



## **PROGRESS REPORT - FOURTH QUARTER 2014**

Fred Meyer Property (aka Bethel Texaco, Facility Site ID #2614)

Port Orchard, Washington

Ecology Site ID #2555, Agreed Order No. DE 9040

Prepared for:

**Fred Meyer Stores, Inc.**

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January 8, 2015

Project No. 9-61M-102820

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**Subject: Progress Report - Fourth Quarter 2014  
Fred Meyer Property (aka Bethel Texaco, Facility Site ID #2614)  
1900 SE Sedgwick Road, Port Orchard, Washington  
Ecology Site ID #2555, Agreed Order No. DE 9040**

Dear Mr. Hermann and Mr. Myers:

On behalf of Fred Meyer Stores, Inc., Amec Foster Wheeler Environment & Infrastructure, Inc. (Amec Foster Wheeler) - formerly AMEC Environment & Infrastructure, Inc. - has prepared this Progress Report for the above referenced Site as provided in Agreed Order No. DE 9040. This report summarizes the results of the groundwater quality monitoring and other activities conducted at the Site during the fourth quarter of 2014. Please note that the November 2014 groundwater quality monitoring event represents the fourth consecutive quarterly event since deactivating the in-situ treatment system wherein detected concentrations of Site-related contaminants were below their respective Model Toxics Control Act (MTCA) Method A cleanup levels in all of the Site's compliance monitoring wells. If you have any questions or comments regarding this report, please contact the undersigned at (503) 639 3400.

Sincerely,

**Amec Foster Wheeler  
Environment & Infrastructure, Inc.**

Joel Eledge, CHMM  
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Attachments: Progress Report - Fourth Quarter 2014  
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**PROGRESS REPORT - FOURTH QUARTER 2014**  
**Fred Meyer Property (aka Bethel Texaco, Facility Site ID #2614)**  
**Port Orchard, Washington**

**1.0 INTRODUCTION**

Amec Foster Wheeler Environment & Infrastructure, Inc. (Amec Foster Wheeler) - formerly known as AMEC Environment & Infrastructure, Inc. or AMEC - has prepared this Progress Report on behalf of Fred Meyer Stores, Inc. (Fred Meyer) to document groundwater quality monitoring and remediation system maintenance performed by Amec Foster Wheeler at the Fred Meyer-Port Orchard service station (Site) on November 11, 2014. The Report is being prepared and submitted pursuant to Agreed Order No. DE 9040, Section VIII.H.

The Site is located at the southeastern corner of the intersection of SE Sedgwick Road and Bethel Road SE in Port Orchard, Washington (Figure 1). Historical petroleum releases from a pre-1990 underground storage tank (UST) system associated with the Bethel Texaco service station (Facility/Site ID #2614) that formerly occupied the Site had impacted underlying soil and groundwater. Between 1999 and 2001, the Site was redeveloped with the existing Fred Meyer branded fuel station.

Release identification number 2555 has been assigned to the Site by the Washington State Department of Ecology (Ecology). Previous investigations and remedial efforts conducted at the Site are documented in the Remedial Investigation Report (AMEC, 2010a). Cleanup action alternatives for treating residual petroleum-related contamination in subsurface soil and groundwater beneath the Site were evaluated and the most feasible cleanup action was identified in the Cleanup Action Plan (CAP) (AMEC, 2010b). The CAP calls for continued operation of the existing air sparging (AS) and soil vapor extraction (SVE) system until concentrations of contaminants of potential concern (COPCs) remaining in soil and groundwater beneath the Site are reduced to levels less than the Model Toxics Control Act (MTCA) Method A cleanup standards. An Agreed Order governing the Site remediation (No. DE 9040) was signed on May 10, 2012 (Ecology, 2012).

**2.0 STATUS OF SUBSURFACE REMEDIATION SYSTEMS, ON-SITE ACTIVITIES, AND DEVIATIONS FROM CAP OR SCHEDULE**

Amec Foster Wheeler has operated an air sparging/soil vapor extraction (AS/SVE) system intermittently at the Site since March 2000. The current AS and VE points are shown on Figure 2. A

description of the original system design, installation, and operations is presented in the third quarter 2004 Quarterly Site Report dated January 20, 2005 (AMEC, 2005). Because of damage incurred during construction of the Fred Meyer branded fuel station and expansion of adjacent roadways from 1999 into the early 2000s, the AS groundwater treatment system was completely off-line between August 2002 and February 21, 2009 and the SVE system operated at a limited capacity from July 2001 through June 2006. During June 2006, further damage to the SVE system's aboveground components resulted in the SVE component becoming inoperable.

AMEC conducted an assessment of the AS/SVE system during a Site visit on June 19, 2008, and began a series of system repairs and optimization steps as detailed in the Progress Report - First Quarter 2012 (AMEC, 2012a). During October 2008, four shallow groundwater monitoring wells (MW-108A, MW-109, MW-110, and MW-111) were installed in place of wells that had been inadvertently destroyed during construction activities in 1999 and 2000.

In January 2012 the AS manifold was modified to separate high-flow and low-flow sparge points in to increase flow in the sparging system and focus air flow and sparging near monitoring wells MW-103 and MW-110 (AMEC, 2012a, 2012b). In February 2013, AMEC shut down the two high-pressure/low-volume air compressors and re-routed all active sparge points to the low-pressure/high-volume rotary vane compressor. In June 2013, AMEC installed shallow groundwater monitoring well MW-109A to further evaluate the source of intermittent benzene detections in up-gradient monitoring well MW-109.

In the fourth quarter 2013 monitoring visit on November 25, 2013, after four consecutive quarterly sampling events wherein COPC concentrations detected in Site monitoring wells remained below MTCA Method A cleanup levels, the AS/SVE system was shut down to begin post-remediation confirmation monitoring.

In April 2014, AMEC collected additional shallow groundwater from temporary direct-push borings in up-gradient locations in the SE Sedgwick Road right-of-way to the north and northeast of the Fred Meyer property to evaluate the source of intermittent benzene detections in monitoring wells MW-109 and MW-109A (AMEC, 2014). The findings of the April 2014 subsurface investigation and the other lines of evidence previously discussed in AMEC's Third Quarter 2013 Progress report (AMEC, 2013c) indicate that petroleum hydrocarbon constituents that have been intermittently detected in monitoring wells MW-109 and MW-109A are not related to the former Bethel Texaco release, but rather appear to be from the up-gradient the Sedgwick 1 Stop facility.

## **2.1 DEVIATIONS FROM CAP OR SCHEDULE**

During this reporting period, there were no deviations from the required tasks under the Agreed Order or from the CAP, and no deviations in schedule.

## **3.0 GROUNDWATER MONITORING**

Fourth quarter 2014 groundwater quality monitoring was conducted on November 11, 2014. Construction details for the Site's groundwater monitoring and remediation wells are summarized in Table 1. Field logs are provided in Appendix A. Sampling methodology and monitoring results are discussed below.

### **3.1 SITE HYDROGEOLOGY**

Depth-to-water measurements were recorded in monitoring wells MW-103, MW-105, MW-108A, MW-109, MW-109A, MW-110, and MW-111 to the nearest 0.01-foot from the top of the well casing (TOC) using an electronic water level indicator. The measurements were converted to elevations relative to mean sea level (msl) using surveyed TOC elevations. Groundwater elevation data for measured wells are presented in Table 2 and approximate groundwater elevation contours are depicted on Figure 2.

The calculated groundwater elevations suggest that the direction of shallow groundwater flow at the Site was directed to the west-southwest. Amec Foster Wheeler calculated a shallow groundwater gradient of approximately 0.08 vertical feet per lateral foot (ft/ft) between monitoring wells MW-109 and MW-111 for the monitoring event.

### **3.2 GROUNDWATER SAMPLING**

On November 11, 2014, groundwater samples were collected from monitoring wells MW-103, MW-105, MW-108A, MW-109, MW-109A, MW-110, and MW-111 using low-flow techniques. Prior to sampling, groundwater was purged from each monitoring well using a peristaltic pump with dedicated sample tubing. For MW-111, purging was completed using a direct-current electric submersible pump equipped with a check-valve and an attached disposable sample bailer. Water quality indicator parameters including temperature, hydrogen ion concentration (pH), dissolved oxygen, specific conductivity, and oxidation-reduction potential were measured using field instrumentation and recorded on groundwater sampling logs (Appendix A). Purging continued until values of the indicator parameters stabilized, indicating that formation water was entering the well casing and sampling intake.

Samples were collected into laboratory-supplied containers, labeled, stored with ice in an insulated container, and transported under chain-of-custody protocol to Apex Labs, Inc. in Tigard, Oregon. Non-disposable sampling equipment was decontaminated between uses by scrubbing in an Alconox detergent solution, followed by two successive deionized water rinses.

### **3.2.1 Analytical Program**

In accordance with the CAP, the November 11, 2014 groundwater samples were analyzed for the following COPCs: gasoline-range organics (GRO) by Northwest Method Total Petroleum Hydrocarbon-Gasoline (NWTPH-Gx); and for selected volatile organic compounds (VOCs) by United States Environmental Protection Agency (EPA) Method 8260B. VOCs analyzed included benzene, toluene, ethylbenzene, and total xylenes (BTEX), naphthalene, methyl tert-butyl ether (MTBE), 1,2-dibromotethane (EDB), and 1,2-dichloroethane (EDC).

Copies of the analytical reports and the chain-of-custody documents are provided in Appendix B. The analytical data for the November 2014 groundwater samples will be entered into Ecology's Environmental Information Management System (EIM), as required by Agreed Order No. 9040 (Ecology, 2012). A historical summary of COPCs detected in groundwater from May 1991 through November 2014 is presented in Appendix C.

In accordance with the CAP and Agreed Order, detected concentrations of COPCs in the groundwater samples are compared to Ecology's MTCA Method A cleanup standards. The Method A groundwater standards are commonly used in routine cleanup actions and where the remedial action objective is to restore groundwater quality to its highest beneficial use (i.e., unrestricted potable use).

### **3.2.2 Quality Assurance/Quality Control**

Amec Foster Wheeler reviewed the laboratory's analytical reports (Appendix B) to assess overall data quality. Based on our review, the November 2014 groundwater sampling data has not been qualified and is considered usable as reported for the purposes of this report.

### **3.2.3 Analytical Results and Cleanup Levels**

The analytical results for the November 2014 groundwater samples are summarized in Table 2 and depicted on Figure 3.

- GRO was only detected in MW-103, at 815 micrograms per liter ( $\mu\text{g/L}$ ) - below the MTCA Method A cleanup standard of 1,000  $\mu\text{g/L}$  (when benzene is not present). Benzene was not detected in the November 2014 MW-103 sample and has not been detected in MW-103



since August 2007. GRO was not detected above the laboratory method reporting limit (MRL) in any of the other wells sampled.

- Benzene was detected in MW-109A, only, at 0.450 µg/L, below the MTCA Method A criterion of 5 µg/L.
- Ethylbenzene was reported in MW-103, only at 1.96 - below the MTCA Method A criterion of 700 µg/L.
- Total xylenes were reported in MW-103 at 6.11 µg/L, only, below the MTCA Method A criterion of 1,000 µg/L.
- No other VOC compounds were detected above their respective MRLs in any of the groundwater samples tested.

### **3.2.4 Non-Aqueous Phase Liquid - Not Present**

Neither measurable non-aqueous phase liquid (NAPL) nor a petroleum-related sheen were observed in groundwater samples collected from monitoring wells MW-103, MW-105, MW-108A, MW-109, MW-109A, MW-110, and MW-111 during the fourth quarter 2014 (4Q2014) event.

### **3.2.5 Data Trends**

The patterns of GRO and VOCs observed in source area wells MW-103 and MW-110 had historically exhibited seasonal variations, inversely correlated with groundwater levels to some extent. The November 2014 sampling results represented the ninth consecutive quarterly monitoring event wherein concentrations of GRO and VOCs detected in MW-103 and MW-110 remained below MTCA Method A cleanup standards; including fourth consecutive quarterly monitoring event since the AS/SVE system was shut down to begin post-remediation confirmation monitoring in November 2013.

GRO and VOC concentrations in down-gradient wells MW-105, MW-108A, and MW-111 remained below MRLs. GRO and VOCs have not been detected in MW-105 since the June 2008 monitoring event or in MW-111 since December 2011. No GRO or VOCs have been detected in MW-108A since its installation in January 2009.

Intermittent detections of benzene have been reported in MW-109 and MW-109A since these wells were initially sampled in January 2009 and June 2013, respectively. Groundwater data from January 2009 through November 2014 (Appendix C) do not indicate any apparent correlation between benzene detections and groundwater elevations or between benzene detections and any particular quarter of the year. The findings of the April 2014 subsurface investigation and the other lines of evidence indicate that petroleum hydrocarbon constituents that have been intermittently detected in monitoring wells MW-109 and MW-109A are not related to the former Bethel Texaco

release, but rather appear to be from the up-gradient the Sedgwick 1 Stop facility. Benzene has not been detected in MW-109 since February 2013. The November 2014 sample results represent the fifth consecutive quarterly monitoring event wherein benzene concentrations detected in MW-109A remained below the MTCA Method A cleanup standard.

#### **4.0 AIR SPARGING/SOIL VAPOR EXTRACTION SYSTEM MONITORING**

As was mutually agreed between Amec Foster Wheeler and Ecology during the conference call with Ecology project manager, Dale Myers, on November 21, 2013, the system has been down since the fourth quarter 2013 monitoring visit on November 25, 2013 to begin post-remediation confirmation monitoring.

#### **5.0 SUMMARY**

The results of the fourth quarter 2014 monitoring event are summarized as follows:

1. The shallow groundwater piezometric surface was evaluated using the compliance points installed in 2008 and 2013. Similar to previous monitoring events, the gradient was directed to the west-southwest with an estimated magnitude of 0.08 ft/ft.
2. Neither measurable NAPL nor sheen was observed. NAPL and sheen have not been observed in the monitoring wells since 1999.
3. The AS/SVE has been shut off since November 25, 2013 for post-remediation confirmation monitoring and to assess potential rebound of GRO and BTEX concentrations in source area wells (MW-103 and MW-110).
4. GRO was detected in MW-103, only, at a concentration below the MTCA Method A cleanup criterion. GRO was not detected above the MRL in any of the wells sampled. GRO has not exceeded the MTCA Method A criterion in any Site monitoring wells for nine consecutive quarterly sample events.
5. No VOCs were detected above their respective MTCA Method A cleanup criteria in the 4Q2014 groundwater samples. VOCs have not exceeded their MTCA Method A criteria in any monitoring wells since 3Q2013. The most recent MTCA Method A exceedances were from benzene detections in up-gradient monitoring wells MW-109 and MW-109A. The findings of the April 2014 subsurface investigation and the other lines of evidence indicate that the petroleum hydrocarbons intermittently detected in monitoring wells MW-109 and MW-109A are not related to the former Bethel Texaco release, but rather appear to be from the up-gradient the Sedgwick 1 Stop facility.

6. The November 2014 groundwater quality monitoring event represents the fourth consecutive quarterly event since deactivating the AS/SVE in-situ treatment system wherein detected concentrations of COPCs were below MTCA Method A cleanup levels in all of the Site's compliance monitoring wells - indicating that the post-remediation confirmation monitoring objectives for groundwater outlined in the CAP have been met.

## 6.0 FUTURE PLANNED ACTIVITIES AND DELIVERABLES


The results from the November 2014 samples and previous quarterly sampling events indicate that the post-remediation confirmation monitoring objectives for groundwater outlined in the CAP have been met. Amec Foster Wheeler will discuss existing soil data with Ecology to see if further soil evaluation would be warranted to meet the soil sampling requirement in the CAP for satisfaction of the Agreed Order.

## 7.0 CLOSING

Amec Foster Wheeler appreciates the opportunity to continue to be of service to Fred Meyer on this project. If you have any questions, or if we can be of further assistance, please contact the undersigned at (503) 639-3400.

**Amec Foster Wheeler**  
**Environment & Infrastructure, Inc.**

**Reviewed by:**



Joel Eledge, CHMM  
Environmental Scientist



Kurt Harrington, PE  
Project Manager

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## REFERENCES

AMEC Earth & Environmental, Inc., 2005. Quarterly Site Report - Third Quarter 2004, Fred Meyer Property, Port Orchard, Washington. January 20, 2005.

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State of Washington Department of Ecology (Ecology), 2012. Agreed Order No. 9040 for Final  
Cleanup Action and Compliance Monitoring. May 10, 2012.

## LIMITATIONS

This report was prepared exclusively for Fred Meyer Stores, Inc. (Fred Meyer) and its agents by Amec Foster Wheeler Environment & Infrastructure, Inc. (Amec Foster Wheeler) - formerly known as AMEC Environment & Infrastructure, Inc. or AMEC. The quality of information, conclusions, and estimates contained herein is consistent with the level of effort involved in Amec Foster Wheeler's services and are based on: i) information available at the time of preparation; ii) data supplied by outside sources; and iii) the assumptions, conditions and qualifications set forth in this report. This Progress Report - Fourth Quarter 2014 is intended for use by Fred Meyer, for the Site at 1900 SE Sedgwick Road, Port Orchard, Washington only, subject to the terms and conditions of its contract with Amec Foster Wheeler. Any other use of, or reliance on, this report by any third party is at that party's sole risk.

The findings contained herein are relevant to the dates of the Amec Foster Wheeler Site visits and should not be relied upon to represent conditions later. In the event that changes in the nature, usage, or layout of the property or nearby properties are made, the conclusions and recommendations contained in this report may not be valid. If additional information becomes available, it should be provided to Amec Foster Wheeler so the original conclusions and recommendations can be modified as necessary.

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**TABLES**

**TABLE 1**  
**Well Construction Summary**  
**Fred Meyer Facility, Port Orchard, Washington**

| Well ID  | Install Date | Top of Casing Elevation (feet msl) | Boring Depth (feet bgs) | Casing Diameter (inches) | Screen Interval (feet bgs) |
|--|--------------|------------------------------------|-------------------------|--------------------------|----------------------------|
| <b>Active Monitoring Wells</b>                       |              |                                    |                         |                          |                            |
| MW-103   | 5/6/91       | 311.70                             | 32                      | 4                        | 12-32                      |
| MW-105   | 11/10/99     | 310.46                             | 30                      | 2                        | 10-30                      |
| MW-108A  | 10/1/08      | 310.38                             | 30                      | 2                        | 15-30                      |
| MW-109   | 10/02/08     | 310.48                             | 32                      | 2                        | 15-30                      |
| MW-109A  | 06/11/13     | 311.71                             | 30                      | 2                        | 20-30                      |
| MW-110   | 10/1/08      | 312.77                             | 30                      | 2                        | 15-30                      |
| MW-111   | 10/1/08      | 310.62                             | 40                      | 2                        | 25-40                      |
| <b>Vapor Extraction Wells</b>                        |              |                                    |                         |                          |                            |
| VE-1^  | 11/4/99      | NA                                 | 15                      | 0.75                     | ~7.5-15                    |
| VE-2^  | 11/4/99      | NA                                 | 15                      | 0.75                     | ~7.5-15                    |
| VE-3   | 11/3/99      | NA                                 | 15                      | 0.75                     | 7.5-15                     |
| VE-4   | 11/3/99      | NA                                 | 15                      | 0.75                     | 7.5-15                     |
| VE-5   | 11/3/99      | NA                                 | 15                      | 0.75                     | 7.5-15                     |
| <b>Air-Sparging Wells</b>                            |              |                                    |                         |                          |                            |
| AS-1^  | 11/4/99      | NA                                 | ~35                     | 0.75                     | ~30-35                     |
| AS-2^  | 11/4/99      | NA                                 | ~35                     | 0.75                     | ~30-35                     |
| AS-3^  | 11/4/99      | NA                                 | ~35                     | 0.75                     | ~30-35                     |
| AS-4^  | 11/4/99      | NA                                 | ~35                     | 0.75                     | ~30-35                     |
| AS-5   | 11/3/99      | NA                                 | ~35                     | 0.75                     | 30-35                      |
| AS-6   | 11/3/99      | NA                                 | ~35                     | 0.75                     | 30-35                      |
| AS-7   | 11/3/99      | NA                                 | ~35                     | 0.75                     | 30-35                      |
| AS-8^  | 11/3/99      | NA                                 | ~35                     | 0.75                     | ~30-35                     |
| AS-9   | 11/3/99      | NA                                 | ~35                     | 0.75                     | 30-35                      |
| AS-10  | 11/3/99      | NA                                 | ~35                     | 0.75                     | 30-35                      |
| <b>Destroyed and Decommissioned Monitoring Wells</b> |              |                                    |                         |                          |                            |
| MW-1S  | 10/15/90     | 312.56                             | 38.5                    | 2                        | 18.5-38.5                  |
| MW-1D  | 10/15/90     | 313.00                             | 79.5                    | 2                        | 34.5-80                    |
| MW-2S  | 10/23/90     | 304.53                             | 38                      | 2                        | 18-38                      |
| MW-2D  | 10/23/90     | 301.13                             | 78                      | 2                        | 43-78                      |
| MW-101   | 5/13/91      | not reported                       | 79                      | 2                        | 60-79                      |
| MW-102   | 5/13/91      | not reported                       | 81                      | 2                        | 61-81                      |
| MW-104   | 5/6/91       | not reported                       | not reported            | 2                        | not reported               |
| MW-106*  | 11/10/99     | 311.73                             | 30                      | 2                        | 10-30                      |
| MW-107*  | 11/9/99      | 310.59                             | 30                      | 2                        | 10-30                      |
| MW-108*  | 11/9/99      | 309.94                             | 30                      | 2                        | 10-30                      |

**Notes:**

msl = Mean sea level

bgs = Below ground surface

^ = Well at 45° angle

\* = Well was destroyed during construction of the fueling station

NA = not applicable

~ = approximately



**TABLE 2**  
**Groundwater Elevations and Analytical Results**  
**Detected Constituents - Fourth Quarter 2014 Monitoring Event**  
**Fred Meyer Facility, Port Orchard, Washington**

| Well No.             | Date       | Gasoline Range Organics                            | Volatile Organic Compounds |              |               |               |           |          |             |             | Groundwater Levels |                |             | Final Dissolved Oxygen |
|----------------------|------------|--|----------------------------|--------------|---------------|---------------|-----------|----------|-------------|-------------|--------------------|----------------|-------------|------------------------|
|                      |            |  | Benzene                    | Toluene      | Ethyl-benzene | Total Xylenes | MTBE      | EDC      | EDB         | Naphthalene | Casing Elev.       | Depth to Water | Water Elev. |                        |
| CAS RN               |            | not applicable                                     | 71-43-2                    | 108-88-3     | 100-41-4      | 1330-20-7     | 1634-04-4 | 107-06-2 | 106-93-4    | 91-20-3     |                    |                |             |                        |
|                      |            | (µg/L)   | (µg/L)                     |              |               |               |           |          |             |             | (feet msl)         | (feet toc)     | (feet msl)  | (mg/L)                 |
| <b>MTCA Method A</b> |            | <b>800<sup>a</sup></b><br><b>1,000<sup>b</sup></b> | <b>5</b>                   | <b>1,000</b> | <b>700</b>    | <b>1,000</b>  | <b>20</b> | <b>5</b> | <b>0.01</b> | <b>160</b>  |                    |                |             |                        |
| <b>Well ID</b>       |            |  |                            |              |               |               |           |          |             |             |                    |                |             |                        |
| MW-103               | 3/17/2014  | 141  | 0.250 U                    | 1.00 U       | 0.500 U       | 1.50 U        | 1.00 U    | 0.500 U  | 0.500 U     | 2.00 U      | 311.70             | 19.14          | 292.56      | 0.20                   |
| MW-103               | 5/21/2014  | 110  | 0.250 U                    | 1.00 U       | 0.500 U       | 1.50 U        | 1.00 U    | 0.500 U  | 0.500 U     | 2.00 U      | 311.70             | 18.75          | 292.95      | 0.16                   |
| MW-103               | 8/20/2014  | 607  | 0.250 U                    | 1.00 U       | 0.222         | 7.32          | 1.00 U    | 0.500 U  | 0.500 U     | 2.00 U      | 311.70             | 23.19          | 288.51      | 0.31                   |
| MW-103               | 11/11/2014 | 815  | 0.250 U                    | 1.00 U       | 1.96          | 6.11          | 1.00 U    | 0.500 U  | 0.500 U     | 2.00 U      | 311.70             | 23.80          | 287.90      | 0.52                   |
| MW-105               | 3/17/2014  | 100 U  | 0.250 U                    | 1.00 U       | 0.500 U       | 1.50 U        | 1.00 U    | 0.500 U  | 0.500 U     | 2.00 U      | 310.46             | 16.12          | 294.34      | 9.18                   |
| MW-105               | 5/21/2014  | 100 U  | 0.250 U                    | 1.00 U       | 0.500 U       | 1.50 U        | 1.00 U    | 0.500 U  | 0.500 U     | 2.00 U      | 310.46             | 16.38          | 294.08      | 7.30                   |
| MW-105               | 8/20/2014  | 100 U  | 0.250 U                    | 1.00 U       | 0.500 U       | 1.50 U        | 1.00 U    | 0.500 U  | 0.500 U     | 2.00 U      | 310.46             | 20.21          | 290.25      | 1.81                   |
| MW-105               | 11/11/2014 | 100 U  | 0.250 U                    | 1.00 U       | 0.500 U       | 1.50 U        | 1.00 U    | 0.500 U  | 0.500 U     | 2.00 U      | 310.46             | 19.62          | 290.84      | 5.40                   |
| MW-108A              | 3/17/2014  | 100 U  | 0.250 U                    | 1.00 U       | 0.500 U       | 1.50 U        | 1.00 U    | 0.500 U  | 0.500 U     | 2.00 U      | 310.38             | 18.62          | 291.76      | 2.62                   |
| MW-108A              | 5/21/2014  | 100 U  | 0.250 U                    | 1.00 U       | 0.500 U       | 1.50 U        | 1.00 U    | 0.500 U  | 0.500 U     | 2.00 U      | 310.38             | 17.83          | 292.55      | 1.90                   |
| MW-108A              | 8/20/2014  | 100 U  | 0.250 U                    | 1.00 U       | 0.500 U       | 1.50 U        | 1.00 U    | 0.500 U  | 0.500 U     | 2.00 U      | 310.38             | 20.41          | 289.97      | 0.56                   |
| MW-108A              | 11/11/2014 | 100 U  | 0.250 U                    | 1.00 U       | 0.500 U       | 1.50 U        | 1.00 U    | 0.500 U  | 0.500 U     | 2.00 U      | 310.38             | 18.77          | 291.61      | 0.41                   |
| MW-109               | 3/17/2014  | 100 U  | 0.250 U                    | 1.00 U       | 0.500 U       | 1.50 U        | 1.00 U    | 0.500 U  | 0.500 U     | 2.00 U      | 310.48             | 13.95          | 296.53      | 6.59                   |
| MW-109               | 5/21/2014  | 100 U  | 0.250 U                    | 1.00 U       | 0.500 U       | 1.50 U        | 1.00 U    | 0.500 U  | 0.500 U     | 2.00 U      | 310.48             | 14.56          | 295.92      | 3.76                   |
| MW-109               | 8/20/2014  | 100 U  | 0.250 U                    | 1.00 U       | 0.500 U       | 1.50 U        | 1.00 U    | 0.500 U  | 0.500 U     | 2.00 U      | 310.48             | 18.42          | 292.06      | 2.45                   |
| MW-109               | 11/11/2014 | 100 U  | 0.250 U                    | 1.00 U       | 0.500 U       | 1.50 U        | 1.00 U    | 0.500 U  | 0.500 U     | 2.00 U      | 310.48             | 16.74          | 293.74      | 3.21                   |
| MW-109A              | 3/17/2014  | 100 U  | 0.250 U                    | 1.00 U       | 0.500 U       | 1.50 U        | 1.00 U    | 0.500 U  | 0.500 U     | 2.00 U      | 311.71             | 15.70          | 296.01      | 2.19                   |
| MW-109A              | 5/21/2014  | 100 U  | 0.250 U                    | 1.00 U       | 0.500 U       | 1.50 U        | 1.00 U    | 0.500 U  | 0.500 U     | 2.00 U      | 311.71             | 16.07          | 295.64      | 2.45                   |
| MW-109A              | 8/20/2014  | 100 U  | 0.930                      | 1.00 U       | 0.500 U       | 1.50 U        | 1.00 U    | 0.500 U  | 0.500 U     | 2.00 U      | 311.71             | 19.41          | 292.30      | 0.71                   |
| MW-109A              | 11/11/2014 | 100 U  | 0.450                      | 1.00 U       | 0.500 U       | 1.50 U        | 1.00 U    | 0.500 U  | 0.500 U     | 2.00 U      | 311.71             | 18.20          | 293.51      | 1.44                   |
| MW-110               | 3/17/2014  | 100 U  | 0.250 U                    | 1.00 U       | 0.500 U       | 1.50 U        | 1.00 U    | 0.500 U  | 0.500 U     | 2.00 U      | 312.77             | 17.91          | 294.86      | 2.91                   |
| MW-110               | 5/21/2014  | 100 U  | 0.250 U                    | 1.00 U       | 0.500 U       | 1.50 U        | 1.00 U    | 0.500 U  | 0.500 U     | 2.00 U      | 312.77             | 18.37          | 294.40      | 1.58                   |
| MW-110               | 8/20/2014  | 258  | 0.250 U                    | 1.00 U       | 0.550         | 1.50 U        | 1.00 U    | 0.500 U  | 0.500 U     | 2.00 U      | 312.77             | 21.71          | 291.06      | 1.48                   |
| MW-110               | 11/11/2014 | 100 U  | 0.250 U                    | 1.00 U       | 0.500 U       | 1.50 U        | 1.00 U    | 0.500 U  | 0.500 U     | 2.00 U      | 312.77             | 20.26          | 292.51      | 3.11                   |
| MW-111               | 3/17/2014  | 100 U  | 0.250 U                    | 1.00 U       | 0.500 U       | 1.50 U        | 1.00 U    | 0.500 U  | 0.500 U     | 2.00 U      | 310.62             | 31.43          | 279.19      | 0.11                   |
| MW-111               | 5/21/2014  | 100 U  | 0.250 U                    | 1.00 U       | 0.500 U       | 1.50 U        | 1.00 U    | 0.500 U  | 0.500 U     | 2.00 U      | 310.62             | 29.35          | 281.27      | 9.60                   |
| MW-111               | 8/20/2014  | 100 U  | 0.250 U                    | 1.00 U       | 0.500 U       | 1.50 U        | 1.00 U    | 0.500 U  | 0.500 U     | 2.00 U      | 310.62             | 30.11          | 280.51      | 9.48                   |
| MW-111               | 11/11/2014 | 100 U  | 0.250 U                    | 1.00 U       | 0.500 U       | 1.50 U        | 1.00 U    | 0.500 U  | 0.500 U     | 2.00 U      | 310.62             | 31.19          | 279.43      | 0.26                   |

**Notes:**

µg/L = micrograms per liter

CAS RN = Chemical Abstracts Service Registry Number

EDB = 1,2-dibromoethane

EDC = 1,2-dichloroethane

feet msl = feet above mean sea level

feet toc = feet below top of well casing

mg/L = milligrams per liter

MTBE = methyl tert-butyl ether

MTCA Method A = Washington Department of Ecology Model Toxics Control Act Method A cleanup standards

<sup>a</sup> Applicable cleanup level if benzene is detected in the groundwater sample.

<sup>b</sup> Applicable cleanup level if benzene is not detected in the groundwater sample.

**Bold** values indicate constituent detected at concentration greater than laboratory reporting limit (MRL)

**Red** values indicate the concentration exceeds the MTCA Method A cleanup level

U: The analyte was not detected above the MRL or method detection limit (MDL) presented

**TABLE 3**  
**Soil Vapor Extraction System Monitoring Data**  
**Fred Meyer Facility, Port Orchard, Washington**

| Date  | Monitoring Days | Operational Days | % Operational | Total Influent VOC Level <sup>1</sup> | Vacuum <sup>2</sup> | Total Flow Velocity | Bleed Flow Velocity | Total Recovered Flow Rate <sup>3</sup> | Volatile Removal Rate at End of Period | Estimated VOCs Removed for Period | Estimated VOCs Removed to Date |
|---|-----------------|------------------|---------------|---------------------------------------|---------------------|---------------------|---------------------|--|--|-----------------------------------|--------------------------------|
|   |                 |                  |               | (ppmv)                                | (inches H2O)        | (feet per minute)   | (cfm)               | (lbs./day)                             | (pounds)                               |                                   |                                |
| 3/1/00  | -               | -                | -             | 105.0                                 | 90                  | 1,200               | 0                   | 105                                    | 2.31                                   | 0                                 | 0                              |
| 5/24/00   | 84              | 84               | 100%          | 160.9                                 | > 100               | 1,000               | 0                   | 87                                     | 2.95                                   | 221                               | 221                            |
| 8/17/00   | 85              | 85               | 100%          | 66.1                                  | 75                  | NA                  | 0                   | 220                                    | 3.05                                   | 255                               | 476                            |
| 10/19/00  | 63              | 63               | 100%          | 17.9                                  | 34                  | NA                  | 0                   | 320                                    | 1.20                                   | 134                               | 610                            |
| 12/13/00  | 55              | 55               | 100%          | 62.2                                  | > 100               | 1,000               | 0                   | 87                                     | 1.14                                   | 64                                | 674                            |
| 2/22/01   | 71              | 71               | 100%          | 4.0                                   | 71                  | NA                  | 0                   | 225                                    | 0.19                                   | 47                                | 721                            |
| 3/19/01   | 25              | 25               | 100%          | 28.3                                  | 90                  | NA                  | 0                   | 160                                    | 0.95                                   | 14                                | 736                            |
| AMEC finds that select SVE wells were destroyed during expansion of the Bethel Road SE and SE Sedgwick Road right-of-ways adjacent to site. |                 |                  |               |                                       |                     |                     |                     |  |  |                                   |                                |
| 6/28/01   | 101             | 101              | 100%          | 11.2                                  | 80                  | NA                  | 0                   | 200                                    | 0.47                                   | 72                                | 807                            |
| 9/23/01   | 87              | 43               | 49%           | 4.2                                   | 100                 | NA                  | 0                   | 120                                    | 0.11                                   | 12                                | 820                            |
| 12/11/01  | 79              | 39               | 49%           | 0.0                                   | 100                 | NA                  | 0                   | 120                                    | 0.00                                   | 2.1                               | 822                            |
| 3/20/02   | 99              | 50               | 51%           | 1.4                                   | 100                 | NA                  | 0                   | 120                                    | 0.04                                   | 0.9                               | 823                            |
| 6/11/02   | 83              | 29               | 35%           | 0.0                                   | 90                  | NA                  | 0                   | 160                                    | 0.00                                   | 0.5                               | 823                            |
| AS system is completely off-line as a result of damages incurred during site redevelopment  |                 |                  |               |                                       |                     |                     |                     |  |  |                                   |                                |
| 9/25/02   | 106             | 106              | 56%           | 0.0                                   | 90                  | 2,600               | 0                   | 227                                    | 0.00                                   | 0                                 | 823                            |
| 12/12/02  | 78              | 78               | 50%           | 2.7                                   | 90                  | 2,500               | 0                   | 218                                    | 0.12                                   | 4.8                               | 828                            |
| 4/1/03  | 110             | 110              | 100%          | 6.0                                   | 80                  | 3,000               | 0                   | 262                                    | 0.33                                   | 25                                | 853                            |
| 6/22/03   | 82              | 82               | 100%          | 0.0                                   | 100                 | NA                  | 0                   | 120                                    | 0.00                                   | 14                                | 867                            |
| 9/23/03   | 93              | 93               | 100%          | 0.0                                   | 60                  | 4,100               | 0                   | 358                                    | 0.00                                   | 0                                 | 867                            |
| 12/17/03  | 85              | 85               | 100%          | 0.0                                   | 70                  | 3,800               | 0                   | 331                                    | 0.00                                   | 0                                 | 867                            |
| 3/31/04   | 105             | 0                | 0%            | 0.0                                   | 0                   | 0                   | 0                   | 0                                      | 0.00                                   | 0                                 | 867                            |
| 6/29/04   | 90              | 90               | 100%          | 0.0                                   | 60                  | 4,100               | 0                   | 358                                    | 0.00                                   | 0                                 | 867                            |
| 9/29/04   | 92              | 92               | 100%          | 0.0                                   | 60                  | 4,100               | 0                   | 358                                    | 0.00                                   | 0                                 | 867                            |
| 11/9/04   | 41              | 41               | 100%          | 0.0                                   | 55                  | 4,300               | 0                   | 375                                    | 0.00                                   | 0                                 | 867                            |
| 3/10/05   | 121             | 121              | 100%          | 0.0                                   | 50                  | 4,500               | 0                   | 393                                    | 0.00                                   | 0                                 | 867                            |
| 6/21/05   | 103             | 103              | 100%          | 0.0                                   | 55                  | 2,000               | 0                   | 174                                    | 0.00                                   | 0                                 | 867                            |
| 9/23/05   | 94              | 94               | 100%          | 0.0                                   | 100                 | NA                  | 0                   | 120                                    | 0.00                                   | 0                                 | 867                            |
| 12/1/05   | 69              | 69               | 100%          | 0.0                                   | 100                 | NA                  | 0                   | 120                                    | 0.00                                   | 0                                 | 867                            |
| 3/9/06*   | 98              | unknown          | unknown       | 0.0                                   | 0                   | 0                   | 0                   | 0                                      | 0.00                                   | 0                                 | 867                            |
| SVE system is completely off-line as a result of damages to blower.   |                 |                  |               |                                       |                     |                     |                     |  |  |                                   |                                |
| 6/8/06**  | 91              | 0                | 0%            | 0.0                                   | 0                   | 0                   | 0                   | 0                                      | 0.00                                   | 0                                 | 867                            |
| 9/22/06   | 106             | 0                | 0%            | 0.0                                   | 0                   | 0                   | 0                   | 0                                      | 0.00                                   | 0                                 | 867                            |
| 12/12/06  | 81              | 0                | 0%            | 0.0                                   | 0                   | 0                   | 0                   | 0                                      | 0.00                                   | 0                                 | 867                            |
| 3/28/07   | 106             | 0                | 0%            | 0.0                                   | 0                   | 0                   | 0                   | 0                                      | 0.00                                   | 0                                 | 867                            |
| 6/13/07   | 77              | 0                | 0%            | 0.0                                   | 0                   | 0                   | 0                   | 0                                      | 0.00                                   | 0                                 | 867                            |
| 8/28/07   | 76              | 0                | 0%            | 0.0                                   | 0                   | 0                   | 0                   | 0                                      | 0.00                                   | 0                                 | 867                            |
| 11/28/07  | 92              | 0                | 0%            | 0.0                                   | 0                   | 0                   | 0                   | 0                                      | 0.00                                   | 0                                 | 867                            |
| 4/15/08   | 139             | 0                | 0%            | 0.0                                   | 0                   | 0                   | 0                   | 0                                      | 0.00                                   | 0                                 | 867                            |
| 6/19/08   | 65              | 0                | 0%            | 0.0                                   | 0                   | 0                   | 0                   | 0                                      | 0.00                                   | 0                                 | 867                            |
| 9/16/08   | 89              | 0                | 0%            | 0.0                                   | 0                   | 0                   | 0                   | 0                                      | 0.00                                   | 0                                 | 867                            |
| 1/24/09   | 130             | 0                | 0%            | 0.0                                   | 0                   | 0                   | 0                   | 0                                      | 0.00                                   | 0                                 | 867                            |
| AS/SVE System Repaired and Restarted on 02/20/09  |                 |                  |               |                                       |                     |                     |                     |  |  |                                   |                                |
| 2/21/09   | 28              | 1                | 100%          | 28.3                                  | 90                  | 6,000               | 1,200               | 175                                    | 0.00                                   | 0                                 | 867                            |
| 3/28/09   | 35              | 35               | 100%          | 31.2                                  | 90                  | 6,000               | 1,200               | 175                                    | 1.15                                   | 40                                | 907                            |
| 6/11/09***  | 75              | 70               | 93%           | 4.0                                   | 90                  | 6,000               | 1,200               | 175                                    | 0.15                                   | 45                                | 952                            |
| 9/10/09   | 91              | 91               | 100%          | 0.5                                   | 100                 | 6,000               | 1,200               | 150                                    | 0.02                                   | 7.4                               | 959                            |
| 1/22/10   | 134             | 134              | 100%          | 0.6                                   | 54                  | 6,000               | 1,200               | 285                                    | 0.04                                   | 3.5                               | 963                            |
| 3/5/10  | 42              | 42               | 100%          | 0.5                                   | 100                 | 6,000               | 1,200               | 150                                    | 0.02                                   | 1.1                               | 964                            |
| 6/10/10****   | 97              | 97               | 50%           | 0.2                                   | 100                 | 6,000               | 1,000               | 150                                    | 0.01                                   | 1.1                               | 965                            |
| 9/9/10  | 91              | 91               | 100%          | 0.6                                   | 100                 | 4,000               | 2,000               | 150                                    | 0.02                                   | 1.1                               | 966                            |
| 12/6/10   | 88              | 88               | 100%          | 0.4                                   | 100                 | 4,300               | 1,700               | 150                                    | 0.01                                   | 1.4                               | 968                            |
| 3/29/11*****  | 113             | 113              | 100%          | 0.4                                   | 100                 | 5,000               | 1,000               | 150                                    | 0.01                                   | 1.4                               | 969                            |
| 6/21/11****   | 84              | 42               | 50%           | 0.6                                   | 90                  | 4,300               | 2,500               | 175                                    | 0.02                                   | 0.7                               | 970                            |

**TABLE 3**  
**Soil Vapor Extraction System Monitoring Data**  
**Fred Meyer Facility, Port Orchard, Washington**

| Date  | Monitoring Days | Operational Days | % Operational | Total Influent VOC Level <sup>1</sup> | Vacuum <sup>2</sup> | Total Flow Velocity | Bleed Flow Velocity | Total Recovered Flow Rate <sup>3</sup> | Volatile Removal Rate at End of Period | Estimated VOCs Removed for Period | Estimated VOCs Removed to Date |  |
|---|-----------------|------------------|---------------|---------------------------------------|---------------------|---------------------|---------------------|--|--|-----------------------------------|--------------------------------|--|
|   |                 |                  |               | (ppmv)                                | (inches H2O)        | (feet per minute)   | (cfm)               | (lbs./day)                             | (pounds)                               |                                   |                                |  |
| One AS blower and one blower connector replaced on 6/21/11  |                 |                  |               |                                       |                     |                     |                     |  |  |                                   |                                |  |
| 9/27/11   | 98              | 98               | 100%          | 0.9                                   | 100                 | 4,000               | 1,500               | 150                                    | 0.03                                   | 2.5                               | 972                            |  |
| 12/7/11   | 71              | 71               | 100%          | 0.0                                   | 90                  | 6,000               | 1,500               | 175                                    | 0.00                                   | 1.0                               | 973                            |  |
| 1/12/12*****  | 36              | 0                | 0%            | 0.0                                   | 0                   | 0                   | 0                   | 0                                      | 0.00                                   | 0.0                               | 973                            |  |
| 5/10/12   | 119             | 119              | 100%          | 0.0                                   | 60                  | 6,000               | 1,500               | 260                                    | 0.00                                   | 0.0                               | 973                            |  |
| 8/8/12  | 90              | 90               | 100%          | 0.0                                   | 60                  | 6,000               | 1,500               | 260                                    | 0.00                                   | 0.0                               | 973                            |  |
| 11/14/12  | 98              | 98               | 100%          | 0.0                                   | 100                 | 4,000               | 1,500               | 150                                    | 0.00                                   | 0.0                               | 973                            |  |
| 2/11/13   | 89              | 89               | 100%          | 0.0                                   | 60                  | 6,000               | 1,500               | 260                                    | 0.00                                   | 0.0                               | 973                            |  |
| 6/11/13   | 120             | 120              | 100%          | 0.0                                   | 60                  | 6,000               | 1,500               | 260                                    | 0.00                                   | 0.0                               | 973                            |  |
| 8/27/13   | 77              | unknown          | unknown       | 0.0                                   | 0                   | 0                   | 0                   | 0                                      | 0.00                                   | 0                                 | 973                            |  |
| SVE system is completely off-line as a result of damage to compressor. AS/SVE System Repaired and Restarted on 10/22/2013 |                 |                  |               |                                       |                     |                     |                     |  |  |                                   |                                |  |
| 11/25/13  | 90              | 34               | 38%           | 0.0                                   | 0                   | 0                   | 0                   | 0                                      | 0.00                                   | 0                                 | 0                              |  |
| AS/SVE System shut down on 11/25/2013 to begin post-remediation confirmation monitoring.                                  |                 |                  |               |                                       |                     |                     |                     |  |  |                                   |                                |  |

**Notes:**

VOC = volatile organic compounds

1 = Reflects VOC concentration of total system influent at monitoring event arrival time based on photoionization detector measurement.

2 = Reflects vacuum measurements collected at total system influent intake at monitoring event arrival time

3 = Volumetric flows through December 2005 were determined from total flow velocity or from measured vacuum and manufacturer's blower curves, if vacuum not available. Volumetric flows from February 2009 are determined from measured vacuum and manufacturer's blower curves, due to uncertainty of field velocity measurements.

NA = measurement not taken

PID = photoionization detector

ppmv = parts per million by volume

cfm = cubic feet per minute

\* = The knock out tank and all piping were full of water upon arrival for this monitoring day. Normal system readings could not be taken

\*\* = The system was off upon arrival and departure from the site. The SVE blowers did not work properly

\*\*\* = The VES blower was off upon arrival and turned on at departure.

\*\*\*\* = The discharge pipe was melted at arrival; damaged sometime between 1Q2010 event and 2Q2010 event.

\*\*\*\*\* = Air sparging blower #1 was off on arrival and departure due to failed connector.

\*\*\*\*\* = Air sparging blower #1 was off on arrival due tripped circuit breaker.

**TABLE 4  
Air Sparging System Performance Monitoring Data  
Fred Meyer Facility, Port Orchard, Washington**

| <b>Monitoring Well</b>                        | <b>Date</b>                                     | <b>Groundwater Depth Below Top of Casing (Feet)</b> | <b>Groundwater Elevation (Feet)</b> | <b>Final Dissolved Oxygen (mg/L)</b> | <b>Gasoline-Range Organics (µg/L)</b> |       |
|---|---|---|-------------------------------------|--------------------------------------|---------------------------------------|-------|
| MW-103  | <i>AS/SVE Systems Reactivated on 02/21/2009</i> |   |                                     |                                      |                                       |       |
|   | 3/28/2009                                       | 18.16   | 293.54                              | 1.50                                 | 80 U                                  |       |
|   | 6/11/2009                                       | 18.61   | 293.09                              | 2.34                                 | 100 U                                 |       |
|   | 9/10/2009                                       | 21.47   | 290.23                              | 8.71                                 | 179                                   |       |
|   | 1/22/2010                                       | 19.31   | 292.39                              | 1.66                                 | 1,320                                 |       |
|   | 3/5/2010  | 18.30   | 293.40                              | 1.31                                 | 100 U                                 |       |
|   | 6/10/2010                                       | 19.44   | 292.26                              | 1.94                                 | 403                                   |       |
|   | 9/9/2010  | 21.86   | 289.84                              | 0.78                                 | 7,430                                 |       |
|   | 12/6/2010                                       | 20.60   | 291.10                              | 0.72                                 | 4,060                                 |       |
|   | 3/29/2011                                       | 15.75   | 295.95                              | 0.81                                 | 100 U                                 |       |
|   | 6/21/2011                                       | 18.06   | 293.64                              | 0.51                                 | 100 U                                 |       |
|   | 9/27/2011                                       | 21.12   | 290.58                              | 1.41                                 | 4,330                                 |       |
|   | 12/7/2011                                       | 20.05   | 291.65                              | 6.24                                 | 664                                   |       |
|   | 1/12/2012                                       | 20.70   | 291.00                              | 6.97                                 | 100 U                                 |       |
|   | 5/10/2012                                       | 21.28   | 290.42                              | 7.42                                 | 108                                   |       |
|   | 8/8/2012  | 22.61   | 289.09                              | 9.92                                 | 2,490                                 |       |
|   | 11/14/2012                                      | 24.45   | 287.25                              | 2.97                                 | 305                                   |       |
|   | 2/11/2013                                       | 18.79   | 292.91                              | 3.05                                 | 311                                   |       |
|   | 6/12/2013                                       | 19.80   | 291.90                              | 15.81                                | 100 U                                 |       |
|   | 8/27/2013                                       | 22.96   | 288.74                              | 3.34                                 | 426                                   |       |
|   | 11/25/2013                                      | 21.63   | 290.07                              | 5.13                                 | 100 U                                 |       |
|   | <i>AS/SVE Systems Shut Down on 11/25/2013</i>   |   |                                     |                                      |                                       |       |
|   | 3/17/2014                                       | 19.14   | 292.56                              | 0.20                                 | 141                                   |       |
|   | 5/21/2014                                       | 18.72   | 292.95                              | 0.16                                 | 110                                   |       |
|   | 8/20/2014                                       | 23.19   | 288.51                              | 0.31                                 | 607                                   |       |
|   | 11/11/2014                                      | 23.80   | 287.90                              | 0.52                                 | 815                                   |       |
|   | MW-105  | <i>AS/SVE Systems Reactivated on 02/21/2009</i>     |                                     |                                      |                                       |       |
|   |   | 3/28/2009   | 17.17                               | 293.29                               | 1.58                                  | 80 U  |
|   |   | 6/11/2009   | 17.63                               | 292.83                               | 1.29                                  | 100 U |
|   |   | 9/10/2009   | 21.48                               | 288.98                               | 3.30                                  | 80 U  |
|   |   | 1/22/2010   | 17.46                               | 293.00                               | 7.66                                  | 80 U  |
| 3/5/2010                                      |   | 16.98   | 293.48                              | 1.38                                 | 100 U                                 |       |
| 6/10/2010                                     |   | 18.11   | 292.35                              | 2.59                                 | 100 U                                 |       |
| 9/9/2010                                      |   | 20.62   | 289.84                              | 1.91                                 | 100 U                                 |       |
| 12/6/2010                                     |   | 19.22   | 291.24                              | 1.89                                 | 100 U                                 |       |
| 3/29/2011                                     |   | 14.22   | 296.24                              | 0.96                                 | 100 U                                 |       |
| 6/21/2011                                     |   | 16.20   | 294.26                              | 0.93                                 | 100 U                                 |       |
| 9/27/2011                                     |   | 20.28   | 290.18                              | 2.57                                 | 100 U                                 |       |
| 12/7/2011                                     |   | 18.51   | 291.95                              | 2.70                                 | 100 U                                 |       |
| 1/12/2012                                     |   | 18.34   | 292.12                              | 3.80                                 | 100 U                                 |       |
| 5/10/2012                                     |   | 16.28   | 294.18                              | 6.55                                 | 100 U                                 |       |
| 8/8/2012                                      |   | 19.72   | 290.74                              | 8.00                                 | 100 U                                 |       |
| 11/14/2012                                    |   | 20.57   | 289.89                              | 3.85                                 | 100 U                                 |       |
| 2/11/2013                                     |   | 16.02   | 294.44                              | 4.47                                 | 50 U                                  |       |
| 6/12/2013                                     |   | 17.13   | 293.33                              | 16.11                                | 100 U                                 |       |
| 8/27/2013                                     |   | 21.05   | 289.41                              | 11.34                                | 100 U                                 |       |
| 11/25/2013                                    |   | 19.66   | 290.80                              | 3.48                                 | 100 U                                 |       |
| <i>AS/SVE Systems Shut Down on 11/25/2013</i> |   |   |                                     |                                      |                                       |       |
| 3/17/2014                                     |   | 16.12   | 294.34                              | 9.18                                 | 100 U                                 |       |
| 5/21/2014                                     |   | 16.38   | 294.08                              | 7.30                                 | 100 U                                 |       |
| 8/20/2014                                     |   | 20.21   | 290.25                              | 1.81                                 | 100 U                                 |       |
| 11/11/2014                                    |   | 19.62   | 290.84                              | 5.40                                 | 100 U                                 |       |
| <b>MTCA Method A Cleanup Standard</b>         |   |   |                                     |                                      |                                       |       |
| 800 <sup>a</sup>                              |   |   |                                     |                                      |                                       |       |
| 1,000 <sup>b</sup>                            |   |   |                                     |                                      |                                       |       |

**TABLE 4**  
**Air Sparging System Performance Monitoring Data**  
**Fred Meyer Facility, Port Orchard, Washington**

| Monitoring Well                       | Date  | Groundwater Depth Below Top of Casing (Feet) | Groundwater Elevation (Feet) | Final Dissolved Oxygen (mg/L) | Gasoline-Range Organics (µg/L) |
|---------------------------------------|---|--|------------------------------|-------------------------------|--------------------------------|
| MW-108A                               | <i>AS/SVE Systems Reactivated on 02/21/2009</i> |  |                              |                               |                                |
|                                       | 3/28/2009                                       | 22.70  | 287.76                       | 1.21                          | 80 U                           |
|                                       | 6/11/2009                                       | 23.42  | 287.04                       | 1.07                          | 100 U                          |
|                                       | 9/10/2009                                       | 25.52  | 284.86                       | 0.75                          | 80 U                           |
|                                       | 1/22/2010                                       | 22.69  | 287.69                       | 2.57                          | 80 U                           |
|                                       | 3/5/2010  | 21.13  | 289.25                       | 1.21                          | 100 U                          |
|                                       | 6/10/2010                                       | 21.48  | 288.90                       | 0.36                          | 100 U                          |
|                                       | 9/9/2010  | 23.50  | 286.88                       | 1.02                          | 100 U                          |
|                                       | 12/6/2010                                       | 23.15  | 287.23                       | 1.20                          | 100 U                          |
|                                       | 3/29/2011                                       | 17.62  | 292.76                       | 0.85                          | 100 U                          |
|                                       | 6/21/2011                                       | 19.89  | 290.49                       | 0.84                          | 100 U                          |
|                                       | 9/27/2011                                       | 22.95  | 287.43                       | 0.46                          | 100 U                          |
|                                       | 12/7/2011                                       | 23.05  | 287.33                       | 0.62                          | 100 U                          |
|                                       | 1/12/2012                                       | 23.17  | 287.21                       | 1.97                          | 100 U                          |
|                                       | 5/10/2012                                       | 21.03  | 289.35                       | 2.94                          | 100 U                          |
|                                       | 8/8/2012  | 22.80  | 287.58                       | 2.81                          | 100 U                          |
|                                       | 11/14/2012                                      | 24.31  | 286.07                       | 0.37                          | 100 U                          |
|                                       | 2/11/2013                                       | 19.90  | 290.48                       | 0.84                          | 50 U                           |
|                                       | 6/12/2013                                       | 21.05  | 289.33                       | 4.38                          | 100 U                          |
|                                       | 8/27/2013                                       | 23.19  | 287.19                       | 0.22                          | 100 U                          |
|                                       | 11/25/2013                                      | 23.36  | 287.02                       | 1.37                          | 100 U                          |
|                                       | <i>AS/SVE Systems Shut Down on 11/25/2013</i>   |  |                              |                               |                                |
|                                       | 3/17/2014                                       | 18.62  | 291.76                       | 2.62                          | 100 U                          |
| 5/21/2014                             | 17.83   | 292.55                                       | 1.90                         | 100 U                         |                                |
| 8/20/2014                             | 20.41   | 289.97                                       | 0.56                         | 100 U                         |                                |
| 11/11/2014                            | 18.77   | 291.61                                       | 0.41                         | 100 U                         |                                |
| MW-109                                | <i>AS/SVE Systems Reactivated on 02/21/2009</i> |  |                              |                               |                                |
|                                       | 3/28/2009                                       | 16.13  | 294.33                       | 0.99                          | 80 U                           |
|                                       | 6/11/2009                                       | 16.27  | 294.19                       | 0.74                          | 100 U                          |
|                                       | 9/10/2009                                       | 19.77  | 290.71                       | 1.95                          | 80 U                           |
|                                       | 1/22/2010                                       | 15.25  | 295.23                       | 6.44                          | 80 U                           |
|                                       | 3/5/2010  | 15.23  | 295.25                       | 0.85                          | 100 U                          |
|                                       | 6/10/2010                                       | 16.20  | 294.28                       | 1.86                          | 100 U                          |
|                                       | 9/9/2010  | 18.92  | 291.56                       | 0.97                          | 100 U                          |
|                                       | 12/6/2010                                       | 16.71  | 293.77                       | 0.79                          | 100 U                          |
|                                       | 3/29/2011                                       | 13.30  | 297.18                       | 0.67                          | 100 U                          |
|                                       | 6/21/2011                                       | 14.70  | 295.78                       | 0.65                          | 100 U                          |
|                                       | 9/27/2011                                       | 18.86  | 291.62                       | 0.60                          | 100 U                          |
|                                       | 12/7/2011                                       | 15.99  | 294.49                       | 2.57                          | <b>137</b>                     |
|                                       | 1/12/2012                                       | 15.76  | 294.72                       | 3.40                          | 100 U                          |
|                                       | 5/10/2012                                       | 14.48  | 296.00                       | 4.00                          | 100 U                          |
|                                       | 8/8/2012  | 17.91  | 292.57                       | 4.96                          | 100 U                          |
|                                       | 11/14/2012                                      | 17.98  | 292.50                       | 1.62                          | 100 U                          |
|                                       | 2/11/2013                                       | 14.19  | 296.29                       | 2.01                          | <b>62.4 J</b>                  |
|                                       | 6/12/2013                                       | 18.77  | 291.71                       | -                             | -                              |
|                                       | 8/27/2013                                       | 18.95  | 291.53                       | 5.02                          | 100 U                          |
|                                       | 11/25/2013                                      | 17.74  | 292.74                       | 2.36                          | 100 U                          |
|                                       | <i>AS/SVE Systems Shut Down on 11/25/2013</i>   |  |                              |                               |                                |
|                                       | 3/17/2014                                       | 13.95  | 296.53                       | 6.59                          | 100 U                          |
| 5/21/2014                             | 14.56   | 295.92                                       | 3.76                         | 100 U                         |                                |
| 8/20/2014                             | 18.42   | 292.06                                       | 2.45                         | 100 U                         |                                |
| 11/11/2014                            | 16.74   | 293.74                                       | 3.21                         | 100 U                         |                                |
| <b>MTCA Method A Cleanup Standard</b> |   |  |                              |                               |                                |
|                                       |   |  |                              | <b>800<sup>a</sup></b>        | <b>1,000<sup>b</sup></b>       |

**TABLE 4**  
**Air Sparging System Performance Monitoring Data**  
**Fred Meyer Facility, Port Orchard, Washington**

| Monitoring Well                       | Date  | Groundwater Depth Below Top of Casing (Feet) | Groundwater Elevation (Feet) | Final Dissolved Oxygen (mg/L) | Gasoline-Range Organics (µg/L) |
|---------------------------------------|---|--|------------------------------|-------------------------------|--------------------------------|
| MW-109A                               | <i>Installed on 6/11/2013</i>                   |  |                              |                               |                                |
|                                       | 6/12/2013                                       | 20.51  | 291.20                       | 10.57                         | 100 U                          |
|                                       | 8/27/2013                                       | 19.93  | 291.78                       | 1.84                          | 100 U                          |
|                                       | 11/25/2013                                      | 19.01  | 292.70                       | 5.36                          | 100 U                          |
|                                       | <i>AS/SVE Systems Shut Down on 11/25/2013</i>   |  |                              |                               |                                |
|                                       | 3/17/2014                                       | 15.70  | 296.01                       | 2.19                          | 100 U                          |
|                                       | 5/21/2014                                       | 16.07  | 295.64                       | 2.45                          | 100 U                          |
|                                       | 8/20/2014                                       | 19.41  | 292.30                       | 0.71                          | 100 U                          |
| 11/11/2014                            | 18.20   | 293.51                                       | 1.44                         | 100 U                         |                                |
| MW-110                                | <i>AS/SVE Systems Reactivated on 02/21/2009</i> |  |                              |                               |                                |
|                                       | 3/28/2009                                       | 16.44  | 294.02                       | 1.10                          | <b>162</b>                     |
|                                       | 6/11/2009                                       | --   | --                           | 6.31                          | 100 U                          |
|                                       | 9/10/2009                                       | 22.60  | 290.17                       | 9.68                          | 80 U                           |
|                                       | 1/22/2010                                       | 19.76  | 293.01                       | 6.19                          | <b>687</b>                     |
|                                       | 3/5/2010  | 18.56  | 294.21                       | 2.16                          | 100 U                          |
|                                       | 6/10/2010                                       | 19.94  | 292.83                       | 1.13                          | 100 U                          |
|                                       | 9/9/2010  | 22.30  | 290.47                       | 3.55                          | <b>1,880</b>                   |
|                                       | 12/6/2010                                       | 20.63  | 292.14                       | 3.85                          | <b>371</b>                     |
|                                       | 3/29/2011                                       | 17.33  | 295.44                       | 1.53                          | <b>442</b>                     |
|                                       | 6/21/2011                                       | 19.52  | 293.25                       | 1.07                          | 100 U                          |
|                                       | 9/27/2011                                       | 21.86  | 290.91                       | 4.45                          | <b>4,020</b>                   |
|                                       | 12/7/2011                                       | 20.23  | 2912.54                      | 3.54                          | <b>1,230</b>                   |
|                                       | 1/12/2012                                       | 20.22  | 292.55                       | 7.50                          | 100 U                          |
|                                       | 5/10/2012                                       | 20.63  | 292.14                       | 9.44                          | 100 U                          |
|                                       | 8/8/2012  | 21.50  | 291.27                       | 11.46                         | <b>1,630</b>                   |
|                                       | 11/14/2012                                      | 25.07  | 287.70                       | 5.73                          | 100 U                          |
|                                       | 2/11/2013                                       | 18.23  | 294.54                       | 6.17                          | 100 U                          |
|                                       | 6/12/2013                                       | 17.43  | 295.34                       | 18.90                         | 100 U                          |
|                                       | 8/27/2013                                       | 22.97  | 289.80                       | 4.82                          | 100 U                          |
|                                       | 11/25/2013                                      | 21.70  | 291.07                       | 5.92                          | 100 U                          |
|                                       | <i>AS/SVE Systems Shut Down on 11/25/2013</i>   |  |                              |                               |                                |
| 3/17/2014                             | 17.91   | 294.86                                       | 2.91                         | 100 U                         |                                |
| 5/21/2014                             | 18.37   | 294.40                                       | 1.58                         | 100 U                         |                                |
| 8/20/2014                             | 21.71   | 291.06                                       | 1.48                         | <b>258</b>                    |                                |
| 11/11/2014                            | 20.30   | 292.47                                       | 3.11                         | 100 U                         |                                |
| <b>MTCA Method A Cleanup Standard</b> |   |  |                              |                               |                                |
| 800 <sup>a</sup>                      |   |  |                              |                               |                                |
| 1,000 <sup>b</sup>                    |   |  |                              |                               |                                |

**TABLE 4**  
**Air Sparging System Performance Monitoring Data**  
**Fred Meyer Facility, Port Orchard, Washington**

| <b>Monitoring Well</b>                | <b>Date</b>                                     | <b>Groundwater Depth Below Top of Casing (Feet)</b> | <b>Groundwater Elevation (Feet)</b> | <b>Final Dissolved Oxygen (mg/L)</b> | <b>Gasoline-Range Organics (µg/L)</b>  |
|---------------------------------------|---|---|-------------------------------------|--------------------------------------|--|
| MW-111                                | <i>AS/SVE Systems Reactivated on 02/21/2009</i> |   |                                     |                                      |  |
|                                       | 3/28/2009                                       | 32.04   | 278.42                              | 0.80                                 | 80 U                                   |
|                                       | 6/11/2009                                       | 31.44   | 279.02                              | 0.67                                 | 100 U                                  |
|                                       | 9/10/2009                                       | 32.02   | 278.60                              | 1.17                                 | 80 U                                   |
|                                       | 1/22/2010                                       | 31.52   | 279.10                              | 8.58                                 | 80 U                                   |
|                                       | 3/5/2010  | 29.76   | 280.86                              | 0.57                                 | 100 U                                  |
|                                       | 6/10/2010                                       | 28.85   | 281.77                              | 0.26                                 | 100 U                                  |
|                                       | 9/9/2010  | 30.19   | 280.43                              | 0.65                                 | 100 U                                  |
|                                       | 12/6/2010                                       | 31.02   | 279.60                              | 0.80                                 | 100 U                                  |
|                                       | 3/29/2011                                       | 26.71   | 283.91                              | 0.70                                 | 100 U                                  |
|                                       | 6/21/2011                                       | 27.31   | 283.31                              | 0.40                                 | 100 U                                  |
|                                       | 9/27/2011                                       | 29.73   | 280.89                              | 0.57                                 | 100 U                                  |
|                                       | 12/7/2011                                       | 30.77   | 279.85                              | 9.08                                 | 100 U                                  |
|                                       | 1/12/2012                                       | 30.97   | 279.65                              | 8.95                                 | 100 U                                  |
|                                       | 5/10/2012                                       | 28.90   | 281.72                              | 0.52                                 | 100 U                                  |
|                                       | 8/8/2012  | 29.90   | 280.72                              | 0.64                                 | 100 U                                  |
|                                       | 11/14/2012                                      | 31.21   | 279.41                              | 0.49                                 | 100 U                                  |
|                                       | 2/11/2013                                       | 28.20   | 282.42                              | 0.65                                 | 50 U                                   |
|                                       | 6/12/2013                                       | 29.05   | 281.57                              | 0.75                                 | 100 U                                  |
|                                       | 8/27/2013                                       | 30.20   | 280.42                              | 0.27                                 | 100 U                                  |
|                                       | 11/25/2013                                      | 31.45   | 279.17                              | 0.37                                 | 100 U                                  |
|                                       | <i>AS/SVE Systems Shut Down on 11/25/2013</i>   |   |                                     |                                      |  |
|                                       |   | 3/17/2014   | 31.43                               | 279.19                               | 0.11                                   |
|                                       | 5/21/2014                                       | 29.35   | 281.27                              | 9.60                                 | 100 U                                  |
|                                       | 8/20/2014                                       | 30.11   | 280.51                              | 9.48                                 | 100 U                                  |
|                                       | 11/11/2014                                      | 31.19   | 279.43                              | 0.26                                 | 100 U                                  |
| <b>MTCA Method A Cleanup Standard</b> |   |   |                                     |                                      | 800 <sup>a</sup><br>1,000 <sup>b</sup> |

**Notes:**

MTCA Method A = Washington Department of Ecology Model Toxics Control Act Method A screening criteria

<sup>a</sup> Applicable cleanup level if benzene is detected in the groundwater sample.

<sup>b</sup> Applicable cleanup level if benzene is not detected in the groundwater sample.

mg/L = milligrams per liter

µg/L = micrograms per liter

AS/SVE = air sparging and soil vapor extraction

**Bold** values indicate concentrations detected above laboratory reporting limit

**Red** values indicate the concentration exceeds the MTCA Method A cleanup standard

U = The analyte was not detected above method reporting limit (MRL) or method detection limit (MDL) presented

J = The analyte detected at concentration greater than or equal to the MDL, but less than the MRL.

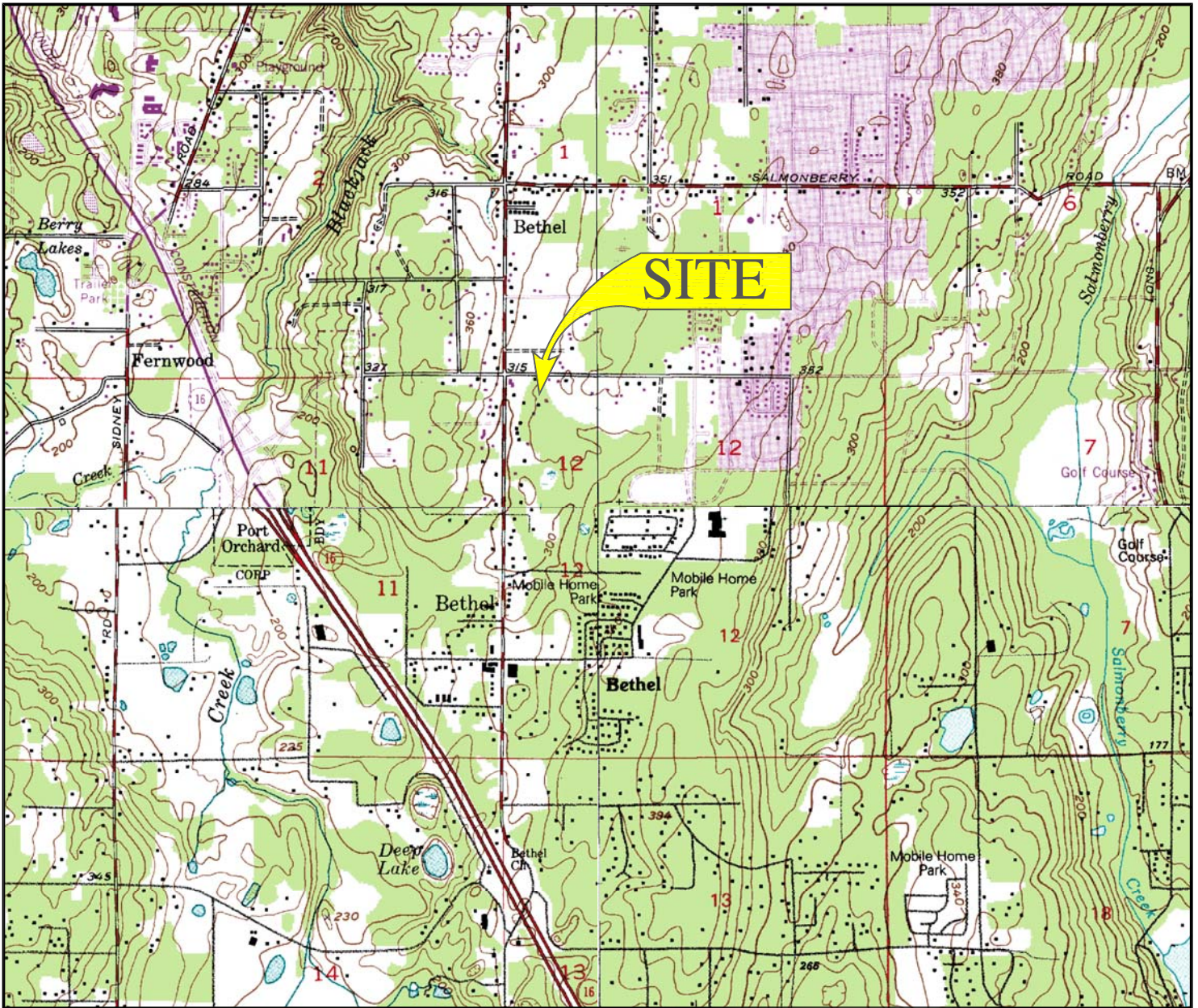
The concentration is an approximate value.

"--" = not measured

---

**FIGURES**





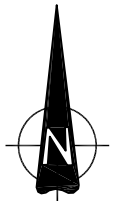
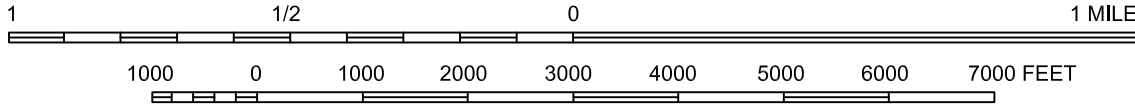
- Heavy-duty
- Medium-duty
- Light-duty
- Unimproved dirt
- U.S. Route
- State Route
- Interstate Route

**BREMERTON WEST, WASH.** 47122-E6-TF-024  
1953  
PHOTOREVISED 1981  
DMA 1479 II SERIES V891

**BREMERTON EAST, WASH.** N4730-W12230/7.5  
1953  
PHOTOREVISED 1981  
DMA 1479 II SERIES V891

**BURLEY, WASH.** 47122-D6-TF-024  
1953  
PHOTOREVISED 1994  
DMA 1478 II NW-SERIES V891

**OLALLA, WASH.** 47122-D5-TF-024  
1953  
PHOTOREVISED 1981  
DMA 1478 I NE SERIES V891


















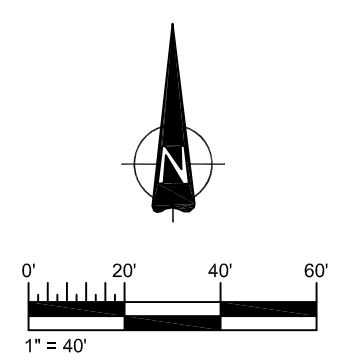
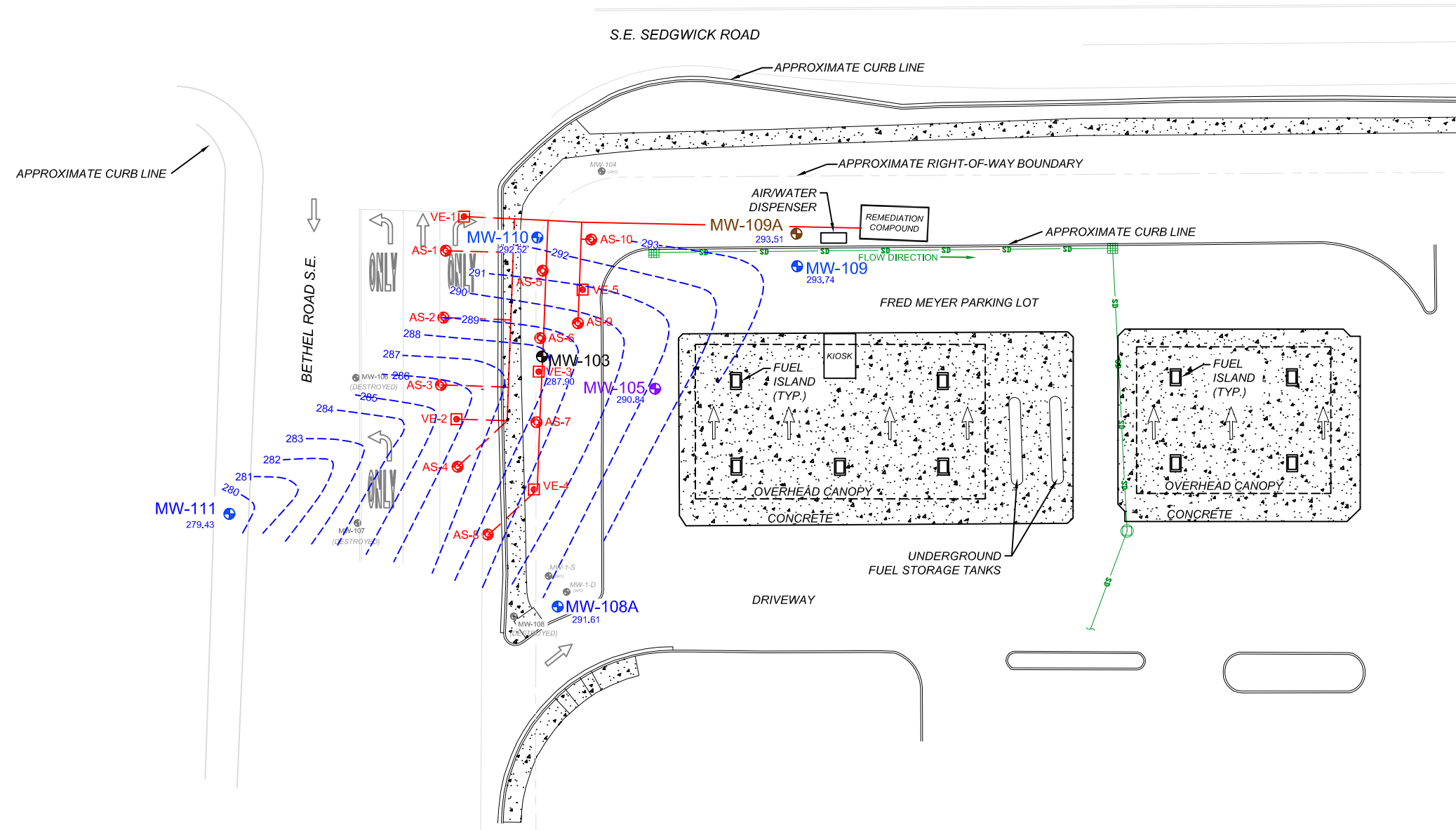
SOURCE: USGS QUAD SHEET: BREMERTON WEST, BREMERTON EAST, BURLEY AND OLALLA, WASH.

|   |  |  |                                 |
|---|--|--|---------------------------------|
| <b>CLIENT</b><br><br><b>FRED MEYER</b><br><br><b>Amec Foster Wheeler</b><br>Environment & Infrastructure, Inc.<br>7376 S.W. Durham Road<br>Portland, OR 97224 |  | <b>PROJECT</b><br><br><b>FRED MEYER - PORT ORCHARD</b> | <b>DATE</b><br><br>JANUARY 2015 |
|   |  | <b>TITLE</b><br><br><b>SITE LOCATION MAP</b>           | <b>SCALE</b><br><br>AS SHOWN    |
|   |  | <b>PROJECT NO.</b><br><br>9-61M-10282-0                | <b>FIGURE</b><br><br><b>1</b>   |

DRAWN BY: PM CHECKED BY: JKH

**LEGEND**

- AS-10  AIR SPARGING WELL NUMBER AND APPROXIMATE LOCATION
- VE-5  VAPOR EXTRACTION WELL NUMBER AND APPROXIMATE LOCATION
- MW-103  EXISTING 4" DIAMETER MONITORING WELL (ECOLOGY, 1991)
- MW-105  EXISTING 2" DIAMETER MONITORING WELL (AGRA, 1999)
- MW-110  EXISTING 2" DIAMETER MONITORING WELL (AMEC, 2008)
- MW-109A  EXISTING 2" DIAMETER MONITORING WELL (AMEC, 2013)
- MW-104  MONITORING WELL DECOMMISSIONED (DEC)
- MW-108  MONITORING WELL DESTROYED BY CONSTRUCTION ACTIVITIES (DESTROYED)
- 296.29 SPOT GROUNDWATER SURFACE ELEVATION IN FEET
- 291  INFERRED GROUNDWATER ELEVATION CONTOUR IN FEET
-  APPROXIMATE DIRECTION OF GROUNDWATER FLOW
-  REMEDIATION SYSTEM TRENCH
-  ANGLED WELL LOCATION
-  CATCH BASIN
-  STORMWATER LINE
-  DIRECTION OF TRAFFIC



|  |  |   |   |                                 |
|--|--|---|---|---------------------------------|
| <p>SOURCE: ABL CIVIL AND STRUCTURAL ENGINEERS,<br/>FILE NAME: 98169-B.dwg.</p> | <p>CLIENT</p> <p><b>FRED MEYER</b></p>   |  | <p>PROJECT</p> <p><b>FRED MEYER - PORT ORCHARD</b></p>              | <p>DATE</p> <p>JANUARY 2015</p> |
|  | <p>Amec Foster Wheeler<br/>Environment &amp; Infrastructure, Inc.<br/>7376 S.W. Durham Road<br/>Portland, OR 97224</p> |   | <p>TITLE</p> <p><b>GROUNDWATER ELEVATIONS<br/>NOVEMBER 2014</b></p> | <p>SCALE</p> <p>1" = 40'</p>    |
|  |  |   | <p>FIGURE</p> <p><b>2</b></p>                                       |                                 |

| MW-110 |            |
|--------|------------|
|        | 11/11/2014 |
| GRO    | 100 U      |
| B      | 0.250 U    |
| T      | 1.00 U     |
| E      | 0.550 U    |
| X      | 1.50 U     |
| MTBE   | 1.00 U     |

| MW-109 |            |
|--------|------------|
|        | 11/11/2014 |
| GRO    | 100 U      |
| B      | 0.250 U    |
| T      | 1.00 U     |
| E      | 0.500 U    |
| X      | 1.50 U     |
| MTBE   | 1.00 U     |

| MW-109A |            |
|---------|------------|
|         | 11/11/2014 |
| GRO     | 100 U      |
| B       | 0.450 U    |
| T       | 1.00 U     |
| E       | 0.500 U    |
| X       | 1.50 U     |
| MTBE    | 1.00 U     |

| MW-103 |            |
|--------|------------|
|        | 11/11/2014 |
| GRO    | 815        |
| B      | 0.250 U    |
| T      | 1.00 U     |
| E      | 1.96       |
| X      | 6.11       |
| MTBE   | 1.00 U     |

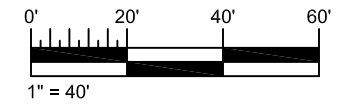
| MW-111 |            |
|--------|------------|
|        | 11/11/2014 |
| GRO    | 100 U      |
| B      | 0.250 U    |
| T      | 1.00 U     |
| E      | 0.500 U    |
| X      | 1.50 U     |
| MTBE   | 1.00 U     |

| MW-108A |            |
|---------|------------|
|         | 11/11/2014 |
| GRO     | 100 U      |
| B       | 0.250 U    |
| T       | 1.00 U     |
| E       | 0.500 U    |
| X       | 1.50 U     |
| MTBE    | 1.00 U     |

| MW-105 |            |
|--------|------------|
|        | 11/11/2014 |
| GRO    | 100 U      |
| B      | 0.250 U    |
| T      | 1.00 U     |
| E      | 0.500 U    |
| X      | 1.50 U     |
| MTBE   | 1.00 U     |

**LEGEND**

- AS-10 AIR SPARGING WELL NUMBER AND APPROXIMATE LOCATION
- VE-5 VAPOR EXTRACTION WELL NUMBER AND APPROXIMATE LOCATION
- MW-103 EXISTING 4" DIAMETER MONITORING WELL (ECOLOGY, 1991)
- MW-105 EXISTING 2" DIAMETER MONITORING WELL (AGRA, 1999)
- MW-110 EXISTING 2" DIAMETER MONITORING WELL (AMEC, 2008)
- MW-109A EXISTING 2" DIAMETER MONITORING WELL (AMEC, 2013)
- MW-104 MONITORING WELL DECOMMISSIONED (DEC)
- MW-108 MONITORING WELL DESTROYED BY CONSTRUCTION ACTIVITIES (DESTROYED)
- REMEDIATION SYSTEM TRENCH
- ANGLED WELL LOCATION
- CATCH BASIN
- STORMWATER LINE
- DIRECTION OF TRAFFIC
- GRO GASOLINE RANGE ORGANICS (µg/L)
- B BENZENE (µg/L)
- T TOLUENE (µg/L)
- E ETHYLBENZENE (µg/L)
- X TOTAL XYLENES (µg/L)
- MTBE METHYL-TERT-BUTYL ETHER (µg/L)
- U ANALYTE NOT DETECTED ABOVE METHOD REPORTING OR METHOD DETECTION LIMIT PRESENTED IN TABLE.
- µg/L MICROGRAMS PER LITER



SOURCE: AHBL CIVIL AND STRUCTURAL ENGINEERS,  
FILE NAME: 98169-B.dwg.

CLIENT  
**FRED MEYER**

Amec Foster Wheeler  
Environment & Infrastructure, Inc.  
7376 S.W. Durham Road  
Portland, OR 97224



PROJECT  
**FRED MEYER - PORT ORCHARD**

TITLE  
**GROUNDWATER ANALYTICAL RESULTS  
NOVEMBER 2014**

DATE  
JANUARY 2015

SCALE  
1" = 40'

PROJECT NO.  
9-61M-10282-0

FIGURE  
**3**

DRAWN BY: SD CHECKED BY: JKH

---

**APPENDIX A**

Field Data Acquisition Forms

# QUARTERLY SYSTEM & GROUNDWATER MONITORING PROGRAM

Fred Meyer - Port Orchard

S.E. Intersection of SE Sedgewick Road & Bethel Road SE  
Port Orchard, Washington

Project #: 9-61M-10282-0  
Project Manager: Joel Eledge  
DATE: 11/11/14

TECHNICIAN: JVG/WJM

Revised: Nov. 18, 2013

Arrival Time:

## Groundwater Levels / Product Thickness / Groundwater/Product Pump Operation / 7.5-Gallon Influent Tanks

| Monitoring Point | Depth to Water (Feet) | Depth to Product (Feet) | Product Thickness (Feet) | Dissolved Oxygen (mg/L) | Notes |
|------------------|-----------------------|-------------------------|--------------------------|-------------------------|-------|
| MW-103           | 23.80                 | ND                      | N/A                      | DEE SHUT                |       |
| MW-105           | 19.62                 |                         |                          |                         |       |
| MW-108A          | 18.77                 |                         |                          |                         |       |
| MW-109           | 16.74                 |                         |                          |                         |       |
| MW-109A          | 18.20                 |                         |                          |                         |       |
| MW-110           | 20.26                 |                         |                          |                         |       |
| MW-111           | 31.19                 |                         |                          |                         |       |

Interface Corrected Factor:      feet

## Vapor Extraction System Monitoring

| VES Line             | Vapor Level (ppm) | Vacuum (in of H2O) | Total Flow (fpm) - 4" pipe | Bleed Flow (fpm) - 2" pipe | VES Lines (ON / OFF) |        |
|----------------------|-------------------|--------------------|----------------------------|----------------------------|----------------------|--------|
|                      |                   |                    |                            |                            | Arrival              | Depart |
| Total Sys. - Arrival | OFF               |                    |                            |                            | OFF                  |        |
| VES-1                |                   |                    |                            |                            |                      | OFF    |
| VES-2                |                   |                    |                            |                            |                      |        |
| VES-3                |                   |                    |                            |                            |                      |        |
| VES-4                |                   |                    |                            |                            |                      |        |
| VES-5                |                   |                    |                            |                            |                      |        |
| Total Sys. - Depart  |                   |                    |                            |                            |                      |        |

VES Blower Model: Gast R7100R-50      PID Type: \_\_\_\_\_      Knockout Tank: \_\_\_\_\_  
 Outlet pipe diameter: 2 outlets @ 2" each      PID Number: \_\_\_\_\_      Full (YES / NO): ND  
 VES Blower Arrival (ON / OFF): \_\_\_\_\_      PID Calibrated: \_\_\_\_\_      Emptied (YES / NO): \_\_\_\_\_  
 VES Blower Depart (ON / OFF): \_\_\_\_\_      Anemometer #: \_\_\_\_\_      Quantity: \_\_\_\_\_ gallons

## Air Sparging System

| Air Sparging Line | Flow (cfm) | AS Lines (ON / OFF) |           | Air Sparging Line | Flow (cfm) | AS Lines (ON / OFF) |           |
|-------------------|------------|---------------------|-----------|-------------------|------------|---------------------|-----------|
|                   |            | Arrival             | Departure |                   |            | Arrival             | Departure |
| AS-1              | ND         | OFF                 | OFF       | AS-6              | NA         | OFF                 | OFF       |
| AS-2              |            |                     |           | AS-7              |            |                     |           |
| AS-3              |            |                     |           | AS-8              |            |                     |           |
| AS-4              |            |                     |           | AS-9              |            |                     |           |
| AS-5              |            |                     |           | AS-10             |            |                     |           |

Air Sparging System at Arrival (ON / OFF): \_\_\_\_\_      Air Sparging System at Departure (ON / OFF): \_\_\_\_\_  
 Air Sparging Blower 1# (top) at Arrival (ON / OFF): \_\_\_\_\_      Air Sparging Blower 2 (top) at Arrival (ON / OFF): \_\_\_\_\_  
 Air Sparging Blower 1# (top) at Depart (ON / OFF): \_\_\_\_\_      Air Sparging Blower 2 (top) at Depart (ON / OFF): \_\_\_\_\_  
 Total Air Sparging System Pressure at Arrival:      psi      Total Air Sparging System Pressure at Departure:      psi

Notes:  
 started system. Initially frozen but got it unstuck

Arrival Time: \_\_\_\_\_  
 Departure Time: \_\_\_\_\_



GROUNDWATER SAMPLING FIELD FORM

Fred Meyer Port Orchard
Quarterly Groundwater Monitoring
AMEC Job #: 9-61M-10282-0

Date: 11/11/14

Field Personnel: JVG/wjm

Monitoring Well ID: MW103

Start Time: 15:55 Weather Conditions: clear

Approx. Air Temp (°F): 50

INITIAL WELL DATA & WELL PURGING INFORMATION

Table with 9 columns: Water Temperature (degree C), Water pH (S.U.), Specific Conductivity (µS/cm), Turbidity (NTUs), Dissolved Oxygen (mg/L), ORP (mV), Water Level (feet bgs), Time (0:00 - 23:59), Volume Purged (gal or liters). Contains 4 rows of data.

0.5 inch tubing: 0.020 gallons/linear foot 2" well casing: 0.17 gal/linear foot Total Purged = 4
Purge Pumping Rate (approx. L/m): 1.24m
Approx. Pump/Intake Depth: screen
Well Yield: High / Moderate / Low
Decontamination Method:

WELL CONDITION

Casing Size and Type: 4"
Casing Condition: OK / NA / Needs Repairs/Repaired Lock Condition: OK / NA / Needs Repairs/Repaired
Cap Condition: OK / NA / Needs Repairs/Repaired Monument Condition: OK / NA / Needs Repairs/Repaired

NOTES:

SAMPLING INFORMATION / DATA

QA/QC Sample (circle one): Duplicate Lab QA/QC NONE
Sampling Method (circle one): dedicated Dual Valve Pump peristaltic pump

Table with 7 columns: Analytical Parameters, Destination Laboratory, Preservative, Bottle size, Number of bottles, Sample ID, Time Sampled. Contains 2 rows of data.

Method of Transportation of samples:
All samples were immediately placed into a cooler and packed with ice or "Blue Ice" YES/NO

Field Observations/Notes of Sampling Event:

Large amount of orange bio in well. never clear

Signature of Field Personnel:

Date: 11/11/14



GROUNDWATER SAMPLING FIELD FORM

Fred Meyer Port Orchard
Quarterly Groundwater Monitoring
AMEC Job #: 9-61M-10282-0

Date: 11/11/14

Field Personnel: JG/WAN

Monitoring Well ID: ~ NW 705

Start Time: 15:15

Weather Conditions: sunny

Approx. Air Temp (°F): ~80

INITIAL WELL DATA & WELL PURGING INFORMATION

Table with 9 columns: Water Temperature (degree C), Water pH (S.U.), Specific Conductivity (µS/cm), Turbidity (NTUs), Dissolved Oxygen (mg/L), ORP (mV), Water Level (feet bgs), Time (0:00 - 23:59), Volume Purged (gal or liters). Contains 4 rows of handwritten data.

0.5 inch tubing: 0.020 gallons/linear foot 2" well casing: 0.17 gal/linear foot Total Purged =
Purge Pumping Rate (approx. L/m): 2/m
Approx. Pump/Intake Depth: screen
Well Yield: High / Moderate / Low
Decontamination Method: NA

WELL CONDITION

Casing Size and Type: 2"
Casing Condition: OK / NA / Needs Repairs/Repaired Lock Condition: OK / NA / Needs Repairs/Repaired
Cap Condition: OK / NA / Needs Repairs/Repaired Monument Condition: OK / NA / Needs Repairs/Repaired

NOTES:

SAMPLING INFORMATION / DATA

QA/QC Sample (circle one): Duplicate Lab QA/QC NONE
Sampling Method (circle one): dedicated Dual Valve Pump peristaltic pump

Table with 7 columns: Analytical Parameters, Destination Laboratory, Preservative, Bottle size, Number of bottles, Sample ID, Time Sampled. Contains 2 rows of handwritten data.

Method of Transportation of samples:
All samples were immediately placed into a cooler and packed with ice or "Blue Ice" YES / NO

Field Observations/Notes of Sampling Event:

Signature of Field Personnel:

Date: 11/11/14



**GROUNDWATER  
SAMPLING FIELD FORM**

Fred Meyer Port Orchard  
Quarterly Groundwater Monitoring  
AMEC Job #: 9-61M-10282-0

Date: MW108 11/11/14

Field Personnel: JVG / WJM

Monitoring Well ID: MW108

Start Time: 17:35 Weather Conditions: Clear

Approx. Air Temp (°F): 50

**INITIAL WELL DATA & WELL PURGING INFORMATION**

| Water Temperature (degree C) | Water pH (S.U.) | Specific Conductivity (µS/cm) | Turbidity (NTUs) | Dissolved Oxygen (mg/L) | ORP (mV) | Water Level (feet bgs) | Time (0:00 - 23:59) | Volume Purged (gal or liters) |
|------------------------------|-----------------|-------------------------------|------------------|-------------------------|----------|------------------------|---------------------|-------------------------------|
| 14.49                        | 5.57            | 169                           | 133              | 1.05                    | +29.1    | 18.77                  | 17:05               | 0.5                           |
| 15.08                        | 6.10            | 168                           | 135              | 0.33                    | +70.2    | 18.81                  | 17:25               | 4                             |
| 15.09                        | 6.1             | 168                           | 135              | 0.39                    | +70.1    | 18.82                  | 17:30               | 5                             |
| 15.09                        | 6.11            | 168                           | 135              | 0.41                    | +70.1    | 18.82                  | 17:35               | 6                             |
|                              |                 |                               |                  |                         |          |                        |                     |                               |
|                              |                 |                               |                  |                         |          |                        |                     |                               |

0.5 inch tubing: 0.020 gallons/linear foot      2" well casing: 0.17 gal/linear foot      Total Purged =

Purge Pumping Rate (approx. L/m): 244

Approx. Pump/Intake Depth: Screen

Well Yield: High / Moderate / Low

Decontamination Method: ND

**WELL CONDITION**

Casing Size and Type: 2"

Casing Condition:  OK /  NA / Needs Repairs/Repaired      Lock Condition:  OK /  NA / Needs Repairs/Repaired

Cap Condition:  OK /  NA / Needs Repairs/Repaired      Monument Condition:  OK /  NA / Needs Repairs/Repaired

NOTES:

**SAMPLING INFORMATION / DATA**

QA/QC Sample (circle one): Duplicate      Lab QA/QC  NONE

Sampling Method (circle one): dedicated Dual Valve Pump       peristaltic pump

| Analytical Parameters | Destination Laboratory | Preservative | Bottle size | Number of bottles | Sample ID   | Time Sampled |
|-----------------------|------------------------|--------------|-------------|-------------------|-------------|--------------|
| NW TPH-Gx 8021        | APEX                   | HCL & ice    | 40 ML       | 3                 | MW108-11114 | 17:35        |
| 8260 Suite            | APEX                   | HCL & ice    | 40 ML       | 3                 |             |              |
|                       |                        |              |             |                   |             |              |
|                       |                        |              |             |                   |             |              |
|                       |                        |              |             |                   |             |              |

Method of Transportation of samples:

All samples were immediately placed into a cooler and packed with ice or "Blue Ice"  YES /  NO

Field Observations/Notes of Sampling Event:

A lot of orange bio fouling

Signature of Field Personnel:

Date: 11/11/14





# GROUNDWATER SAMPLING FIELD FORM

Fred Meyer Port Orchard  
Quarterly Groundwater Monitoring  
AMEC Job #: 9-61M-10282-0

Date: 11/11/14

Field Personnel: JG/WJM

Monitoring Well ID: MW109

Start Time: Weather Conditions: clear

Approx. Air Temp (°F):

### INITIAL WELL DATA & WELL PURGING INFORMATION

| Water Temperature (degree C) | Water pH (S.U.) | Specific Conductivity (µS/cm) | Turbidity (NTUs) | Dissolved Oxygen (mg/L) | ORP (mV) | Water Level (feet bgs) | Time (0:00 - 23:59) | Volume Purged (gal or liters) |
|------------------------------|-----------------|-------------------------------|------------------|-------------------------|----------|------------------------|---------------------|-------------------------------|
| 13.77                        | 5.64            | 262                           | 11.4             | 2.30                    | +130.3   | 16.74                  | 18:25               | 0                             |
| 14.43                        | 5.62            | 265                           | 7.5              | 3.14                    | +129.9   | 16.70                  | 18:45               | 4                             |
| 14.44                        | 5.60            | 265                           | 7.5              | 3.20                    | +131.2   | 16.70                  | 18:50               | 5                             |
| 14.46                        | 5.59            | 264                           | 7.5              | 3.21                    | +131.0   | 16.70                  | 18:55               | 6                             |

0.5 inch tubing: 0.020 gallons/linear foot      2" well casing: 0.17 gal/linear foot      Total Purged = 6

Purge Pumping Rate (approx. L/m): 2 L/m

Approx. Pump/Intake Depth: screw

Well Yield: High / Moderate / Low

Decontamination Method: N/A

### WELL CONDITION

Casing Size and Type: 2"

Casing Condition: OK / NA / Needs Repairs/Repaired      Lock Condition: OK / NA / Needs Repairs/Repaired

Cap Condition: OK / NA / Needs Repairs/Repaired      Monument Condition: OK / NA / Needs Repairs/Repaired

NOTES:

### SAMPLING INFORMATION / DATA

QA/QC Sample (circle one): Duplicate      Lab QA/QC NONE

Sampling Method (circle one): dedicated Dual Valve Pump      peristaltic pump

| Analytical Parameters | Destination Laboratory | Preservative | Bottle size | Number of bottles | Sample ID   | Time Sampled |
|-----------------------|------------------------|--------------|-------------|-------------------|-------------|--------------|
| NW TPH-Gx 8021        | APEX                   | HCL & ice    | 40 ML       | 3                 | MW109-11114 | 18:55        |
| 8260 Suite            | APEX                   | HCL & ice    | 40 ML       |                   |             |              |

Method of Transportation of samples:  
All samples were immediately placed into a cooler and packed with ice or "Blue Ice" YES NO

Field Observations/Notes of Sampling Event:

No water over TOC

Signature of Field Personnel:

Date: 11/11/14



# GROUNDWATER SAMPLING FIELD FORM

Fred Meyer Port Orchard  
Quarterly Groundwater Monitoring  
AMEC Job #: 9-61M-10282-0

Date: 11/11/14

Field Personnel: JVG/WJH

Monitoring Well ID: MW109A

Start Time: 17:45

Weather Conditions: clear

Approx. Air Temp (°F): ~50

### INITIAL WELL DATA & WELL PURGING INFORMATION

| Water Temperature (degree C) | Water pH (S.U.) | Specific Conductivity (µS/cm) | Turbidity (NTUs) | Dissolved Oxygen (mg/L) | ORP (mV) | Water Level (feet bgs) | Time (0:00 - 23:59) | Volume Purged (gal or liters) |
|------------------------------|-----------------|-------------------------------|------------------|-------------------------|----------|------------------------|---------------------|-------------------------------|
| 13.43                        | 5.74            | 344                           | 19.2             | 1.43                    | +112.9   | 18.00                  | 17:45               | 0                             |
| 13.61                        | 5.70            | 348                           | 15.7             | 1.44                    | +112.3   | 18.25                  | 18:05               | 4                             |
| 13.61                        | 5.68            | 348                           | 15.2             | 1.44                    | +118.2   | 18.25                  | 18:10               | 5                             |
| 13.62                        | 5.67            | 348                           | 14.9             | 1.44                    | +118.7   | 18.25                  | 18:15               | 6                             |

0.5 inch tubing: 0.020 gallons/linear foot      2" well casing: 0.17 gal/linear foot      Total Purged = 6

Purge Pumping Rate (approx. L/m): 2.44

Approx. Pump/Intake Depth: Screen

Well Yield: High / Moderate / Low

Decontamination Method: NA

### WELL CONDITION

Casing Size and Type: 2"

Casing Condition: OK / NA / Needs Repairs/Repaired      Lock Condition: OK / NA / Needs Repairs/Repaired

Cap Condition: OK / NA / Needs Repairs/Repaired      Monument Condition: OK / NA / Needs Repairs/Repaired

NOTES:

### SAMPLING INFORMATION / DATA

QA/QC Sample (circle one): Duplicate      Lab QA/QC: NONE

Sampling Method (circle one): dedicated Dual Valve Pump      peristaltic pump

| Analytical Parameters | Destination Laboratory | Preservative | Bottle size | Number of bottles | Sample ID    | Time Sampled |
|-----------------------|------------------------|--------------|-------------|-------------------|--------------|--------------|
| NW TPH-Gx 8021        | APEX                   | HCL & ice    | 40 ML       | 3                 | MW109A-11114 | 18:15        |
| 8260 Suite            | APEX                   | HCL & ice    | 40 ML       | 3                 | "            |              |

Method of Transportation of samples:  
All samples were immediately placed into a cooler and packed with ice or "Blue Ice" (YES) / NO

Field Observations/Notes of Sampling Event:

Signature of Field Personnel:

Date: 11/11/14



**GROUNDWATER  
SAMPLING FIELD FORM**

Fred Meyer Port Orchard  
Quarterly Groundwater Monitoring  
AMEC Job #: 9-61M-10282-0

Date: 11/11/14

Field Personnel: JNG / WJM

Monitoring Well ID: MW110

Start Time: 16:30

Weather Conditions: clear

Approx. Air Temp (°F): ~50

**INITIAL WELL DATA & WELL PURGING INFORMATION**

| Water Temperature (degree C) | Water pH (S.U.) | Specific Conductivity (µS/cm) | Turbidity (NTUs) | Dissolved Oxygen (mg/L) | ORP (mV) | Water Level (feet bgs) | Time (0:00 - 23:59) | Volume Purged (gal or liters) |
|------------------------------|-----------------|-------------------------------|------------------|-------------------------|----------|------------------------|---------------------|-------------------------------|
| 12.75                        | 5.62            | 115                           | 3.7              | 3.30                    | +46.2    | 20.76                  | 16:30               | 0                             |
| 13.54                        | 5.48            | 120                           | 1.0              | 3.13                    | +55.7    | 20.30                  | 16:50               | 4                             |
| 13.55                        | 5.48            | 120                           | 1.8              | 3.10                    | +55.9    | 20.30                  | 16:55               | 5                             |
| 13.55                        | 5.48            | 120                           | 1.8              | 3.11                    | +56.1    | 20.30                  | 17:00               | 6                             |
|                              |                 |                               |                  |                         |          |                        |                     |                               |
|                              |                 |                               |                  |                         |          |                        |                     |                               |

0.5 inch tubing: 0.020 gallons/linear foot      2" well casing: 0.17 gal/linear foot      Total Purged = 6

Purge Pumping Rate (approx. L/m): 2.4/m

Approx. Pump/Intake Depth: screen

Well Yield: High / Moderate / Low

Decontamination Method: NA

**WELL CONDITION**

Casing Size and Type: 2"

Casing Condition: OK / NA / Needs Repairs/Repaired

Lock Condition:

OK / NA / Needs Repairs/Repaired

Cap Condition: OK / NA / Needs Repairs/Repaired

Monument Condition:

OK / NA / Needs Repairs/Repaired

NOTES:

**SAMPLING INFORMATION / DATA**

QA/QC Sample (circle one): Duplicate      Lab QA/QC NONE

Sampling Method (circle one): dedicated Dual Valve Pump      peristaltic pump

| Analytical Parameters | Destination Laboratory | Preservative | Bottle size | Number of bottles | Sample ID    | Time Sampled |
|-----------------------|------------------------|--------------|-------------|-------------------|--------------|--------------|
| NW TPH-Gx 8021        | APEX                   | HCL & ice    | 40 ML       | 3                 | MW110-111114 | 17:00        |
| 8260 Suite            | APEX                   | HCL & ice    | 40 ML       |                   |              |              |
|                       |                        |              |             |                   |              |              |
|                       |                        |              |             |                   |              |              |

Method of Transportation of samples:

All samples were immediately placed into a cooler and packed with ice or "Blue Ice" YES/NO

Field Observations/Notes of Sampling Event:

Signature of Field Personnel:

Date: 11/11/14



# GROUNDWATER SAMPLING FIELD FORM

Fred Meyer Port Orchard  
Quarterly Groundwater Monitoring  
AMEC Job #: 9-61M-10282-0

Date: 11/11/14

Field Personnel: JVG WJM

Monitoring Well ID: MW-111

Start Time: 14:30

Weather Conditions: clear

Approx. Air Temp (°F): 50

### INITIAL WELL DATA & WELL PURGING INFORMATION

| Water Temperature (degree C) | Water pH (S.U.) | Specific Conductivity (µS/cm) | Turbidity (NTUs) | Dissolved Oxygen (mg/L) | ORP (mV) | Water Level (feet bgs) | Time (0:00 - 23:59) | Volume Purged (gal or liters) |
|------------------------------|-----------------|-------------------------------|------------------|-------------------------|----------|------------------------|---------------------|-------------------------------|
| 13.85                        | 5.39            | 107                           | 2.1              | 0.96                    | -39.6    | 31.9                   | 14:30               | 4                             |
| 13.93                        | 5.45            | 118                           | 0.9              | 0.30                    | -87.2    | NA                     | 14:50               | 4                             |
| 13.84                        | 5.44            | 118                           | 0.9              | 0.27                    | -84.3    | ↓                      | 14:55               | 5                             |
| 13.94                        | 5.44            | 118                           | 0.9              | 0.26                    | -84.7    | ↓                      | 15:00               | 6                             |

0.5 inch tubing: 0.020 gallons/linear foot      2" well casing: 0.17 gal/linear foot      Total Purged = 60

Purge Pumping Rate (approx. L/m): 2 L/m

Approx. Pump/Intake Depth: SCREEN

Well Yield: High / Moderate / Low

Decontamination Method:

### WELL CONDITION

Casing Size and Type: 2"

Casing Condition: OK / NA / Needs Repairs/Repaired

Lock Condition:

OK / NA / Needs Repairs/Repaired

Cap Condition: OK / NA / Needs Repairs/Repaired

Monument Condition:

OK / NA / Needs Repairs/Repaired

NOTES:

### SAMPLING INFORMATION / DATA

QA/QC Sample (circle one): Duplicate      Lab QA/QC: NONE

DC electric w/ attached peristaltic pump boiler.

Sampling Method (circle one): dedicated Dual Valve Pump

| Analytical Parameters | Destination Laboratory | Preservative | Bottle size | Number of bottles | Sample ID   | Time Sampled |
|-----------------------|------------------------|--------------|-------------|-------------------|-------------|--------------|
| NW TPH-Gx 8021        | APEX                   | HCL & ice    | 40 ML       | 3                 | MW111-11114 | 15:00        |
| 8260 Suite            | APEX                   | HCL & ice    | 40 ML       | 3                 |             |              |

Method of Transportation of samples:

All samples were immediately placed into a cooler and packed with ice or "Blue Ice" YES/NO

Field Observations/Notes of Sampling Event:

Signature of Field Personnel:

Date: 11/11/14

---

**APPENDIX B**

Laboratory Analytical Results and Chain-or-Custody Documents

# Apex Labs

12232 S.W. Garden Place  
Tigard, OR 97223  
503-718-2323 Phone  
503-718-0333 Fax

Wednesday, November 26, 2014

Kurt Harrington  
Amec Environment & Infrastructure, Inc  
7376 SW Durham Road  
Portland, OR 97224

RE: Fred Meyer (FMPO) Port Orchard / 961M10282-0

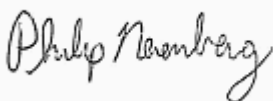
Enclosed are the results of analyses for work order A4K0383, which was received by the laboratory on 11/13/2014 at 3:40:00PM.

Thank you for using Apex Labs. We appreciate your business and strive to provide the highest quality services to the environmental industry.

If you have any questions concerning this report or the services we offer, please feel free to contact me by email at: [pnerenberg@apex-labs.com](mailto:pnerenberg@apex-labs.com), or by phone at 503-718-2323.

---

Apex Laboratories



*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*

---

Philip Nerenberg, Lab Director

Amec Environment & Infrastructure, Inc  
7376 SW Durham Road  
Portland, OR 97224

Project: Fred Meyer (FMPO) Port Orchard  
Project Number: 961M10282-0  
Project Manager: Kurt Harrington

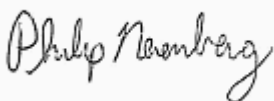
Reported:  
11/26/14 16:51

## ANALYTICAL REPORT FOR SAMPLES

### SAMPLE INFORMATION

| Sample ID     | Laboratory ID | Matrix | Date Sampled   | Date Received  |
|---------------|---------------|--------|----------------|----------------|
| MW111-111114  | A4K0383-01    | Water  | 11/11/14 14:30 | 11/13/14 15:40 |
| MW109-111114  | A4K0383-02    | Water  | 11/11/14 18:55 | 11/13/14 15:40 |
| MW109A-111114 | A4K0383-03    | Water  | 11/11/14 18:15 | 11/13/14 15:40 |
| MW108-111114  | A4K0383-04    | Water  | 11/11/14 17:35 | 11/13/14 15:40 |
| MW110-111114  | A4K0383-05    | Water  | 11/11/14 17:00 | 11/13/14 15:40 |
| MW103-111114  | A4K0383-06    | Water  | 11/11/14 16:25 | 11/13/14 15:40 |
| MW105-111114  | A4K0383-07    | Water  | 11/11/14 15:45 | 11/13/14 15:40 |
| TB            | A4K0383-08    | Water  | 11/11/14 00:00 | 11/13/14 15:40 |

Apex Laboratories



Philip Nerenberg, Lab Director

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Amec Environment & Infrastructure, Inc  
7376 SW Durham Road  
Portland, OR 97224

Project: Fred Meyer (FMPO) Port Orchard  
Project Number: 961M10282-0  
Project Manager: Kurt Harrington

Reported:  
11/26/14 16:51

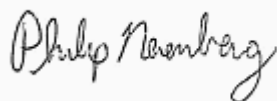
## ANALYTICAL SAMPLE RESULTS

### Gasoline Range Hydrocarbons (Benzene through Naphthalene) by NWTPH-Gx

| Analyte                                      | Result       | MDL | Reporting              |                         | Dilution              | Date Analyzed  | Method        | Notes |
|--|--------------|-----|------------------------|-------------------------|-----------------------|----------------|---------------|-------|
|  |              |     | Limit                  | Units                   |                       |                |               |       |
| <b>MW111-111114 (A4K0383-01)</b>             |              |     | <b>Matrix: Water</b>   |                         | <b>Batch: 4110432</b> |                |               |       |
| Gasoline Range Organics                      | ND           | --- | 0.100                  | mg/L                    | 1                     | 11/17/14 03:52 | NWTPH-Gx (MS) |       |
| <i>Surrogate: 4-Bromofluorobenzene (Sur)</i> |              |     | <i>Recovery: 99 %</i>  | <i>Limits: 50-150 %</i> | "                     | "              | "             |       |
| <i>1,4-Difluorobenzene (Sur)</i>             |              |     | <i>102 %</i>           | <i>Limits: 50-150 %</i> | "                     | "              | "             |       |
| <b>MW109-111114 (A4K0383-02)</b>             |              |     | <b>Matrix: Water</b>   |                         | <b>Batch: 4110432</b> |                |               |       |
| Gasoline Range Organics                      | ND           | --- | 0.100                  | mg/L                    | 1                     | 11/17/14 04:50 | NWTPH-Gx (MS) |       |
| <i>Surrogate: 4-Bromofluorobenzene (Sur)</i> |              |     | <i>Recovery: 99 %</i>  | <i>Limits: 50-150 %</i> | "                     | "              | "             |       |
| <i>1,4-Difluorobenzene (Sur)</i>             |              |     | <i>103 %</i>           | <i>Limits: 50-150 %</i> | "                     | "              | "             |       |
| <b>MW109A-111114 (A4K0383-03)</b>            |              |     | <b>Matrix: Water</b>   |                         | <b>Batch: 4110432</b> |                |               |       |
| Gasoline Range Organics                      | ND           | --- | 0.100                  | mg/L                    | 1                     | 11/17/14 05:19 | NWTPH-Gx (MS) |       |
| <i>Surrogate: 4-Bromofluorobenzene (Sur)</i> |              |     | <i>Recovery: 100 %</i> | <i>Limits: 50-150 %</i> | "                     | "              | "             |       |
| <i>1,4-Difluorobenzene (Sur)</i>             |              |     | <i>102 %</i>           | <i>Limits: 50-150 %</i> | "                     | "              | "             |       |
| <b>MW108-111114 (A4K0383-04)</b>             |              |     | <b>Matrix: Water</b>   |                         | <b>Batch: 4110432</b> |                |               |       |
| Gasoline Range Organics                      | ND           | --- | 0.100                  | mg/L                    | 1                     | 11/17/14 05:47 | NWTPH-Gx (MS) |       |
| <i>Surrogate: 4-Bromofluorobenzene (Sur)</i> |              |     | <i>Recovery: 100 %</i> | <i>Limits: 50-150 %</i> | "                     | "              | "             |       |
| <i>1,4-Difluorobenzene (Sur)</i>             |              |     | <i>102 %</i>           | <i>Limits: 50-150 %</i> | "                     | "              | "             |       |
| <b>MW110-111114 (A4K0383-05)</b>             |              |     | <b>Matrix: Water</b>   |                         | <b>Batch: 4110432</b> |                |               |       |
| Gasoline Range Organics                      | ND           | --- | 0.100                  | mg/L                    | 1                     | 11/17/14 06:16 | NWTPH-Gx (MS) |       |
| <i>Surrogate: 4-Bromofluorobenzene (Sur)</i> |              |     | <i>Recovery: 100 %</i> | <i>Limits: 50-150 %</i> | "                     | "              | "             |       |
| <i>1,4-Difluorobenzene (Sur)</i>             |              |     | <i>103 %</i>           | <i>Limits: 50-150 %</i> | "                     | "              | "             |       |
| <b>MW103-111114 (A4K0383-06)</b>             |              |     | <b>Matrix: Water</b>   |                         | <b>Batch: 4110432</b> |                |               |       |
| Gasoline Range Organics                      | <b>0.815</b> | --- | 0.100                  | mg/L                    | 1                     | 11/17/14 06:45 | NWTPH-Gx (MS) |       |
| <i>Surrogate: 4-Bromofluorobenzene (Sur)</i> |              |     | <i>Recovery: 101 %</i> | <i>Limits: 50-150 %</i> | "                     | "              | "             |       |
| <i>1,4-Difluorobenzene (Sur)</i>             |              |     | <i>103 %</i>           | <i>Limits: 50-150 %</i> | "                     | "              | "             |       |
| <b>MW105-111114 (A4K0383-07)</b>             |              |     | <b>Matrix: Water</b>   |                         | <b>Batch: 4110432</b> |                |               |       |
| Gasoline Range Organics                      | ND           | --- | 0.100                  | mg/L                    | 1                     | 11/17/14 07:14 | NWTPH-Gx (MS) |       |
| <i>Surrogate: 4-Bromofluorobenzene (Sur)</i> |              |     | <i>Recovery: 100 %</i> | <i>Limits: 50-150 %</i> | "                     | "              | "             |       |
| <i>1,4-Difluorobenzene (Sur)</i>             |              |     | <i>103 %</i>           | <i>Limits: 50-150 %</i> | "                     | "              | "             |       |
| <b>TB (A4K0383-08)</b>                       |              |     | <b>Matrix: Water</b>   |                         | <b>Batch: 4110432</b> |                |               |       |
| Gasoline Range Organics                      | ND           | --- | 0.100                  | mg/L                    | 1                     | 11/17/14 03:22 | NWTPH-Gx (MS) |       |
| <i>Surrogate: 4-Bromofluorobenzene (Sur)</i> |              |     | <i>Recovery: 101 %</i> | <i>Limits: 50-150 %</i> | "                     | "              | "             |       |
| <i>1,4-Difluorobenzene (Sur)</i>             |              |     | <i>103 %</i>           | <i>Limits: 50-150 %</i> | "                     | "              | "             |       |

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Reported:  
 11/26/14 16:51

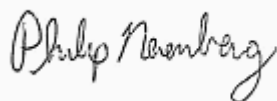
## ANALYTICAL SAMPLE RESULTS

### RBCA Compounds (BTEX+) by EPA 8260B

| Analyte                                       | Result       | MDL | Reporting              |                         |          | Date Analyzed         | Method    | Notes |
|---|--------------|-----|------------------------|-------------------------|----------|-----------------------|-----------|-------|
|   |              |     | Limit                  | Units                   | Dilution |                       |           |       |
| <b>MW111-111114 (A4K0383-01)</b>              |              |     | <b>Matrix: Water</b>   |                         |          | <b>Batch: 4110432</b> |           |       |
| Benzene                                       | ND           | --- | 0.250                  | ug/L                    | 1        | 11/17/14 03:52        | EPA 8260B |       |
| Toluene                                       | ND           | --- | 1.00                   | "                       | "        | "                     | "         |       |
| Ethylbenzene                                  | ND           | --- | 0.500                  | "                       | "        | "                     | "         |       |
| Xylenes, total                                | ND           | --- | 1.50                   | "                       | "        | "                     | "         |       |
| Naphthalene                                   | ND           | --- | 2.00                   | "                       | "        | "                     | "         |       |
| Methyl tert-butyl ether (MTBE)                | ND           | --- | 1.00                   | "                       | "        | "                     | "         |       |
| 1,2-Dibromoethane (EDB)                       | ND           | --- | 0.500                  | "                       | "        | "                     | "         |       |
| 1,2-Dichloroethane (EDC)                      | ND           | --- | 0.500                  | "                       | "        | "                     | "         |       |
| <i>Surrogate: Dibromofluoromethane (Surr)</i> |              |     | <i>Recovery: 98 %</i>  | <i>Limits: 80-120 %</i> | "        | "                     | "         |       |
| <i>1,4-Difluorobenzene (Surr)</i>             |              |     | <i>103 %</i>           | <i>Limits: 80-120 %</i> | "        | "                     | "         |       |
| <i>Toluene-d8 (Surr)</i>                      |              |     | <i>102 %</i>           | <i>Limits: 80-120 %</i> | "        | "                     | "         |       |
| <i>4-Bromofluorobenzene (Surr)</i>            |              |     | <i>101 %</i>           | <i>Limits: 80-120 %</i> | "        | "                     | "         |       |
| <b>MW109-111114 (A4K0383-02)</b>              |              |     | <b>Matrix: Water</b>   |                         |          | <b>Batch: 4110432</b> |           |       |
| Benzene                                       | ND           | --- | 0.250                  | ug/L                    | 1        | 11/17/14 04:50        | EPA 8260B |       |
| Toluene                                       | ND           | --- | 1.00                   | "                       | "        | "                     | "         |       |
| Ethylbenzene                                  | ND           | --- | 0.500                  | "                       | "        | "                     | "         |       |
| Xylenes, total                                | ND           | --- | 1.50                   | "                       | "        | "                     | "         |       |
| Naphthalene                                   | ND           | --- | 2.00                   | "                       | "        | "                     | "         |       |
| Methyl tert-butyl ether (MTBE)                | ND           | --- | 1.00                   | "                       | "        | "                     | "         |       |
| 1,2-Dibromoethane (EDB)                       | ND           | --- | 0.500                  | "                       | "        | "                     | "         |       |
| 1,2-Dichloroethane (EDC)                      | ND           | --- | 0.500                  | "                       | "        | "                     | "         |       |
| <i>Surrogate: Dibromofluoromethane (Surr)</i> |              |     | <i>Recovery: 100 %</i> | <i>Limits: 80-120 %</i> | "        | "                     | "         |       |
| <i>1,4-Difluorobenzene (Surr)</i>             |              |     | <i>103 %</i>           | <i>Limits: 80-120 %</i> | "        | "                     | "         |       |
| <i>Toluene-d8 (Surr)</i>                      |              |     | <i>102 %</i>           | <i>Limits: 80-120 %</i> | "        | "                     | "         |       |
| <i>4-Bromofluorobenzene (Surr)</i>            |              |     | <i>99 %</i>            | <i>Limits: 80-120 %</i> | "        | "                     | "         |       |
| <b>MW109A-111114 (A4K0383-03)</b>             |              |     | <b>Matrix: Water</b>   |                         |          | <b>Batch: 4110432</b> |           |       |
| <b>Benzene</b>                                | <b>0.450</b> | --- | 0.250                  | ug/L                    | 1        | 11/17/14 05:19        | EPA 8260B |       |
| Toluene                                       | ND           | --- | 1.00                   | "                       | "        | "                     | "         |       |
| Ethylbenzene                                  | ND           | --- | 0.500                  | "                       | "        | "                     | "         |       |
| Xylenes, total                                | ND           | --- | 1.50                   | "                       | "        | "                     | "         |       |
| Naphthalene                                   | ND           | --- | 2.00                   | "                       | "        | "                     | "         |       |
| Methyl tert-butyl ether (MTBE)                | ND           | --- | 1.00                   | "                       | "        | "                     | "         |       |
| 1,2-Dibromoethane (EDB)                       | ND           | --- | 0.500                  | "                       | "        | "                     | "         |       |
| 1,2-Dichloroethane (EDC)                      | ND           | --- | 0.500                  | "                       | "        | "                     | "         |       |

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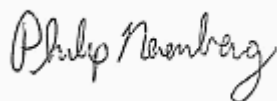
## ANALYTICAL SAMPLE RESULTS

### RBCA Compounds (BTEX+) by EPA 8260B

| Analyte                                       | Result      | MDL | Reporting              |                         | Dilution              | Date Analyzed  | Method    | Notes |
|---|-------------|-----|------------------------|-------------------------|-----------------------|----------------|-----------|-------|
|   |             |     | Limit                  | Units                   |                       |                |           |       |
| <b>MW109A-111114 (A4K0383-03)</b>             |             |     | <b>Matrix: Water</b>   |                         | <b>Batch: 4110432</b> |                |           |       |
| <i>Surrogate: Dibromofluoromethane (Surr)</i> |             |     | <i>Recovery: 101 %</i> | <i>Limits: 80-120 %</i> | 1                     | "              | EPA 8260B |       |
| <i>1,4-Difluorobenzene (Surr)</i>             |             |     | <i>102 %</i>           | <i>Limits: 80-120 %</i> | "                     | "              | "         |       |
| <i>Toluene-d8 (Surr)</i>                      |             |     | <i>101 %</i>           | <i>Limits: 80-120 %</i> | "                     | "              | "         |       |
| <i>4-Bromofluorobenzene (Surr)</i>            |             |     | <i>101 %</i>           | <i>Limits: 80-120 %</i> | "                     | "              | "         |       |
| <b>MW108-111114 (A4K0383-04)</b>              |             |     | <b>Matrix: Water</b>   |                         | <b>Batch: 4110432</b> |                |           |       |
| Benzene                                       | ND          | --- | 0.250                  | ug/L                    | 1                     | 11/17/14 05:47 | EPA 8260B |       |
| Toluene                                       | ND          | --- | 1.00                   | "                       | "                     | "              | "         |       |
| Ethylbenzene                                  | ND          | --- | 0.500                  | "                       | "                     | "              | "         |       |
| Xylenes, total                                | ND          | --- | 1.50                   | "                       | "                     | "              | "         |       |
| Naphthalene                                   | ND          | --- | 2.00                   | "                       | "                     | "              | "         |       |
| Methyl tert-butyl ether (MTBE)                | ND          | --- | 1.00                   | "                       | "                     | "              | "         |       |
| 1,2-Dibromoethane (EDB)                       | ND          | --- | 0.500                  | "                       | "                     | "              | "         |       |
| 1,2-Dichloroethane (EDC)                      | ND          | --- | 0.500                  | "                       | "                     | "              | "         |       |
| <i>Surrogate: Dibromofluoromethane (Surr)</i> |             |     | <i>Recovery: 99 %</i>  | <i>Limits: 80-120 %</i> | "                     | "              | "         |       |
| <i>1,4-Difluorobenzene (Surr)</i>             |             |     | <i>103 %</i>           | <i>Limits: 80-120 %</i> | "                     | "              | "         |       |
| <i>Toluene-d8 (Surr)</i>                      |             |     | <i>101 %</i>           | <i>Limits: 80-120 %</i> | "                     | "              | "         |       |
| <i>4-Bromofluorobenzene (Surr)</i>            |             |     | <i>99 %</i>            | <i>Limits: 80-120 %</i> | "                     | "              | "         |       |
| <b>MW110-111114 (A4K0383-05)</b>              |             |     | <b>Matrix: Water</b>   |                         | <b>Batch: 4110432</b> |                |           |       |
| Benzene                                       | ND          | --- | 0.250                  | ug/L                    | 1                     | 11/17/14 06:16 | EPA 8260B |       |
| Toluene                                       | ND          | --- | 1.00                   | "                       | "                     | "              | "         |       |
| Ethylbenzene                                  | ND          | --- | 0.500                  | "                       | "                     | "              | "         |       |
| Xylenes, total                                | ND          | --- | 1.50                   | "                       | "                     | "              | "         |       |
| Naphthalene                                   | ND          | --- | 2.00                   | "                       | "                     | "              | "         |       |
| Methyl tert-butyl ether (MTBE)                | ND          | --- | 1.00                   | "                       | "                     | "              | "         |       |
| 1,2-Dibromoethane (EDB)                       | ND          | --- | 0.500                  | "                       | "                     | "              | "         |       |
| 1,2-Dichloroethane (EDC)                      | ND          | --- | 0.500                  | "                       | "                     | "              | "         |       |
| <i>Surrogate: Dibromofluoromethane (Surr)</i> |             |     | <i>Recovery: 100 %</i> | <i>Limits: 80-120 %</i> | "                     | "              | "         |       |
| <i>1,4-Difluorobenzene (Surr)</i>             |             |     | <i>103 %</i>           | <i>Limits: 80-120 %</i> | "                     | "              | "         |       |
| <i>Toluene-d8 (Surr)</i>                      |             |     | <i>101 %</i>           | <i>Limits: 80-120 %</i> | "                     | "              | "         |       |
| <i>4-Bromofluorobenzene (Surr)</i>            |             |     | <i>100 %</i>           | <i>Limits: 80-120 %</i> | "                     | "              | "         |       |
| <b>MW103-111114 (A4K0383-06)</b>              |             |     | <b>Matrix: Water</b>   |                         | <b>Batch: 4110432</b> |                |           |       |
| Benzene                                       | ND          | --- | 0.250                  | ug/L                    | 1                     | 11/17/14 06:45 | EPA 8260B |       |
| Toluene                                       | ND          | --- | 1.00                   | "                       | "                     | "              | "         |       |
| <b>Ethylbenzene</b>                           | <b>1.96</b> | --- | 0.500                  | "                       | "                     | "              | "         |       |

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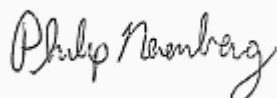
## ANALYTICAL SAMPLE RESULTS

### RBCA Compounds (BTEX+) by EPA 8260B

| Analyte                                       | Result | MDL | Reporting              |                         | Dilution              | Date Analyzed  | Method    | Notes |
|---|--------|-----|------------------------|-------------------------|-----------------------|----------------|-----------|-------|
|   |        |     | Limit                  | Units                   |                       |                |           |       |
| <b>MW103-111114 (A4K0383-06)</b>              |        |     | <b>Matrix: Water</b>   |                         | <b>Batch: 4110432</b> |                |           |       |
| Xylenes, total                                | 6.11   | --- | 1.50                   | ug/L                    | 1                     | "              | EPA 8260B |       |
| Naphthalene                                   | ND     | --- | 2.00                   | "                       | "                     | "              | "         |       |
| Methyl tert-butyl ether (MTBE)                | ND     | --- | 1.00                   | "                       | "                     | "              | "         |       |
| 1,2-Dibromoethane (EDB)                       | ND     | --- | 0.500                  | "                       | "                     | "              | "         |       |
| 1,2-Dichloroethane (EDC)                      | ND     | --- | 0.500                  | "                       | "                     | "              | "         |       |
| <i>Surrogate: Dibromofluoromethane (Surr)</i> |        |     | <i>Recovery: 100 %</i> | <i>Limits: 80-120 %</i> | "                     | "              | "         |       |
| <i>1,4-Difluorobenzene (Surr)</i>             |        |     | <i>104 %</i>           | <i>Limits: 80-120 %</i> | "                     | "              | "         |       |
| <i>Toluene-d8 (Surr)</i>                      |        |     | <i>102 %</i>           | <i>Limits: 80-120 %</i> | "                     | "              | "         |       |
| <i>4-Bromofluorobenzene (Surr)</i>            |        |     | <i>99 %</i>            | <i>Limits: 80-120 %</i> | "                     | "              | "         |       |
| <b>MW105-111114 (A4K0383-07)</b>              |        |     | <b>Matrix: Water</b>   |                         | <b>Batch: 4110432</b> |                |           |       |
| Benzene                                       | ND     | --- | 0.250                  | ug/L                    | 1                     | 11/17/14 07:14 | EPA 8260B |       |
| Toluene                                       | ND     | --- | 1.00                   | "                       | "                     | "              | "         |       |
| Ethylbenzene                                  | ND     | --- | 0.500                  | "                       | "                     | "              | "         |       |
| Xylenes, total                                | ND     | --- | 1.50                   | "                       | "                     | "              | "         |       |
| Naphthalene                                   | ND     | --- | 2.00                   | "                       | "                     | "              | "         |       |
| Methyl tert-butyl ether (MTBE)                | ND     | --- | 1.00                   | "                       | "                     | "              | "         |       |
| 1,2-Dibromoethane (EDB)                       | ND     | --- | 0.500                  | "                       | "                     | "              | "         |       |
| 1,2-Dichloroethane (EDC)                      | ND     | --- | 0.500                  | "                       | "                     | "              | "         |       |
| <i>Surrogate: Dibromofluoromethane (Surr)</i> |        |     | <i>Recovery: 100 %</i> | <i>Limits: 80-120 %</i> | "                     | "              | "         |       |
| <i>1,4-Difluorobenzene (Surr)</i>             |        |     | <i>104 %</i>           | <i>Limits: 80-120 %</i> | "                     | "              | "         |       |
| <i>Toluene-d8 (Surr)</i>                      |        |     | <i>101 %</i>           | <i>Limits: 80-120 %</i> | "                     | "              | "         |       |
| <i>4-Bromofluorobenzene (Surr)</i>            |        |     | <i>100 %</i>           | <i>Limits: 80-120 %</i> | "                     | "              | "         |       |
| <b>TB (A4K0383-08)</b>                        |        |     | <b>Matrix: Water</b>   |                         | <b>Batch: 4110432</b> |                |           |       |
| Benzene                                       | ND     | --- | 0.250                  | ug/L                    | 1                     | 11/17/14 03:22 | EPA 8260B |       |
| Toluene                                       | ND     | --- | 1.00                   | "                       | "                     | "              | "         |       |
| Ethylbenzene                                  | ND     | --- | 0.500                  | "                       | "                     | "              | "         |       |
| Xylenes, total                                | ND     | --- | 1.50                   | "                       | "                     | "              | "         |       |
| Naphthalene                                   | ND     | --- | 2.00                   | "                       | "                     | "              | "         |       |
| Methyl tert-butyl ether (MTBE)                | ND     | --- | 1.00                   | "                       | "                     | "              | "         |       |
| 1,2-Dibromoethane (EDB)                       | ND     | --- | 0.500                  | "                       | "                     | "              | "         |       |
| 1,2-Dichloroethane (EDC)                      | ND     | --- | 0.500                  | "                       | "                     | "              | "         |       |
| <i>Surrogate: Dibromofluoromethane (Surr)</i> |        |     | <i>Recovery: 96 %</i>  | <i>Limits: 80-120 %</i> | "                     | "              | "         |       |
| <i>1,4-Difluorobenzene (Surr)</i>             |        |     | <i>103 %</i>           | <i>Limits: 80-120 %</i> | "                     | "              | "         |       |
| <i>Toluene-d8 (Surr)</i>                      |        |     | <i>101 %</i>           | <i>Limits: 80-120 %</i> | "                     | "              | "         |       |
| <i>4-Bromofluorobenzene (Surr)</i>            |        |     | <i>100 %</i>           | <i>Limits: 80-120 %</i> | "                     | "              | "         |       |

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Philip Nerenberg, Lab Director

Amec Environment & Infrastructure, Inc  
7376 SW Durham Road  
Portland, OR 97224

Project: Fred Meyer (FMPO) Port Orchard  
Project Number: 961M10282-0  
Project Manager: Kurt Harrington

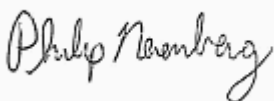
Reported:  
11/26/14 16:51

## ANALYTICAL SAMPLE RESULTS

### RBCA Compounds (BTEX+) by EPA 8260B

| Analyte | Result | MDL | Reporting<br>Limit | Units | Dilution | Date Analyzed | Method | Notes |
|---------|--------|-----|--------------------|-------|----------|---------------|--------|-------|
|---------|--------|-----|--------------------|-------|----------|---------------|--------|-------|

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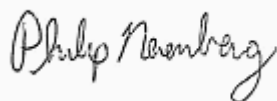
## QUALITY CONTROL (QC) SAMPLE RESULTS

### Gasoline Range Hydrocarbons (Benzene through Naphthalene) by NWTPH-Gx

| Analyte                                     | Result | MDL | Reporting Limit        | Units                   | Dil. | Spike Amount                                      | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---|--------|-----|------------------------|-------------------------|------|---|---------------|------|-------------|-----|-----------|-------|
| <b>Batch 4110432 - EPA 5030B</b>            |        |     |                        |                         |      | <b>Water</b>                                      |               |      |             |     |           |       |
| <b>Blank (4110432-BLK1)</b>                 |        |     |                        |                         |      | Prepared: 11/17/14 00:00 Analyzed: 11/17/14 02:53 |               |      |             |     |           |       |
| NWTPH-Gx (MS)                               |        |     |                        |                         |      |   |               |      |             |     |           |       |
| Gasoline Range Organics                     | ND     | --- | 0.100                  | mg/L                    | 1    | ---   | ---           | ---  | ---         | --- | ---       | ---   |
| <i>Surr: 4-Bromofluorobenzene (Sur)</i>     |        |     | <i>Recovery: 99 %</i>  | <i>Limits: 50-150 %</i> |      | <i>Dilution: 1x</i>                               |               |      |             |     |           |       |
| <i>1,4-Difluorobenzene (Sur)</i>            |        |     | <i>102 %</i>           | <i>50-150 %</i>         |      | <i>"</i>  |               |      |             |     |           |       |
| <b>LCS (4110432-BS2)</b>                    |        |     |                        |                         |      | Prepared: 11/17/14 00:00 Analyzed: 11/17/14 02:24 |               |      |             |     |           |       |
| NWTPH-Gx (MS)                               |        |     |                        |                         |      |   |               |      |             |     |           |       |
| Gasoline Range Organics                     | 0.550  | --- | 0.100                  | mg/L                    | 1    | 0.500   | ---           | 110  | 70-130%     | --- | ---       | ---   |
| <i>Surr: 4-Bromofluorobenzene (Sur)</i>     |        |     | <i>Recovery: 102 %</i> | <i>Limits: 50-150 %</i> |      | <i>Dilution: 1x</i>                               |               |      |             |     |           |       |
| <i>1,4-Difluorobenzene (Sur)</i>            |        |     | <i>103 %</i>           | <i>50-150 %</i>         |      | <i>"</i>  |               |      |             |     |           |       |
| <b>Duplicate (4110432-DUP1)</b>             |        |     |                        |                         |      | Prepared: 11/17/14 02:00 Analyzed: 11/17/14 04:21 |               |      |             |     |           |       |
| QC Source Sample: MW111-111114 (A4K0383-01) |        |     |                        |                         |      |   |               |      |             |     |           |       |
| NWTPH-Gx (MS)                               |        |     |                        |                         |      |   |               |      |             |     |           |       |
| Gasoline Range Organics                     | ND     | --- | 0.100                  | mg/L                    | 1    | ---   | ND            | ---  | ---         | --- | 30%       | ---   |
| <i>Surr: 4-Bromofluorobenzene (Sur)</i>     |        |     | <i>Recovery: 100 %</i> | <i>Limits: 50-150 %</i> |      | <i>Dilution: 1x</i>                               |               |      |             |     |           |       |
| <i>1,4-Difluorobenzene (Sur)</i>            |        |     | <i>102 %</i>           | <i>50-150 %</i>         |      | <i>"</i>  |               |      |             |     |           |       |

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Project: Fred Meyer (FMPO) Port Orchard  
Project Number: 961M10282-0  
Project Manager: Kurt Harrington

Reported:  
11/26/14 16:51

## QUALITY CONTROL (QC) SAMPLE RESULTS

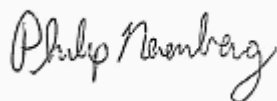
### RBCA Compounds (BTEX+) by EPA 8260B

| Analyte                                  | Result | MDL | Reporting Limit                                   | Units                   | Dil. | Spike Amount        | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|--|--------|-----|---|-------------------------|------|---------------------|---------------|------|-------------|-----|-----------|-------|
| <b>Batch 4110432 - EPA 5030B</b>         |        |     |   |                         |      |                     |               |      |             |     |           |       |
| <b>Water</b>                             |        |     |   |                         |      |                     |               |      |             |     |           |       |
| <b>Blank (4110432-BLK1)</b>              |        |     | Prepared: 11/17/14 00:00 Analyzed: 11/17/14 02:53 |                         |      |                     |               |      |             |     |           |       |
| <b>EPA 8260B</b>                         |        |     |   |                         |      |                     |               |      |             |     |           |       |
| Benzene                                  | ND     | --- | 0.250   | ug/L                    | 1    | ---                 | ---           | ---  | ---         | --- | ---       | ---   |
| Toluene                                  | ND     | --- | 1.00  | "                       | "    | ---                 | ---           | ---  | ---         | --- | ---       | ---   |
| Ethylbenzene                             | ND     | --- | 0.500   | "                       | "    | ---                 | ---           | ---  | ---         | --- | ---       | ---   |
| Xylenes, total                           | ND     | --- | 1.50  | "                       | "    | ---                 | ---           | ---  | ---         | --- | ---       | ---   |
| Naphthalene                              | ND     | --- | 2.00  | "                       | "    | ---                 | ---           | ---  | ---         | --- | ---       | ---   |
| Methyl tert-butyl ether (MTBE)           | ND     | --- | 1.00  | "                       | "    | ---                 | ---           | ---  | ---         | --- | ---       | ---   |
| Isopropylbenzene                         | ND     | --- | 1.00  | "                       | "    | ---                 | ---           | ---  | ---         | --- | ---       | ---   |
| n-Propylbenzene                          | ND     | --- | 0.500   | "                       | "    | ---                 | ---           | ---  | ---         | --- | ---       | ---   |
| 1,2,4-Trimethylbenzene                   | ND     | --- | 1.00  | "                       | "    | ---                 | ---           | ---  | ---         | --- | ---       | ---   |
| 1,3,5-Trimethylbenzene                   | ND     | --- | 1.00  | "                       | "    | ---                 | ---           | ---  | ---         | --- | ---       | ---   |
| 1,2-Dibromoethane (EDB)                  | ND     | --- | 0.500   | "                       | "    | ---                 | ---           | ---  | ---         | --- | ---       | ---   |
| 1,2-Dichloroethane (EDC)                 | ND     | --- | 0.500   | "                       | "    | ---                 | ---           | ---  | ---         | --- | ---       | ---   |
| <i>Surr: Dibromofluoromethane (Surr)</i> |        |     | <i>Recovery: 93 %</i>                             | <i>Limits: 80-120 %</i> |      | <i>Dilution: 1x</i> |               |      |             |     |           |       |
| <i>1,4-Difluorobenzene (Surr)</i>        |        |     | <i>103 %</i>                                      | <i>80-120 %</i>         |      | <i>"</i>            |               |      |             |     |           |       |
| <i>Toluene-d8 (Surr)</i>                 |        |     | <i>101 %</i>                                      | <i>80-120 %</i>         |      | <i>"</i>            |               |      |             |     |           |       |
| <i>4-Bromofluorobenzene (Surr)</i>       |        |     | <i>100 %</i>                                      | <i>80-120 %</i>         |      | <i>"</i>            |               |      |             |     |           |       |

|   |      |     |       |      |   |      |     |     |         |     |     |     |
|---|------|-----|-------|------|---|------|-----|-----|---------|-----|-----|-----|
| <b>LCS (4110432-BS1)</b>                          |      |     |       |      |   |      |     |     |         |     |     |     |
| Prepared: 11/17/14 00:00 Analyzed: 11/17/14 01:55 |      |     |       |      |   |      |     |     |         |     |     |     |
| <b>EPA 8260B</b>                                  |      |     |       |      |   |      |     |     |         |     |     |     |
| Benzene   | 21.3 | --- | 0.250 | ug/L | 1 | 20.0 | --- | 107 | 70-130% | --- | --- | --- |
| Toluene   | 20.0 | --- | 1.00  | "    | " | "    | --- | 100 | "       | --- | --- | --- |
| Ethylbenzene                                      | 20.1 | --- | 0.500 | "    | " | "    | --- | 101 | "       | --- | --- | --- |
| Xylenes, total                                    | 61.9 | --- | 1.50  | "    | " | 60.0 | --- | 103 | "       | --- | --- | --- |
| Naphthalene                                       | 22.6 | --- | 2.00  | "    | " | 20.0 | --- | 113 | "       | --- | --- | --- |
| Methyl tert-butyl ether (MTBE)                    | 22.4 | --- | 1.00  | "    | " | "    | --- | 112 | "       | --- | --- | --- |
| Isopropylbenzene                                  | 20.7 | --- | 1.00  | "    | " | "    | --- | 104 | "       | --- | --- | --- |
| n-Propylbenzene                                   | 21.0 | --- | 0.500 | "    | " | "    | --- | 105 | "       | --- | --- | --- |
| 1,2,4-Trimethylbenzene                            | 21.4 | --- | 1.00  | "    | " | "    | --- | 107 | "       | --- | --- | --- |
| 1,3,5-Trimethylbenzene                            | 21.2 | --- | 1.00  | "    | " | "    | --- | 106 | "       | --- | --- | --- |
| 1,2-Dibromoethane (EDB)                           | 21.8 | --- | 0.500 | "    | " | "    | --- | 109 | "       | --- | --- | --- |

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Reported:  
 11/26/14 16:51

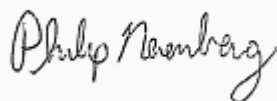
## QUALITY CONTROL (QC) SAMPLE RESULTS

### RBCA Compounds (BTEX+) by EPA 8260B

| Analyte  | Result | MDL | Reporting Limit        | Units                   | Dil. | Spike Amount                                      | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|--|--------|-----|------------------------|-------------------------|------|---|---------------|------|-------------|-----|-----------|-------|
| <b>Batch 4110432 - EPA 5030B</b>                   |        |     |                        |                         |      | <b>Water</b>                                      |               |      |             |     |           |       |
| <b>LCS (4110432-BS1)</b>                           |        |     |                        |                         |      | Prepared: 11/17/14 00:00 Analyzed: 11/17/14 01:55 |               |      |             |     |           |       |
| 1,2-Dichloroethane (EDC)                           | 21.1   | --- | 0.500                  | ug/L                    | "    | "   | ---           | 106  | "           | --- | ---       |       |
| <i>Surr: Dibromofluoromethane (Surr)</i>           |        |     | <i>Recovery: 105 %</i> | <i>Limits: 80-120 %</i> |      | <i>Dilution: 1x</i>                               |               |      |             |     |           |       |
| <i>1,4-Difluorobenzene (Surr)</i>                  |        |     | <i>104 %</i>           | <i>80-120 %</i>         |      | <i>"</i>  |               |      |             |     |           |       |
| <i>Toluene-d8 (Surr)</i>                           |        |     | <i>102 %</i>           | <i>80-120 %</i>         |      | <i>"</i>  |               |      |             |     |           |       |
| <i>4-Bromofluorobenzene (Surr)</i>                 |        |     | <i>100 %</i>           | <i>80-120 %</i>         |      | <i>"</i>  |               |      |             |     |           |       |
| <b>Duplicate (4110432-DUP1)</b>                    |        |     |                        |                         |      | Prepared: 11/17/14 02:00 Analyzed: 11/17/14 04:21 |               |      |             |     |           |       |
| <b>QC Source Sample: MW111-111114 (A4K0383-01)</b> |        |     |                        |                         |      |   |               |      |             |     |           |       |
| <b>EPA 8260B</b>                                   |        |     |                        |                         |      |   |               |      |             |     |           |       |
| Benzene  | ND     | --- | 0.250                  | ug/L                    | 1    | ---   | ND            | ---  | ---         | --- | 30%       |       |
| Toluene  | ND     | --- | 1.00                   | "                       | "    | ---   | ND            | ---  | ---         | --- | 30%       |       |
| Ethylbenzene                                       | ND     | --- | 0.500                  | "                       | "    | ---   | ND            | ---  | ---         | --- | 30%       |       |
| Xylenes, total                                     | ND     | --- | 1.50                   | "                       | "    | ---   | ND            | ---  | ---         | --- | 30%       |       |
| Naphthalene  | ND     | --- | 2.00                   | "                       | "    | ---   | ND            | ---  | ---         | --- | 30%       |       |
| Methyl tert-butyl ether (MTBE)                     | ND     | --- | 1.00                   | "                       | "    | ---   | ND            | ---  | ---         | --- | 30%       |       |
| Isopropylbenzene                                   | ND     | --- | 1.00                   | "                       | "    | ---   | ND            | ---  | ---         | --- | 30%       |       |
| n-Propylbenzene                                    | ND     | --- | 0.500                  | "                       | "    | ---   | ND            | ---  | ---         | --- | 30%       |       |
| 1,2,4-Trimethylbenzene                             | ND     | --- | 1.00                   | "                       | "    | ---   | ND            | ---  | ---         | --- | 30%       |       |
| 1,3,5-Trimethylbenzene                             | ND     | --- | 1.00                   | "                       | "    | ---   | ND            | ---  | ---         | --- | 30%       |       |
| 1,2-Dibromoethane (EDB)                            | ND     | --- | 0.500                  | "                       | "    | ---   | ND            | ---  | ---         | --- | 30%       |       |
| 1,2-Dichloroethane (EDC)                           | ND     | --- | 0.500                  | "                       | "    | ---   | ND            | ---  | ---         | --- | 30%       |       |
| <i>Surr: Dibromofluoromethane (Surr)</i>           |        |     | <i>Recovery: 91 %</i>  | <i>Limits: 80-120 %</i> |      | <i>Dilution: 1x</i>                               |               |      |             |     |           |       |
| <i>1,4-Difluorobenzene (Surr)</i>                  |        |     | <i>103 %</i>           | <i>80-120 %</i>         |      | <i>"</i>  |               |      |             |     |           |       |
| <i>Toluene-d8 (Surr)</i>                           |        |     | <i>102 %</i>           | <i>80-120 %</i>         |      | <i>"</i>  |               |      |             |     |           |       |
| <i>4-Bromofluorobenzene (Surr)</i>                 |        |     | <i>101 %</i>           | <i>80-120 %</i>         |      | <i>"</i>  |               |      |             |     |           |       |
| <b>Matrix Spike (4110432-MS1)</b>                  |        |     |                        |                         |      | Prepared: 11/17/14 02:00 Analyzed: 11/17/14 07:43 |               |      |             |     |           |       |
| <b>QC Source Sample: MW105-111114 (A4K0383-07)</b> |        |     |                        |                         |      |   |               |      |             |     |           |       |
| <b>EPA 8260B</b>                                   |        |     |                        |                         |      |   |               |      |             |     |           |       |
| Benzene  | 22.7   | --- | 0.250                  | ug/L                    | 1    | 20.0  | ND            | 113  | 70-130%     | --- | ---       |       |
| Toluene  | 21.6   | --- | 1.00                   | "                       | "    | "   | ND            | 108  | "           | --- | ---       |       |
| Ethylbenzene                                       | 21.6   | --- | 0.500                  | "                       | "    | "   | ND            | 108  | "           | --- | ---       |       |

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 Project Number: 961M10282-0  
 Project Manager: Kurt Harrington

Reported:  
 11/26/14 16:51

## QUALITY CONTROL (QC) SAMPLE RESULTS

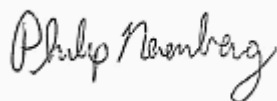
### RBCA Compounds (BTEX+) by EPA 8260B

| Analyte  | Result | MDL | Reporting Limit | Units | Dil. | Spike Amount                                      | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|--|--------|-----|-----------------|-------|------|---|---------------|------|-------------|-----|-----------|-------|
| <b>Batch 4110432 - EPA 5030B</b>                   |        |     |                 |       |      | <b>Water</b>                                      |               |      |             |     |           |       |
| <b>Matrix Spike (4110432-MS1)</b>                  |        |     |                 |       |      | Prepared: 11/17/14 02:00 Analyzed: 11/17/14 07:43 |               |      |             |     |           |       |
| <b>QC Source Sample: MW105-111114 (A4K0383-07)</b> |        |     |                 |       |      |   |               |      |             |     |           |       |
| Xylenes, total                                     | 65.7   | --- | 1.50            | ug/L  | "    | 60.0  | ND            | 109  | "           | --- | ---       |       |
| Naphthalene  | 23.4   | --- | 2.00            | "     | "    | 20.0  | ND            | 117  | "           | --- | ---       |       |
| Methyl tert-butyl ether (MTBE)                     | 22.8   | --- | 1.00            | "     | "    | "   | ND            | 114  | "           | --- | ---       |       |
| Isopropylbenzene                                   | 22.5   | --- | 1.00            | "     | "    | "   | ND            | 113  | "           | --- | ---       |       |
| n-Propylbenzene                                    | 22.3   | --- | 0.500           | "     | "    | "   | ND            | 111  | "           | --- | ---       |       |
| 1,2,4-Trimethylbenzene                             | 22.1   | --- | 1.00            | "     | "    | "   | ND            | 111  | "           | --- | ---       |       |
| 1,3,5-Trimethylbenzene                             | 22.2   | --- | 1.00            | "     | "    | "   | ND            | 111  | "           | --- | ---       |       |
| 1,2-Dibromoethane (EDB)                            | 22.2   | --- | 0.500           | "     | "    | "   | ND            | 111  | "           | --- | ---       |       |
| 1,2-Dichloroethane (EDC)                           | 21.9   | --- | 0.500           | "     | "    | "   | ND            | 109  | "           | --- | ---       |       |

|  |                        |                         |                     |
|--|------------------------|-------------------------|---------------------|
| <i>Surr: Dibromofluoromethane (Surr)</i> | <i>Recovery: 103 %</i> | <i>Limits: 80-120 %</i> | <i>Dilution: 1x</i> |
| <i>1,4-Difluorobenzene (Surr)</i>        | <i>102 %</i>           | <i>80-120 %</i>         | <i>"</i>            |
| <i>Toluene-d8 (Surr)</i>                 | <i>101 %</i>           | <i>80-120 %</i>         | <i>"</i>            |
| <i>4-Bromofluorobenzene (Surr)</i>       | <i>98 %</i>            | <i>80-120 %</i>         | <i>"</i>            |

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Reported:  
 11/26/14 16:51

## SAMPLE PREPARATION INFORMATION

### Gasoline Range Hydrocarbons (Benzene through Naphthalene) by NWTPH-Gx

**Prep: EPA 5030B**

| Lab Number            | Matrix | Method        | Sampled        | Prepared       | Sample Initial/Final | Default Initial/Final | RL Prep Factor |
|-----------------------|--------|---------------|----------------|----------------|----------------------|-----------------------|----------------|
| <b>Batch: 4110432</b> |        |               |                |                |                      |                       |                |
| A4K0383-01            | Water  | NWTPH-Gx (MS) | 11/11/14 14:30 | 11/17/14 02:00 | 5mL/5mL              | 5mL/5mL               | 1.00           |
| A4K0383-02            | Water  | NWTPH-Gx (MS) | 11/11/14 18:55 | 11/17/14 02:00 | 5mL/5mL              | 5mL/5mL               | 1.00           |
| A4K0383-03            | Water  | NWTPH-Gx (MS) | 11/11/14 18:15 | 11/17/14 02:00 | 5mL/5mL              | 5mL/5mL               | 1.00           |
| A4K0383-04            | Water  | NWTPH-Gx (MS) | 11/11/14 17:35 | 11/17/14 02:00 | 5mL/5mL              | 5mL/5mL               | 1.00           |
| A4K0383-05            | Water  | NWTPH-Gx (MS) | 11/11/14 17:00 | 11/17/14 02:00 | 5mL/5mL              | 5mL/5mL               | 1.00           |
| A4K0383-06            | Water  | NWTPH-Gx (MS) | 11/11/14 16:25 | 11/17/14 02:00 | 5mL/5mL              | 5mL/5mL               | 1.00           |
| A4K0383-07            | Water  | NWTPH-Gx (MS) | 11/11/14 15:45 | 11/17/14 02:00 | 5mL/5mL              | 5mL/5mL               | 1.00           |
| A4K0383-08            | Water  | NWTPH-Gx (MS) | 11/11/14 00:00 | 11/17/14 02:00 | 5mL/5mL              | 5mL/5mL               | 1.00           |

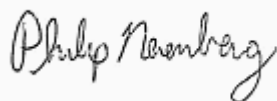
### RBCA Compounds (BTEX+) by EPA 8260B

**Prep: EPA 5030B**

| Lab Number            | Matrix | Method    | Sampled        | Prepared       | Sample Initial/Final | Default Initial/Final | RL Prep Factor |
|-----------------------|--------|-----------|----------------|----------------|----------------------|-----------------------|----------------|
| <b>Batch: 4110432</b> |        |           |                |                |                      |                       |                |
| A4K0383-01            | Water  | EPA 8260B | 11/11/14 14:30 | 11/17/14 02:00 | 5mL/5mL              | 5mL/5mL               | 1.00           |
| A4K0383-02            | Water  | EPA 8260B | 11/11/14 18:55 | 11/17/14 02:00 | 5mL/5mL              | 5mL/5mL               | 1.00           |
| A4K0383-03            | Water  | EPA 8260B | 11/11/14 18:15 | 11/17/14 02:00 | 5mL/5mL              | 5mL/5mL               | 1.00           |
| A4K0383-04            | Water  | EPA 8260B | 11/11/14 17:35 | 11/17/14 02:00 | 5mL/5mL              | 5mL/5mL               | 1.00           |
| A4K0383-05            | Water  | EPA 8260B | 11/11/14 17:00 | 11/17/14 02:00 | 5mL/5mL              | 5mL/5mL               | 1.00           |
| A4K0383-06            | Water  | EPA 8260B | 11/11/14 16:25 | 11/17/14 02:00 | 5mL/5mL              | 5mL/5mL               | 1.00           |
| A4K0383-07            | Water  | EPA 8260B | 11/11/14 15:45 | 11/17/14 02:00 | 5mL/5mL              | 5mL/5mL               | 1.00           |
| A4K0383-08            | Water  | EPA 8260B | 11/11/14 00:00 | 11/17/14 02:00 | 5mL/5mL              | 5mL/5mL               | 1.00           |

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Philip Nerenberg, Lab Director

Amec Environment & Infrastructure, Inc  
7376 SW Durham Road  
Portland, OR 97224

Project: **Fred Meyer (FMPO) Port Orchard**  
Project Number: 961M10282-0  
Project Manager: Kurt Harrington

Reported:  
11/26/14 16:51

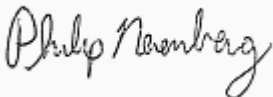
## Notes and Definitions

### Qualifiers:

### Notes and Conventions:

- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis. Results listed as 'wet' or without 'dry' designation are not dry weight corrected.
- RPD Relative Percent Difference
- MDL If MDL is not listed, data has been evaluated to the Method Reporting Limit only.
- WMSC Water Miscible Solvent Correction has been applied to Results and MRLs for volatiles soil samples per EPA 8000C.
- Batch QC Unless specifically requested, this report contains only results for Batch QC derived from client samples included in this report. All analyses were performed with the appropriate Batch QC (including Sample Duplicates, Matrix Spikes and/or Matrix Spike Duplicates) in order to meet or exceed method and regulatory requirements. Any exceptions to this will be qualified in this report. Complete Batch QC results are available upon request. In cases where there is insufficient sample provided for Sample Duplicates and/or Matrix Spikes, a Lab Control Sample Duplicate (LCS Dup) is analyzed to demonstrate accuracy and precision of the extraction and analysis.
- Blank Policy Apex assesses blank data for potential high bias down to a level equal to 1/2 the method reporting limit (MRL), except for conventional chemistry and HCID analyses which are assessed only to the MRL. Sample results flagged with a B or B-02 qualifier are potentially biased high if they are less than ten times the level found in the blank for inorganic analyses or less than five times the level found in the blank for organic analyses.
- For accurate comparison of volatile results to the level found in the blank; water sample results should be divided by the dilution factor, and soil sample results should be divided by 1/50 of the sample dilution to account for the sample prep factor.
- Results qualified as reported below the MRL may include a potential high bias if associated with a B or B-02 qualified blank. B and B-02 qualifications are not applied to J qualified results reported below the MRL.
- QC results are not applicable. For example, % Recoveries for Blanks and Duplicates, % RPD for Blanks, Blank Spikes and Matrix Spikes, etc.
- \*\*\* Used to indicate a possible discrepancy with the Sample and Sample Duplicate results when the %RPD is not available. In this case, either the Sample or the Sample Duplicate has a reportable result for this analyte, while the other is Non Detect (ND).

Apex Laboratories



Philip Nerenberg, Lab Director

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Amec Environment & Infrastructure, Inc  
7376 SW Durham Road  
Portland, OR 97224

Project: Fred Meyer (FMPO) Port Orchard  
Project Number: 961M10282-0  
Project Manager: Kurt Harrington

Reported:  
11/26/14 16:51

Lab # A4K0383 COC 1 of 1

### CHAIN OF CUSTODY

**APEX LABS**

12232 S.W. Garden Place, Tigard, OR 97223 PH: 503-718-2323 Fax: 503-718-0333

|                                   |                                     |  |  |                 |           |         |         |          |                |           |           |               |           |         |                 |                 |   |                |           |        |       |  |  |  |  |
|-----------------------------------|-------------------------------------|--|--|-----------------|-----------|---------|---------|----------|----------------|-----------|-----------|---------------|-----------|---------|-----------------|-----------------|---|----------------|-----------|--------|-------|--|--|--|--|
| Company: <b>AMEC</b>              | Project Mgr: <b>Kurt Harrington</b> | Project Name: <b>Fred Meyer Port Orchard</b> | Project # <b>961M10282-0</b>           |                 |           |         |         |          |                |           |           |               |           |         |                 |                 |   |                |           |        |       |  |  |  |  |
| Address: <b>7376 SW Durham Rd</b> | Phone: <b>503-737-3400</b>          | Project # <b>961M10282-0</b>                 | Email: <b>kurt.harrington@amec.com</b> |                 |           |         |         |          |                |           |           |               |           |         |                 |                 |   |                |           |        |       |  |  |  |  |
| Sample by: <b>Jason Gardner</b>   | Site Location: <b>OR</b>            | Other: <b>WA</b>                             |  |                 |           |         |         |          |                |           |           |               |           |         |                 |                 |   |                |           |        |       |  |  |  |  |
| SAMPLE ID                         | DATE                                | TIME   | MATRIX                                 | # OF CONTAINERS | NWTFH-CID | NWTFH-D | NWTFH-G | R260 VOC | R260 RBDH VOCs | R260 MTEX | R270 SVOC | R270 SIM PAHs | 8102 PCBs | 610 TFO | RCRA Metals (B) | TCLP Metals (B) | As, Sb, Ar, Ba, Bi, Br, Ca, Cd, Cr, Cu, Fe, Ni, Pb, R, Se, Ag, Mn, Mo, Na, Zn | TOTAL MSB TEST | 1200-COLS | 1200-Z | Other |  |  |  |  |
| MW111-11114                       | 11/14                               | 14:30  | W                                      | 3               |           |         |         |          |                |           |           |               |           |         |                 |                 |   |                |           |        |       |  |  |  |  |
| MW109-11114                       |                                     | 18:55  |  |                 |           |         |         |          |                |           |           |               |           |         |                 |                 |   |                |           |        |       |  |  |  |  |
| MW108A-11114                      |                                     | 18:15  |  |                 |           |         |         |          |                |           |           |               |           |         |                 |                 |   |                |           |        |       |  |  |  |  |
| MW108-11114                       |                                     | 17:55  |  |                 |           |         |         |          |                |           |           |               |           |         |                 |                 |   |                |           |        |       |  |  |  |  |
| MW110-11114                       |                                     | 17:00  |  |                 |           |         |         |          |                |           |           |               |           |         |                 |                 |   |                |           |        |       |  |  |  |  |
| MW103-11114                       |                                     | 16:35  |  |                 |           |         |         |          |                |           |           |               |           |         |                 |                 |   |                |           |        |       |  |  |  |  |
| MW105-11114                       |                                     | 15:45  |  |                 |           |         |         |          |                |           |           |               |           |         |                 |                 |   |                |           |        |       |  |  |  |  |
| TS                                |                                     | NA   |  |                 |           |         |         |          |                |           |           |               |           |         |                 |                 |   |                |           |        |       |  |  |  |  |

SPECIAL INSTRUCTIONS:

Normal Turn Around Time (TAT) = 7-10 Business Days

TAT Requested (circle): 1 Day 2 Day 3 Day 4 DAY 5 DAY Other: \_\_\_\_\_

RECEIVED BY: **[Signature]** Date: **11-13-14** Time: **15:40**

RECEIVED BY: **[Signature]** Date: **11-13-14** Time: **15:40**

Company: **AMEC**

Apex Laboratories  
*Philip Nerenberg*

Philip Nerenberg, Lab Director

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**APPENDIX C**

Summary of Historical Analytical Results











**Appendix C  
Groundwater Elevations and Analytical Results  
Fred Meyer Facility, Port Orchard, Washington**

| Well No.                  | Date     | Gasoline-Range Organics                         | Volatile Organic Compounds |          |               |               |           |          |          | Alkylbenzenes & Naphthalene |          |           |           |                   |                   |                 |              |             | Groundwater Levels |                |                |             |        |
|---------------------------|----------|---|----------------------------|----------|---------------|---------------|-----------|----------|----------|-----------------------------|----------|-----------|-----------|-------------------|-------------------|-----------------|--------------|-------------|--------------------|----------------|----------------|-------------|--------|
|                           |          |   | Benzene                    | Toluene  | Ethyl-benzene | Total Xylenes | MTBE      | EDC      | EDB      | i-PB                        | n-PB     | 1,2,4-TMB | 1,3,5-TMB | tertbutyl Benzene | sec-butyl Benzene | n-butyl-Benzene | 4-IP-Toluene | Naphthalene | Casing Elev.       | Depth to Water | NAPL Thickness | Water Elev. |        |
| CAS RN                    |          | not applicable                                  | 71-43-2                    | 108-88-3 | 100-41-4      | 1330-20-7     | 1634-04-4 | 107-06-2 | 106-93-4 | 98-82-8                     | 103-65-1 | 95-63-6   | 108-67-8  | 98-06-6           | 135-98-8          | 104-51-8        | 99-87-6      | 91-20-3     |                    |                |                |             |        |
| MTCA Method A             |          | 800 <sup>a</sup><br>1,000 <sup>b</sup>          | 5                          | 1,000    | 700           | 1,000         | 20        | 5        | 0.01     | None                        | None     | None      | None      | None              | None              | None            | None         | 160         |                    |                |                |             |        |
| <b>Air Sparging Wells</b> |          |   |                            |          |               |               |           |          |          |                             |          |           |           |                   |                   |                 |              |             |                    |                |                |             |        |
| AS-5                      | 9/16/08  | 80 U  | 0.205 U                    | 1.00 U   | 0.500 U       | 1.50 U        | 1.00 U    | 0.500 U  | 0.500 U  | 0.500 U                     | 0.500 U  | 1.00 U    | 1.00 U    | 1.00 U            | 10.0 U            | 1.00 U          | 1.00 U       | 5.00 U      | NA                 | 20.25          | 0.00           | NA          |        |
| AS-9                      | 9/16/08  | 80 U  | 0.205 U                    | 1.00 U   | 0.500 U       | 1.50 U        | 1.00 U    | 0.500 U  | 0.500 U  | 0.500 U                     | 0.500 U  | 1.00 U    | 1.00 U    | 1.00 U            | 10.0 U            | 1.00 U          | 1.00 U       | 5.00 U      | NA                 | 24.77          | 0.00           | NA          |        |
| AS-10                     | 9/16/08  | 0.0800 U  | 0.205 U                    | 1.00 U   | 0.500 U       | 1.50 U        | 1.00 U    | 0.500 U  | 0.500 U  | 0.500 U                     | 0.500 U  | 1.00 U    | 1.00 U    | 0.500 U           | 10.0 U            | 1.00 U          | 1.00 U       | 5.00 U      | NA                 | 23.46          | 0.00           | NA          |        |
| <b>Destroyed Wells</b>    |          |   |                            |          |               |               |           |          |          |                             |          |           |           |                   |                   |                 |              |             |                    |                |                |             |        |
| MW-104                    | 05/22/91 | 1,000   | 1.0 U                      | 20 U     | 1.0 U         | 1.0 U         | -         | -        | -        | -                           | -        | -         | -         | -                 | -                 | -               | -            | -           | -                  | -              | -              | -           |        |
| MW-104                    | 03/25/93 | 250 U   | 5.0 U                      | 5.0 U    | 5.0 U         | 15 U          | -         | -        | -        | -                           | -        | -         | -         | -                 | -                 | -               | -            | -           | -                  | -              | -              | -           |        |
| MW-104                    | 05/28/97 | 250 U   | 1.0 U                      | 1.0 U    | 1.0 U         | 3.0 U         | -         | -        | -        | -                           | -        | -         | -         | -                 | -                 | -               | -            | -           | -                  | -              | -              | -           |        |
| MW-104                    | 02/18/98 | 120   | 2.6                        | 1.0      | 0.88          | 1.0           | -         | -        | -        | -                           | -        | -         | -         | -                 | -                 | -               | -            | -           | -                  | -              | -              | -           |        |
| MW-104                    | 8/1999   | Abandoned August 1999                           |                            |          |               |               |           |          |          |                             |          |           |           |                   |                   |                 |              |             |                    |                |                |             |        |
| MW-106                    | 11/2/99  | ^   | ^                          | ^        | ^             | ^             | ^         | ^        | ^        | ^                           | ^        | ^         | ^         | ^                 | ^                 | ^               | ^            | ^           | ^                  | 311.73         | 24.95          | 0.00        | 286.78 |
| MW-106                    | 3/1/00   | 100 U   | 1.0 U                      | 1.0 U    | 1.0 U         | 1.0 U         | 1.0 U     | 1.0 U    | 1.0 U    | -                           | -        | -         | -         | -                 | -                 | -               | -            | -           | -                  | 311.73         | 20.88          | 0.00        | 290.85 |
| MW-106                    | 5/24/00  | ^   | ^                          | ^        | ^             | ^             | ^         | ^        | ^        | ^                           | ^        | ^         | ^         | ^                 | ^                 | ^               | ^            | ^           | ^                  | 311.73         | 25.93          | 0.00        | 285.80 |
| MW-106                    | 7/10/00  | 50 U  | 1.0 U                      | 1.0 U    | 1.0 U         | 2.0 U         | 1.0 U     | 1.0 U    | 1.0 U    | -                           | -        | -         | -         | -                 | -                 | -               | -            | -           | -                  | 311.73         | 27.00          | 0.00        | 284.73 |
| MW-106                    | 10/19/00 | 50 U  | 1.0 U                      | 1.0 U    | 1.0 U         | 2.0 U         | 1.0 U     | 1.0 U    | 1.0 U    | 1 U                         | 1 U      | 1 U       | 1 U       | 1 U               | 1 U               | 5 U             | 1 U          | 25 U        | 311.73             | 25.63          | 0.00           | 286.10      |        |
| MW-106                    | 12/13/00 | 50 U  | 0.5 U                      | 0.5 U    | 0.5 U         | 1.5 U         | 0.5 U     | -        | -        | -                           | -        | -         | -         | -                 | -                 | -               | -            | -           | -                  | 311.73         | 26.30          | 0.00        | 285.43 |
| MW-106                    | 3/19/01  | ^   | ^                          | ^        | ^             | ^             | ^         | ^        | ^        | ^                           | ^        | ^         | ^         | ^                 | ^                 | ^               | ^            | ^           | ^                  | 311.73         | Dry            | Dry         | Dry    |
| MW-106                    | 6/28/01  | Well destroyed during roadway paving activities |                            |          |               |               |           |          |          |                             |          |           |           |                   |                   |                 |              |             |                    |                |                |             |        |
| MW-107                    | 11/2/99  | ^   | ^                          | ^        | ^             | ^             | ^         | ^        | ^        | ^                           | ^        | ^         | ^         | ^                 | ^                 | ^               | ^            | ^           | ^                  | 310.59         | 23.61          | 0.00        | 286.98 |
| MW-107                    | 3/1/00   | 100 U   | 1.0 U                      | 1.0 U    | 1.0 U         | 1.0 U         | 1.0 U     | 1.0 U    | 1.0 U    | -                           | -        | -         | -         | -                 | -                 | -               | -            | -           | -                  | 310.59         | 19.46          | 0.00        | 291.13 |
| MW-107                    | 5/24/00  | ^   | ^                          | ^        | ^             | ^             | ^         | ^        | ^        | ^                           | ^        | ^         | ^         | ^                 | ^                 | ^               | ^            | ^           | ^                  | 310.59         | 23.54          | 0.00        | 287.05 |
| MW-107                    | 7/10/00  | 50 U  | 1.0 U                      | 1.0 U    | 1.0 U         | 2.0 U         | 1.0 U     | 1.0 U    | 1.0 U    | -                           | -        | -         | -         | -                 | -                 | -               | -            | -           | -                  | 310.59         | 24.79          | 0.00        | 285.80 |
| MW-107                    | 10/19/00 | 50 U  | 1.0 U                      | 1.0 U    | 1.0 U         | 2.0 U         | 1.0 U     | 1.0 U    | 1.0 U    | 1 U                         | 1 U      | 1 U       | 1 U       | 1 U               | 1 U               | 5 U             | 1 U          | 25 U        | 310.59             | 23.87          | 0.00           | 286.72      |        |
| MW-107                    | 12/13/00 | 50 U  | 0.5 U                      | 0.5 U    | 0.5 U         | 1.5 U         | 0.5 U     | -        | -        | -                           | -        | -         | -         | -                 | -                 | -               | -            | -           | -                  | 310.59         | 24.50          | 0.00        | 286.09 |
| MW-107                    | 3/19/01  | ^   | ^                          | ^        | ^             | ^             | ^         | ^        | ^        | ^                           | ^        | ^         | ^         | ^                 | ^                 | ^               | ^            | ^           | ^                  | 310.59         | 26.67          | 0.00        | 283.92 |
| MW-107                    | 6/28/01  | Well destroyed during roadway paving activities |                            |          |               |               |           |          |          |                             |          |           |           |                   |                   |                 |              |             |                    |                |                |             |        |
| MW-108                    | 11/2/99  | ^   | ^                          | ^        | ^             | ^             | ^         | ^        | ^        | ^                           | ^        | ^         | ^         | ^                 | ^                 | ^               | ^            | ^           | ^                  | 309.94         | 22.96          | 0.00        | 286.98 |
| MW-108                    | 3/1/00   | 100 U   | 1.0 U                      | 1.0 U    | 1.0 U         | 1.0 U         | 1.0 U     | 1.0 U    | 1.0 U    | -                           | -        | -         | -         | -                 | -                 | -               | -            | -           | -                  | 309.94         | 18.55          | 0.00        | 291.39 |
| MW-108                    | 5/24/00  | ^   | ^                          | ^        | ^             | ^             | ^         | ^        | ^        | ^                           | ^        | ^         | ^         | ^                 | ^                 | ^               | ^            | ^           | ^                  | 309.94         | 22.72          | 0.00        | 287.22 |
| MW-108                    | 7/10/00  | 50 U  | 1.0 U                      | 1.0 U    | 1.0 U         | 2.0 U         | 1.0 U     | 1.0 U    | 1.0 U    | -                           | -        | -         | -         | -                 | -                 | -               | -            | -           | -                  | 309.94         | 24.48          | 0.00        | 285.46 |
| MW-108                    | 10/19/00 | 50 U  | 1.0 U                      | 1.0 U    | 1.0 U         | 2.0 U         | 1.0 U     | 1.0 U    | 1.0 U    | 1 U                         | 1 U      | 1 U       | 1 U       | 1 U               | 1 U               | 5 U             | 1 U          | 25 U        | 309.94             | 20.46          | 0.00           | 289.48      |        |
| MW-108                    | 12/13/00 | 50 U  | 0.5 U                      | 0.5 U    | 0.5 U         | 1.5 U         | 0.5 U     | -        | -        | -                           | -        | -         | -         | -                 | -                 | -               | -            | -           | -                  | 309.94         | 23.47          | 0.00        | 286.47 |
| MW-108                    | 3/19/01  | 50 U  | 1.0 U                      | 1.0 U    | 1.0 U         | 2.0 U         | 1.0 U     | 1.0 U    | 1.0 U    | 1 U                         | 1 U      | 1 U       | 1 U       | 1 U               | 1 U               | 5 U             | 1 U          | 25 U        | 309.94             | 25.43          | 0.00           | 284.51      |        |
| MW-108                    | 6/28/01  | Well destroyed during roadway paving activities |                            |          |               |               |           |          |          |                             |          |           |           |                   |                   |                 |              |             |                    |                |                |             |        |

Notes:  
 MTCA Method A : Washington Department of Ecology Model Toxics Control Act Method A screening criteria  
 NAPL: non-aqueous phase liquid  
 MTBE: methyl tert-butyl ether  
 EDC: 1,2-dichloroethane  
 EDB: 1,2-dibromoethane  
 i-PB: isopropylbenzene  
 n-PB: n-propylbenzene  
 TMB: trimethylbenzene  
 \* Corrected field label error for switched MW-103 and MW-105 samples  
 4-IP-Toluene: 4-isopropyltoluene  
 µg/L: micrograms per liter  
<sup>a</sup> Applicable cleanup level if benzene is detected in the groundwater sample.  
<sup>b</sup> Applicable cleanup level if benzene is not detected in the groundwater sample.  
**Bold** values indicate concentrations detected above laboratory reporting limit (MRL)  
 NM: not measured  
 -: The analyte was not tested for by this method  
 ^: not sampled  
 U: The analyte was not detected above the MRL or method detection limit (MDL) presented  
 J: The analyte detected was at a concentration greater than or equal to the MDL, but less than the MRL. The concentration is an approximate value  
**Red** values indicate the concentration exceeds the MTCA Method A cleanup level  
 MW-105 resurveyed on January 24, 2009 following repairs. Top of casing elevation previously 311.99 feet, now 310.46 feet.