethylbenzene, and xylene concentrations decreased between December 2013 and July 2014, followed by a continued and marked decrease between July 2014 and July 2015. Concentrations of ethylbenzene and toluene have been less than MTCA Method A cleanup levels for the past five to seven monitoring events, respectively.

#### **3.1.1.5 Monitoring Well MW-6**

The concentrations of GRO and xylenes detected in groundwater samples collected from monitoring well MW-6 during the December 2013 monitoring event decreased to about one-half the levels detected in May 2012, and were the lowest detected since the monitoring well was installed in early 2008. Although GRO, ethylbenzene, and xylene concentrations increased slightly between December 2013 and July 2014, the concentrations of each of these constituents decreased significantly between July 2014 and July 2015. GRO, toluene, and ethylbenzene concentrations were less than MTCA Method A cleanup levels during the July 2015 monitoring event.

#### **3.1.1.6 Monitoring Well MW-8**

The concentrations of GRO, ethylbenzene, and xylenes detected in groundwater samples collected from monitoring well MW-8 have been decreasing steadily since November 2011. During the July 2015 monitoring event, the concentration of benzene increased to a level exceeding the laboratory reporting limit for the first time since the monitoring well was installed in 2008. Toluene has been detected at concentrations less than the MTCA Method A cleanup level in groundwater samples collected from monitoring well MW-8 since October 2010. The GRO, ethylbenzene, and xylenes concentrations detected during the July 2015 monitoring event were the lowest since the well was installed in 2008.



### **3.1.2 Sea Level Aquifer Monitoring Wells**

Contaminant trends and LNAPL thickness observations in the Sea Level Aquifer monitoring wells are discussed below, by monitoring well.

#### **3.1.2.1 Monitoring Well MW-9**

LNAPL thickness in monitoring well MW-9 has varied from 0.98 foot in September 2012 to less than 0.01 foot in June and July 2013 and April and July 2015. LNAPL thicknesses measured during the February and March 2015 monitoring events were 0.01 and 0.02 foot, respectively. The maximum LNAPL thickness measured during 2015 monitoring events was 0.05 foot on June 5.

#### **3.1.2.2 Monitoring Well MW-10**

None of the constituents analyzed for has been detected at concentrations exceeding MTCA Method A cleanup levels in groundwater samples collected from monitoring well MW-10 since the well was installed in 2009.

#### **3.1.2.3 Monitoring Well MW-11**

The maximum concentrations of GRO and BTEX constituents in monitoring well MW-11 were detected in May 2011 following a steady rise in concentrations from the time the well was installed in early 2009. GRO and BTEX constituent concentrations detected in groundwater samples collected from this well during the December 2013 monitoring event were significantly reduced relative to previous events. Concentrations of each of these constituents were less than laboratory reporting limits during the February and July 2015 monitoring events.

#### **3.1.2.4 Monitoring Well MW-12**

DRO, GRO, toluene, ethylbenzene, and xylenes were detected at concentrations exceeding MTCA Method A cleanup levels during the July 2015 monitoring event. In addition, the laboratory reporting limit for benzene exceeded the MTCA Method A cleanup level during this monitoring event. GRO and BTEX constituent concentrations detected in groundwater samples collected from monitoring well MW-12 during the July 2015 monitoring event were the lowest since the well was installed in 2009. The DRO, GRO, toluene, ethylbenzene, and xylenes concentrations detected during the July 2015 monitoring event were approximately one-half those detected during the previous monitoring event in February 2015.

In addition to weathered gasoline, the July 2015 and previous laboratory reports for monitoring well MW-12 typically have noted that the chromatograms indicate that the samples likely have contained weathered diesel and an unidentified oil-range or lube oil product. The source for the diesel or oil-range petroleum hydrocarbons is unknown.





### **3.1.2.5 Monitoring Well MW-13**

DRO, GRO, and each of the BTEX constituents were detected at concentrations exceeding MTCA Method A cleanup levels in monitoring well MW-13 during the July 2015 monitoring event. A quality assurance/quality control (QA/QC) duplicate sample was collected from monitoring well MW-13 during the July 2015 monitoring event and the results for the duplicate analyses were higher than the results for the initial groundwater samples collected from the well. The GRO and BTEX concentrations detected in the QA/QC duplicate groundwater samples collected from monitoring well MW-13 during the July 2015 monitoring event were similar to those detected in the groundwater samples collected in February 2015. The reason for the increase in concentrations between the initial and QA/QC duplicate samples is unclear; QA/QC duplicate samples collected from monitoring well MW-13 on three previous occasions showed results very similar to the corresponding initial samples.

In addition to weathered gasoline, the July 2015 and previous laboratory reports for monitoring well MW-13 typically have noted that the chromatograms indicate that the samples likely have contained weathered diesel. The source for the diesel-range petroleum hydrocarbons is unknown.

### **3.1.2.6 Monitoring Well MW-14**

Toluene was detected at a concentration exceeding the laboratory reporting limit, but considerably less than the MTCA Method A cleanup level in the groundwater sample collected from monitoring well MW-14 during the July 2015 monitoring event. Low concentrations of toluene have been detected in groundwater samples collected from monitoring well MW-14 since July 2014.

### **3.1.2.7 Monitoring Wells MW-15 and MW-16**

None of the constituents analyzed for has been detected at concentrations at or exceeding laboratory reporting limits in groundwater samples collected from monitoring wells MW-15 or MW-16 since the wells were installed in December 2013.

## **3.2 LNAPL MONITORING**

A detectable thickness of LNAPL was only measured in monitoring well MW-9 in one of the last three monitoring events conducted at the Site between April 30 and July 20, 2015. An LNAPL thickness of 0.05 foot was measured in monitoring well MW-9 on June 5, 2015. Farallon previously recommended installation of a 2-inch-diameter passive LNAPL skimmer pump for more-efficient recovery of LNAPL from monitoring well MW-9. However, a minimum initial LNAPL thickness of 0.25 inch (0.02 foot) is recommended for installation of the skimmer pumps researched. It does not appear that the current LNAPL thickness is sufficient for recovery of LNAPL using this technology.





### 3.3 RECOMMENDATIONS

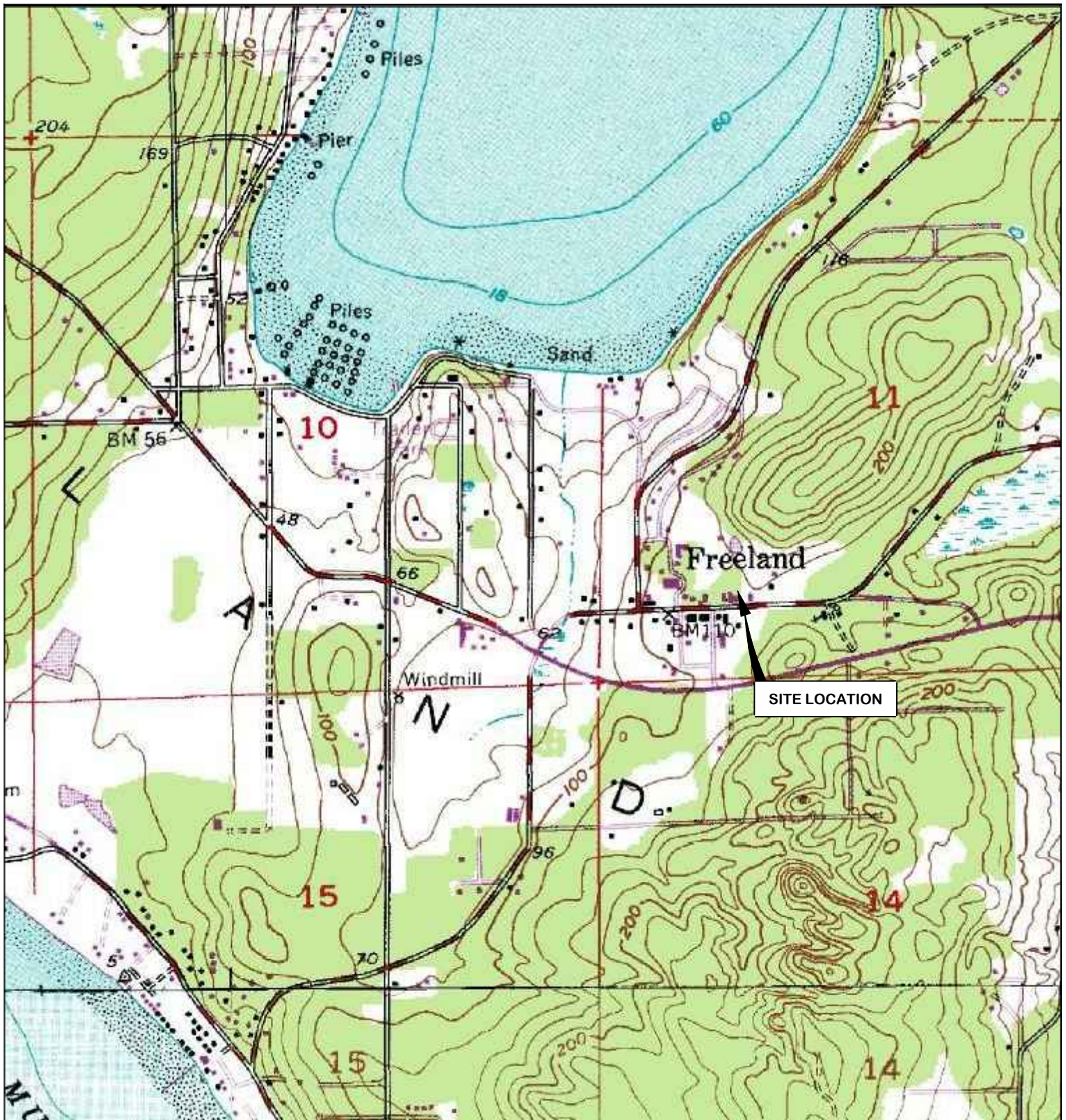
Monitoring and sampling of select Sea Level Aquifer monitoring wells is recommended for October 2015. The monitoring wells from which groundwater samples will be collected for chemical analyses during the October 2015 monitoring event include Sea Level Aquifer monitoring wells MW-11 through MW-16 in accordance with the 2015 Scope of Work. Monitoring wells MW-1 through MW-4 and MW-6 through MW-10 will be monitored for water level measurements only during the October 2015 monitoring event. Monitoring well MW-5 has been dry since installation. Monitoring wells MW-9, MW-12, and MW-13 also will be monitored for the presence of LNAPL during the October 2015 monitoring event.

Farallon recommends continued monitoring of LNAPL thickness in monitoring well MW-9, and removal if a sufficient thickness is encountered. If a sustained thickness of LNAPL greater than the minimum initial LNAPL thickness of 0.25 inch recommended for installation of a skimmer pump is encountered for several consecutive monitoring events, a passive skimmer pump will be installed as previously recommended for more-efficient recovery of LNAPL from monitoring well MW-9.

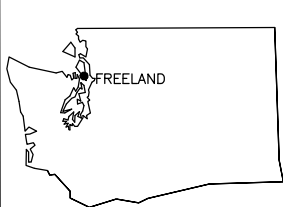
## **FIGURES**

### **JULY 2015 PROGRESS REPORT Whidbey Marine & Auto Supply Site Freeland, Washington**

Farallon PN: 454-001



REFERENCE: 7.5 MINUTE USGS QUADRANGLE FREELAND, WASHINGTON. DATED 1993



WASHINGTON





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**FIGURE 1**  
SITE VICINITY MAP  
WHIDBEY MARINE & AUTO SUPPLY SITE  
FREELAND, WASHINGTON

FARALLON PN: 454-001

Drawn By: DEW

Checked By: PJ

Date: 7/11/07

Disk Reference: 454001





LEGEND

- PERCHED ZONE MONITORING WELL
- SEA LEVEL AQUIFER MONITORING WELL





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**FIGURE 2**

AERIAL PHOTOGRAPH SHOWING  
MONITORING WELL LOCATIONS  
WHIDBEY MARINE & AUTO SUPPLY SITE  
FREELAND, WASHINGTON

FARALLON PN: 454-001

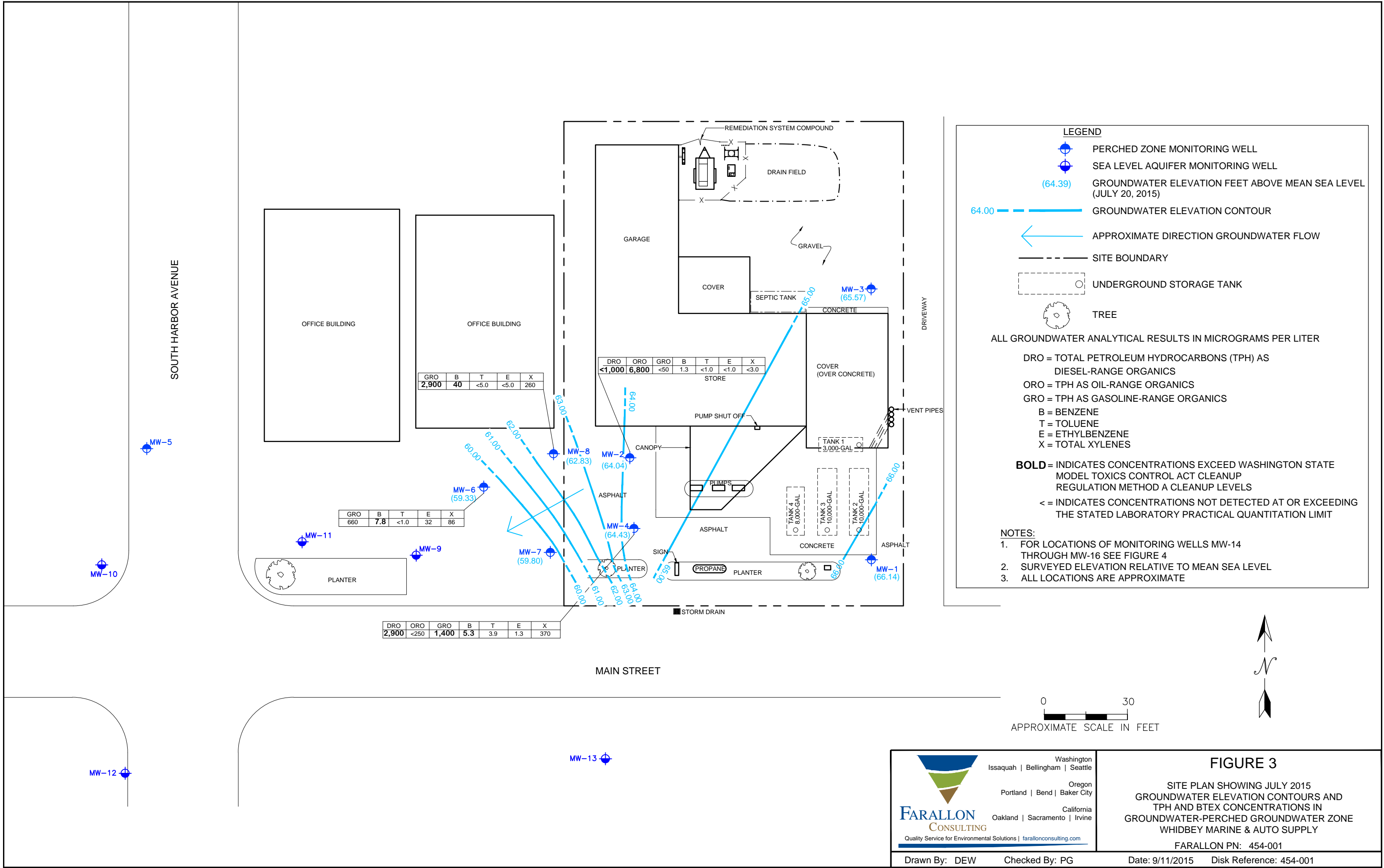
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Checked By: PG

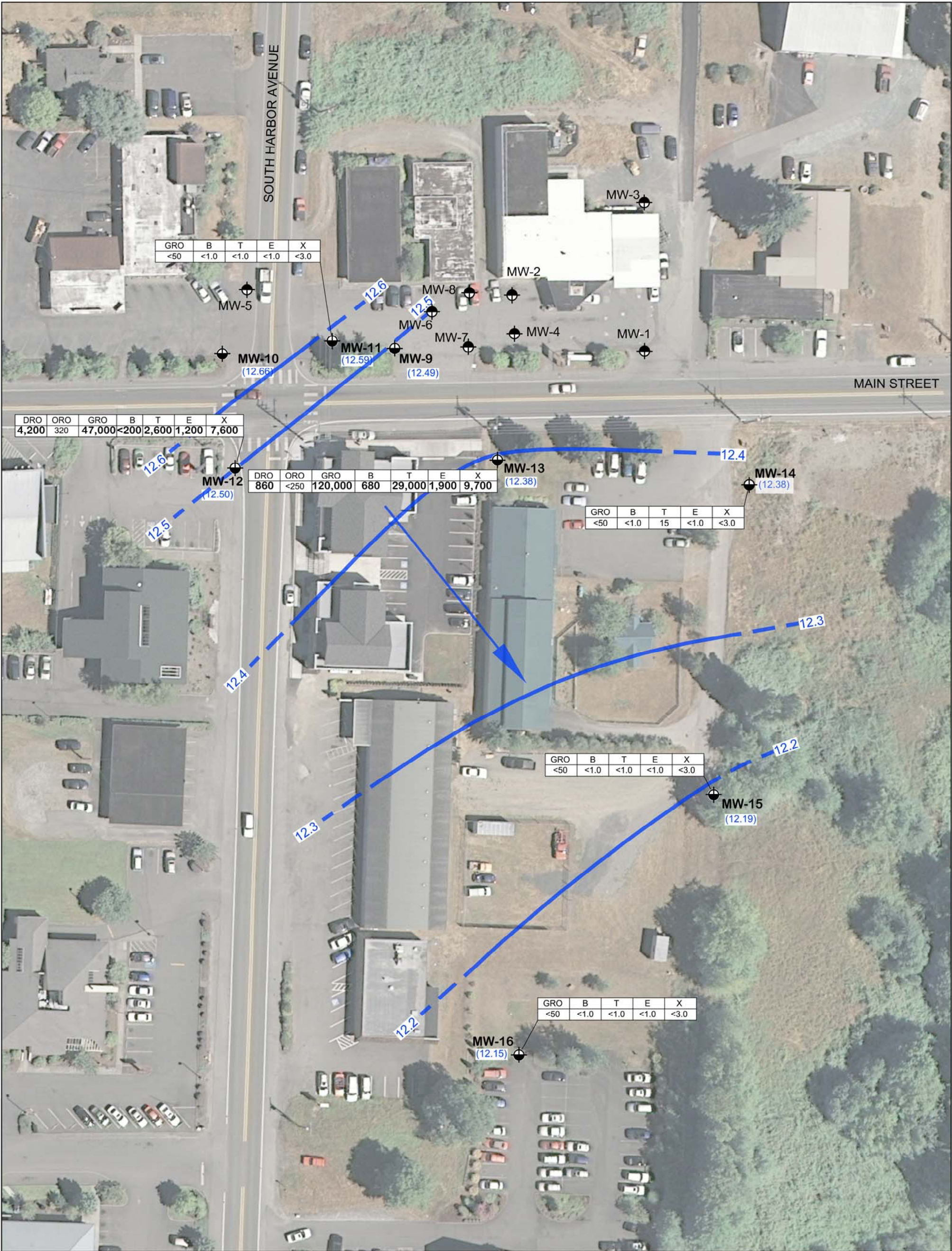
Date: 11/7/2014

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PERCHED GROUNDWATER ZONE MONITORING WELL

SEA LEVEL AQUIFER MONITORING WELL

**(12.19)** GROUNDWATER ELEVATION FEET ABOVE MEAN SEA LEVEL (JULY 20, 2015)

12.6 GROUNDWATER ELEVATION CONTOUR

APPROXIMATE DIRECTION OF GROUNDWATER FLOW

ALL GROUNDWATER ANALYTICAL RESULTS IN MICROGRAMS PER LITER

DRO = TOTAL PETROLEUM HYDROCARBONS (TPH) AS DIESEL-RANGE ORGANICS

ORO = TPH AS OIL-RANGE ORGANICS

GRO = TPH AS GASOLINE-RANGE ORGANICS

B = BENZENE

T = TOLUENE

E = ETHYLBENZENE

X = TOTAL XYLENES

**LEGEND**

**BOLD** = INDICATES CONCENTRATIONS EXCEED WASHINGTON STATE MODEL TOXICS CONTROL ACT CLEANUP REGULATION METHOD A CLEANUP LEVELS

**<** = INDICATES CONCENTRATIONS NOT DETECTED AT OR EXCEEDING THE STATED LABORATORY PRACTICAL QUANTITATION LIMIT

0 60  
Scale in feet

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**FIGURE 4**

AERIAL PHOTOGRAPH SHOWING JULY 2015 GROUNDWATER ELEVATION CONTOURS AND TPH AND BTEX CONCENTRATIONS IN GROUNDWATER SEA LEVEL AQUIFER WHIDBEY MARINE & AUTO SUPPLY SITE, FREELAND, WA

FARALLON PN: 454-001

Drawn By: DEW      Checked By: PG      Date: 10/6/2015      Disk Reference: AERIAL



## **TABLES**

### **JULY 2015 PROGRESS REPORT Whidbey Marine & Auto Supply Site Freeland, Washington**

Farallon PN: 454-001

**Table 1**  
**Groundwater Elevation Data**  
**Whidbey Marine Auto Supply Site**  
**Freeland, Washington**  
**Farallon PN: 454-001**

Well Identification	Groundwater Zone	Date	Top of Well Casing Elevation (feet) <sup>1</sup>	Depth to LNAPL (feet) <sup>2</sup>	Depth to Water (feet) <sup>2</sup>	Groundwater Elevation (feet) <sup>1,3</sup>
MW-1 <sup>4</sup>	Perched Zone	12/5/05	116.64	NM	52.54	64.10
		6/7/06		NM	52.67	63.97
		10/9/06		NM	51.93	64.71
		1/9/07		NM	51.80	64.84
		3/27/07		NM	51.50	65.14
		6/19/07		NM	51.66	64.98
		12/7/07		NM	51.98	64.66
		4/17/08		NM	51.10	65.54
		6/30/08		NM	51.24	65.40
		8/14/08		NM	51.36	65.28
		9/9/08		NM	51.45	65.19
		10/21/08		NM	51.63	65.01
		1/15/09		NM	51.63	65.01
		5/12/09		NM	51.29	65.35
		8/5/09		NM	51.46	65.18
		2/10/10		NM	51.13	65.51
		10/21/10		NM	51.28	65.36
		5/18/11		NM	50.20	66.44
		11/17/11		NM	49.98	66.66
		5/15/12		NM	51.05	65.59
		12/18/13		NM	51.16	65.48
		3/27/14		NM	50.88	65.76
		7/28/14		NM	50.85	65.79
		7/20/15		NM	50.50	66.14
MW-2	Perched Zone	12/5/05	117.49	NM	55.06	62.43
		6/7/06		NM	55.56	61.93
		10/9/06		NM	54.69	62.80
		1/9/07		NM	54.60	62.89
		3/27/07		NM	54.44	63.05
		6/19/07		NM	54.50	62.99
		12/7/07		NM	54.81	62.68
		4/17/08		NM	54.06	63.43
		6/30/08		NM	54.12	63.37
		8/14/08		NM	54.21	63.28
		9/9/08		NM	54.26	63.23
		10/21/08		NM	54.44	63.05
		1/15/09		NM	54.40	63.09
		5/12/09		NM	54.08	63.41
		8/5/09		NM	54.19	63.30
		2/10/10		NM	53.92	63.57
		10/21/10		NM	54.11	63.38
		5/18/11		NM	53.22	64.27
		11/17/11		NM	53.80	63.69
		5/15/12		NM	53.75	63.74
		7/22/13		ND	53.64	63.85
		12/18/13		NM	53.69	63.80
		3/27/14		NM	53.68	63.81
		7/28/14		NM	53.53	63.96
		7/20/15		NM	53.45	64.04



**Table 1**  
**Groundwater Elevation Data**  
**Whidbey Marine Auto Supply Site**  
**Freeland, Washington**  
**Farallon PN: 454-001**

<b>Well Identification</b>	<b>Groundwater Zone</b>	<b>Date</b>	<b>Top of Well Casing Elevation (feet)<sup>1</sup></b>	<b>Depth to LNAPL (feet)<sup>2</sup></b>	<b>Depth to Water (feet)<sup>2</sup></b>	<b>Groundwater Elevation (feet)<sup>1,3</sup></b>
MW-3	Perched Zone	12/5/05	117.47	NM	53.48	63.99
		6/7/06		NM	53.96	63.51
		10/9/06		NM	53.26	64.21
		1/9/07		NM	53.02	64.45
		3/27/07		NM	52.82	64.65
		6/19/07		NM	52.70	64.77
		12/7/07		NM	53.33	64.14
		4/17/08		NM	52.50	64.97
		6/30/08		NM	52.66	64.81
		8/14/08		NM	52.76	64.71
		9/9/08		NM	52.84	64.63
		10/21/08		NM	52.99	64.48
		1/15/09		NM	53.01	64.46
		5/12/09		NM	52.64	64.83
		8/5/09		NM	52.79	64.68
		2/10/10		NM	52.50	64.97
		10/21/10		NM	52.63	64.84
		5/18/11		NM	51.63	65.84
		11/17/11		NM	52.28	65.19
		5/15/12		NM	52.31	65.16
		12/18/13		NM	52.49	64.98
		3/27/14		NM	52.22	65.25
		7/28/14		NM	52.22	65.25
		7/20/15		NM	51.90	65.57
MW-4	Perched Zone	3/27/07	117.27	NM	53.94	63.33
		6/19/07		NM	54.02	63.25
		12/7/07		NM	54.28	62.99
		4/17/08		NM	53.58	63.69
		6/30/08		NM	53.64	63.63
		8/14/08		NM	53.71	63.56
		9/9/08		NM	53.76	63.51
		10/21/08		NM	53.89	63.38
		1/15/09		NM	53.88	63.39
		5/12/09		NM	53.50	63.77
		8/5/09		NM	53.65	63.62
		2/10/10		NM	53.44	63.83
		10/21/10		NM	53.58	63.69
		5/18/11		NM	52.76	64.51
		11/17/11		NM	53.28	63.99
		5/15/12		NM	53.31	63.96
		7/22/13		ND	53.14	64.13
		12/18/13		NM	53.39	63.88
		3/27/14		NM	53.10	64.17
		7/28/14		NM	53.11	64.16
		7/20/15		NM	52.84	64.43

**Table 1**  
**Groundwater Elevation Data**  
**Whidbey Marine Auto Supply Site**  
**Freeland, Washington**  
**Farallon PN: 454-001**

<b>Well Identification</b>	<b>Groundwater Zone</b>	<b>Date</b>	<b>Top of Well Casing Elevation (feet)<sup>1</sup></b>	<b>Depth to LNAPL (feet)<sup>2</sup></b>	<b>Depth to Water (feet)<sup>2</sup></b>	<b>Groundwater Elevation (feet)<sup>1,3</sup></b>
MW-6	Perched Zone	4/17/08	116.56	NM	59.84	56.72
		6/30/08		NM	60.07	56.49
		8/14/08		NM	60.26	56.30
		9/9/08		NM	60.35	56.21
		10/21/08		NM	60.47	56.09
		1/15/09		NM	60.50	56.06
		5/12/09		NM	60.34	56.22
		8/5/09		NM	60.49	56.07
		10/21/10		NM	59.45	57.11
		5/18/11		NM	57.76	58.80
		11/17/11		NM	57.75	58.81
		5/15/12		NM	57.10	59.46
		7/22/13		ND	57.68	58.88
		12/18/13		ND	57.90	58.66
		3/27/14		ND	57.86	58.70
		7/28/14		ND	57.74	58.82
		7/20/15		ND	57.23	59.33
MW-7	Perched Zone	4/17/08	116.82	NM	56.98	59.84
		6/30/08		NM	57.42	59.40
		8/14/08		NM	57.87	58.95
		9/9/08		NM	58.25	58.57
		10/21/08		NM	58.34	58.48
		1/15/09		NM	DRY	DRY
		5/12/09		NM	57.43	59.39
		8/5/09		NM	58.32	58.50
		2/10/10		NM	58.24	58.58
		10/21/10		NM	58.30	58.52
		5/18/11		NM	58.05	58.77
		11/17/11		NM	58.72	58.10
		5/15/12		NM	58.73	58.09
		7/22/13		ND	58.24	58.58
		12/18/13		ND	58.22	58.60
		3/27/14		ND	58.25	58.57
		7/28/14		ND	57.59	59.23
		7/20/15		ND	57.02	59.80

**Table 1**  
**Groundwater Elevation Data**  
**Whidbey Marine Auto Supply Site**  
**Freeland, Washington**  
**Farallon PN: 454-001**

<b>Well Identification</b>	<b>Groundwater Zone</b>	<b>Date</b>	<b>Top of Well Casing Elevation (feet)<sup>1</sup></b>	<b>Depth to LNAPL (feet)<sup>2</sup></b>	<b>Depth to Water (feet)<sup>2</sup></b>	<b>Groundwater Elevation (feet)<sup>1,3</sup></b>
MW-8	Perched Zone	7/28/2014	117.23	NM	55.29	61.94
		6/30/08		NM	55.34	61.89
		8/14/08		NM	55.33	61.90
		9/9/08		NM	55.36	61.87
		10/21/08		NM	55.47	61.76
		1/15/09		NM	55.37	61.86
		5/12/09		NM	55.09	62.14
		8/5/09		NM	55.21	62.02
		2/10/10		NM	54.93	62.30
		10/21/10		NM	55.08	62.15
		5/18/21		NM	54.47	62.76
		11/17/11		NM	54.83	62.40
		5/15/12		NM	54.83	62.40
		12/18/13		ND	54.87	62.36
		3/27/14		ND	54.78	62.45
		7/28/14		ND	54.64	62.59
		7/20/15		ND	54.40	62.83
MW-9	Sea-Level Aquifer	5/12/09	114.79	NM	103.54	11.25
		8/5/09		NM	103.85	10.94
		2/10/10		NM	103.79	11.00
		10/21/10		NM	103.77	11.02
		5/18/11		NM	103.12	11.67
		11/17/11		NM	NM	NM
		5/15/12		NM	103.05	11.74
		9/5/12		102.03	103.01	12.50
		11/8/12		102.15	102.97	12.43
		2/8/13		102.13	103.05	12.42
		5/10/13		101.77	101.78	13.02
		6/11/13		ND	101.67	13.12
		7/22/13		ND	101.76	13.03
		10/16/13		101.88	102.18	12.83
		11/20/13		101.74	102.23	12.92
		12/18/13		101.85	102.36	12.81
		2/20/14		102.10	103.02	12.45
		3/27/14		102.05	102.43	12.64
		7/28/14		102.15	102.50	12.55
		10/24/14		102.50	102.75	12.23
		2/10/15		102.70	102.71	12.09
		3/25/15		102.35	102.37	12.43
		4/30/15		ND	102.24	12.55
		6/5/15		102.14	102.19	12.64
		7/20/15		ND	102.30	12.49

**Table 1**  
**Groundwater Elevation Data**  
**Whidbey Marine Auto Supply Site**  
**Freeland, Washington**  
**Farallon PN: 454-001**

Well Identification	Groundwater Zone	Date	Top of Well Casing Elevation (feet) <sup>1</sup>	Depth to LNAPL (feet) <sup>2</sup>	Depth to Water (feet) <sup>2</sup>	Groundwater Elevation (feet) <sup>1,3</sup>
MW-10	Sea-Level Aquifer	5/12/09	113.45	NM	102.02	11.43
		8/5/09		NM	102.29	11.16
		2/10/10		NM	102.25	11.20
		10/21/10		NM	101.95	11.50
		5/18/11		NM	101.47	11.98
		11/17/11		NM	100.30	13.15
		5/15/12		NM	100.83	12.62
		9/5/12		ND	100.70	12.75
		11/8/12		ND	100.82	12.63
		2/8/13		ND	100.82	12.63
		5/10/13		ND	100.29	13.16
		6/11/13		ND	100.21	13.24
		7/22/13		ND	100.30	13.15
		10/16/13		ND	100.48	12.97
		11/20/13		ND	100.36	13.09
		12/18/13		ND	100.56	12.89
		2/20/14		NM	100.74	12.71
		3/27/14		ND	100.67	12.78
		7/28/14		ND	100.75	12.70
		2/10/15		NM	101.13	12.32
		3/25/15		NM	100.89	12.56
		7/20/15		ND	100.79	12.66
MW-11	Sea-Level Aquifer	5/12/09	114.24	NM	102.82	11.42
		8/5/09		NM	103.09	11.15
		2/10/10		NM	103.09	11.15
		10/21/10		NM	102.82	11.42
		5/18/11		NM	102.31	11.93
		11/17/11		NM	NM	NM
		5/15/12		NM	101.64	12.60
		9/5/12		ND	101.54	12.70
		11/8/12		ND	101.66	12.58
		2/8/13		ND	101.65	12.59
		5/10/13		ND	101.14	13.10
		6/11/13		ND	101.06	13.18
		7/22/13		ND	101.41	12.83
		10/16/13		ND	101.31	12.93
		11/20/13		ND	101.20	13.04
		12/18/13		ND	101.31	12.93
		2/20/14		ND	101.62	12.62
		3/27/14		ND	101.50	12.74
		7/28/14		ND	101.59	12.65
		2/10/15		NM	101.99	12.25
		3/25/15		NM	101.70	12.54
		7/20/15		ND	101.65	12.59

**Table 1**  
**Groundwater Elevation Data**  
**Whidbey Marine Auto Supply Site**  
**Freeland, Washington**  
**Farallon PN: 454-001**

Well Identification	Groundwater Zone	Date	Top of Well Casing Elevation (feet) <sup>1</sup>	Depth to LNAPL (feet) <sup>2</sup>	Depth to Water (feet) <sup>2</sup>	Groundwater Elevation (feet) <sup>1,3</sup>
MW-12	Sea-Level Aquifer	5/12/09	114.23	NM	103.96	10.27
		8/5/09		NM	103.24	10.99
		2/10/10		NM	103.36	10.87
		10/21/10		NM	102.90	11.33
		5/18/11		NM	103.37	10.86
		11/17/11		NM	NM	NM
		5/15/12		NM	101.69	12.54
		9/5/12		ND	101.60	12.63
		11/8/12		ND	101.72	12.51
		2/8/13		ND	101.72	12.51
		5/10/13		ND	101.21	13.02
		6/11/13		ND	101.11	13.12
		7/22/13		ND	100.21	14.02
		10/16/13		ND	101.39	12.84
		11/20/13		ND	101.27	12.96
		12/18/13		ND	101.4	12.83
		2/20/14		ND	101.70	12.53
		3/27/14		ND	101.55	12.68
		7/28/14		ND	101.67	12.56
		2/10/15		ND	102.10	12.13
		3/25/15		ND	101.78	12.45
		4/30/15		ND	101.69	12.54
		6/5/15		ND	101.60	12.63
		7/20/15		ND	101.73	12.50
MW-13	Sea-Level Aquifer	12/18/13	116.34	ND	103.56	12.78
		2/20/14		ND	103.90	12.44
		3/27/14		ND	103.75	12.59
		7/28/14		ND	103.84	12.50
		2/10/15		ND	104.35	11.99
		3/25/15		ND	103.97	12.37
		4/30/15		ND	103.89	12.45
		6/5/15		ND	103.82	12.52
MW-14	Sea-Level Aquifer	7/20/15	116.22	ND	103.96	12.38
		12/18/13		NM	103.61	12.61
		2/20/14		NM	103.73	12.49
		3/27/14		NM	103.54	12.68
		7/28/14		NM	103.80	12.42
		2/10/15		NM	104.05	12.17
		3/25/15		NM	103.90	12.32
		7/20/15		ND	103.84	12.38

**Table 1**  
**Groundwater Elevation Data**  
**Whidbey Marine Auto Supply Site**  
**Freeland, Washington**  
**Farallon PN: 454-001**

Well Identification	Groundwater Zone	Date	Top of Well Casing Elevation (feet) <sup>1</sup>	Depth to LNAPL (feet) <sup>2</sup>	Depth to Water (feet) <sup>2</sup>	Groundwater Elevation (feet) <sup>1,3</sup>
MW-15	Sea-Level Aquifer	12/18/13	116.73	NM	104.23	12.50
		2/20/14		NM	104.45	12.28
		3/27/14		NM	104.21	12.52
		7/28/14		NM	104.45	12.28
		2/10/15		NM	104.91	11.82
		3/25/15		NM	104.60	12.13
		7/20/15		ND	104.54	12.19
MW-16	Sea-Level Aquifer	12/18/13	116.92	NM	104.46	12.46
		2/20/14		NM	104.68	12.24
		3/27/14		NM	104.40	12.52
		7/28/14		NM	104.71	12.21
		2/10/15		NM	105.08	11.84
		3/25/15		NM	104.80	12.12
		7/20/15		ND	104.77	12.15

**NOTES:**

<sup>1</sup>Feet above mean sea level, based on May 2008 survey data.

<sup>2</sup>Feet below top of well casing.

<sup>3</sup>Groundwater elevation at monitoring well MW-9 corrected as follows:  
(Casing Elevation - Depth to Water) + (LNAPL Thickness x LNAPL Specific Gravity) = Corrected Groundwater Elevation using a specific gravity for gasoline of 0.74.

<sup>4</sup>Top of well casing elevation adjusted using change in total depth measurements before and after change in well casing length following soil vapor extraction system installation.

ND = not detected

NM = not measured

LNAPL = light nonaqueous-phase liquid

**Table 2**  
**Summary of Laboratory Analytical Results for TPH and BTEX in Groundwater**  
**Whidbey Marine Auto Supply Site**  
**Freeland, Washington**  
**Farallon PN: 454-001**

Sample Location	Groundwater Zone	Sample Identification	Sample Date	Analytical Results (micrograms per liter)						
				DRO <sup>1</sup>	ORO <sup>1</sup>	GRO <sup>2</sup>	Benzene <sup>3</sup>	Toluene <sup>3</sup>	Ethyl-benzene <sup>3</sup>	Xylenes <sup>3</sup>
MW-1	Perched Zone	MW1-120505	12/5/05	-	-	4,200	480	770	65	318
		MW1-060706	6/7/06	-	-	5,800	500	1,000	70	780
		MW-1-100906	10/9/06	-	-	17,000	2,400	3,800	270	2,200
		MW1-010907	1/9/07	-	-	1,500	14	6	11	120
		QA/QC-010907	1/9/07	-	-	1,500	11	6	10	110
		MW1-032707	3/27/07	-	-	290	1	1	<1	17
		QA/QC-032707	3/27/07	-	-	320	1	<1	<1	19
		MW1-061907	6/19/07	-	-	73	<1	<1	<1	<3
		MW1-120707	12/7/07	-	-	110	<1	<1	<1	<3
		MW1-041808	4/18/08	-	-	74	<1	<1	<1	<3
		MW1-090908	9/9/08	-	-	68	<1	<1	<1	<3
		MW1-051409	5/14/09	-	-	<50	<1	<1	<1	<3
		MW1-021110	2/11/10	-	-	<50	<1	<1	<1	<3
		MW1-102110	10/21/10	-	-	<50	<1	<1	<1	<3
		MW1-051811	5/18/11	-	-	<50	<1	<1	<1	<3
		MW-1-111711	11/17/11	-	-	<50	<1.0	<1.0	<1.0	<3.0
		MW-1-051512	5/15/12	-	-	<50	<1.0	<1.0	<1.0	<3.0
		MW-1-121913	12/19/13	<130	<250	<50	<1.0	<1.0	<1.0	<3.0
MW-1-072914	7/29/14	-	-	<50	<1.0	<1.0	<1.0	<3.0		
MW-2	Perched Zone	MW2-120505	12/5/05	-	-	570	110	110	2.8	50
		MW2-060706	6/7/06	-	-	2,800	440	540	15	430
		MW2-100906	10/9/06	-	-	370	20	44	1	77
		MW2-010907	1/9/07	-	-	730	35	69	11	150
		MW2-032707	3/27/07	-	-	610	6	9	<1	150
		MW2-061907	6/19/07	-	-	1,000	17	52	22	200
		MW2-120707	12/7/07	-	-	2,300	7	310	36	270
		MW2-041808	4/18/08	-	-	3,700	<1	57	33	890
		MW2-090908	9/9/08	-	-	20,000	<50	3,100	470	4,200
		MW2-051309	5/13/09	-	-	4,300	<5	380	130	1,100
		MW2-021110	2/11/10	-	-	15,000	<10	160	590	3,800
		MW2-102210	10/22/10	-	-	12,000	50	15	420	2,400
		MW2-032111	3/21/11	-	-	7,000	<10	1.9	31	1,400
		MW-2-111711	11/17/11	-	-	130	<1.0	1.5	1.3	10
		MW-2-051512	5/15/12	-	-	210	1.9	<1.0	1.1	13
		MW-2-121913	12/19/13	5,400	11,000	82	<1.0	<1.0	<1.0	<3.0
		MW-2-032814	3/28/14	<650	12,000	-	-	-	-	-
		MW-2-072115	7/21/15	<1,000 <sup>7</sup>	6,800	<50	1.3	<1.0	<1.0	<3.0
MW-3	Perched Zone	MW3-120505	12/5/05	-	-	<100	<1.0	<1.0	<1.0	<2.0
		FD-120505	12/5/05	-	-	<100	<1.0	<1.0	<1.0	<2.0
		MW3-060706	6/7/06	-	-	<50	<1	<1	<1	<3
		MW3-100906	10/9/06	-	-	<50	<1	<1	<1	<3
		MW3-010907	1/9/07	-	-	<50	<1	<1	<1	<3
MTCA Method A Cleanup Levels for Groundwater <sup>8</sup>				500	500	800	5	1,000	700	1,000

**Table 2**  
**Summary of Laboratory Analytical Results for TPH and BTEX in Groundwater**  
**Whidbey Marine Auto Supply Site**  
**Freeland, Washington**  
**Farallon PN: 454-001**

Sample Location	Groundwater Zone	Sample Identification	Sample Date	Analytical Results (micrograms per liter)						
				DRO <sup>1</sup>	ORO <sup>1</sup>	GRO <sup>2</sup>	Benzene <sup>3</sup>	Toluene <sup>3</sup>	Ethyl-benzene <sup>3</sup>	Xylenes <sup>3</sup>
MW-3	Perched Zone	MW3-032707	3/27/07	-	-	<50	<1	<1	<1	<3
		MW3-061907	6/19/07	-	-	<50	<1	<1	<1	<3
		QA/QC-061907	6/19/07	-	-	<50	<1	<1	<1	<3
		MW3-120707	12/7/07	-	-	<50	<1	<1	<1	<3
		MW3-041808	4/18/08	-	-	<50	<1	<1	<1	<3
		MW3-090908	9/9/08	-	-	<50	<1	<1	<1	<3
		MW3-051409	5/14/09	-	-	<50	<1	<1	<1	<3
		MW3-021110	2/11/10	-	-	<50	<1	<1	<1	<3
		MW3-102110	10/21/10	-	-	<50	<1	<1	<1	<3
		MW3-051811	5/18/11	-	-	<50	<1	1.1	<1	<3
		MW-3-111711	11/17/11	-	-	<50	<1.0	<1	<1.0	<3.0
		MW-3-051512	5/15/12	-	-	<50	<1.0	<1	<1.0	<3.0
		MW-3-121913	12/19/13	<130	<250	<50	<1.0	<1.0	<1.0	<3.0
		MW-3-072914	7/29/14	-	-	<50	<1.0	<1.0	<1.0	<3.0
MW-4	Perched Zone	MW4-032707	3/27/07	-	-	99,000	31,000	32,000	970	6,000
		MW4-061907	6/19/07	-	-	110,000	22,000	36,000	1,600	8,200
		MW4-120707	12/7/07	-	-	39,000	7,600	12,000	300	2,400
		QA/QC-120707	12/7/07	-	-	60,000	9,500	18,000	710	4,700
		MW4-041808	4/18/08	-	-	140,000	530	42,000	1,600	9,400
		MW4-090908	9/9/08	-	-	120,000	150	40,000	2,000	11,000
		QA/QC-1-090908	9/9/08	-	-	120,000	150	43,000	1,900	11,000
		MW4-051409	5/14/09	680 <sup>4</sup>	<250	83,000	<50	30,000	1,100	6,600
		MW4-021110	2/11/10	-	-	71,000	<50	20,000	940	5,900
		MW4-102110	10/21/10	-	-	32,000	<10	4,200	1,100	6,600
		MW4-032111	3/21/11	-	-	32,000	<10	160	870	6,900
		MW4-051811	5/18/11	-	-	33,000	<10	550	840	6,700
		MW-4-111811	11/18/11	-	-	2,300	<5.0	20	110	610
		MW-4-051612	5/16/12	-	-	5,200	<10	12	77	1,500
		MW-4-121913	12/19/13	<630 <sup>5</sup>	<250	41,000	<25	<25	280	11,000
		MW-4-072914	7/29/14	-	-	37,000	<50	<50	63	9,200
MW-6	Perched Zone	MW-4-072115	7/21/15	2,900	<250	1,400	5.3	3.9	1.3	370
		MW6-041708	4/18/08	-	-	23,000	260	1,500	530	3,600
		MW6-090908	9/9/08	-	-	42,000	450	8,500	1,300	7,800
		MW6-051409	5/14/09	-	-	17,000	29	3,200	250	3,100
		MW6-021110	2/11/10	-	-	89,000	<100	16,000	1,800	14,000
		MW6-102210	10/22/10	-	-	39,000	<10	1,800	1,200	7,800
		MW6-032111	3/21/11	-	-	37,000	<20	350	650	9,200
		MW6-051811	5/18/11	-	-	49,000	<25	270	690	11,000
		MW-6-111711	11/17/11	-	-	22,000	<20	1,200	520	5,400
		MW-6-051512	5/15/12	-	-	17,000	<20	220	210	3,700
		MW-6-121913	12/19/13	<250 <sup>5</sup>	<250	8,900	<5.0	<5.0	120	1,700
		MW-6-073014	7/30/14	-	-	9,700	<10	<10	290	1,800
MW-7	Perched Zone	MW-6-072115	7/21/15	-	-	660	7.8	<1.0	32	86
		MW7-041808	4/18/08	-	-	54,000	13,000	17,000	420	3,700
		MW7-051409	5/14/09	-	-	13,000	2,500	3,700	180	1,700
MTCA Method A Cleanup Levels for Groundwater <sup>8</sup>				500	500	800	5	1,000	700	1,000



**Table 2**  
**Summary of Laboratory Analytical Results for TPH and BTEX in Groundwater**  
**Whidbey Marine Auto Supply Site**  
**Freeland, Washington**  
**Farallon PN: 454-001**

Sample Location	Groundwater Zone	Sample Identification	Sample Date	Analytical Results (micrograms per liter)						
				DRO <sup>1</sup>	ORO <sup>1</sup>	GRO <sup>2</sup>	Benzene <sup>3</sup>	Toluene <sup>3</sup>	Ethyl-benzene <sup>3</sup>	Xylenes <sup>3</sup>
MW-8	Perched Zone	MW8-041808	4/18/08	-	-	5,400	<1	57	57	890
		QA/QC-1-041808	4/18/08	-	-	5,600	<1	42	55	930
		MW8-090908	9/9/08	-	-	34,000	<50	3,500	670	6,700
		MW8-051309	5/13/09	-	-	60,000	<50	9,000	1,800	9,500
		QA/QC-051309	5/13/09	-	-	57,000	<50	8,900	1,700	9,400
		MW8-021110	2/11/10	-	-	54,000	<50	3,900	2,000	12,000
		MW8-102210	10/22/10	-	-	58,000	<10	770	2,200	15,000
		MW8-032111	3/21/11	-	-	17,000	<10	<10	600	2,900
		MW8-051811	5/18/11	-	-	2,900	<1	2.3	23	320
		MW-8-111711	11/17/11	-	-	47,000	<50	<50	1,200	12,000
		DUP-1-111711	11/17/11	-	-	47,000	<50	<50	1,200	12,000
		MW-8-051512	5/15/12	-	-	46,000	<50	<50	930	10,000
		DUP-1-051512	5/15/12	-	-	42,000	<50	<50	900	9,700
		MW-8-121913	12/19/13	<630 <sup>5</sup>	<250	24,000	<25	<25	150	4,200
		MW-8-073014	7/30/14	-	-	10,000	<10	<10	13	1,300
		MW-8-072115	7/21/15	-	-	2,900	40	<5.0	<5.0	260
MW-9	Sea Level Aquifer	MW9-051309	5/13/09	800 <sup>4</sup>	<250	94,000	18,000	32,000	1,500	7,600
		MW9-021010	2/10/10	-	-	32,000	10,000	9,800	390	1,800
		MW9-102210	10/22/10	-	-	160,000	15,000	42,000	2,700	14,000
		MW9-032111	3/21/11	-	-	260,000	13,000	55,000	5,300	27,000
		MW9-051811	5/18/11	-	-	230,000	18,000	55,000	4,000	21,000
		MW-9-111811	11/18/11	-	-	240,000	19,000	68,000	4,400	23,000
		MW-9-051612	5/16/12	-	-	280,000	13,000	59,000	4,700	25,000
MW-10	Sea Level Aquifer	MW10-051309	5/13/09	<130	<250	<50	<1	2	<1	<3
		MW10-021010	2/10/10	-	-	140	<1	3.3	1.5	7.3
		MW10-102210	10/22/10	-	-	<50	<1	4.0	<1	3.2
		MW10-051811	5/18/11	-	-	69	<1	2.6	<1	<3
		MW-10-111711	11/17/11	-	-	<50	<1.0	<1.0	<1.0	<3.0
		MW-10-051512	5/15/12	-	-	<50	<1.0	<1.0	<1.0	<3.0
		MW-10-121913	12/19/13	<130	<250	<50	<1.0	<1.0	<1.0	<3.0
		MW-10-032714	3/27/14	-	-	<50	<1.0	<1.0	<1.0	<3.0
MW-10-072914	7/29/14	-	-	<50	<1.0	<1.0	<1.0	<3.0		
MW-11	Sea Level Aquifer	MW11-051309	5/13/09	<130	<250	2,300	500	530	19	230
		MW11-021010	2/10/10	-	-	23,000	4,000	7,000	340	1,600
		MW11-102210	10/22/10	-	-	29,000	2,400	7,400	790	2,800
		MW11-051811	5/18/11	-	-	70,000	3,100	15,000	1,500	7,200
		MW-11-111811	11/18/11	-	-	24,000	670	3,700	820	3,000
		MW-11-051612	5/16/12	-	-	19,000	700	2,200	700	2,700
		MW-11-122013	12/20/13	<130	<250	2,800	8	64	26	440
		MW-11-032814	3/28/14	-	-	1,200	4.7	13	3	150
		MW-11-073014	7/30/14	-	-	540	3.1	1.1	1.1	32
		MW-11-021015	2/10/15	-	-	<50	<1.0	<1.0	<1.0	<3.0
		MW-11-072015	7/20/15	-	-	<50	<1.0	<1.0	<1.0	<3.0
MTCA Method A Cleanup Levels for Groundwater <sup>8</sup>				500	500	800	5	1,000	700	1,000

**Table 2**  
**Summary of Laboratory Analytical Results for TPH and BTEX in Groundwater**  
**Whidbey Marine Auto Supply Site**  
**Freeland, Washington**  
**Farallon PN: 454-001**

Sample Location	Groundwater Zone	Sample Identification	Sample Date	Analytical Results (micrograms per liter)						
				DRO <sup>1</sup>	ORO <sup>1</sup>	GRO <sup>2</sup>	Benzene <sup>3</sup>	Toluene <sup>3</sup>	Ethylbenzene <sup>3</sup>	Xylenes <sup>3</sup>
MW-12	Sea Level Aquifer	MW12-051309	5/13/09	<1,300 <sup>5</sup>	<250	55,000	200	8,900	1,700	9,700
		MW12-021010	2/10/10	2,600 <sup>4</sup>	310	52,000	92	3,900	1,300	8,400
		MW12-102210	10/22/10	-	-	81,000	120	5,300	2,100	14,000
		MW12-051811	5/18/11	-	-	69,000	83	4,400	1,700	11,000
		MW-12-111711	11/17/11	-	-	68,000	82	4,700	1,500	11,000
		MW-12-051512	5/15/12	-	-	77,000	<100	5,100	1,700	13,000
		MW-12-122013	12/20/13	2,500 <sup>4</sup>	790	78,000	38	3,300	1,200	11,000
		MW-12-032814	3/28/14	2,500 <sup>4</sup>	<250	75,000	29	4,200	1,500	10,000
		MW-12-073014	7/30/14	2,200 <sup>4</sup>	<250	75,000	<50	4,500	1,800	11,000
		MW-12-021015	2/10/15	10,000 <sup>4</sup>	1,100 <sup>6</sup>	94,000	<100	5,600	2,500	15,000
MW-12-072015	7/20/15	4,200 <sup>4</sup>	320	47,000	<200	2,600	1,200	7,600		
MW-13	Sea Level Aquifer	MW-13-121913	12/19/13	1,000 <sup>4</sup>	<250	120,000	2,500	30,000	1,100	5,700
		QAQC-1-121913	12/19/13	820 <sup>4</sup>	290	110,000	2,500	28,000	1,100	5,600
		MW-13-032814	3/28/14	780 <sup>4</sup>	<250	140,000	1,600	33,000	2,000	9,900
		QA/QC-032814	3/28/14	830 <sup>4</sup>	<250	140,000	1,600	31,000	1,900	9,600
		MW-13-073014	7/30/14	1,300 <sup>4</sup>	<250	150,000	1,400	37,000	2,300	11,000
		QA/QC-1-072914	7/30/14	1,400 <sup>4</sup>	<250	160,000	1,400	37,000	2,200	11,000
		MW-13-021015	2/10/15	4,800 <sup>4</sup>	<500	190,000	980	45,000	3,400	17,000
		MW-13-072015	7/20/15	860 <sup>4</sup>	<250	120,000	680	29,000	1,900	9,700
DUP1-072015	7/20/15	1,800 <sup>4</sup>	290	190,000	820	42,000	3,500	18,000		
MW-14	Sea Level Aquifer	MW-14-121813	12/18/13	<130	<250	<50	<1.0	<1.0	<1.0	<3.0
		MW-14-032714	3/27/14	-	-	<50	<1.0	<1.0	<1.0	<3.0
		MW-14-072914	7/29/14	-	-	62	<1.0	17	<1.0	<3.0
		MW-14-021015	2/10/15	-	-	<50	<1.0	<1.0	<1.0	<3.0
		DUP1-021015	2/10/15	-	-	<50	<1.0	1.2	<1.0	<3.0
		MW-14-072015	7/20/15	-	-	<50	<1.0	15	<1.0	<3.0
MW-15	Sea Level Aquifer	MW-15-121813	12/18/13	<130	<250	<50	<1.0	<1.0	<1.0	<3.0
		MW-15-032714	3/27/14	-	-	<50	<1.0	<1.0	<1.0	<3.0
		MW-15-072914	7/29/14	-	-	<50	<1.0	<1.0	<1.0	<3.0
		MW-15-021015	2/10/15	-	-	<50	<1.0	<1.0	<1.0	<3.0
		MW-15-072015	7/20/15	-	-	<50	<1.0	<1.0	<1.0	<3.0
MW-16	Sea Level Aquifer	MW-16-121813	12/18/13	<130	<250	<50	<1.0	<1.0	<1.0	<3.0
		MW-16-032714	3/27/14	-	-	<50	<1.0	<1.0	<1.0	<3.0
		MW-16-072914	7/29/14	-	-	<50	<1.0	<1.0	<1.0	<3.0
		MW-16-021015	2/10/15	-	-	<50	<1.0	<1.0	<1.0	<3.0
		MW-16-072015	7/20/15	-	-	<50	<1.0	<1.0	<1.0	<3.0
MTCA Method A Cleanup Levels for Groundwater <sup>8</sup>				500	500	800	5	1,000	700	1,000

**NOTES:**

Results in **bold** denote concentration or laboratory reporting limit exceeds applicable cleanup levels.

< denotes analyte not detected at or exceeding the reporting limit listed.

- denotes sample not analyzed

<sup>1</sup>Analyzed by Northwest Method NWTPH-Dx.

<sup>2</sup>Analyzed by Northwest Method NWTPH-Gx.

<sup>3</sup>Analyzed by U.S. Environmental Protection Agency Method 8021B.

<sup>4</sup>Laboratory report narrative indicates DRO result is biased high due to GRO overlap.

<sup>5</sup>Laboratory report narrative indicates reporting limit for DRO is elevated due to GRO overlap.

<sup>6</sup>Laboratory report narrative indicates ORO result is biased high due to DRO overlap.

<sup>7</sup>Laboratory report narrative indicates reporting limit for DRO is elevated due to ORO overlap.

<sup>8</sup>Washington State Model Toxics Control Act Cleanup Regulation Method A Cleanup Levels for Groundwater, Table 720-1 of Section 900 of Chapter 173-340 of the Washington Administrative Code, as revised 2013.

BTEX = benzene, toluene, ethylbenzene, and xylenes

DRO = TPH as diesel-range organics

GRO = TPH as gasoline-range organics

ORO = TPH as oil-range organics

TPH = total petroleum hydrocarbons

**APPENDIX A**  
**LABORATORY ANALYTICAL REPORT**

JULY 2015 PROGRESS REPORT  
Whidbey Marine & Auto Supply Site  
Freeland, Washington

Farallon PN: 454-001



July 24, 2015

Mr. Paul Grabau  
Farallon Consulting  
975 Fifth Ave. NW, Suite 100  
Issaquah, WA 98027

Dear Mr. Grabau,

On July 22nd, 11 samples were received by our laboratory and assigned our laboratory project number EV15070095. The project was identified as your 454-001 Whidbey Marine & Auto. The sample identification and requested analyses are outlined on the attached chain of custody record.

No abnormalities or nonconformances were observed during the analyses of the project samples.

Please do not hesitate to call me if you have any questions or if I can be of further assistance.

Sincerely,

ALS Laboratory Group

Rick Bagan  
Laboratory Director

**CERTIFICATE OF ANALYSIS**

CLIENT:	Farallon Consulting 975 Fifth Ave. NW, Suite 100 Issaquah, WA 98027	DATE:	7/24/2015
		ALS JOB#:	EV15070095
CLIENT CONTACT:	Paul Grabau	ALS SAMPLE#:	EV15070095-01
CLIENT PROJECT:	454-001 Whidbey Marine & Auto	DATE RECEIVED:	07/22/2015
CLIENT SAMPLE ID	MW-16-072015	COLLECTION DATE:	7/20/2015 12:05:00 PM
		WDOE ACCREDITATION:	C601

**SAMPLE DATA RESULTS**

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range	NWTPH-GX	U	50	1	UG/L	07/21/2015	PAB
Benzene	EPA-8021	U	1.0	1	UG/L	07/21/2015	PAB
Toluene	EPA-8021	U	1.0	1	UG/L	07/21/2015	PAB
Ethylbenzene	EPA-8021	U	1.0	1	UG/L	07/21/2015	PAB
Xylenes	EPA-8021	U	3.0	1	UG/L	07/21/2015	PAB

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TFT	NWTPH-GX	79.6	07/21/2015	PAB
TFT	EPA-8021	92.4	07/21/2015	PAB

U - Analyte analyzed for but not detected at level above reporting limit.

**CERTIFICATE OF ANALYSIS**

CLIENT:	Farallon Consulting 975 Fifth Ave. NW, Suite 100 Issaquah, WA 98027	DATE:	7/24/2015
CLIENT CONTACT:	Paul Grabau	ALS JOB#:	EV15070095
CLIENT PROJECT:	454-001 Whidbey Marine & Auto	ALS SAMPLE#:	EV15070095-02
CLIENT SAMPLE ID	MW-15-072015	DATE RECEIVED:	07/22/2015
		COLLECTION DATE:	7/20/2015 1:15:00 PM
		WDOE ACCREDITATION:	C601

**SAMPLE DATA RESULTS**

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range	NWTPH-GX	U	50	1	UG/L	07/21/2015	PAB
Benzene	EPA-8021	U	1.0	1	UG/L	07/21/2015	PAB
Toluene	EPA-8021	U	1.0	1	UG/L	07/21/2015	PAB
Ethylbenzene	EPA-8021	U	1.0	1	UG/L	07/21/2015	PAB
Xylenes	EPA-8021	U	3.0	1	UG/L	07/21/2015	PAB

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TFT	NWTPH-GX	81.9	07/21/2015	PAB
TFT	EPA-8021	94.9	07/21/2015	PAB

U - Analyte analyzed for but not detected at level above reporting limit.

**CERTIFICATE OF ANALYSIS**

CLIENT:	Farallon Consulting 975 Fifth Ave. NW, Suite 100 Issaquah, WA 98027	DATE:	7/24/2015
CLIENT CONTACT:	Paul Grabau	ALS JOB#:	EV15070095
CLIENT PROJECT:	454-001 Whidbey Marine & Auto	ALS SAMPLE#:	EV15070095-03
CLIENT SAMPLE ID	MW-14-072015	DATE RECEIVED:	07/22/2015
		COLLECTION DATE:	7/20/2015 2:20:00 PM
		WDOE ACCREDITATION:	C601

**SAMPLE DATA RESULTS**

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range	NWTPH-GX	U	50	1	UG/L	07/21/2015	PAB
Benzene	EPA-8021	U	1.0	1	UG/L	07/21/2015	PAB
Toluene	EPA-8021	15	1.0	1	UG/L	07/21/2015	PAB
Ethylbenzene	EPA-8021	U	1.0	1	UG/L	07/21/2015	PAB
Xylenes	EPA-8021	U	3.0	1	UG/L	07/21/2015	PAB

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TFT	NWTPH-GX	85.5	07/21/2015	PAB
TFT	EPA-8021	96.6	07/21/2015	PAB

U - Analyte analyzed for but not detected at level above reporting limit.

**CERTIFICATE OF ANALYSIS**

CLIENT:	Farallon Consulting 975 Fifth Ave. NW, Suite 100 Issaquah, WA 98027	DATE:	7/24/2015
CLIENT CONTACT:	Paul Grabau	ALS JOB#:	EV15070095
CLIENT PROJECT:	454-001 Whidbey Marine & Auto	ALS SAMPLE#:	EV15070095-04
CLIENT SAMPLE ID	MW-11-072015	DATE RECEIVED:	07/22/2015
		COLLECTION DATE:	7/20/2015 3:20:00 PM
		WDOE ACCREDITATION:	C601

**SAMPLE DATA RESULTS**

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range	NWTPH-GX	U	50	1	UG/L	07/21/2015	PAB
Benzene	EPA-8021	U	1.0	1	UG/L	07/21/2015	PAB
Toluene	EPA-8021	U	1.0	1	UG/L	07/21/2015	PAB
Ethylbenzene	EPA-8021	U	1.0	1	UG/L	07/21/2015	PAB
Xylenes	EPA-8021	U	3.0	1	UG/L	07/21/2015	PAB

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TFT	NWTPH-GX	87.0	07/21/2015	PAB
TFT	EPA-8021	96.7	07/21/2015	PAB

U - Analyte analyzed for but not detected at level above reporting limit.



**CERTIFICATE OF ANALYSIS**

<b>CLIENT:</b>	Farallon Consulting 975 Fifth Ave. NW, Suite 100 Issaquah, WA 98027	<b>DATE:</b>	7/24/2015
		<b>ALS JOB#:</b>	EV15070095
		<b>ALS SAMPLE#:</b>	EV15070095-05
<b>CLIENT CONTACT:</b>	Paul Grabau	<b>DATE RECEIVED:</b>	07/22/2015
<b>CLIENT PROJECT:</b>	454-001 Whidbey Marine & Auto	<b>COLLECTION DATE:</b>	7/20/2015 4:20:00 PM
<b>CLIENT SAMPLE ID</b>	MW-12-072015	<b>WDOE ACCREDITATION:</b>	C601

**SAMPLE DATA RESULTS**

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range	NWTPH-GX	47000	10000	200	UG/L	07/21/2015	PAB
Benzene	EPA-8021	U	200	200	UG/L	07/21/2015	PAB
Toluene	EPA-8021	2600	200	200	UG/L	07/21/2015	PAB
Ethylbenzene	EPA-8021	1200	200	200	UG/L	07/21/2015	PAB
Xylenes	EPA-8021	7600	600	200	UG/L	07/21/2015	PAB
TPH-Diesel Range	NWTPH-DX	4200	130	1	UG/L	07/22/2015	EBS
TPH-Oil Range	NWTPH-DX	320	250	1	UG/L	07/22/2015	EBS

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TFT 200X Dilution	NWTPH-GX	89.3	07/21/2015	PAB
TFT 200X Dilution	EPA-8021	99.2	07/21/2015	PAB
C25	NWTPH-DX	91.9	07/22/2015	EBS

U - Analyte analyzed for but not detected at level above reporting limit.

Chromatogram indicates that it is likely that sample contains highly weathered gasoline, weathered diesel and an unidentified oil range product.

Diesel range product results biased high due to gasoline range product overlap.

**CERTIFICATE OF ANALYSIS**

<b>CLIENT:</b>	Farallon Consulting 975 Fifth Ave. NW, Suite 100 Issaquah, WA 98027	<b>DATE:</b>	7/24/2015
		<b>ALS JOB#:</b>	EV15070095
		<b>ALS SAMPLE#:</b>	EV15070095-06
<b>CLIENT CONTACT:</b>	Paul Grabau	<b>DATE RECEIVED:</b>	07/22/2015
<b>CLIENT PROJECT:</b>	454-001 Whidbey Marine & Auto	<b>COLLECTION DATE:</b>	7/20/2015 5:20:00 PM
<b>CLIENT SAMPLE ID</b>	MW-13-072015	<b>WDOE ACCREDITATION:</b>	C601

**SAMPLE DATA RESULTS**

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range	NWTPH-GX	120000	10000	200	UG/L	07/22/2015	PAB
Benzene	EPA-8021	680	200	200	UG/L	07/22/2015	PAB
Toluene	EPA-8021	29000	200	200	UG/L	07/22/2015	PAB
Ethylbenzene	EPA-8021	1900	200	200	UG/L	07/22/2015	PAB
Xylenes	EPA-8021	9700	600	200	UG/L	07/22/2015	PAB
TPH-Diesel Range	NWTPH-DX	860	130	1	UG/L	07/22/2015	EBS
TPH-Oil Range	NWTPH-DX	U	250	1	UG/L	07/22/2015	EBS

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TFT 200X Dilution	NWTPH-GX	90.7	07/22/2015	PAB
TFT 200X Dilution	EPA-8021	100	07/22/2015	PAB
C25	NWTPH-DX	97.7	07/22/2015	EBS

U - Analyte analyzed for but not detected at level above reporting limit.  
Chromatogram indicates that it is likely that sample contains lightly weathered gasoline and weathered diesel.  
Diesel range product results biased high due to gasoline range product overlap.

**CERTIFICATE OF ANALYSIS**

<b>CLIENT:</b>	Farallon Consulting 975 Fifth Ave. NW, Suite 100 Issaquah, WA 98027	<b>DATE:</b>	7/24/2015
		<b>ALS JOB#:</b>	EV15070095
		<b>ALS SAMPLE#:</b>	EV15070095-07
<b>CLIENT CONTACT:</b>	Paul Grabau	<b>DATE RECEIVED:</b>	07/22/2015
<b>CLIENT PROJECT:</b>	454-001 Whidbey Marine & Auto	<b>COLLECTION DATE:</b>	7/20/2015 5:15:00 PM
<b>CLIENT SAMPLE ID</b>	DUP1-072015	<b>WDOE ACCREDITATION:</b>	C601

**SAMPLE DATA RESULTS**

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range	NWTPH-GX	190000	25000	500	UG/L	07/22/2015	PAB
Benzene	EPA-8021	820	500	500	UG/L	07/22/2015	PAB
Toluene	EPA-8021	42000	500	500	UG/L	07/22/2015	PAB
Ethylbenzene	EPA-8021	3500	500	500	UG/L	07/22/2015	PAB
Xylenes	EPA-8021	18000	1500	500	UG/L	07/22/2015	PAB
TPH-Diesel Range	NWTPH-DX	1800	130	1	UG/L	07/22/2015	EBS
TPH-Oil Range	NWTPH-DX	290	250	1	UG/L	07/22/2015	EBS

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TFT 500X Dilution	NWTPH-GX	89.3	07/22/2015	PAB
TFT 500X Dilution	EPA-8021	100	07/22/2015	PAB
C25	NWTPH-DX	97.6	07/22/2015	EBS

Chromatogram indicates that it is likely that sample contains lightly weathered gasoline, weathered diesel and an unidentified oil range product.  
Diesel range product results biased high due to gasoline range product overlap.

**CERTIFICATE OF ANALYSIS**

CLIENT:	Farallon Consulting 975 Fifth Ave. NW, Suite 100 Issaquah, WA 98027	DATE:	7/24/2015
CLIENT CONTACT:	Paul Grabau	ALS JOB#:	EV15070095
CLIENT PROJECT:	454-001 Whidbey Marine & Auto	ALS SAMPLE#:	EV15070095-08
CLIENT SAMPLE ID	MW-2-072115	DATE RECEIVED:	07/22/2015
		COLLECTION DATE:	7/21/2015 10:20:00 AM
		WDOE ACCREDITATION:	C601

**SAMPLE DATA RESULTS**

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range	NWTPH-GX	U	50	1	UG/L	07/22/2015	PAB
Benzene	EPA-8021	1.3	1.0	1	UG/L	07/22/2015	PAB
Toluene	EPA-8021	U	1.0	1	UG/L	07/22/2015	PAB
Ethylbenzene	EPA-8021	U	1.0	1	UG/L	07/22/2015	PAB
Xylenes	EPA-8021	U	3.0	1	UG/L	07/22/2015	PAB
TPH-Diesel Range	NWTPH-DX	U	1000	5	UG/L	07/23/2015	EBS
TPH-Oil Range	NWTPH-DX	6800	1200	5	UG/L	07/23/2015	EBS

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TFT	NWTPH-GX	89.0	07/22/2015	PAB
TFT	EPA-8021	97.6	07/22/2015	PAB
C25 5X Dilution	NWTPH-DX	109	07/23/2015	EBS

U - Analyte analyzed for but not detected at level above reporting limit.  
Chromatogram indicates that it is likely that sample contains an unidentified oil range product.  
Diesel range product reporting limits raised due to motor oil range product overlap.

**CERTIFICATE OF ANALYSIS**

<b>CLIENT:</b>	Farallon Consulting 975 Fifth Ave. NW, Suite 100 Issaquah, WA 98027	<b>DATE:</b>	7/24/2015
		<b>ALS JOB#:</b>	EV15070095
		<b>ALS SAMPLE#:</b>	EV15070095-09
<b>CLIENT CONTACT:</b>	Paul Grabau	<b>DATE RECEIVED:</b>	07/22/2015
<b>CLIENT PROJECT:</b>	454-001 Whidbey Marine & Auto	<b>COLLECTION DATE:</b>	7/21/2015 11:45:00 AM
<b>CLIENT SAMPLE ID</b>	MW-4-072115	<b>WDOE ACCREDITATION:</b>	C601

**SAMPLE DATA RESULTS**

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range	NWTPH-GX	1400	50	1	UG/L	07/22/2015	PAB
Benzene	EPA-8021	5.3	1.0	1	UG/L	07/22/2015	PAB
Toluene	EPA-8021	3.9	1.0	1	UG/L	07/22/2015	PAB
Ethylbenzene	EPA-8021	1.3	1.0	1	UG/L	07/22/2015	PAB
Xylenes	EPA-8021	370	3.0	1	UG/L	07/22/2015	PAB
TPH-Diesel Range	NWTPH-DX	2900	130	1	UG/L	07/23/2015	EBS
TPH-Oil Range	NWTPH-DX	U	250	1	UG/L	07/23/2015	EBS

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TFT	NWTPH-GX	116	07/22/2015	PAB
TFT	EPA-8021	128	07/22/2015	PAB
C25	NWTPH-DX	96.8	07/23/2015	EBS

U - Analyte analyzed for but not detected at level above reporting limit.

Chromatogram indicates that it is likely that sample contains highly weathered gasoline and an unidentified diesel range product.

Diesel range product results biased high due to gasoline range product overlap.

**CERTIFICATE OF ANALYSIS**

<b>CLIENT:</b>	Farallon Consulting 975 Fifth Ave. NW, Suite 100 Issaquah, WA 98027	<b>DATE:</b>	7/24/2015
<b>CLIENT CONTACT:</b>	Paul Grabau	<b>ALS JOB#:</b>	EV15070095
<b>CLIENT PROJECT:</b>	454-001 Whidbey Marine & Auto	<b>ALS SAMPLE#:</b>	EV15070095-10
<b>CLIENT SAMPLE ID</b>	MW-8-072115	<b>DATE RECEIVED:</b>	07/22/2015
		<b>COLLECTION DATE:</b>	7/21/2015 12:45:00 PM
		<b>WDOE ACCREDITATION:</b>	C601

**SAMPLE DATA RESULTS**

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range	NWTPH-GX	2900	250	5	UG/L	07/22/2015	PAB
Benzene	EPA-8021	40	5.0	5	UG/L	07/22/2015	PAB
Toluene	EPA-8021	U	5.0	5	UG/L	07/22/2015	PAB
Ethylbenzene	EPA-8021	U	5.0	5	UG/L	07/22/2015	PAB
Xylenes	EPA-8021	260	15	5	UG/L	07/22/2015	PAB

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TFT 5X Dilution	NWTPH-GX	95.4	07/22/2015	PAB
TFT 5X Dilution	EPA-8021	102	07/22/2015	PAB

U - Analyte analyzed for but not detected at level above reporting limit.  
Chromatogram indicates that it is likely that sample contains highly weathered gasoline.



# CERTIFICATE OF ANALYSIS

CLIENT:	Farallon Consulting 975 Fifth Ave. NW, Suite 100 Issaquah, WA 98027	DATE:	7/24/2015
CLIENT CONTACT:	Paul Grabau	ALS JOB#:	EV15070095
CLIENT PROJECT:	454-001 Whidbey Marine & Auto	ALS SAMPLE#:	EV15070095-11
CLIENT SAMPLE ID	MW-6-072115	DATE RECEIVED:	07/22/2015
		COLLECTION DATE:	7/21/2015 1:35:00 PM
		WDOE ACCREDITATION:	C601

# SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range	NWTPH-GX	660	50	1	UG/L	07/22/2015	PAB
Benzene	EPA-8021	7.8	1.0	1	UG/L	07/22/2015	PAB
Toluene	EPA-8021	U	1.0	1	UG/L	07/22/2015	PAB
Ethylbenzene	EPA-8021	32	1.0	1	UG/L	07/22/2015	PAB
Xylenes	EPA-8021	86	3.0	1	UG/L	07/22/2015	PAB

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TFT	NWTPH-GX	116	07/22/2015	PAB
TFT	EPA-8021	132	07/22/2015	PAB

U - Analyte analyzed for but not detected at level above reporting limit.  
Chromatogram indicates that it is likely that sample contains highly weathered gasoline.



# CERTIFICATE OF ANALYSIS

CLIENT: Farallon Consulting  
975 Fifth Ave. NW, Suite 100  
Issaquah, WA 98027  
CLIENT CONTACT: Paul Grabau  
CLIENT PROJECT: 454-001 Whidbey Marine & Auto

DATE: 7/24/2015  
ALS SDG#: EV15070095  
WDOE ACCREDITATION: C601

# LABORATORY BLANK RESULTS

## MBG-072115W - Batch 95497 - Water by NWTPH-GX

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range	NWTPH-GX	U	50	1	UG/L	07/21/2015	PAB

U - Analyte analyzed for but not detected at level above reporting limit.

## MB-072115W - Batch 95497 - Water by EPA-8021

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
Benzene	EPA-8021	U	1.0	1	UG/L	07/21/2015	PAB
Toluene	EPA-8021	U	1.0	1	UG/L	07/21/2015	PAB
Ethylbenzene	EPA-8021	U	1.0	1	UG/L	07/21/2015	PAB
Xylenes	EPA-8021	U	3.0	1	UG/L	07/21/2015	PAB

U - Analyte analyzed for but not detected at level above reporting limit.

## MB-072115W - Batch 95457 - Water by NWTPH-DX

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range	NWTPH-DX	U	130	1	UG/L	07/21/2015	EBS
TPH-Oil Range	NWTPH-DX	U	250	1	UG/L	07/21/2015	EBS

U - Analyte analyzed for but not detected at level above reporting limit.





# CERTIFICATE OF ANALYSIS

CLIENT: Farallon Consulting  
975 Fifth Ave. NW, Suite 100  
Issaquah, WA 98027  
CLIENT CONTACT: Paul Grabau  
CLIENT PROJECT: 454-001 Whidbey Marine & Auto

DATE: 7/24/2015  
ALS SDG#: EV15070095  
WDOE ACCREDITATION: C601

# LABORATORY CONTROL SAMPLE RESULTS

## ALS Test Batch ID: 95497 - Water by NWTPH-GX

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range - BS	NWTPH-GX	79.8			07/21/2015	PAB
TPH-Volatile Range - BSD	NWTPH-GX	83.5	5		07/21/2015	PAB

## ALS Test Batch ID: 95497 - Water by EPA-8021

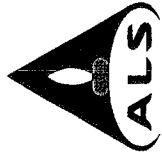
SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
Benzene - BS	EPA-8021	95.2			07/21/2015	PAB
Benzene - BSD	EPA-8021	97.8	3		07/21/2015	PAB
Toluene - BS	EPA-8021	96.2			07/21/2015	PAB
Toluene - BSD	EPA-8021	98.1	2		07/21/2015	PAB
Ethylbenzene - BS	EPA-8021	96.6			07/21/2015	PAB
Ethylbenzene - BSD	EPA-8021	99.7	3		07/21/2015	PAB
Xylenes - BS	EPA-8021	98.1			07/21/2015	PAB
Xylenes - BSD	EPA-8021	102	4		07/21/2015	PAB

## ALS Test Batch ID: 95457 - Water by NWTPH-DX

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range - BS	NWTPH-DX	93.4			07/21/2015	EBS
TPH-Diesel Range - BSD	NWTPH-DX	93.3	0		07/21/2015	EBS

APPROVED BY

Laboratory Director



ALS Environmental  
8620 Holly Drive, Suite 100  
Everett, WA 98208  
Phone (425) 356-2600  
Fax (425) 356-2626  
http://www.alsglobal.com

# Chain Of Custody/ Laboratory Analysis Request

ALS Job#

(Laboratory Use Only)

EV15070095

Date 7/21/15 Page 1 Of 3

PROJECT ID: 454-001				ANALYSIS REQUESTED										OTHER (Specify)										
REPORT TO COMPANY:	PROJECT MANAGER:	ADDRESS:	PHONE:	P.O. #:	INVOICE TO COMPANY:	ATTENTION:	ADDRESS:	MTBE by EPA-8021	Halogenated Volatiles by EPA 8260	Volatile Organic Compounds by EPA 8260	EDB / EDC by EPA 8260 SIM (water)	EDB / EDC by EPA 8260 (soil)	Semivolatile Organic Compounds by EPA 8270	Polycyclic Aromatic Hydrocarbons (PAH) by EPA-8270 SIM	PCB Pesticides by EPA 8081/8082	Metals-MTCA-5	Metals Other (Specify)	TCLP-Metals	VOA	Semi-Vol	Pest	Herbs	NUMBER OF CONTAINERS	RECEIVED IN GOOD CONDITION?
1. MW-16-072015	7/20/15	1205	W	1																				
2. MW-15-072015	7/20/15	1315	W	2																				
3. MW-14-072015	7/20/15	1420	W	3																				
4. MW-11-072015	7/20/15	1520	W	4																				
5. MW-12-072015	7/20/15	1620	W	5																				
6. MW-13-072015	7/20/15	1710	W	6																				
7. Dupl-072015	7/20/15	1715	W	7																				
8. MW-2-072115	7/21/15	1020	W	8																				
9. MW-4-072115	7/21/15	1145	W	9																				
10. MW-8-072115	7/21/15	1245	W	10																				

## SPECIAL INSTRUCTIONS

SIGNATURES (Name, Company, Date, Time):

1. Relinquished By: Ken [Signature], FARALLON, 7/21/15 @ 1545

Received By: Wall [Signature], ALS, 7/21/15, 1545

2. Relinquished By: \_\_\_\_\_

Received By: \_\_\_\_\_

TURNAROUND REQUESTED in Business Days\*  
Organic, Metals & Inorganic Analysis

Specify: ☐ 10 Standard ☐ 5 ☐ 3 ☐ 2 ☐ 1 SAME DAY

Fuels & Hydrocarbon Analysis

☒ 10 Standard ☒ 5 ☐ 3 ☐ 2 ☐ 1 SAME DAY

\*Turnaround request less than standard may incur Rush Charges



ALS Job# (Laboratory Use Only)

<http://www.aisglobal.com>

Date 7/24/15 Page 2 Of 2

ANALYSIS REQUESTED		OTHER (Specify)	
NWTPH-HCID			
NWTPH-DX			
NWTPH-GX			
BTEX by EPA-8021			
MTBE by EPA-8021 <input type="checkbox"/> EPA-8260 <input type="checkbox"/>			
Halogenated Volatiles by EPA 8260			
Volatile Organic Compounds by EPA 8260			
EDB / EDC by EPA 8260 (water)			
EDB / EDC by EPA 8260 (soil)			
Semivolatile Organic Compounds by EPA 8270			
Polycyclic Aromatic Hydrocarbons (PAH) by EPA-8270 SIM <input type="checkbox"/>			
PCB <input type="checkbox"/> Pesticides <input type="checkbox"/> by EPA 8081/8082			
Metals-MTCA-5 <input type="checkbox"/> RCRA-8 <input type="checkbox"/> Ptl Pol <input type="checkbox"/> TAL <input type="checkbox"/>			
Metals Other (Specify)			
TCLP-Metals <input type="checkbox"/> VOA <input type="checkbox"/> Semi-Vol <input type="checkbox"/> Past <input type="checkbox"/> Herbs <input type="checkbox"/>			
NUMBER OF CONTAINERS		RECEIVED IN GOOD CONDITION?	

SAMPLE I.D.	DATE	TIME	TYPE	LAB#
1. MW-6-072415	7/2/15	1335	W	11
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				

A hand-drawn diagram on a grid background. A straight line with a negative slope is drawn, passing through the upper left and lower right. A circle is drawn in the lower right quadrant, intersecting the line. A small triangle is drawn on the left side of the grid, near the bottom.

SIGNATURES (Name, Company, Date, Time):

1. Relinquished By: Ka. Smith - First Name, 7125/15@1545  
Received By: Blair G. Smith, ACS, 7125/15.1545

2. Relinquished By: \_\_\_\_\_  
Received By: \_\_\_\_\_

TURNAROUND  
Organic, Metals & Inorganic Analysis

Standard

	10	5	3	2	1	SAME DAY
Fuels & Hydrocarbon Analysis						

TESTED in Business Days\*  
OTHER:

\*Turnaround request less than standard may incur Rush Charges